REPUBLIC OF MAURITIUS

Digital Government Transformation Strategy

2018 - 2022 >

Central Informatics Bureau
Ministry of Technology, Communication & Innovation

Acknowledgement

This strategy has been prepared by the Central Informatics Bureau (CIB) of the Ministry of Technology, Communication and Innovation (MTCI). It is the culmination of collaborative work that could not have been completed without the concerted effort of many people.

First and foremost, the CIB wishes to express its sincere gratitude to Hon. Yogida Sawmynaden, Minister of Technology, Communication and Innovation for giving us the opportunity to shape the digital government vision through this document.

We would also like to thank:

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- Consumer associations, academic institutions and students, including University of Mauritius, University of Technology and Open University of Mauritius for their inputs in the G2C survey;
- Gartner for validation of the strategy; and
- Citizens, private sector and government agencies for their keen interest and inputs provided through the digital government needs survey.

The CIB also wishes to place on record its appreciation to all those, who, in one way or another, have been involved in the formulation of this Digital Government Transformation Strategy 2018–2022.

Executive Summary

The e-Government Strategy was formulated in 2013 to re-engineer the e-Government agenda and to rethink delivery of its services and operations where citizens are given pride of place. Five years onward, around 75 % of the e-Government Strategy has been implemented and helped to further integrate technology in support of government operations and service delivery. Policies and projects in areas of data sharing, open source, open data, e-Participation, e-Payment, digital signatures, document management system, e-Procurement, mobile apps among others have reformed how Government transacts with its stakeholders while improving international digital indices.

Recognising the positive impact of e-Government on the development of the Republic of Mauritius, the Digital Government Transformation Strategy 2018-2022 (DGTS) lays emphasis on how critical it is to use and reuse data to support the work of Government, to optimise, transform and create better government services and to achieve large-scale business optimisation that improves effectiveness. Against this backdrop, a methodology based on 12 digital government pillars was adopted to guide the formulation of the strategy. To make the methodology grounded in reality, the strategy adopts a needs-centric approach encompassing situational analysis, e-readiness, digital maturity assessment, digital synergies analysis, data insights from digital government survey with citizens, businesses and government agencies as well as scanning of best practices, both in Mauritius and worldwide, for evidenced-based solutions. Application of the methodology and interaction with Gartner yielded in following main recommendations:

Digital-by-Default Services
Provision of services via the digital channel by default while at the same time assist users with limited digital skills in using digital services via support desks.

Once-Only Principle
Capture data only once from citizens and stakeholders and reuse the data (e.g. copy of IDs, proof of address, birth/marriage/death certificate) if it is already available within government.

End-to-end Services
Transformation of existing services into transactional services which are end-to-end, paperless and do not require physical travel or office hopping, through cross-agency collaboration, interoperability and data sharing between systems.

Co-creation of Services
Engagement and working closely with citizens and other stakeholders in the conception and design of services.

Open Data-by-Default
Establishment of mechanisms to ensure regular release of non-personal and non-sensitive data of public interest in an open and anonymised format by Ministries/Departments and engagement of public for co-creation of open data-driven apps.

Data Driven Culture
Integrate use of data for informed decision-making, policy formulation, monitoring and continuously improving quality of services.
Measuring success and benefits of Government services using key performance indicators and publication of public service usage statistics.

E-Business Strategies
Formulation of e-Business strategies at Ministries/Departments level for streamlining and simplification of their business processes and modes of operation with a blueprint to address key elements of digital transformation.

E-Participation
Provision of digital platforms for integrating citizens and other stakeholders' views in government decision-making processes.
Engagement with public and dissemination of information by Ministries/departments on social media channels.

E-Procurement-by-default
Adoption of "e-Procurement-by-default" principle and provision of training and support to both public bodies and suppliers.

Agile Principle
Adoption of an iterative way of implementing services through harvesting user feedback and improving services until fully operational.

Digital Skills
Review national digital skills programme to cater for digital natives and digital immigrants.
Empowerment of public officials and service owners with digital skills and capabilities to use technologies and support digital service delivery.
Foster digital savviness in high-ranking executives to lead the digital transformation through executive trainings.
Continuous and customised capacity building programmes and industry exposure on technology and business domains to ICT staff supporting the digital ecosystem.

E-Governance
Governance structures such as High-level Digital Government Task Force, Minister-led Committees, and Project Steering Committees to look into whole-of-Government, organisational-level and project-level digital transformation.

Digital Inclusiveness
Provision of online services, which are easy to use for people with varying abilities.
Provision of mobile-friendly services that is the preferred channel of most citizens.
Tackling uptake of government services through awareness campaigns using digital marketing channels.

Through harnessing of opportunities for digital transformation in the Public Sector, the DGTS is aligned with, and goes hand-in-hand with the Public Sector Business Transformation Strategy (PSBTS) for achieving Government's Vision 2030.

On a higher note, the DGTS provides the Government with digital policies to attain all 17 Sustainable Development Goals.
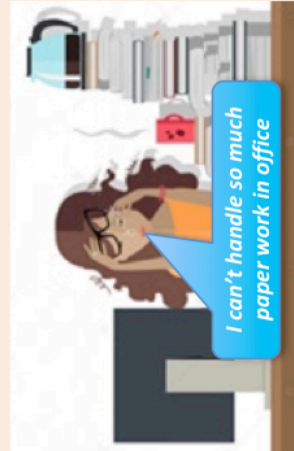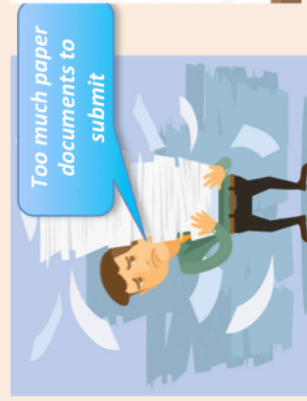
Digital Government Transformation Strategy 2018 - 2022

Today's Pains

Interaction between citizens, businesses and Government require processes to be re-aligned with evolving digital needs of stakeholders.

Leveraging Digital Revolution

'Digital-by-Default' government services to transform public service delivery.
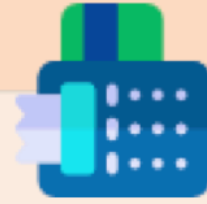
TODAY

We are fed up of long waiting time

I can't handle so much paper work in office

I wish I could have access to more open and transparent data

I hate transactions over the counter

Too much paper documents to submit

I need more engagement and participation

DIGITAL TRANSFORMATION

GDP Growth

Quality of Life

Economic Competitiveness

Productivity Growth

Public Service Delivery

Business Potential
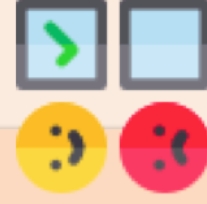
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1   Introduction

Citizens and businesses interact with Government at various points in time, not out of choice, but out of necessity. Until recently these transactions have been carried out over the counters using paper-based documents. Digital technologies are changing the way governments operate and interact with citizens, businesses, and other government agencies. Mauritius has to adapt to this digital revolution.

In 2013, an e-Government Strategy 2013–2017 was developed taking into consideration internal and external elements that constitute the building blocks for a successful e-Government. It emphasized on creating an open, participatory and trustworthy public sector geared towards social inclusiveness and government accountability.

In the margins of the e-Government Strategy 2013–2017, new approaches were adopted to support a shift from counter services to digitalised services, through a focus on environment in which citizens and businesses determine their own needs and address them in partnership with Government. Government has modernised legacy systems, implemented a number of online services and mobile applications, as well as an open data portal amongst others. These measures have assisted and guided Government to drive its e-Government agenda.

Although Government has made significant progress in digitising its services and operations, there is still room for improvement the more so that Government is facing increasing expectations and greater demands from digitally engaged citizens and businesses for a wider range of online services which are more personalised and 'individual-oriented' rather than just 'customer-oriented'.

Moreover, the Vision 2030 blueprint has set political objectives to achieve greater trust in Government through responsiveness and transparency, and by providing opportunities for greater engagement by service users and citizens in general.

Moving to the next level of digital government, calls for a more transformative set of changes to renew public sector service delivery. Within the digital government agenda, Government will make greater use of digital technologies and data sharing to achieve openness, transparency, engagement and informed decision-making as well as to offer integrated services to citizens and businesses.

This Digital Government Transformation Strategy 2018-2022 (DGTS) outlines the governmental imperative for making government services 'digital by default' and improving the efficiency, effectiveness and governance of public services through a successful digitalised transformation. The DGTS shapes government priorities and promotes collaboration in the design of government services.

1.1 Objectives

The DGTS sets the course for accelerated public sector digitisation efforts in its digital transformation journey. It makes recommendations that culminate into better policies and services that are simple, smart and seamless.

The strategy charts the direction for increased operational effectiveness and efficiency, and better service to citizen, business and government constituents. By putting each of the elements of this strategy in place, Mauritius will be poised to join the digitally advanced and inclusive countries in the world.

1.2 Scope

The DGTS provides directions for a digital government aligned with the Vision 2030 and Public Sector Business Transformation Strategy.

The strategy encompasses:

- A review of the existing e-Government Strategy 2013-2017;
- A needs-centric approach through consultations and surveys with citizens, businesses as well as government agencies to tackle the current challenges of Mauritius;
- Recommendations which will leverage on latest technological trends and best practice; and
- An action plan to accompany government agencies in the implementation of the strategy.

While the DGTS provides an overarching digital policy relevant for the whole of Government irrespective of any development sector, Ministries and Departments should also ensure that they implement e-Business strategies for their respective sectors, which include business process reengineering and a roadmap to achieve digital transformation of their services and processes, in line with the DGTS.

2   Approach and Methodology

A successful strategy stems out from a well-defined methodology. A methodology provides for a set of standards, practices and direction to be followed.

2.1 Digital Government Transformation Strategy Framework

The DGTS is governed by a framework, as depicted in Figure 1, standing on the 12 principles of OECD recommendation on digital government strategies (OECD 2016).

The framework ensures that the recommendations of the DGTS are evidence-based and proven to "work".
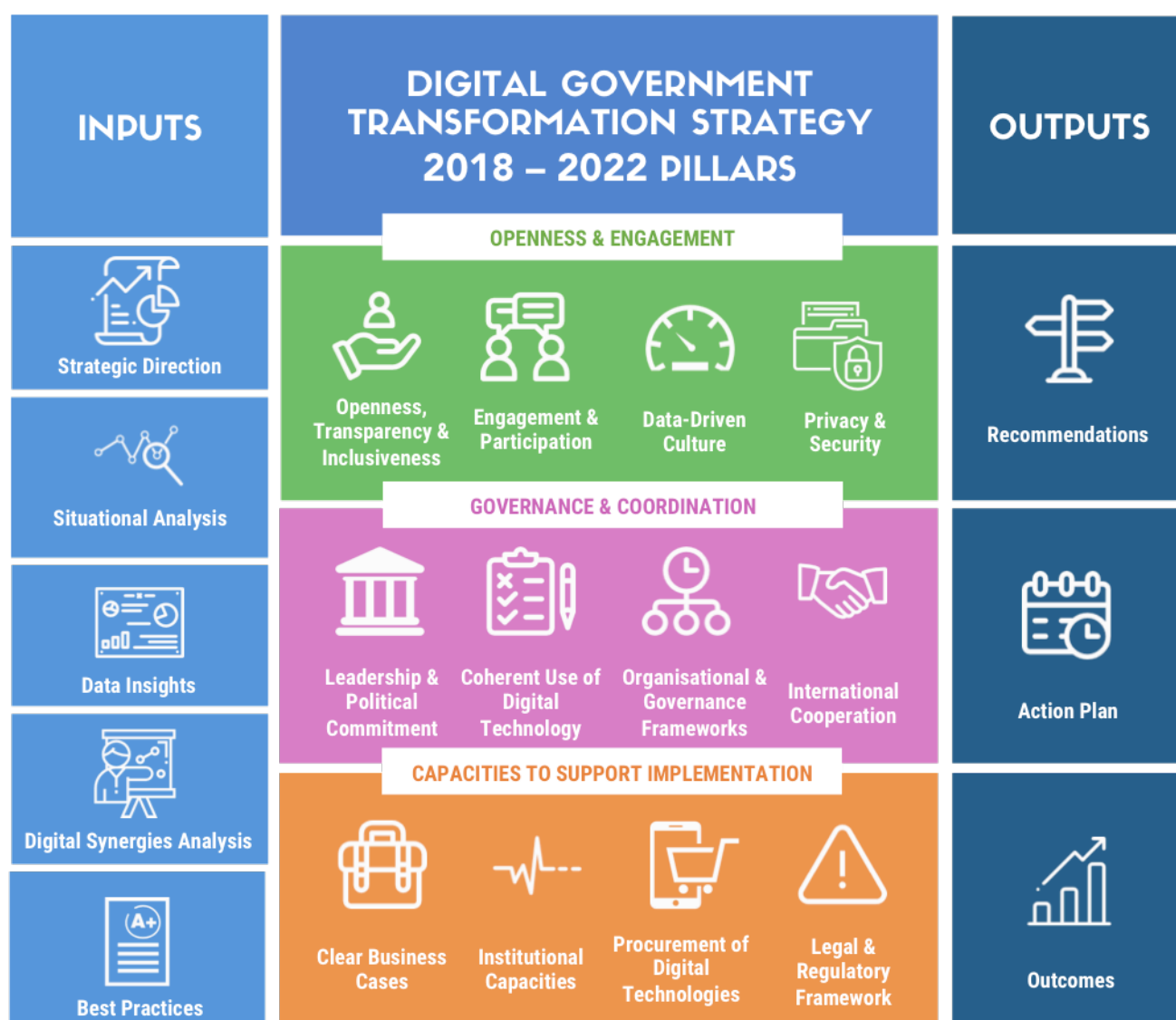
Figure 1: Digital Government Transformation Strategy Framework

Actions based on the following 12 principles ensure that the DGTS has the most impact in bringing government closer to citizens and businesses and create a more open, transparent, innovative, participatory and trustworthy government:

1. ***Openness, transparency*** in government operations and ***inclusiveness*** of stakeholders for greater trust in government and increased social well-being;

2. ***Engagement and participation of stakeholders*** in policymaking and service delivery to foster user-centred and user-driven service design and delivery;

3. ***Creation of a data-driven culture*** that embeds the use of data throughout the policy-cycle to improve existing processes and dynamics in the public sector;

4. ***Protecting privacy*** of people and ensuring digital ***security*** to preserve trust in government institutions and foster greater interactions with Government through digital means;

5. ***Leadership and political commitment*** for increased support for the digital government agenda;

6. ***Coherent use of digital technology across policy areas*** to ensure common vision and objectives for public sector digitalisation;

7. ***Effective organisation and governance frameworks*** to coordinate the Digital Government Transformation Strategy;

8. ***Strengthen international cooperation*** with governments to facilitate sharing skills, knowledge and experiences;

9. ***Development of clear business cases*** to sustain the funding and success of digital technologies projects;

10. ***Reinforce institutional capacities*** to better support implementation of digital government initiatives;

11. ***Procurement rules*** that are compatible with current trends in technology and ***modern methods of ICT deployment*** to support the digital transformation of the public sector;

12. ***Legal and regulatory framework*** to address digital opportunities.

The framework has been contextualised to the local environment through the use of information generated via the process depicted in Figure 2.
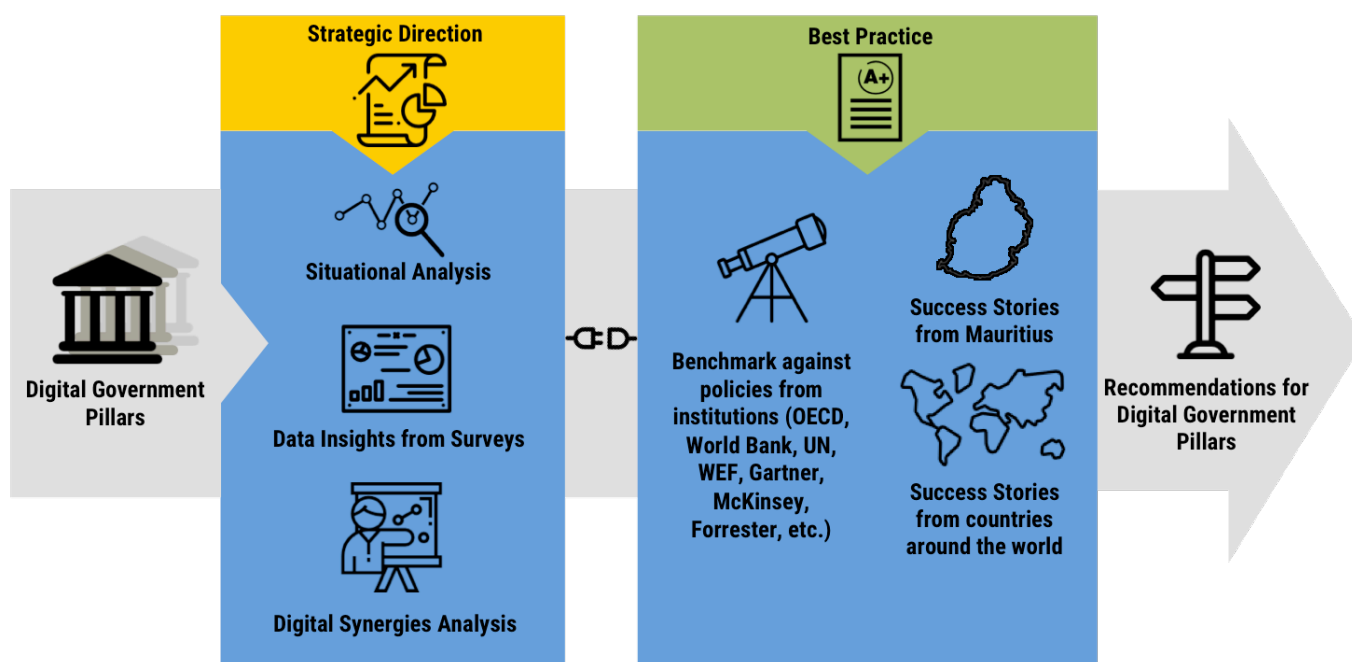
Figure 2: Process for formulation of recommendations

- *Strategic Direction*: Recommendations and action plans have been aligned to national priorities set by existing strategies such as Vision 2030 and Public Sector Business Transformation.

- *Situational Analysis*: The current state of government was assessed to gauge progress made and the level of maturity reached with respect to digital transformation;

- *Data Insights*: Analysis of data collected from surveys and consultations have been used to align the strategy with the needs of stakeholders;

- *Digital Synergies Analysis*: Based on digital synergies analysis, Government can build on its strengths, correct weaknesses and protect against threats and exploit new opportunities that digital technologies may offer;

- *Best Practice*: To address challenges and areas of improvement raised as a result of situational, digital synergies and data analysis, evidenced-based solutions were identified through research on international best practices as well as success stories within Government.

The contextual inputs from the processes depicted in Figure 2 were used for the formulation of *recommendations* under each pillar. Each recommendation is then accompanied by an *action plan* to be implemented by government agencies in order to realise *strategic outcomes*.

2.2 Needs-centric approach

The DGTS adopts a needs-centric approach for the digital transformation of Government with a view to tackle the current challenges of Mauritius, by involving citizens, businesses as well as Government agencies.

2.2.1 Digital Government Survey

A Digital Government Survey was conducted and consisted of:

- Three questionnaires (Government to Citizen - G2C, Government to Business - G2B and Government to Government - G2G) which were published online; and

- A Government to Citizen field survey in collaboration with Statistics Mauritius with a population of 880 households spread around the island.

To encourage public to respond to the online survey, the following actions were taken:

- Online Surveys were advertised in the press;

- Government agencies were informed through Government Email Service;

- The Ministry issued a circular to Ministries and Departments about the survey;

- The Business community including Economic Development Board, Small and medium enterprises, Mauritius IT Association (MITIA), Mauritius Export Association (MEXA), Business Mauritius, Mauritius Chamber of Commerce and Industry (MCCI) were invited to participate in the survey; and

- Consumer associations, academic institutions and students including, University of Mauritius, University of Technology and Open University of Mauritius were invited to participate in the survey.
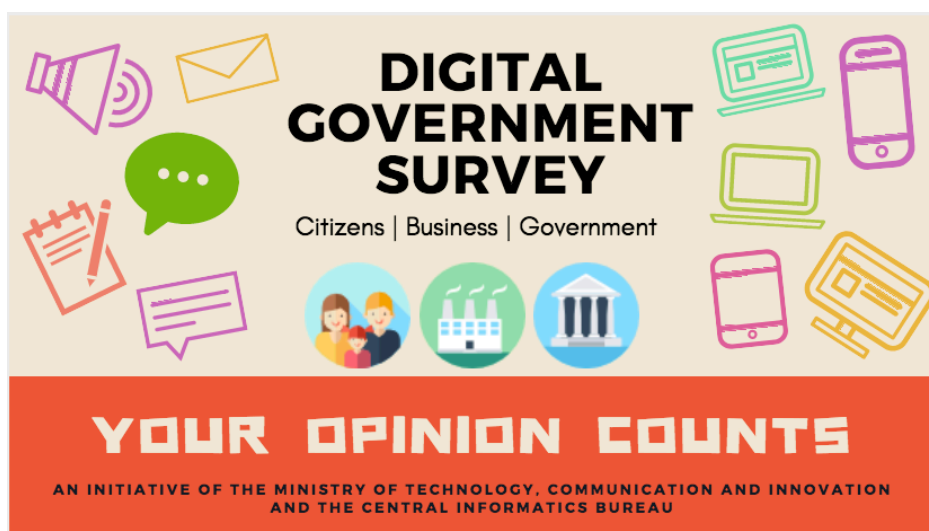
The questionnaires were adapted from and aligned with international digital government surveys namely:

- OECD survey on Digital Government Performance targeting 25 OECD member countries (OECD 2014)

- Deloitte Digital global survey on digital transformation of governments involving 1,200 government officials from over 70 countries (Deloitte Digital 2015).

- European Commission's eGovernment Benchmark Framework User Survey in each of EU member states totalling 27,000 respondents (European Commission 2015).

- United Nations' Member States Questionnaire (MSQ) in preparation of the United Nations E-Government Survey 2018 publication (United Nations 2017)

2.2.2 Consultation

Consultations were held with stakeholders through workshops namely:
- Executive Workshop on "Oracle in Government", April 2018
- Digital Mauritius 2030 Consultative Workshop, July 2017
- Open Data Portal Workshop by World Bank, May 2017

Inputs from the following stakeholders were also gathered during the focused working groups as part of the Digital Mauritius 2030 Consultative Workshop: -
- Prime Minister's Office
- Ministry of Education and Human Resources, Tertiary Education and Scientific Research
- Ministry of Technology, Communication and Innovation
- Ministry of Health and Quality of Life
- Ministry of Social Security, National Solidarity and Environment and Sustainable Development
- Ministry of Gender Equality, Child Development and Family Welfare
- Ministry of Civil Service and Administrative Reforms
- Civil Status Division (CSD)
- Procurement Policy Office
- National Computer Board
- Government Online Centre
- Economic Development Board (formerly Board of Investment)
- Mauritius IT Industry Association (MITIA)
- Mauritius Post Ltd

Interactions through working sessions and web conferences were held with Gartner experts regarding digital transformation in April and May 2018.

Moreover, a validation workshop with all stakeholders was carried out in June 2018 in view of finalising the report.

The DGTS was consolidated following outcome from interactions with Gartner, and stakeholders during the validation workshop.

3   Strategic Direction

3.1 Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) is a universal call to action for every country to work together on 17 critical measures (Figure 3) that embody the collective aspirations of the world's citizens, i.e. to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.

Figure 3: Sustainable Development Goals (SDGs)

> ICT acts as an essential catalyst in driving rapid transformation of nearly every aspect of our lives such that it is a powerful enabler in the implementation of the 17 SDGs. Annex B provides a non-exhaustive list of ICT applications as best practice for facilitating implementation of SDGs. In view of attaining SDGs, government agencies can adopt the ICT applications through the implementation of recommendations proposed in the DGTS.

3.2 Vision 2030

In 2015, Government formulated the **Vision 2030 Blueprint** with the objective of transforming Mauritius into a high income, sustainable, innovative and inclusive economy, with modern infrastructure, global connectivity and advanced skills and technology.

Government aims to embed the use of technology in the day-to-day life of every Mauritian, which would require that government services, businesses, lifestyle as well as our physical infrastructures be centered around digital infrastructure. A number of initiatives namely, smart cities and WIFI spots in public places, are already off the ground.

The Vision 2030 Blueprint also ambitions to transform Mauritius into a SMART island and provide for high end activities like software and animation development, big data analytics, disaster recovery and cloud computing amongst others, using innovative and state-of-the art technology and communication infrastructure.

3.3 Public Sector Business Transformation Strategy

The Government has prepared the Public Sector Business Transformation Strategy (PSBTS) with the technical assistance of the Commonwealth Secretariat. The PSBTS aims to transform the Mauritius Public Service to be:

- Highly efficient, where performance, accountability, excellence and results are the standard way of doing business;
- Adaptive and responsive with a continuous focus on being a catalyst, facilitator and enabler of nation building, socio-economic development and realising the government's vision;
- Citizen-centred in policy development and service delivery, informed by research, evidence and client feedback;
- Technology-enabled, open and forward-thinking, with smart practices and processes that continuously improve and have in-time adjustment;
- Cross-cutting and boundary-less in sharing information and knowledge, with a strong focus on integrated strategy and priority-setting, resource allocation, planning and execution; and
- A merit-based workforce that is well developed in both capacity and capability achieved through strategic human resource planning and talent development, learning, coaching and mentoring.

The PSBTS is founded on 10 pillars that includes digital transformation and recommends:

- Use of technology for improved quality service delivery, efficiency, productivity, performance and results, new behaviour and mindsets
- Use of all available e-platforms, tools, apps and technology to drive digital transformation and e-Participation by the public and clients
- To be digitally curious
- Sharing of information among all Ministries
- Use of centrally-pooled, accessible and re-usable data so that Public Officers can take decisions in a standardised and consistent manner
- Dedicate resources, time and effort in developing a new work culture for a successful digital transformation.

> **While the PSBTS recommends optimisation and transformation of government's business models to bring significant value to its constituents, the DGTS addresses how information and technology will be used to achieve business success. The business strategy provides the context, and shapes the design of the digital strategy. Both strategies thus go hand in hand in achieving whole-of-government transformation through coherent actions. Annex C describes actions recommended in the DGTS to achieve the strategic objectives of the PSBTS.**

3.4 Vision

The vision of government is to transform Mauritius into a high income, sustainable, innovative and inclusive economy, with modern infrastructure, global connectivity and advanced skills and technology.

3.5 Benefits/Outcomes

The DGTS has several priority areas and sets out to accomplish:

1. Access to high-quality government information and services anywhere, anytime, on any device;
2. Innovative approaches for contribution to national development and long-term sustainable growth;
3. Increased efficiency and effectiveness of government agencies;
4. Improved productivity and transparency of government operations;
5. Enhanced interaction between government agencies and stakeholders including citizens and businesses; and
6. Delivery of better digital services using latest tools and technologies.

Against this backdrop, the strategy sets the scene to equip citizens, businesses and government for the future and help build a sustainable and secure digital Mauritius

4   Situational Analysis

4.1 E-Government Strategy 2013-2017

The MTCI through the CIB formulated the e-Government Strategy 2013-2017 and proposed a number of initiatives to be put in place for improving effectiveness and efficiency of Ministries and Departments, with emphasis on service delivery to businesses and citizens. Around 75% of the initiatives have already been implemented:

- E-Procurement
- E-Work Permit
- Open Source Policy and Strategy
- Facility to effect electronic payment for Government services
- Mobile Apps
- Online publication of examination results (SC and HSC)
- Online Application for Building and Land Permit
- Online Participation of Citizens in decision-making (Vision 2030, Budget 2016-2017, Budget 2017-2018)
- Data Sharing between Government agencies through the InfoHighway
- New e-Services

E-Government Strategy 2013-2017

The Strategy proposed a number of initiatives to be put in place for improving effectiveness and efficiency of Ministries and Departments, with emphasis on enhancing service delivery to **citizens**, **businesses** and **government** constituents.
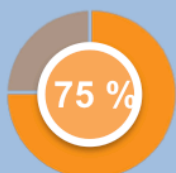
75 % Overall implementation status of strategy's recommendations

Mauritius 1st in e-Government in Africa as per UN

Some of the E-Government Initiatives Implemented

Government Efficiency

- Open Source Strategy
- Open Data Policy
- Open Data Readiness Assessment
- Green ICT Measures (EnergyStar, EPEAT, Duplex Printing, Document Management Systems)
- Reforms Steering Council set up and e-Government related meetings held
- Data Sharing Policy, Data Architecture & Business Registration Act to facilitate data sharing
- InfoHighway data sharing platform
- Project Management Manual for ICT projects
- E-Government measurement metric
- ICT courses by E-Learning Portal
- Physical Assets Management System (Stores Package)
- Social Media Guideline

Citizen Convenience

- Open Data Portal with 100 datasets
- Helpdesk on Portal and e-Services
- New e-Services on Government Portal
- Job portal (mauritiusjobs.mu) operational
- Crowdsourcing platforms for engaging with Citizens (e.g. Mauritiusbudget.com, Vision2030, CSU.mu)
- Online publication of examination results (SC & HSC)
- Application for driver's license
- Citizen Support Portal handles citizens' complaints and requests online
- Electronic payment for Government services
- Mobile App Platform with 3 Mobile Apps launched

Business Facilitation

- e-Judiciary at Commercial Court
- Computerised Library System at Judiciary
- e-Procurement System operational
- e-Work Permit System operational
- Single Window for trade facilitation operational
- Online Building and Land Permit (BLP) implemented
- End-to-end systems e.g. e-Registrar-General, e-Work Permit, e-Procurement
- Use of Digital Signatures in newly implemented systems such as e-Registrar-General and e-Procurement.
- Online filing of objections at Assessment Review Committee

Completed

4.2 International Digital Government Indices

In the last 3 years, Mauritius has seen significant achievements in e-Government and this is reflected in various global indices.

4.2.1 E-Government Development Index (EGDI)

The UN e-Government Survey 2018 is a benchmarking tool that provides a comparative assessment of the e-government development of UN Member States. It offers an interactive snapshot of each country's e-government development from a regional and global perspective. The index ranks Mauritius first in Africa ahead of South Africa and Tunisia.

4.2.2 Network Readiness Index

The Global Information Technology Report 2016, released by the World Economic Forum (WEF), includes a Network Readiness Index, which measures the capacity of countries to leverage ICTs for increased competitiveness and well-being. Out of 139 countries considered, Mauritius ranked 49th in the Network Readiness Index. Mauritius is in the first position in sub-Saharan Africa as per the following table:

Country	Rank	Networked Readiness Index	Usage SubIndex – Government Usage[1]
Mauritius	49	4.4	4.3
South Africa	65	4.2	3.3
Seychelles	74	4.0	3.7
Rwanda	80	3.9	5.3
Cape Verde	85	3.8	3.6

Table 1: Networked Readiness Index 2016

4.3 Current state assessment

4.3.1 Data Insights

This section provides a snapshot of data insights from the digital government survey carried out with citizens, businesses and government agencies.

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[1] The government usage pillar (three variables) provides insights into the importance that governments place to carry out ICT policies for competitiveness and wellbeing and the efforts they carry out to implement their visions for ICT development and the number of government services they provide online.

DATA INSIGHTS
DIGITAL GOVERNMENT TRANSFORMATION STRATEGY 2018 – 2022

DATA DRIVEN CULTURE
- **83 %** of G2G survey respondents view **data as an important asset** for decision-making, yet only **42%** say that government is using data to **improve processes and service-delivery**
- **70 %** of G2B survey respondents say they are willing to retrieve **data from Government systems** to facilitate transactions with their customers
- **52 %** of G2C survey respondents see **Open Data** initiative as high priority
- Citizens have stated the **Once-only principle** as the top-most priority project to be implemented by Government i.e. request data only once and re-use in subsequent transactions
- **Paperless transactions** are rated among top priority projects by both citizens and businesses

AWARENESS, CITIZEN ENGAGEMENT & E-PARTICIPATION
- **84 %** of G2C survey respondents are on **Social media**
- **71 %** of G2C survey respondents cite **lack of awareness** as the main reason for not using e-Services
- **66 %** of G2C survey respondents say they never had interaction with Government online regarding policy issues while **57 %** say they never participated in **online consultation** with Government.

MOBILE USAGE
- **81 %** of G2C survey respondents prefer accessing Internet via their **smartphones**
- **Online portal** and **mobile platforms** are seen as most cost effective and traditional paper documents as least cost effective for transacting with Government

E-BUSINESS STRATEGIES AND SERVICE-DELIVERY
- **96 %** of G2G survey respondents think **business process reengineering** in Government agencies will lead to **streamlined** and **simplified processes**
- **94 %** of G2G survey respondents say **strategic application of ICT** in Government will yield **more benefits** than piece-meal implementation of ICT
- Over **80 %** of G2B survey respondents recommend **internal efficiency** and **effectiveness** and **service delivery** as main areas Government should transform

DIGITAL SAVVY LEADERSHIP AND GOVERNANCE
- Half of G2G survey respondents think Senior Management in Government agencies lack **understanding of digital trends** and lack sufficient **skills** to govern digital transformation
- Majority of G2G survey respondents stress that digital projects do not receive the right **priority and commitment** from key stakeholders

ICT CAPACITY AND SKILLS
- **68 %** of G2G survey respondents underline that the number of **ICT staff** supporting government agencies is **insufficient**
- **50 %** of G2G survey respondents say that staff is not provided with **necessary skills** to take advantage of digital trends

FUNDING AND ICT INVESTMENT
- **54 %** of G2G survey respondents say there is a **mismatch** between **funding** and **digital priorities**
- **ICT investment** in national budget amounts to less than **1 %** of GDP

4.3.2   Digital Synergies

Government agencies must remain relevant in a digital world. The development of a digital strategy for government should consider a range of public-sector-specific issues in relation to the four specific elements: digital opportunities, threats, capabilities and gaps (Figure 4). Data insights, consultation with stakeholders and experience in the implementation of digital government projects, among others have been harvested as inputs for the analysis of the four elements in the digital synergies. The digital synergies have, in turn, served as input for conducting the situational analysis of digital government in Mauritius.

DIGITAL CAPABILITIES

- Increasing number of initiatives (policy support, strategies for eGov development, legislative/regulatory development)
- e-Government Strategy 2013-2017
- Open Data Portal and Policy
- Open-Source Policy
- Data Sharing Policy
- Secure IT infrastructure
- Government Data Centre
- Government Fibre Network interconnecting Government agencies
- Experience in implementing key Digital Government Projects
- Data Sharing e-Services via Info Highway - Secure Data Sharing Platform
- Mobile App Platform
- Mauritius Smart National ID Card
- One-Stop-Shop National Portal offering increasing number of e-Services and e-Payment Services
- Cyber Crime and Cyber Security Strategies
- Digital Signatures (Hard and soft tokens)
- High smartphone penetration
- Island-wide deployment of WIFI hotspots free for public

DIGITAL GAP

- Limited use of social media by Government agencies
- Mismatch of funding and ICT priorities
- Need for ongoing awareness of services and other digital initiatives
- Low ICT investment as % of GDP
- Inadequate ICT staff to support Digital Government
- Digital not yet in the DNA of Government
- Government agencies do not always participate actively in projects across policy domains
- Some government agencies are relunctant to share data
- Authority to decide on budget approval for ICT projects should rest with central body coordinating ICT
- Few end-to-end services
- Low experimentation with latest technologies
- Digital Government projects not given enough priority and commitment by key users except when they are driven by high ranking Ministries
- Slow adoption of iterative development and agile methodologies
- Ministries and Departments cannot make distinction between ICT operations and ICT projects and are unaware of the roles of ICT organisations

DIGITAL SYNERGIES

DIGITAL OPPORTUNITIES

- Sustainable Growth (High GDP)
- Citizen well-being
- e-Participation
- Digital end-end services
- Business Facilitation
- Data-driven decision-making
- Paperless transactions
- Mobile friendly services
- Transparency
- Digital inclusiveness
- Openness
- Enhanced Public service delivery
- Agile delivery
- Digital and innovative mindset

DIGITAL THREATS

- Citizens outcry and low trust in Government
- Office hopping and queuing for availing services
- Insufficient staff capacity to support ICT systems and operations resulting in recurrent breakdowns in service delivery
- Insufficient actions to foster ICT development
- Obsolete, redundant and inefficient system environment
- Lack of competitive and high skilled local labour force
- Privacy Concerns
- Change in Government vision
- Low uptake of existing services by citizen and industry
- Declining e-Government Development Index
- Legacy applications not responding to evolving needs
- Lack of interoperability between systems
- Siloed organisations

Figure 4: Digital Synergies

4.3.3 Urgency and Readiness

Progress in digital transformation requires actions set with the right priorities to overcome challenges, mitigate risks, and leverage on opportunities offered by digital technologies.

Gartner's advice is to select and sequence actions in a way that reflects the current level of readiness of government and the degree of urgency for digital transformation. "Urgency" refers to external and internal pressures, i.e., demand factors like expectations of citizens or potential for digital disruption. "Readiness" is the organisation's capacity to respond to those demands, i.e. available human resources or adequate budget for digital (Gartner 2018a).
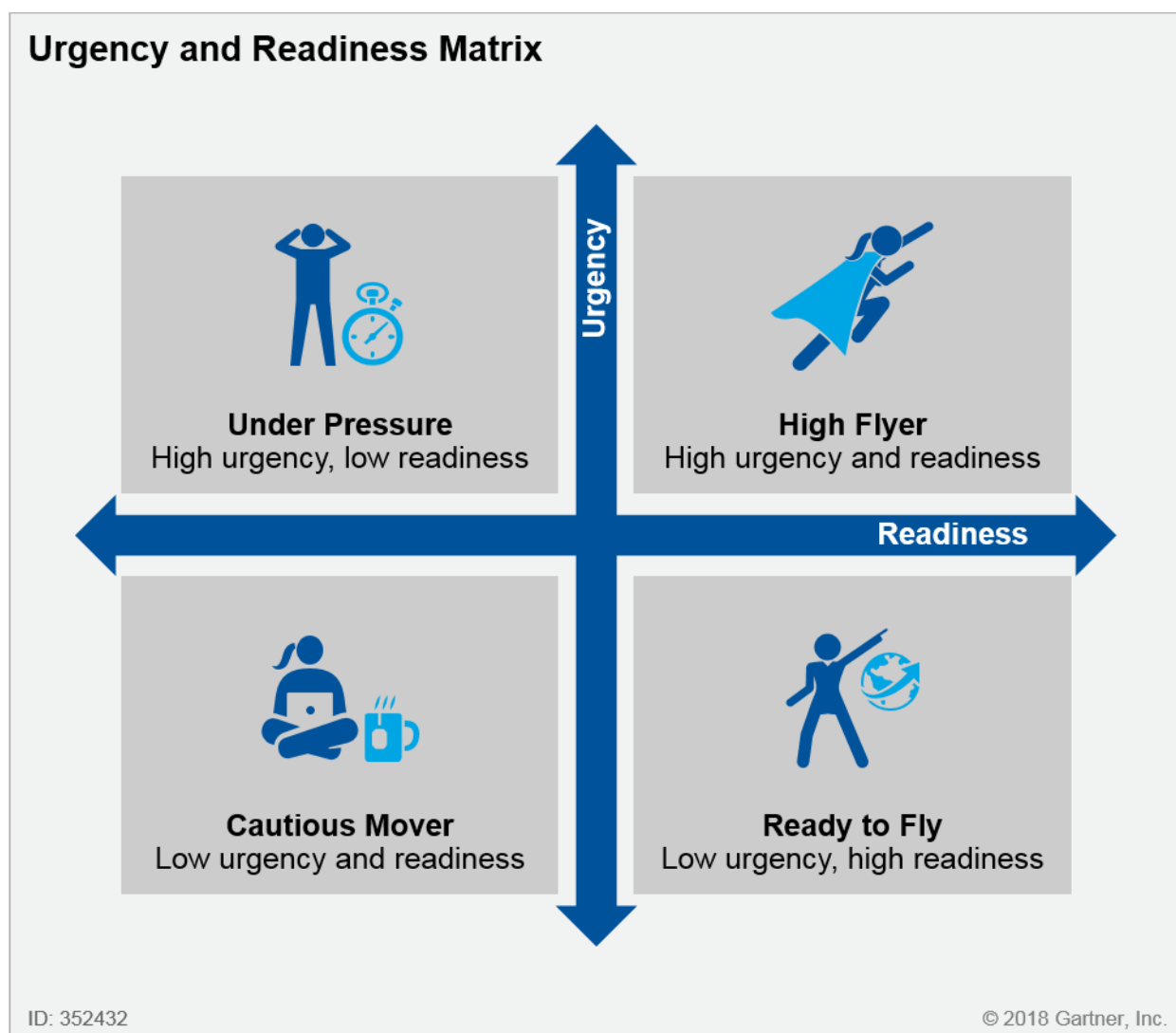
Figure 5: Urgency and Readiness Matrix (Gartner 2018a)

Urgency

The Vision 2030 Blueprint and PSBTS have placed digital transformation as high priority for the Government. Moreover, as per data insights, the Government is also facing increasing expectations and greater demands from digitally engaged citizens and businesses for a wider range of online services. Thus, there's a call for a more transformative set of changes to renew public sector service delivery to achieve openness, transparency, engagement and informed decision-making as well as to offer integrated services to citizens and businesses.

Readiness

A digital government needs survey and data analysis was carried out and it was found that the Civil Service suffers from scarcity of ICT human resources, and discrepancy between availability of funds and priority of ICT initiatives. Moreover, assessment of ICT in Ministries and Departments reveals that digitisation is evolving at a pace that does not match the aspirations of "a high income, sustainable, innovative and inclusive economy, with modern infrastructure, global connectivity and advanced skills and technology."

On the basis of the urgency and readiness matrix above, Government falls in the "Under Pressure" quadrant (Figure 5), i.e. Ministries and Departments have a high urgency to transform, but a low degree of readiness for digital transformation.

For governments falling in the "Under Pressure" quadrant, Gartner (2018a) advises customisation and sequencing of actions (Figure 6) based upon the following rules:
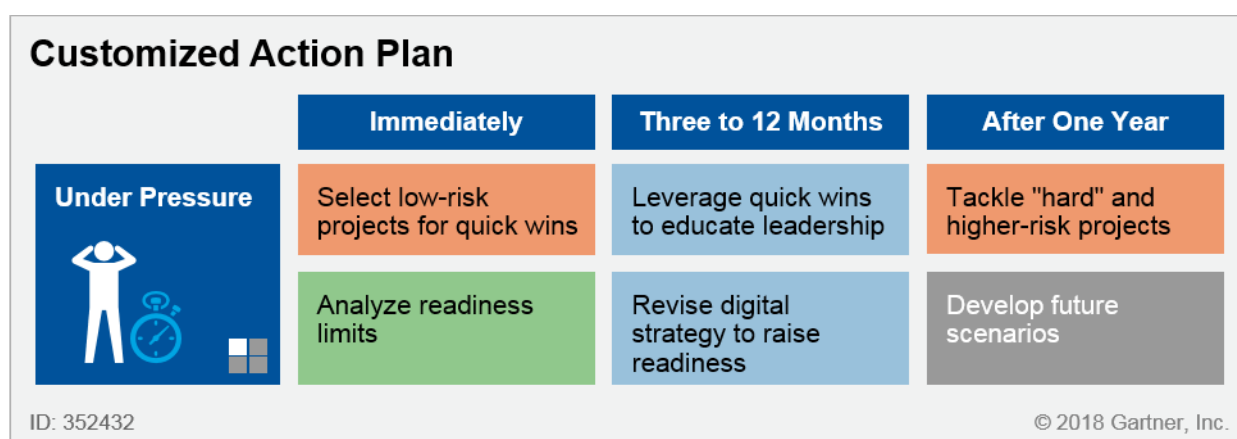
Figure 6: Customised Action Plan for "Under Pressure" governments (Gartner 2018a)

Projects

1. Focus on quick-wins, i.e. projects that are fast to execute and have minimal risk of failure;
2. Educate leaders on the success of quick-wins and scale up success throughout government and
3. Eventually, tackle higher risk projects after acquiring required capabilities to deliver.

Readiness

1. Analysis of factors inhibiting government's readiness to digital transformation (lack of skills and talent, insufficient budget for digital transformation, etc.);
2. Revision of digital government transformation strategy to raise digital readiness;
3. Conduct scenario planning by engaging with internal and external stakeholders for development of a digital roadmap for the next 10 to 12 years

4.3.4   Digital Government Maturity

Gartner (2017a) developed the Digital Government Maturity Model 2.0 (Figure 7) to assist governments in assessing current capabilities, reviewing priorities and creating a roadmap to ensure a sustainable and innovative digital transformation.

Maturity Level	E-Government 01 Initial	Open 02 Developing	Data-Centric 03 Defined	Fully Digital 04 Managed	Smart 05 Optimizing
Value Focus	Compliance	Transparency	Constituent Value	Insight-Driven Transformation	Sustainability
Service Model	Reactive	Intermediated	Proactive	Embedded	Predictive
Platform	IT-Centric	Customer-Centric	Data-Centric	Thing-Centric	Ecosystem-Centric
Ecosystem	Government-Centric	Service Co-creation	Aware	Engaged	Evolving
Leadership	Technology	Data	Business	Information	Innovation
Technology Focus	SOA	API Management	Open Any Data	Modularity	Intelligence
Key Metrics	% Services Online	No. of Open Datasets	% Improvement in Outcomes, KPIs	% New and Retired Services	No. of New Service Delivery Models

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Figure 7: Digital Government Maturity Model 2.0 (Gartner 2017a)

Using Gartner's model, an assessment of the digital government maturity was carried out (Table 2), which includes the state of digital government that this strategy is aspiring for. The desired level of digital maturity was selected in line with the findings of the urgency and readiness assessment and digital synergies of Government presented earlier.

Table 2: Assessment of digital government maturity in Mauritius

Dimension	Current Maturity	Current State	Targeted Maturity	Desired State
Value Focus	Compliance (Initial)	• Technology seen by top management as a peripheral support channel that can offer some operational efficiency, but do not consider the need to transform internal traditional processes. • Mode of operation is primarily to comply with existing policies	• Transparency (Developing) • Constituent Value (Defined)	• Primary objectives are openness and transparency. • Industry, citizens and developers leverage open data for their own purposes. • More and more data starts being used to build new solutions. • Data-driven services delivered by nongovernment entities.

Service Model	Reactive (Initial)	• **Agencies rather than constituents initiate new services.** • **Reliance on maintaining physical offices and human service agents to provide assistance for citizens**	• **Intermediated (Developing)** • **Proactive (Defined)**	• **Constituents initiate services.** • **Development of applications by third parties, mostly startups and activists, through app contests and hackathons.** • **Preventive healthcare, child care services and rapid management of emergencies through clever use of data**
Platform	IT-Centric (Initial)	• IT platform is the only platform. • Back-office administrative systems, core mission-critical applications, constituent portals and apps, business intelligence, and — in selected domains	• Customer-Centric (Developing) • Data-Centric (Defined)	• Use of customer engagement platforms. • Government provides information on leading social networks. • Open data is re-used internally by government agencies. • Data analytics takes centre-stage. • Web APIs allow checking of access rights and identity credentials.
Ecosystem	Government-centric (Initial)	• Involvement of non-government parties is mostly limited to technology vendors as well as consulting and outsourcing firms that help deliver services.	• Service Co-creation (Developing)	• Use of crowdsourcing among hacktivists, developers, and civic tech companies for co-creation of services.
Leadership	Technology (Initial)	• Top management is focused on technology e.g. Blockchain and IoT rather than focus on customer needs and then apply relevant technologies.	• Data (Developing) • Business (Defined)	• Top management shows interest in data by creating special roles such as Chief Data Officer and support extraction and sharing of data outside agency boundaries. • Top management recognises that digital transformation is not only about technology but actually business transformation supported by technology.

Technology Focus	Service-oriented architecture (Initial)	• Increasing number of agencies share data among themselves via the InfoHighway.	• Fully Service-oriented architecture (Developing) • Open any data • (Defined)	• Integration of services across agencies and makes the government portal more user-friendly and feature-rich. • Agencies have capabilities to perform analytics. • Agencies have good level of maturity in provision and use of open data.
Key Metrics	• Number of services (Initial) • Number of mobile apps (Initial) • Number of Open datasets (Developing)	• Non-availability of statistics on number of services (non-digital) provided per agency • Increase in number of online services, mobile apps and open datasets.	• % Improvement in outcomes, KPI (Defined)	• Number or percentage of services online. • Percentage of services accessible through mobile devices. • Percentage of integrated services, and electronic channel utilisation. • Number or percentage of open public data per agency. • Number of apps based on open data. • Number of external players that build services on the open data.

The outcomes and KPIs identified in the desired state will be used to guide the formulation of recommendations such that actions are coherent with the context and capacity of Government to move forward in its digital transformation.

5   Openness, Transparency and Inclusiveness

5.1 Openness and Transparency

5.1.1   Open Government Data

Open Government Data allows Government to improve transparency and accountability, to fight corruption and to ultimately enhance public sector performance (OECD 2015). In this vein, a national Open Data Portal (data.govmu.org) has been setup by Government to promote transparency in its operations as well as empower citizens and businesses for carrying out data-driven initiatives.

Case Study: National Open Data Portal

The Ministry of Technology, Communication and Innovation, in line with the e-Government Strategy 2013-2017 and the Open Data Policy, launched the National Open Data portal (data.govmu.org). The portal, which has been implemented using Open-Source technologies, currently houses around 150 datasets from Government agencies in an open format categorised under different sectors including health, education, social, labour, finance and Environment among others.

By opening up data through the Open Data portal, Government aims to promote:

- Transparency – citizens being able to freely access information about what their Government is doing;
- Public Service Improvement – giving citizens the raw material to engage and contribute to making public services better as well as improve the quality of decision-making
- Innovation – empowering citizens and businesses for carrying out data-driven initiatives such as development of mobile apps, data analysis, creation of innovative products and research among others.
- Efficiency – Governments can come up with smarter and more efficient public services and applications by allowing information to be more easily reused within Government and enabling citizens to help improve data quality.
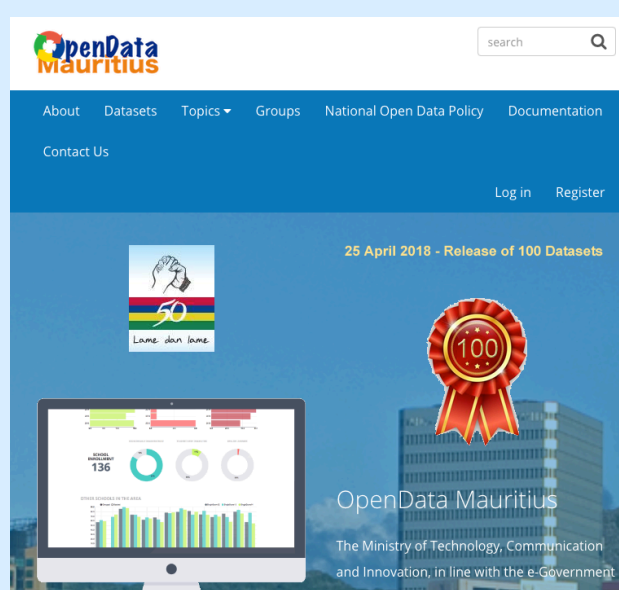
Figure 8: Priority of "Open Government Data", i.e. Opening up online access to information (non-personal) held by Government agencies
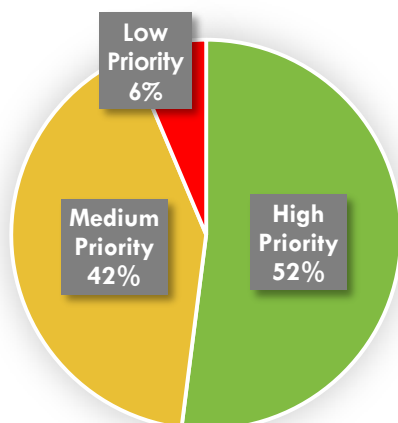
Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

A high number of respondents (Figure 8) of the G2C survey affirmed that online access to non-personal information to Public should be given high priority by Government agencies. There is therefore a need for Government to release more datasets to the Public. Legislative measures in the UK, US and France, who are all leaders in Open Data, have mandated that data be open by default with enablers to provide a directive framework for releasing of datasets subject to appropriate rights and responsibilities. The Government of Canada has issued mandatory policy requiring federal government departments and agencies to maximize the release of data and information of business value subject to applicable restrictions related to privacy, confidentiality, and security.

Recommendation 1.1

Enforce "open by default" standard regarding non-sensitive government data

The G2G survey revealed that 57% of respondents (Figure 9) either do not agree or do not have an opinion as to whether senior management at Ministries/Departments are aware of the benefits of releasing Open Data. With a view to incite a culture change to improve the future availability of public data, public sector officials in UK, Ireland and Scotland are provided training through expert firms on the opportunities presented by open data or the citizen, public sector and others.

Figure 9: Senior Management are aware of the benefits of opening non-sensitive Government data to the Public via an Open Data Portal
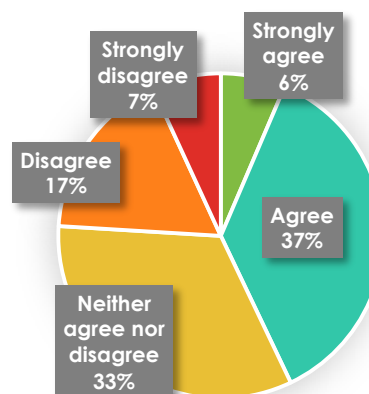
Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

Recommendation 1.2

Sensitise Government agencies on the importance of releasing Open Data as a means to achieve transparency in public sector operations and empower Government agencies to continuously release Open Data to foster creation of innovative solutions

Once the efficiency gains from Open Data are recognised and empowerment of Government agencies in releasing Open Data is undertaken, it is important to bring on-board data consumers to move from being an Open Data initiative to a "business as usual" for Government.

To bring the public and businesses on board and to generate tangible value and results from Open Data, World Bank (2017) recommends the organisation of hackathons and apps challenges and competitions where technologists use existing data to develop and build utility apps that solve development problems, with an emphasis on public service delivery. These events held in many countries, including Australia, Canada, Nigeria, Singapore, the United Kingdom, and the United States help promote the use of data in the development of innovative products and services (McKinsey 2014).

> **Recommendation 1.3**
> **Organise public engagement campaigns on the use of Open Data via hackhatons, web cups, and mobile apps competitions that improves quality of life, solve social development problems or enhance public service delivery**

5.2 Inclusiveness

5.2.1 Multi-Channel Delivery

OECD (2015) and European Commission (2016) recommend that governments should ensure people are not left out of opportunities provided by digital technologies. Actions should be undertaken to increase inclusiveness of disadvantaged groups of users, which includes increasing their comfort and familiarity with using technology and creating awareness on online channels to interact with governments. At the same time, Government should provide access to online services and information to as many users as possible while respecting the choice of those citizens who prefer offline channels.

Figure 10: Mins/Depts provide multiple delivery channels (digital channels as well as face-to-face interactions) for people to access services or interact with government

Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

Based on the G2G survey, the findings (Figure 10) reveal that most of the respondents agree that digital channels as well as face-to-face interactions are essential for people to access services or interact with government. As an illustration, UK provides assisted digital support using Front Office Counter Services (FOCS) to people who can't use digital government services on their own and require assistance from government officials.

5.2.2 Mobile-friendly Public Services

In Mauritius, there is a high uptake of mobile subscriptions, i.e. for every 100 inhabitants, there are around 143 mobile subscriptions. 8 out of 10 G2C survey respondents as depicted in Figure 11 say that they prefer to use a mobile device to get online.

Although G2G survey respondents acknowledge that mobile platforms (e.g. applications, SMS, MMS or online service designed for mobile devices) are among the most cost-effective delivery channels (Figure 12), they recognise that very few Government agencies provide public services through mobile devices and SMS (Figure 13). According to McKinsey (2016), shifting services onto mobile platforms is important, given that

Figure 11: Citizens' preferred device for accessing the Internet
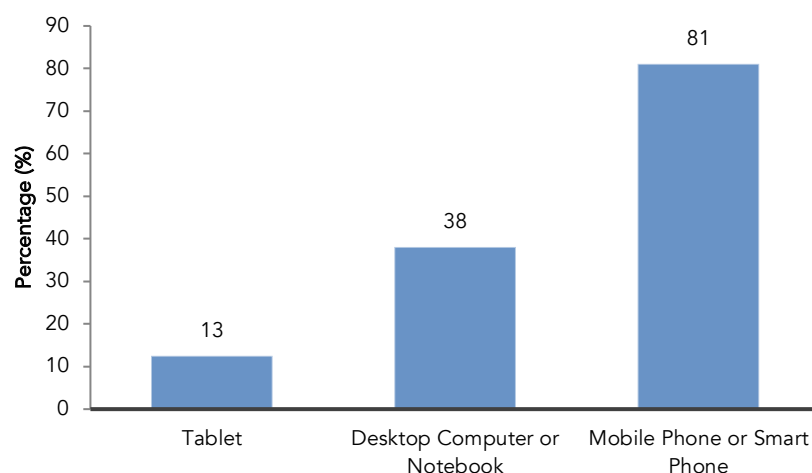
Note: Persons may report more than one answer
Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

citizens are increasingly demanding digital services via mobile. In India, mobile government is catching up very fast. Various mobile-based channels are being leveraged to deliver services to citizens through mobile devices. SMS is widely used for status, alerts and notifications. The mobile app store of Government of India currently hosts 240 mobile apps.

Figure 12: Cost effectiveness of public service delivery channels
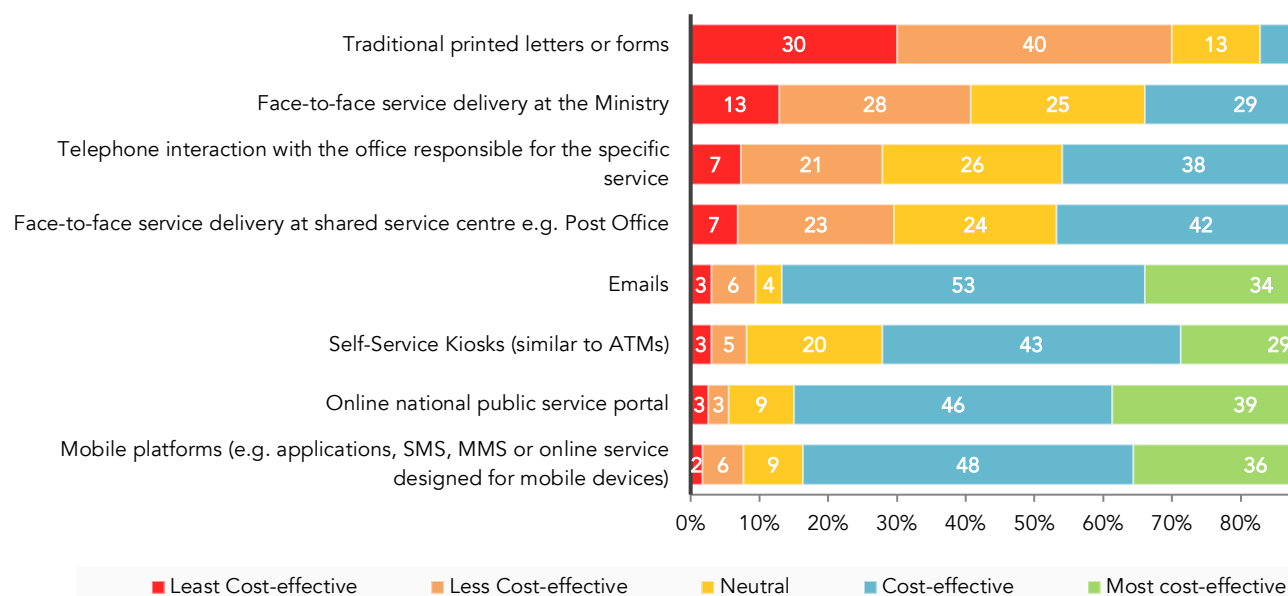
Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

Figure 13: Ministries/Departments provide public services that are accessible through mobile devices such as smartphones and tablets or using SMS
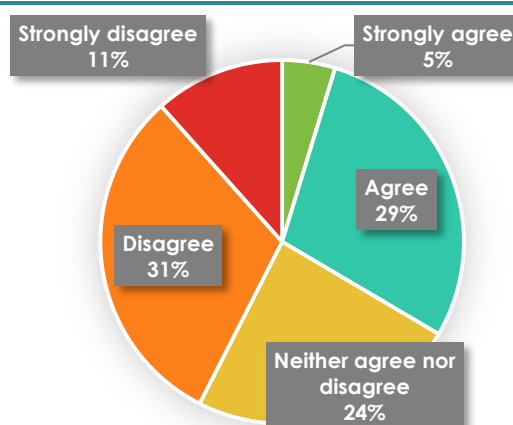
Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

To enhance delivery of services to Citizens, government agencies in Mauritius can leverage on the newly implemented Smart Mobile Apps platform (refer to case study below) to roll-out their own mobile apps which can be accessed via a single repository (mauritiusapps.govmu.org).

Case Study: Nou La Pou Ou – Mobile Apps

A Smart Mobile Apps Platform has been implemented comprising three main components, namely:

- Mobile Apps, available on major platforms (iOS and Android)
- A government "app store" website (mauritiusapps.govmu.org) to reference and promote the mobile apps as well as any future apps
- A Service Oriented Architecture system that will allow the quick and consistent deployment of mobile app servers

The platform regroups all of the common services required by the Mobile applications, such as access to external systems, backup schedulers and authentication/identity management services. The architecture relies on the Info Highway data-sharing platform to enable the integration of different Government services.

Seven mobile apps have already been launched and are already available via the platform.

- Smart Traffic App (Mauritius Police Force)
- Smart Police App (Mauritius Police Force)
- Consumer Protection App (Ministry of Industry, Commerce and Consumer Protection)
- SearchGov (Government Information Service)
- Emergency Alert (National Disaster, Risk Reduction and Management Centre)
- Family Welfare (Ministry of Gender Equality, Child Development and Family Welfare)
- School Companion (Ministry of Education and Human Resources, Tertiary Education and Scientific Research)

Implementation of mobile apps from other Ministries/Departments are currently in progress (Ministry of Business, Enterprise and Cooperatives, among others)
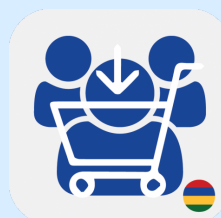
5.2.3   User Experience and Accessibility

European Commission (2016) recommends, "Public administrations should design digital public services that are inclusive by default and cater for different needs such as those of the elderly and people with disabilities". The use of graphics, symbols, and audio or video content encourage disadvantaged groups to adopt digital services (World Bank 2016a). Moreover, mobile-friendly websites lead to a more positive user experience. A research conducted by the European Commission (2016) shows that mobile users tend to give up a transaction, which cannot be conducted on a mobile device. The US Government is implementing a mobile-first strategy whereby all web sites should first be designed for mobile devices.

Accessibility/User Interface was mentioned by Citizens in the G2C survey (Figure 14) as one of the main areas where Government should focus in its Digital Government Transformation Strategy.

Figure 14: Areas Government should focus in its Digital Government Transformation Strategy
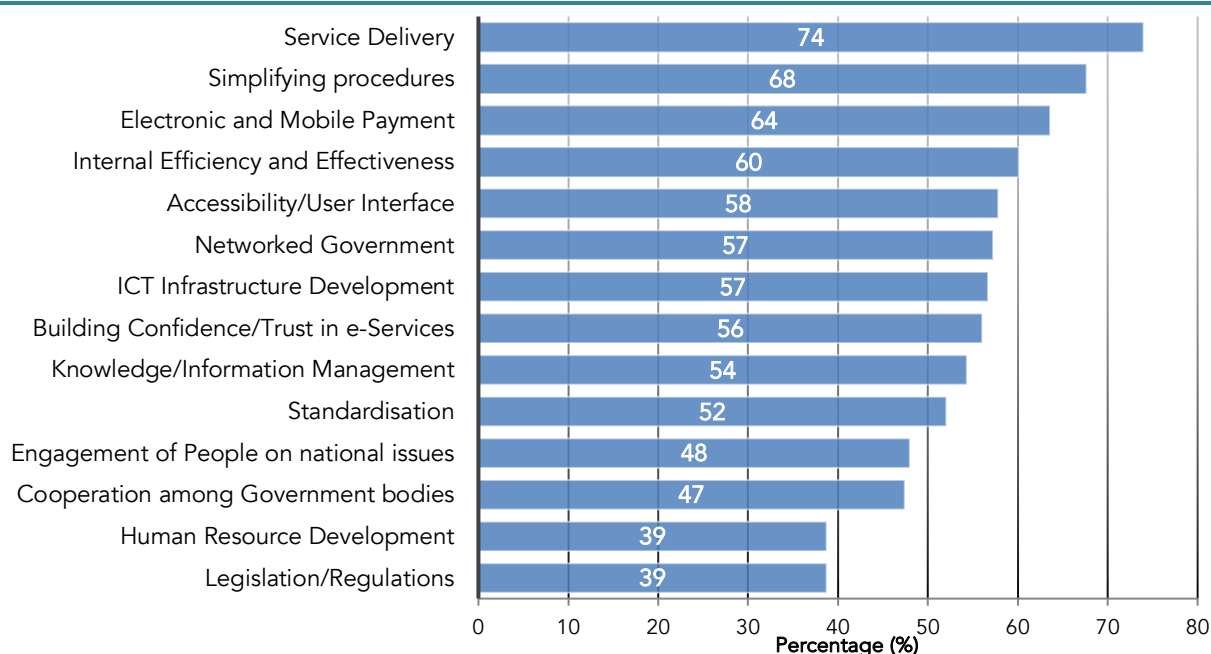
Note: Persons may report more than one answer
Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

If digital services are not user-friendly, users will waste time searching for the right websites or information and may eventually abandon the service. Inadequate usability may also result in Government agencies investing more resources in the provision of online support and correction of usability errors and deficiencies in digital services that could have been prevented (Danish National Audit Office 2015).

G2C respondents (Figure 15) say that difficulty to find or access information or services was one of the main reasons for not having used the Internet to interact with Government.

Figure 15: Reasons given by Citizens for not having used Internet to contact Government

Reason	Percentage (%)
The relevant services would require personal visits or paper submission any way	44
I preferred to have personal contact to get what I wanted/needed	40
I could not find or access the information or services I wanted/needed	38
I was not aware of the existence of relevant websites or online services	31
The service's website or application had technical failures	26
The service was too difficult to use	17
I expected to have things done more easily by using other channels	16
I did not use the Internet because of concerns about protection and security of personal data	13
Not Applicable (Did not have contact)	12
I did not expect to save time by using the Internet to get what I wanted/needed	3
I did not have the skills	1

Note: Persons may report more than one answer
Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

To instil a user-centred culture in government, countries have adopted user experience (UX) best practices in the design of digital systems and services. By embracing the user experience best practices and the user-centred design process, government agencies can:

- Identify and respond to user needs through conducting user research while still meeting organisational goals.
- Produce information that is easily understood and acted upon.
- Create systems that better facilitate transactions, internally and externally.
- Deliver information so that it can be accessed anywhere and through various channels and technologies.
- Encourage participation by making it easy to connect with people.
- Increase productivity and efficiency with usable systems.
- Improve based upon feedback and analysis of other performance measurements.

The US government has integrated user experience in its design of digital systems and services through its website (Usability.gov). In 2013, the UK Government Digital Services (GDS) team won Design of the Year for its self-service Web site GOV.UK, beating contenders in fashion, architecture, and product development. In Singapore, the GovTech has created the User Experience Design (UXD) team to assist government agencies in designing better services for the people of Singapore.

Recommendation 1.4

Digital Government systems should cater for stakeholders with different needs and include:
   a) **Responsive mobile-friendly services**
   b) **Mobile Apps**
   c) **SMS-based notifications**
   d) **Help material provided in the form of audio and video for increased accessibility**
   e) **User friendly interfaces designed with user or customer experience in mind**
   f) **Assisted digital support desks for clients preferring counter services**

5.2.4 Digital Skills for Inclusion

World Bank (2016a) sets out that in the coming decades 'that policy makers face a race between technology and education, and the winners will be those who encourage skill upgrading so that all can benefit from digital opportunities'.

In this respect, European Parliamentary Research Service (2015) opined that Governments may need to support digital skills training, not only as a way of supporting the labour market and helping citizens to improve their job prospects, but also to ensure that all citizens can use digital government services.

Public officials may also need additional training and time to learn new skills so that they can adapt to support electronic service delivery. 50% of respondents from the G2G survey (Figure 16) say that Ministries and Departments do not provide their staff with the resources or opportunities to obtain digital skills. In the same vein, respondents mentioned that a lack of digital workspace skills was one of the main reasons impeding Ministries and Departments to take advantage of digital trends (Figure 17). UK is implementing a Digital Inclusion Strategy in partnership with public, private and voluntary organisations to reduce the number of offline people in the UK by 25%. Moreover, government employees are being empowered with digital capabilities to use and improve government services.

Figure 16: Mins/Depts provide their staff with resources or opportunities to obtain the right skills to take advantage of digital trends.
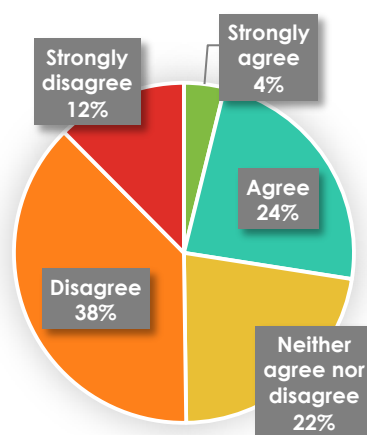
Strongly agree 4%
Agree 24%
Neither agree nor disagree 22%
Disagree 38%
Strongly disagree 12%

Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

Figure 17: Reasons impeding Mins/Depts from taking advantage of Digital Trends
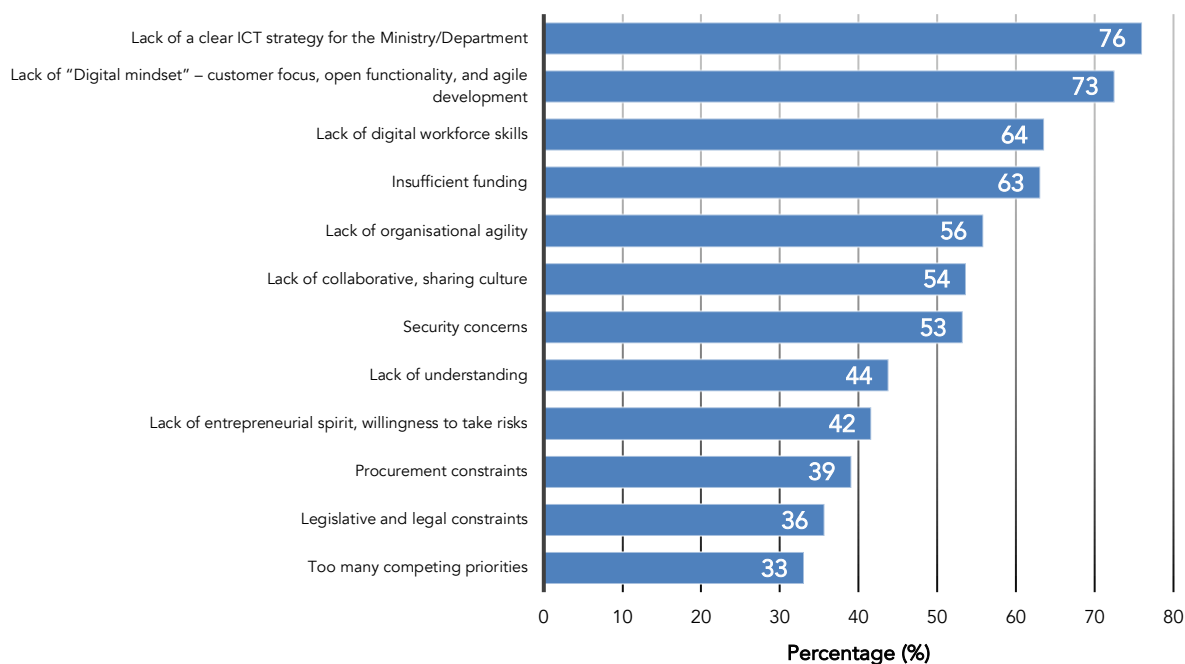
Reason	Percentage (%)
Lack of a clear ICT strategy for the Ministry/Department	76
Lack of "Digital mindset" – customer focus, open functionality, and agile development	73
Lack of digital workforce skills	64
Insufficient funding	63
Lack of organisational agility	56
Lack of collaborative, sharing culture	54
Security concerns	53
Lack of understanding	44
Lack of entrepreneurial spirit, willingness to take risks	42
Procurement constraints	39
Legislative and legal constraints	36
Too many competing priorities	33

Note: Persons may report more than one answer
Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

Recommendation 1.5

Review and adapt national digital skills programmes to cater for varying needs of digital natives and digital immigrants

Recommendation 1.6

Conduct capacity building programmes for Public Officials to strengthen their skills and capacity to use technology and support e-Service delivery

5.2.5   Social Media

Figure 18: Citizens use of social networks

No 16%

Yes 84%

Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

The majority of respondents of the G2C survey are on social media (Figure 18), which provides unprecedented platforms for interactive and two-way communication (European Parliamentary Research Service 2015). Government can leverage on such platforms to increase access to online services and information to as many citizens as possible (Accenture 2014). In this context, social media guidelines [2] have been formulated by the Ministry of Technology, Communication and Innovation to accompany Ministries/Departments in the setting up and operation of social media accounts.

The Energy Efficiency Management Office (EEMO) actively uses Facebook (refer to case study below) to sensitise public on energy-saving best practices through video, competitions and other informative content. Although other Government agencies such as Mauritius Police Force, Procurement Policy Office have social media accounts, the presence of Government on social media can be considered limited.

Case Study: Energy Efficiency Management Office (EEMO)

The Energy Efficiency Management Office (EEMO) tasked with the promotion of awareness for the efficient use of energy actively uses Facebook to sensitise public on energy-saving best practices.

The EEMO leverages on Facebook for wide dissemination of information and content related to energy management through:

- Public video submission competitions;
- Sharing of videos containing short-stories on energy-saving practices;
- Sharing of energy-saving tips using graphical content e.g. "Eski ou ti kone", "Conseil du jour";
- Public token prize competitions based on graphical contents among others.

EEMO
15 Janvier, 07:53 · 🌐

Eski ou ti koné 🤔
Pas blier Like, Comment ek Share nou bane posts 😊
#EEMO #EnergySaving #EnergyEfficiency

ESKI OU TI KONÉ ?

Dans place ou fer ban ti lavaz, rempli ou machine laver au maximum. Ou pou servi moins délo ek courant.

EEMO has dedicated staff and a committee to oversee engagement with Public on social media.

Recommendation 1.7

Government agencies should be present on social media channel to connect with the Public and to communicate governments' decisions, programmes, etc.

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[2] Available at http://mtci.govmu.org/English/Pages/Policies.aspx

5.2.6   Awareness of online services

Online services are useless if citizens are not aware about them. Lack of awareness of government e-Services was identified by 71% of citizens participating in the digital government survey as the main reason hindering the use of government e-Services by citizens in Mauritius (Figure 19).

Figure 19: Reasons hindering use of e-Services by citizens
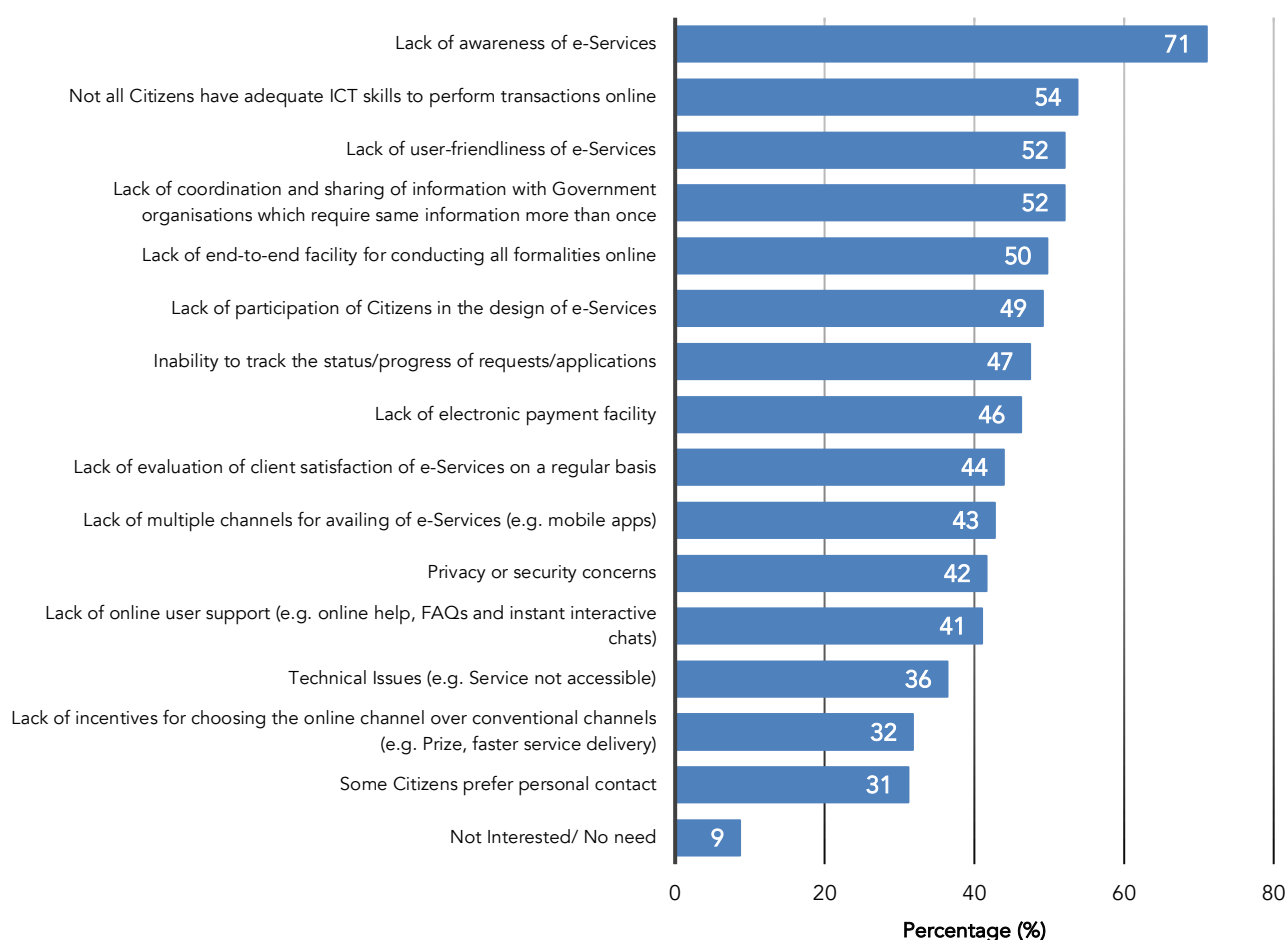
Note: Persons may report more than one answer
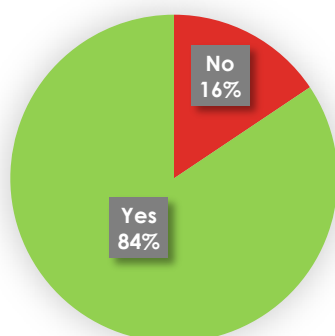*Source:* Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

Additionally, the G2C survey results (Figure 20) also reveal that there is an issue of awareness as regards to the benefits of digital government.

Given the overwhelming penetration of digital use in households, government agencies will need to promote their services through digital and social channels. Governments around the world have resorted to digital marketing channels to reach citizens. Digital marketing extends beyond Internet marketing to include channels such as mobile phones (both SMS and MMS), social media marketing, display advertising, search engine marketing, and any other form of digital media.

The Government of India has placed strong emphasis on citizen marketing campaigns to raise awareness of its digital

Figure 20: Citizens are aware of the benefits of e-Government or Digital Government

Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

transformation through the Digital India campaign. The services of digital marketing agencies have been contracted for engaging with citizens through the use of website, mobile app, game, search engine optimisation, social media integration, and email marketing among others.

Digital marketing strategies can therefore be leveraged by government for raising awareness of digital initiatives implemented for the public e.g. services, mobile apps, and open data among others.

Recommendation 1.8
Create awareness on digital initiatives implemented for the public with strong emphasis on digital marketing channels

6   Engagement and Participation in Policymaking and Service Delivery

6.1 Involvement of stakeholders in the design of digital services

Traditionally, decision-making processes in government tend to follow a top-down approach (OECD 2015) where internal buy-in is secured rather than delivering to customer needs. Change-resistant cultures and bureaucratic management have convinced long-serving decision-makers that they know what is best for customers. However, an insight of user needs could create a case for change. As such to effectively drive a digital transformation agenda, governments need to be user-focused (Deloitte Digital 2015).

From the results of the digital government survey, it is observed that more G2G respondents are of the opinion that lack of customer focus is impeding government agencies from taking advantage of digital trends (Figure 21).

Figure 21: Reasons impeding Government agencies from taking advantage of digital trends
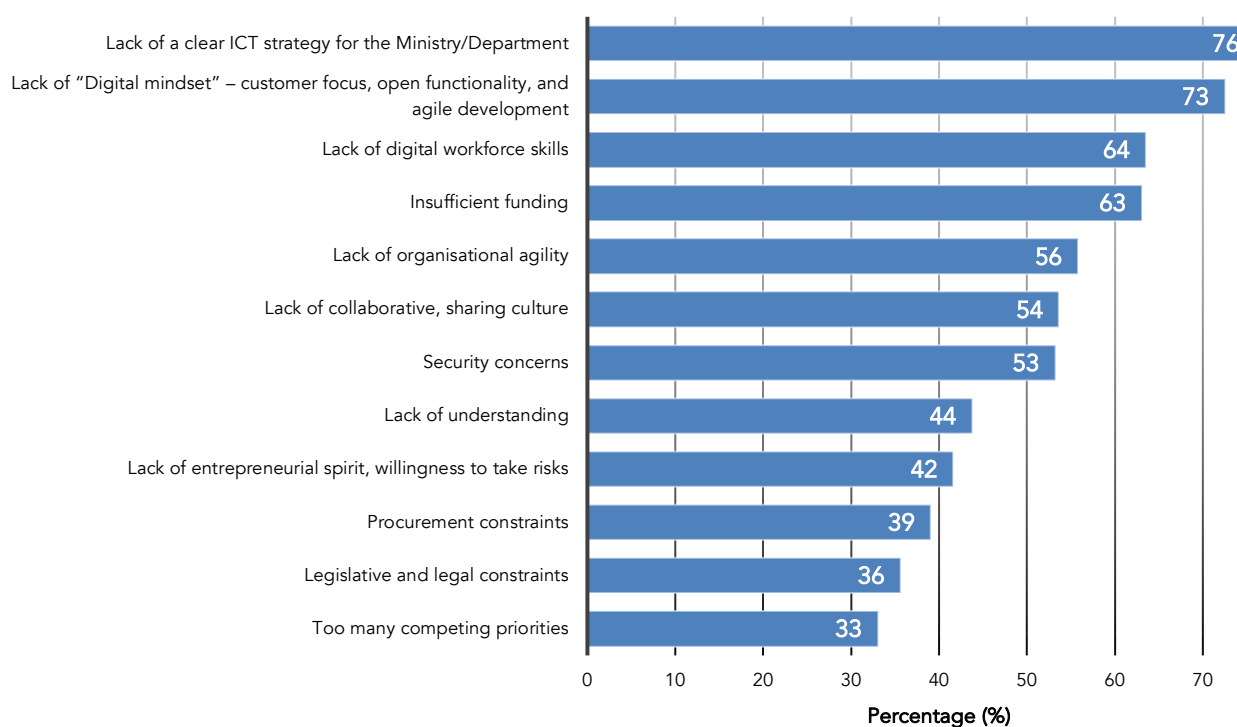
Note: Persons may report more than one answer
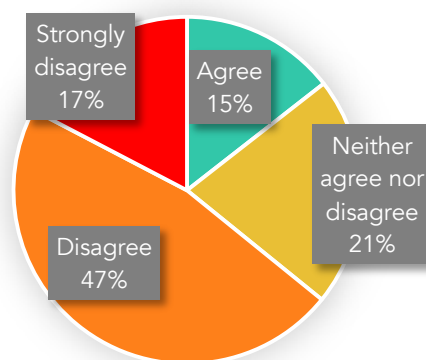*Source:* Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

As regards to involvement of citizens, a large number of G2C respondents asserted that Government does not seek feedback on its e-Services (Figure 22).

Figure 22: Government seeks feedback from Citizens on its e-Services
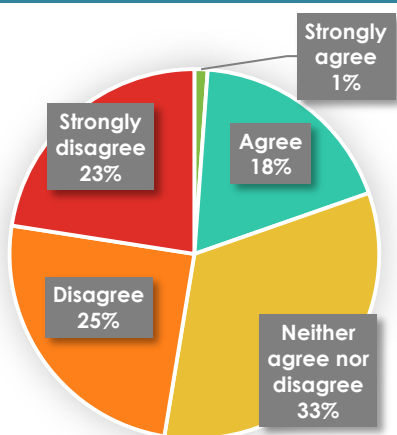
Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

The United States portal (usa.gov) uses electronic satisfaction questionnaire called the American Customer Satisfaction Index (ACSI) to improve its usa.gov national portal and digital services. As a result, citizens' level of satisfaction and positive attitudes toward government services has seen an overall improvement (ACSI 2016).

Crowdsourcing ideas, user-centered design, and co-creation of services are some of the ways to engage stakeholders and develop user-centric digital services (Deloitte Digital 2015).

Singapore actively promotes co-creation of services. According to the Deputy Prime Minister of Singapore "Governments must take on the roles of a facilitator and enabler—to collaborate with the public and private sectors in creating new solutions, new businesses, and new wealth." In line with this policy, the Government of Singapore co-created more than 110 apps using 3,000 datasets with its citizens.

6.2 e-Participation

Stronger online participation of public has the potential to improve the quality of political decisions and to increase the perception of legitimacy of the decisions taken (European Parliament 2015). An increasing number of countries as depicted in Table 3 proactively use online tools to engage with people and evolve towards participatory decision-making.

Country	Rank in e-Participation Index 2016	e-Participation Initiative
United Kingdom	1	Public can submit petitions online to the Government (petition.parliament.uk). The government will respond If a petition gets 10,000 signatures, and a petition will be considered for debate in Parliament if it receives 100,000 signatures.
Japan	2	Local governments provide e-Forums for the public to participate in policy-making as well as to contribute to the improvement of the efficiency of administration the quality of public services.
Australia	2	Government agencies promote public consultations and speak to businesses, individuals, industry associations and not for profits via the business consultation website (consultation.business.gov.au)
Singapore	8	The government uses the REACH (Reaching Everyone for Active Citizenry@Home) portal (reach.gov.sg) to engage and connect with Singaporeans on national and social issues. Citizens are invited and informed of public consultation topics via alerts sent through mobile and social media applications.
Morocco	17	Morocco offers discussion forums via its e-Participation portal (fikra.egov.ma) to engage with public for the improvement of public administration, government websites and allows submission of ideas for new digital services.
Estonia	22	A specialised portal (osale.ee) allows public to submit ideas and suggestions to the government, collect signatures for petitions, provide feedback on draft bills as well as look for legislation or strategy papers.
India	27	MyGov (mygov.in) enables citizens' engagement in decision making and provides an opportunity for citizens and well-wishers from across the world to share their views on key issues directly with the Prime Minister of India
Tunisia	43	The online consultation portal (consultations-publiques.tn) was developed in order to enhance public participation in public policy-making process.

Table 3: e-Participation around the world

In Mauritius, the Citizen Support Portal (refer to case study below) is the online e-Participation platform, which connects citizens with government for handling complaints and queries among others. Moreover, online consultation on national strategies such as Vision 2030 Blueprint and National Budget has been conducted with citizens and businesses to capture their feedback. In addition, the Ministry of Technology, Communication and Innovation has provided an online facility "e-Ideas" for the public to contribute and suggest ideas for fostering innovation in the ICT field.

Case Study: Citizen Support Portal, the e-Participation platform

The Citizen Support Portal is an online service which acts as the main e-Participation and e-Decision Making platform to engage with users, handle Citizen complaints, allow monitoring of complaints and inform Citizens on Government policies, communiqués among others. The portal empowers citizens to directly transmit their requests, share their concerns and ideas. The requests are then directed to Ministries, departments, parastatals and local authorities as appropriate. Citizen can also keep track of their requests through a ticketing system.

Analysis of data from the portal enables Government to get a broader picture of the needs of the population and can allocate resources more efficiently in addressing the issues.

In the spirit to be more digitally inclusive, Citizens having no access to computer or the Internet can go to the nearest service desks in the form of "Citizens Advice Bureaus" or any of the 95 post offices (Public Internet Access Points) where an officer assists them in filing their request(s) on the Citizen Support Portal.

www.csu.mu allows the Government to become more citizen-centric with the aim of building a modern and better Mauritius.

Despite these initiatives of government to involve public in decision-making processes, a majority of G2C respondents say that government does not seek feedback from citizens on national issues (Figure 23) and they did not participate in online discussions or online consultations on policy issues organised by government (Figure 24).

The e-Government Development Index 2016 report (United Nations 2016) identified the organisation of public consultations online (e-Consultation) and involvement of citizens directly in decision processes (e-Decision-Making) as two main priorities that the Government of Mauritius needs to improve on.

Figure 23: Government seeks feedback from Citizens on national issues via online channels

Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

Figure 24: Frequency that Citizens use Internet

To participate in interactive discussions on Government policy issues (for example: via online discussion forums): Not once 66, At least once but not every month 18, At least once a month but not every week 9, At least once a week but not every day 4, Every day or almost every day 2

To participate in online consultations on policy issues organised by Government (for example: Vision 2030, National Budget): Not once 57, At least once but not every month 25, At least once a month but not every week 8, At least once a week but not every day 8, Every day or almost every day 2

To contact Government by e-mail (for example: to ask a question, formulate a complaint): Not once 42, At least once but not every month 30, At least once a month but not every week 9, At least once a week but not every day 5, Every day or almost every day 14

To submit completed online forms to request a public service (for example: to obtain a certificate or permit): Not once 35, At least once but not every month 47, At least once a month but not every week 10, At least once a week but not every day 5, Every day or almost every day 2

To download application forms that are necessary to obtain a public service (for example: to obtain a certificate or permit): Not once 17, At least once but not every month 55, At least once a month but not every week 16, At least once a week but not every day 9, Every day or almost every day 3

To consult policy documents or decisions on Government websites: Not once 16, At least once but not every month 29, At least once a month but not every week 21, At least once a week but not every day 23, Every day or almost every day 11

To obtain information from Government websites: Not once 14, At least once but not every month 24, At least once a month but not every week 18, At least once a week but not every day 21, Every day or almost every day 22

Legend:
- Not once
- At least once, but not every month
- At least once a month, but not every week
- At least once a week, but not every day
- Every day or almost every day

Note: Persons may report more than one answer
Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

Recommendation 2.1

Implement mechanisms to support the integration of citizens and other stakeholders' views in decision-making processes, design and improvement of digital services, data to be released in open formats, among others

7 Creation of a Data-Driven culture in the Public Sector

7.1 Decision-making, policy formulation and service-delivery

> Without data, we cannot know how many people are born and at what age they die; how many men, women and children still live in poverty; how many children need educating; how many doctors to train or schools to build; how public money is being spent and to what effect; whether greenhouse gas emissions are increasing or the fish stocks in the ocean are dangerously low; how many people are in what kinds of work, what companies are trading and whether economic activity is expanding.
> United Nations (2014a)

Data has become quintessential for decision-making and without data, designing, monitoring and evaluating effective policies become difficult (United Nations 2014a). Along the same lines, OECD (2015) recommends that governments should collect, share and analyse data in a way that actively supports evidence-based policy-making.

G2G survey respondents conquer that data is an important asset that can be tapped on for decision-making (Figure 25A).

Figure 25: Data for improving Decision-making and Service Delivery
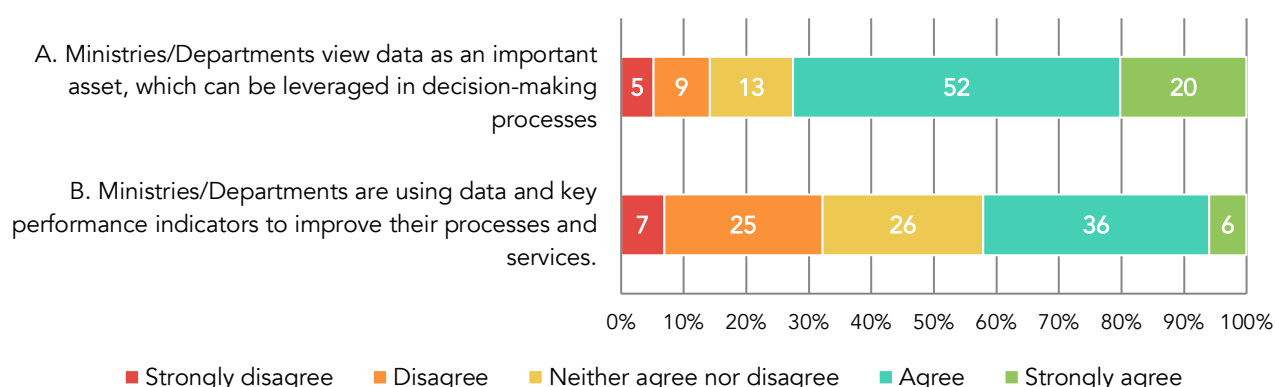
Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

Effective use of data allows government to become more responsive to the public's needs (Forrester 2015) through better-designed policies and tailored services. For example, data can be used in real-time by front-line staff to ensure the person they are serving gets the best possible support to meet their needs (Gov.uk 2017a).

A majority of G2G respondents are either in disagreement or do not have a stand as to whether government agencies are using data for improvement of processes and service-delivery (Figure 25B).

To better help government agencies understand how people find, access, and use government services online, both UK and US have implemented digital analytics dashboards. The dashboards let government service managers to quickly spot problems with their services and they can take

action to improve it. Service managers also use the data to focus human resources on services that matter most to the public, and analyse progress in service delivery improvement.

Recommendation 3.1

Data and analytics e.g. data-driven dashboards, service usage statistics, among others should be leveraged upon by top management to monitor and continuously improve quality of digital services and enhance decision-making and policy formulation

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7.2 Once-Only Principle

Figure 26: Ministries/Departments reuse data that has already been captured by other Government agencies rather than requesting the same data again
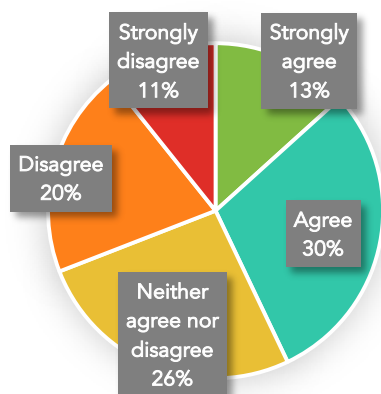
Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

The once-only principle is gathering momentum worldwide. Within this principle, government agencies ensure that they seek information from citizens and businesses only once and re-use this data, in due respect of data protection rules. The once-only principle is key to delivering public services in an efficient way, realising both cost reductions for government as well as burden reduction for users of digital services (European Commission 2016).

G2G survey results reveal that government agencies are already reusing data that has been captured rather than requesting same data again (Figure 26) showing that they are aware of the benefits of data re-use.

The Tell Us Once service of UK allows public to register a birth or a death once, and the service takes care of reporting the event to several other government agencies at one go. E.g. On registration of a death, the Tell Us Once service may report the death to more than 20 agencies.

Recommendation 3.2

Enforce once-only principle in Government where citizens and businesses provide information only once to Government and the information is re-used for delivering services

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7.3 Interoperability and data sharing via InfoHighway

The success of once-only principle depends on:

- The availability of base registries or data stores used by governments to automatically validate or fetch data relating to citizens or businesses (Accenture 2014).
- Whether sharing of data happens regularly among Government agencies (Gartner 2016).

The Danish Basic Data Programme stores personal, business, property, address, geographic and income data in electronic repositories across different levels of government. Public authorities share this data internally and in a secure manner to create digital end-to-end services for the benefit of citizens and businesses (European Parliament 2015).

In Mauritius, the lack of information sharing between government agencies and end-to-end facility in digital transactions may inhibit the use of digital government services (Figure 27).

Figure 27: What are the reasons you believe hinders the use of Government e-Services by Citizens in Mauritius?

Bar chart: Percentage (%)

- Lack of awareness of e-Services: 71
- Not all Citizens have adequate ICT skills to perform transactions online: 54
- Lack of user-friendliness of e-Services: 52
- Lack of coordination and sharing of information with Government organisations which require same information more than once: 52
- Lack of end-to-end facility for conducting all formalities online: 50
- Lack of participation of Citizens in the design of e-Services: 49
- Inability to track the status/progress of requests/applications: 47
- Lack of electronic payment facility: 46
- Lack of evaluation of client satisfaction of e-Services on a regular basis: 44
- Lack of multiple channels for availing of e-Services (e.g. mobile apps): 43
- Privacy or security concerns: 42
- Lack of online user support (e.g. online help, FAQs and instant interactive chats): 41
- Technical Issues (e.g. Service not accessible): 36
- Lack of incentives for choosing the online channel over conventional channels (e.g. Prize, faster service delivery): 32
- Some Citizens prefer personal contact: 31
- Not Interested/ No need: 9

Note: Persons may report more than one answer
Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

The InfoHighway (refer to case study below) is the invisible yet crucial platform that can address the majority of data operational concerns and data-sharing needs in government as it allows disjoint e-Services to link up via the exchange of data in a secure manner. As an illustration, the Mauritius Revenue Authority (MRA) leverages on the InfoHighway to support its digital service where citizens can register for the Negative Income Tax scheme. The service is linked to the citizens' database of the Civil Status Division (CSD) via the InfoHighway using the Publisher/Subscriber principle.

Case Study: InfoHighway, the award winning data sharing platform

InfoHighway is the Government integrated platform that allows multiple government agencies to share data with other agencies via a secure publisher-subscriber architecture using web portal, web services and file extraction.

The connection of multiple strategic public and parastatal agencies such as the Central Business Registration Department (CBRD), the Civil Status Division (CSD), the Economic Development Board (EDB), the Mauritius Revenue Authority (MRA) and the National Transport Authority (NTA) has been a key milestone in the delivery of services with the technical breakthrough of the InfoHighway.

Portal

1. Connect on a Web Browser
2. Insert Username/Password
3. Insert search field to access publisher data

Web Service

1. Web service made available by InfoHighway
2. Web service accessed by local application
3. Search done directly from subscriber application

Extraction

1. Extract scheduled based on specific criteria
2. Data extracted to be shared
3. Extract shared with Subscriber using sFTP

As at date, the InfoHighway enables a total of 74 connections between various Ministries and departments including parastatal institutions and 253 E-Services. The InfoHighway was awarded as the **WSIS Champion 2018** in the e-Government category by the International Telecommunication Union (ITU).
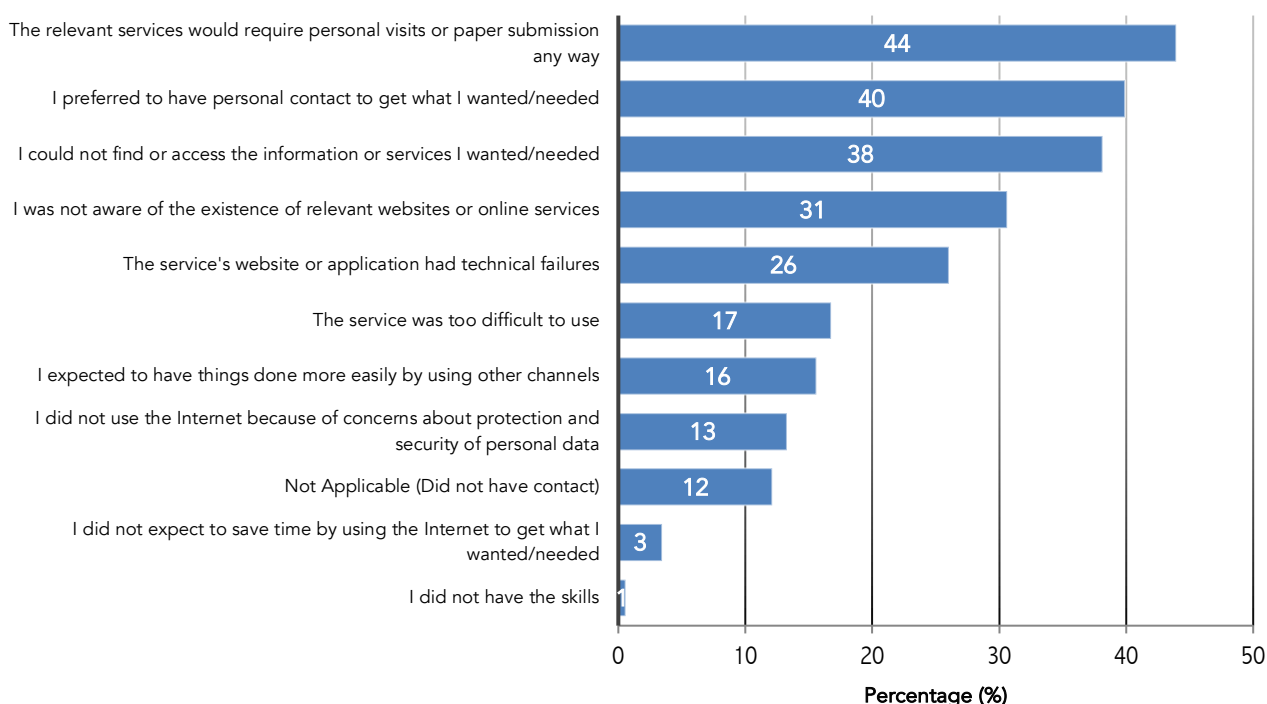
To achieve a connected-government with end-to-end digital services, it is therefore important that systems and services are seamlessly inter-operable and share data via the InfoHighway.

Recommendation 3.3
Promote high degree of interoperability in systems and enhance sharing of data especially registers such as citizen, company, property, address, etc.

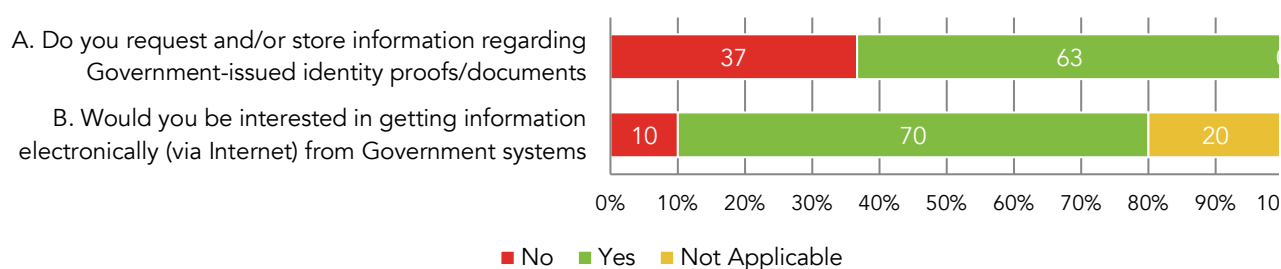## 7.4 Retrieve data, not documents

Interoperability and data sharing between systems reduce transaction-processing time, pressure on counter services and errors in data entry, among others. Most importantly, data re-use would save public from travelling to counters and submit paper documents which appear as the prime obstacle for public not using Internet to transact with government (Figure 28).

Figure 28: Reasons for not having used Internet to contact Government agencies/officials

Reason	Percentage (%)
The relevant services would require personal visits or paper submission any way	44
I preferred to have personal contact to get what I wanted/needed	40
I could not find or access the information or services I wanted/needed	38
I was not aware of the existence of relevant websites or online services	31
The service's website or application had technical failures	26
The service was too difficult to use	17
I expected to have things done more easily by using other channels	16
I did not use the Internet because of concerns about protection and security of personal data	13
Not Applicable (Did not have contact)	12
I did not expect to save time by using the Internet to get what I wanted/needed	3
I did not have the skills	1

Note: Persons may report more than one answer
Source: Government-to-Citizens (G2C) Questionnaire, Digital Government Survey 2018

In delivering their services, businesses either request or store information on government-issued identity/documents when transacting with customers (Figure 29A). A majority of those businesses that participated in the G2B survey have expressed an interest in retrieving such information from government via digital means (Figure 29B).

Figure 29: Use of Documents by Businesses

	No	Yes	Not Applicable
A. Do you request and/or store information regarding Government-issued identity proofs/documents	37	63	
B. Would you be interested in getting information electronically (via Internet) from Government systems	10	70	20

Source: Government-to-Business (G2B) Questionnaire, Digital Government Survey 2018

Moreover, both G2C and G2B survey respondents (Table 4) say that they would like to use electronic documents over paper submission when transacting with government and are highly favourable for the use of electronic versions of documents for proof of address, educational certificates, etc.

Table 4: Projects in order of priority

Citizens	Business
Request Information Only Once	E-Licensing Platform
Paperless Transactions	Paperless Transactions
Consolidated Job Portal for Public and Private Sector	Online Public Consultations
Online Public Consultations	Digital Safe for Documents
Open Government Data	Online Authentication
Digital Safe for Documents	Consolidated Job Portal for Public and Private Sector
Directory of Mobile Apps	Open Government Data

Source: Government-to-Citizens (G2C) and Government-to-Business (G2B) Questionnaire, Digital Government Survey 2018

Students in the Netherlands do not need to provide personal and educational data when they apply for higher studies in Dutch universities as the data is available in a national database (StudieLink). The database is used by all government-funded higher education institutions.

Recommendation 3.4
Instead of requesting copies of government-issued documents (e.g. copy of IDs, proof of address, birth/marriage/death certificate, etc.) during transactions, data should be sourced from Government agencies via InfoHighway, and any identification and/or verification be conducted electronically

8   Protecting Privacy and Ensuring Security

Today's cyber security and privacy protection challenges require a more holistic solution because digital initiatives are happening everywhere (Cisco Systems 2017).

In order to ensure security and resilience, government must develop the capabilities through internal governance structures and behaviours as well as work with other organisations (World Economic Forum 2018).

Mauritius is already ranked **6th in the world** and **1st in Africa** in the Global Cybersecurity Index (GCI) 2017 of the International Telecommunications Union (ITU) with high scores in legal, technical and capacity building areas.

The Government has committed to support the development of cyber resilience governance capabilities by putting in place a number of structures, strategies and legal framework to ensure Mauritius has a strong data privacy protection and cyber-security ecosystem.

- The *Data Protection Office (DPO)* is the data protection and privacy enforcement authority in Mauritius. The responsibilities of the DPO are, amongst others, to exercise control on all data processing activities and verify whether processing of data is in accordance with the provisions of the law.

- A *Data Protection Act* provides for the protection of the privacy rights of individuals. The act has been recently been amended to be in line with international standards, in particular the European Union's General Data Protection Regulation (GDPR).

- The *Computer Emergency Response Team of Mauritius (CERT-MU)* provides information and assistance to its constituents in implementing proactive measures to reduce the risks of information security incidents as well as responding to such incidents as and when they occur. By handling security incidents and monitoring security problems occurring within public and private sectors. The CERT-MU provides guidance on how to adopt best practices in information security and also warns and educates system administrators and users about latest information security threats and countermeasures by means of information dissemination.

- An *IT Security Unit* acts as a key contact point for IT Security in Government and is responsible for dissemination of knowledge on Information Security, promotion of the implementation of Information Security standards and establishment IT security practices within Government.

- A *National Cybercrime Strategy* facilitates Government efforts to tackle cybercrime. The strategy provides for a more effective law enforcement and criminal justice response in view of a safer and more secure digital environment for Mauritius.

- A *National Cyber Security Strategy* addresses cyber security issues in Mauritius. The strategy defines the main goals, guidelines and action plans to respond effectively to cyber threats and also recognizes the fundamental challenge of balancing the measures intended to protect security.

- Mauritius acceded to the ***Budapest Convention on Cybercrime*** in November 2013. The principles enshrined in the Budapest Convention are being implemented through the ***Global Action on Cybercrime (GLACY)*** Project. GLACY is a joint project of the European Union and the Council of Europe aimed at supporting countries worldwide in the implementation of the Budapest Convention. The Convention provides a comprehensive model framework of offences and law enforcement powers and facilitates close co-operation between member countries. It has become the cornerstone of a harmonised approach to cybercrime for a growing global community of nations. Following the successful implementation of the GLACY project, there is a GLACY + project running up to 2020.

- The ***Computer Misuse and Cybercrime Act*** deals with offences of unauthorised access, unauthorised modification of computer material and interception of data transmitted through a computer system, and electronic fraud.

- Additionally, section 46 of the ***Information and Communication Technologies Act*** caters for a number of offences in the Cyberspace.

As cyber threats are becoming more sophisticated over time, sharing knowledge and working with the private sector can make cybersecurity plans more effective and practical. By exchanging experience and knowledge on cyber threats as well as security responses, and by collaborating on security plans, public and private-sector organisations can better defend themselves against risks they face in common, and thereby guard the interests of their constituents (McKinsey 2016).

In order to strengthen Mauritius' foothold in the cyber-security domain, it is therefore imperative that its efforts are continuously in line with international best practice. Thus, strong cooperation with international bodies and local public-private partnership is required in order to combat cyber-security threats that are inherent in the digital world.

Recommendation 4.1
Develop partnerships with the private sector to collect data on security incidents and privacy violations

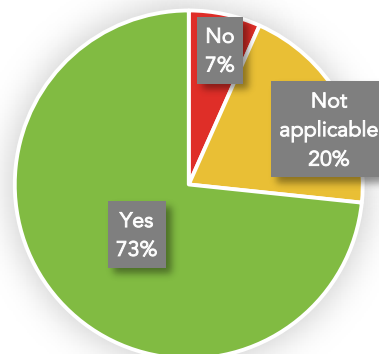| Recommendation 4.2 |
| --- |
| **Work in co-operation with international organisations in the development of strong assessment and performance indicators regarding security and privacy** |

8.1 National Authentication Framework

Businesses identified the facility to allow businesses to authenticate citizens into their digital service e.g. Internet banking using secure infrastructure of Government, as one of the priority projects that Government could implement in the future (Table 4).

Moreover, a large number of businesses are willing to authenticate identity of customers using their Smart ID Cards (Figure 30).

Singapore (OneKey) and Estonia (e-Identity) have implemented their National Authentication Framework to facilitate the delivery of safe online services to citizens offered by both the public (e.g. digital government services) and private sectors (e.g. online bank transactions). In Estonia, two out of every three citizens regularly use a national electronic ID to perform online transactions (McKinsey 2016).

Figure 30: Authentication of customers by business using Smart ID Cards

Source: Government-to-Business (G2B) Questionnaire, Digital Government Survey 2018

| Recommendation 4.3 |
|---|
| **Implement a National Authentication Framework, which will allow both public and private sector to authenticate citizens in the delivery of digital services** |

50

9   Leadership and Political Commitment

9.1 Political Support, Priority, Commitment and Leadership

Gartner (2015) and OECD (2015) emphasise that the success of implementation of digital transformation agenda depend mainly on:
- Political system and/or relative degree to which a strategy can be promoted versus being enforced or implemented by mandate.
- Degree of leadership or executive endorsement associated with the digital government.
- Urgency ascribed to achieving digital government

Moreover, the e-Government Survey 2014 (United Nations 2014b) and the Information Technology and Innovation Foundation (ITIF 2015) aver that high-level political support and fully dedicated digital government champions at administrative level can overcome barriers in the delivery of online services.

Figure 31: Digital Government projects receive the right priority and level of commitment from all key stakeholders involved
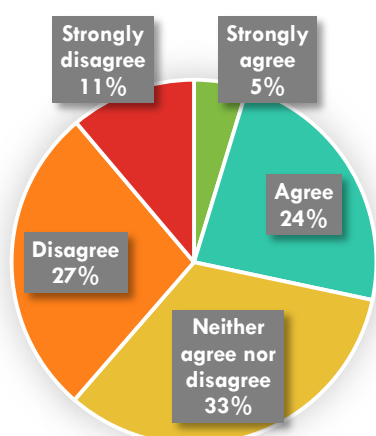
Source: Government-to-Government Questionnaire, Digital Government Survey 2018

The Digital Government G2G Survey reveals that only 29% of respondents (Figure 31) are of the view that digital government projects receive the right priority and level of commitment from key stakeholders.

The OECD (2015) recommends that policy makers should involve and secure commitment of top political leadership in the implementation of their e-Business strategies e.g. Head of Government as the champion of change - at all stages of implementation of ICT initiatives.

In that respect, government leaders in Denmark rearranged their priorities to devote more time and attention to major digital programs and chair weekly meetings to review progress, bring up challenges, and come up with solutions.

Recommendation 5.1

Digital government initiatives, with high public impact, should be championed by Ministers to show high political support and gain executive endorsement

Recommendation 5.2

Agreements should be contracted between key stakeholders to ensure digital government projects are given the right priority and level of commitment

9.2 Government Leaders with Digital Skills

McKinsey (2016) recommends that government leaders need to be informed about digital technologies and trends and be attuned to the opportunities these create. Leaders who understand digital trends and technologies are more likely to provide support to their workforce in the delivery of digital services (Deloitte Digital 2015).

44 % of G2G survey respondents opined that senior management at Ministries/Departments do not have sufficient understanding of digital trends and emerging technologies (Figure 32A) and more than half were of the opinion that senior management do not have sufficient skills to govern their organisation's digital strategy (Figure 32B).

Figure 32: Digital Savvy Leadership
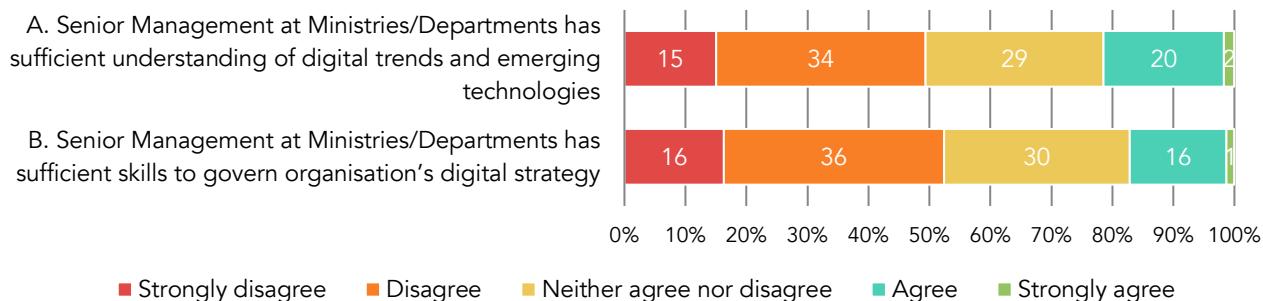
Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

As a solution to increase the digital savviness:
- United Kingdom which is the world leader in digital government, through its Government transformation strategy, is making sure that government employees of professions other than ICT understand digital and is imparting agile project and programme management skills to its leaders (Gov.uk 2017a)
- Senior leaders in New Zealand were provided with a full-day executive class where they were introduced with digital and innovation concepts including digitisation best practices and hiring digital talent.

Recommendation 5.3

High-ranking executives should be empowered with digital skills to lead the digital transformation

## 10 Coherent use of digital technology across policy areas

OECD (2015) recommends that government should ensure strong coherence in the use of digital technologies across all policy areas by adopting a common approach to digital transformation based on standards, policies and efficient use of existing assets.

10.1   Management of digital assets

Consolidated information on digital assets such as information systems, services, data repositories, and licenses often requires intensive work; comes from several sources and may be inconsistent or out of date (Figure 33).

Having up-to-date inventories of digital assets provide for opportunities for re-use, re-allocation of resources across policy areas and levels of government and plan for the government's information management E.g. spare database or antivirus licenses can be allocated to new systems, government agencies may look up and subscribe to existing data sharing services from a catalogue, etc.

Figure 33: Ministries/Departments keep an updated list of ICT equipment, systems and their lifespan
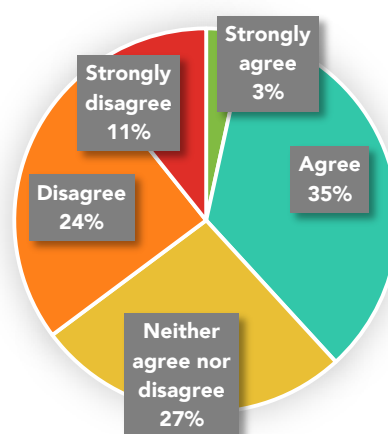
Source: Government-to-Business (G2B) Questionnaire, Digital Government Survey 2018

In Estonia, the Information System Authority manages a catalogue, which provides information on systems, databases and related key contact points, data fields, data sharing services and enabling legal frameworks, and other digital assets. The catalogue is an indispensable tool for developers and administrators for the planning, design and management of the state digital services and systems.

> **Recommendation 6.1**
> **Maintain electronic inventories of digital assets such as information systems, digital services, data repositories, and licenses**

10.2   Standards and policies

Providing end-to-end services to citizens and avoiding duplication requires different parts of the public sector to work together. If different parts of government handle processes differently, it makes it harder to run digital services until and unless processes are standardised (Gov.uk 2016).

According to most businesses surveyed, standardisation is one of the priority areas government should focus in its Digital Government Transformation Strategy (Figure 34).

Figure 34: Areas Government should focus in its Digital Government Transformation Strategy
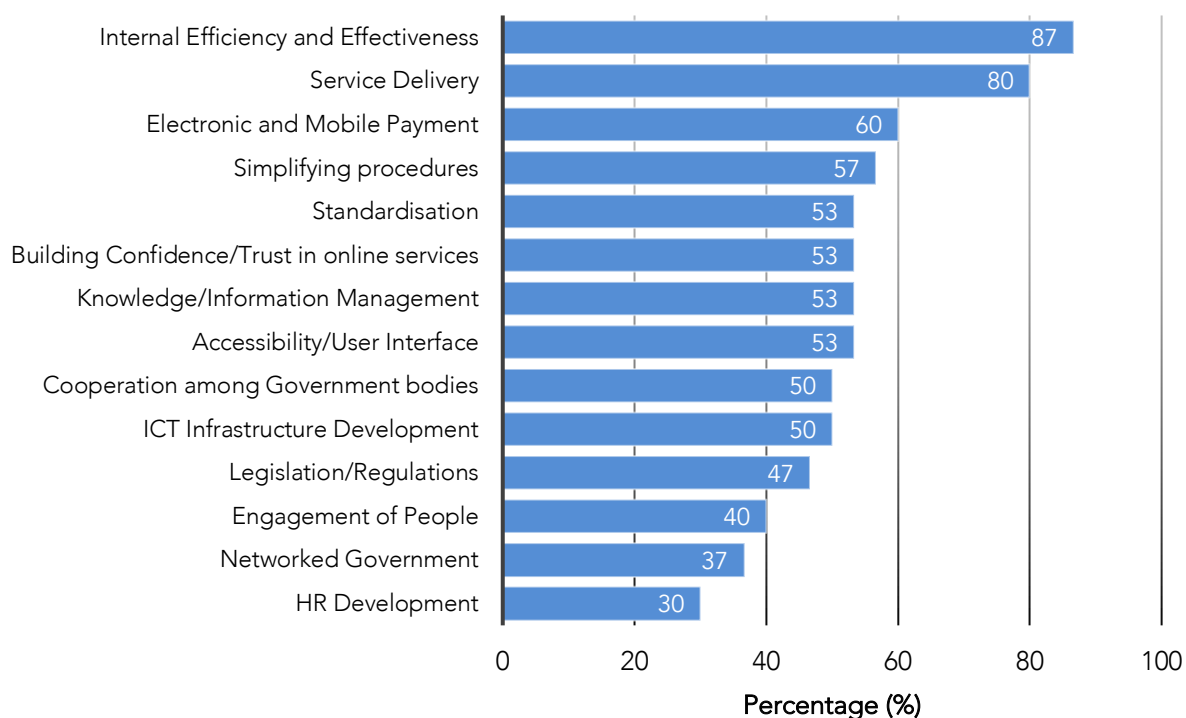
Note: Persons may report more than one answer
Source: Government-to-Business (G2B) Questionnaire, Digital Government Survey 2018
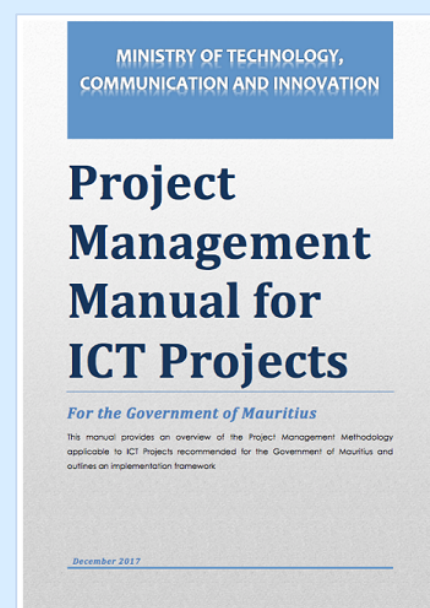
Adoption of standards and policies allows for harmonisation within government, which in turn ensures better integration of services and reduction in duplication of effort and costs as showcased in the case study of the Project Management Manual for ICT projects below.

Case Study: Project Management Manual for ICT projects (PMMI)

A Project Management Manual for ICT projects (PMMI) derived from leading international and proven project management methodologies was formulated to describe the project management methodology for the implementation of ICT projects in the Civil Service. The PMMI outlines the processes, roles of the stakeholders and provides project document templates, among others for the implementation of ICT projects.

By standardising the project management methodology, the PMMI aims to bring Government-wide benefits *viz*:
- Increase efficiency in implementing projects
- Reduce variances in project results including cost overruns and schedule slippage
- Provide a harmonised understanding of steps, roles and approach in the implementation of all ICT projects
- Improve maturity of project management processes through the use of proven methodologies
- Build a common base of project management document templates to be used in practice

MINISTRY OF TECHNOLOGY, COMMUNICATION AND INNOVATION

Project Management Manual for ICT Projects

For the Government of Mauritius

This manual provides an overview of the Project Management Methodology applicable to ICT Projects recommended for the Government of Mauritius and outlines an implementation framework

December 2017

Initiatives such as the PMMI, which received government approval, can be used as an example for bringing harmonisation in government. Process manuals for document management systems, guidelines on publication of open datasets, email usage, database administration, publishing of content on government websites, and incident handling among many others already exist but are not well promoted within government.

The United Kingdom translated recommendations and principles from its digital transformation strategy into a Technology Code of Practice (TCoP), which sets the standard for how government should design, build and buy technology. Departments have to follow all points of the TCoP for implementing their technology projects or programmes.

Recommendation 6.2
Reinforce policies and standards regarding the use of ICT in public sector

10.3   Digital by Default

> A modern public service should be paper-free.
> Government of South Australia (2017)

Leading governments are implementing the "digital by default" principle (Table 5), which involves re-designing and re-engineering processes so that services are delivered through digital channels and have an entirely digital workflow. Digital services with end-to-end workflows provide a number of benefits (World Bank 2016b) such as:
- Services are more efficient and manageable;
- Progress of applications can be tracked and become more transparent;
- Citizens can be kept informed of important steps;
- Processing or validation of applications can be automated (e.g. checklists);

- Cross-verification/validation with other government databases can be done in real-time;
- Business reports, key performance indicators, statistics among others can be generated in lesser time.

The application of Visa and payment of fees in Turkey, US and Australia is entirely digital without the need to affix stickers on passports and Visa is verified electronically at border control. In the UK, the paper car tax certificate has been abolished as the car tax paid status is held on the vehicle licensing agency's computers, and enforced digitally through automatic camera systems.

Country	Initiative
UK	The UK has a Digital Service Standard, which is a set of 18 criteria to help government offer services which are digital by default. The final criterion is to "test the service from beginning to end with the minister responsible for it."
Australia	Australia has a digital service standard, which has been adapted from the UK's model to support its digital by default principle.
Canada	Canada has issued a directive to all its government agencies emphasising "digital media and platforms as the primary means to connect and interact with the public".
Denmark	Denmark has made digital mandatory for government-citizen interactions for the most frequently used citizen's public services.
EU Countries	All European Union (EU) and European Free Trade Association (EFTA) member states have signed an eGovernment declaration, promising to implement digital-by-default services

In order to ensure the "digital by default" principle is fair to all citizens, assistance will need to be provided to those who need help in accessing government services online. The United Kingdom, in its Digital Service standard, emphasises on the need for government agencies to provide assisted digital support to anyone who has difficulty using the Internet and therefore can't use digital services. This may entail use of telephone, web chats or service desks where user is provided with support to complete a digital service without the use of paper.

We will always provide assistance for those who need help in accessing government services online. The world is changing and when you can bank online at midnight and shop from your bedroom, people rightly expect high-quality digital services from government.
Cabinet Office, United Kingdom (The Guardian 2014)
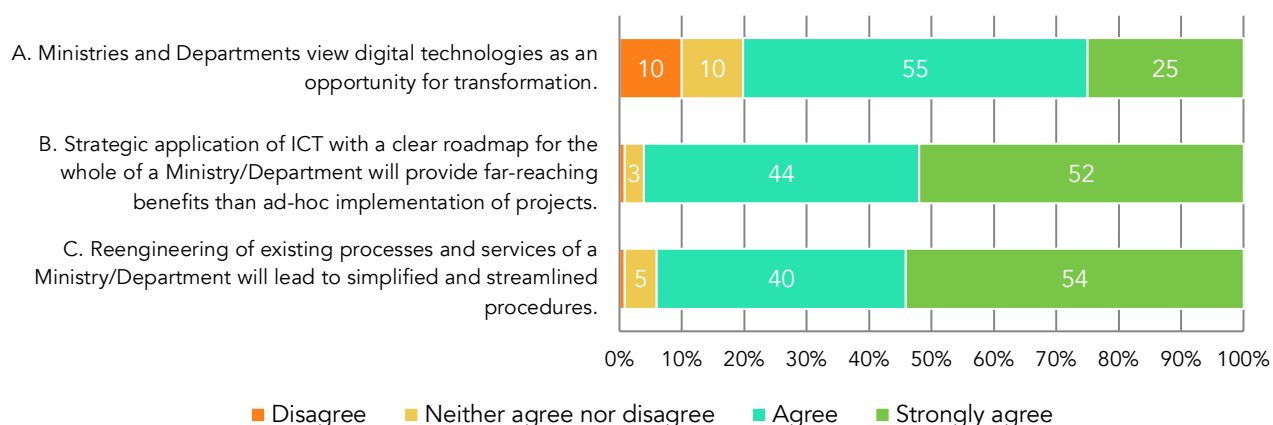
Recommendation 6.3

Government should adopt the "Digital-by-default" principle where agencies proactively transform their services, using digital technology while at the same time ensuring assistance is provided to those who need help in accessing digital government services

10.4   E-Business Strategies

Devising a clear and coherent technology-led business strategy is the first step toward successful digital transformation of government agencies (Figure 35A) and can provide far-reaching benefits than ad-hoc implementation of projects (Figure 35B). Ministries and departments can benefit from a roadmap that addresses the key elements of digital transformation (Deloitte Digital 2015):
- Documentation of current processes and services (as-is) and how these can be transformed (to-be)
- A detailed plan of action for each project identified
- Change management initiatives to engage stakeholders and secure their backing to implement the strategy
- Monitoring and evaluating the progress of implementation of the digital strategy

Figure 35: e-Business Strategies

	Disagree	Neither agree nor disagree	Agree	Strongly agree
A. Ministries and Departments view digital technologies as an opportunity for transformation.	10	10	55	25
B. Strategic application of ICT with a clear roadmap for the whole of a Ministry/Department will provide far-reaching benefits than ad-hoc implementation of projects.		3	44	52
C. Reengineering of existing processes and services of a Ministry/Department will lead to simplified and streamlined procedures.		5	40	54

Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

The process of digitalisation demands organisational changes and re-engineering of operational procedures at the very outset before application of technology (McKinsey 2016). Re-engineered processes translate into simplified and streamlined procedures without barriers such as administrative and legal elements that could hinder digital transformation (Figure 35C).

> **Recommendation 6.4**
>
> **Ministries and Departments should ensure that they have a e-Business strategy/plan, which includes business process reengineering and a blueprint to achieve digital transformation of their services and processes**

58

11 Effective organisational and governance frameworks to co-ordinate the implementation of digital government strategies

11.1 Whole-of-Government approach to digital governance

The Digital Government Transformation Strategy 2018 – 2022 recommends actions which will have to be implemented government-wide. It is essential that Ministries/Departments follow strategy recommendations in order to achieve harmonisation and maximise benefits across government.

Most of the recommendations of the e-Government Strategy 2013 - 2017 that are yet to be implemented are in discussion phase. E.g. online application and issuance of birth certificate, online publication of government gazette, among others. During discussions for implementation of these recommendations, it came out that a policy decision would be required at either ministerial level or cabinet level. Yet, other countries are able to offer similar services online e.g. US, Mexico and New Zealand allow citizens to order birth certificates online. Malta and Australia publish their government gazettes and notices on the web.

Authority to demand changes, ability to influence and political drive are therefore required to lead common decisions for the deployment of digital solutions across the public sector, e.g. decisions on "digital by default" (OECD 2015).

Additionally, user-centric end-to-end digital services require horizontal integration among agencies and at different levels of government because there is a necessity for data to flow easily so that joined-up services can run seamlessly. The division of accountabilities between government Ministries and Departments make integration difficult to accomplish (World Bank 2016b).

Cross-silo coordination mechanisms at the head of government level are essential to engage stakeholders in the implementation of technology-led national strategic objectives, integration and interoperability. Without these mechanisms, government agencies do not always participate actively in digital projects that cut across policy domains and as a result, benefits associated with digital transformation are not reaped.

Countries that are leveraging the inter-linkages and synergies between government agencies are transforming delivery of public service, improving governance processes, and driving efficiencies in services and reducing costs, while providing high-quality services to their citizens (Accenture 2014).

Table 6: Digital transformation leadership in digitally advanced countries

Country	Digital Transformation Leadership
UK	The Digital Government Service under the Cabinet Office leads digital transformation and related strategies in government.
Australia	The Digital Transformation Office under the Prime Minister leads digital transformation.
Estonia	e-Estonia council chaired by the Prime Minister and comprised of experts, ICT sector representatives and three Ministers directs the development of Estonian digital society and e-governance, especially the implementation of national digital agenda. Other government institutions and experts are involved in the work upon need.
Singapore	The GovTech agency under the Prime Minister's Office oversee digital transformation across sectors.

It is not a coincidence that in all digitally advanced countries (Table 6), digital transformation is led or overseen by the highest level of Government. In Mauritius, the Prime Minister's Office has setup oversight and reporting mechanisms to ensure that budget measures are implemented across government and blocking factors, if any are resolved. Similar mechanisms are needed to ensure that digital transformation is a success.

Recommendation 7.1
Establishment of oversight and reporting mechanisms e.g. a High Level Digital Government Task Force chaired by the Prime Minister, who has the authority to engage stakeholders and make things happen in the implementation of technology-led national strategic objectives such as Digital Government Transformation Strategy 2018 – 2022 recommendations, integration and interoperability between agencies

11.2 Governance of digital projects at organisational level

At organisational level, governance of digital projects are presently being ensured by the following committees:

- ***Minister-led Committee***
  Projects of national importance and/or high complexity implemented by a particular line Ministry/Department are sometimes monitored by a committee chaired by the Hon. Minister (Figure 36). The committee is comprised of high-level executives (e.g. Senior Chief Executive, and/or Permanent Secretary, Chief Technical Officer, departmental heads, directors of digital government, operations and security and the chairpersons of the sub-level committees).
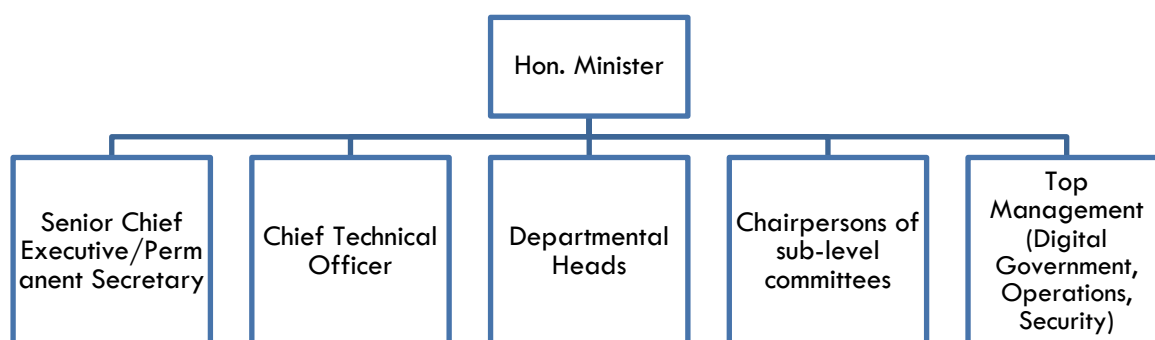

Figure 36: Ministerial Committee

- *Project Steering Committee*

  A Project Steering Committee (PSC) at the level of the user Ministry/Department to track, review and monitor the progress and performance of the project. The PSC is normally chaired by the Head of the user Ministry/Department (project sponsor) and comprises Programme Managers, solution providers and other stakeholders (Figure 37). The PSC identifies any areas in which changes to the plan are required and initiates the appropriate changes.
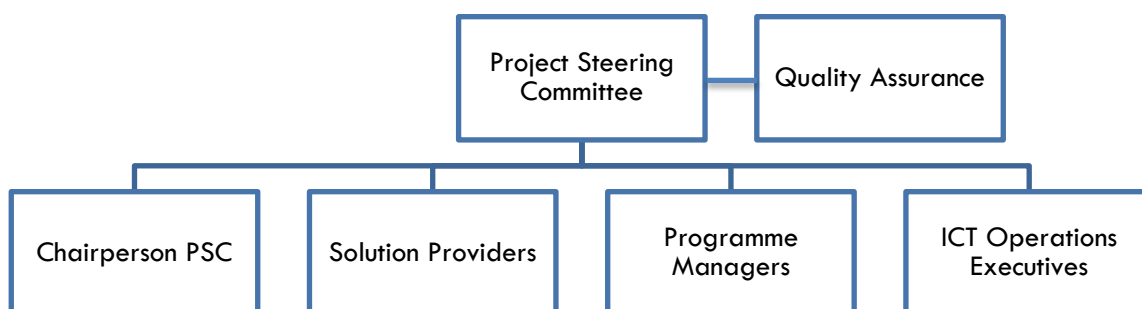

Figure 37: Project Steering Committee

- *Project Monitoring Committee*

  A Project Monitoring Committee (PMC) chaired by the user Ministry/Department (Figure 38) comprising Senior management personnel from user Ministry/ Department, solution providers, and Programme Managers. Additional members may be co-opted as and when required. The PMC participates in the planning process, monitors the project and ensure adequate user commitment. The PMC is also responsible for undertaking follow-up on decisions taken by the PSC and monitors the progress of the project.
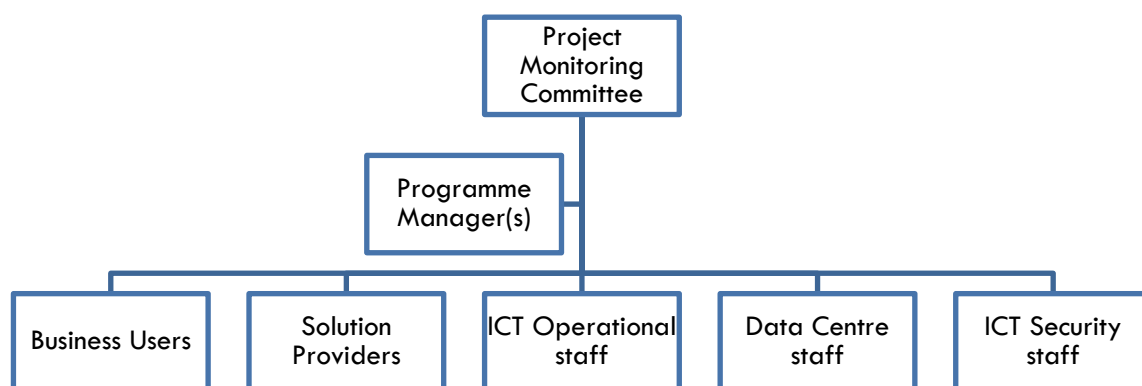

Figure 38: Project Monitoring Committee

On a case to case basis, besides monitoring of projects, it is necessary to monitor the digital strategy at each Ministry/department that will not only look at one project in particular but a programme of digital projects aimed at transforming the Ministry/department.

Recommendation 7.2

Minister-led committees should monitor implementation of digital transformation projects at the level of line Ministries/Departments and progress should be reported to and reviewed by the High-Level Digital Government Task Force

11.3   Approval of funding for digital projects

Figure 39: Funding provided to Ministries/Departments for Digital Government priorities is sufficient
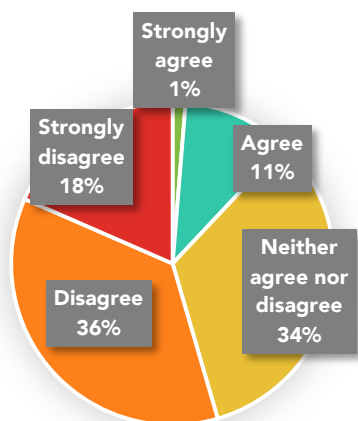
Source: Government-to-Government Questionnaire, Digital Government Survey 2018

Line Ministries/Departments propose digital government projects along with justifications to the Ministry of Finance and Economic Development for funding. Survey data (Figure 39) reveals that level of funding provided to Ministries and Departments to match digital priorities is inadequate.

Best practice in the most digitally advanced countries shows that proportioning and approval of digital transformation funds rests with the body responsible for digital transformation and involves capabilities that have a digital-embracing vision. E.g. in US, technology review boards have been setup to oversee investments in technology. In UK, departments submit digital and technology spending requests for approval to the Government Digital Service, which is responsible for leading government-wide digital transformation.

Recommendation 7.3

Funding for digital government projects should be governed at the level of High-Level Digital Government Task Force and be aligned with the priorities set by overall Digital Government Transformation Strategy

11.4   Investment in ICT

> ICT investment generates a bigger return to productivity growth than most other forms of capital investment – a so-called "ICT dividend".
>
> Oxford Economics (2012)

A number of studies have reported that investment in ICT results in positive impact for the country (Figure 40):

Figure 40: Impact of ICT Investment & Digitisation in Government

- Huawei (2017), as part of its Global Connectivity Index 2017 concluded that every additional US$1 investment on ICT Infrastructure could bring a return of US$3 in GDP at present, US$3.70 in 2020 and the potential return increases to US$5 in 2025.

- A study by Accenture (2014) opined that digitisation improves economic competitiveness, quality of life, business potential and public service delivery so much that 1% increase in digitisation raises the GDP by 0.5%.

- Oxford Economics (2012) purports that investment in ICT enables the economy to be more productive and to generate a higher level of GDP. This extra GDP will be generated over a number of years as that ICT capital is operated. ICT investment generates a bigger return to productivity growth than most other forms of capital investment
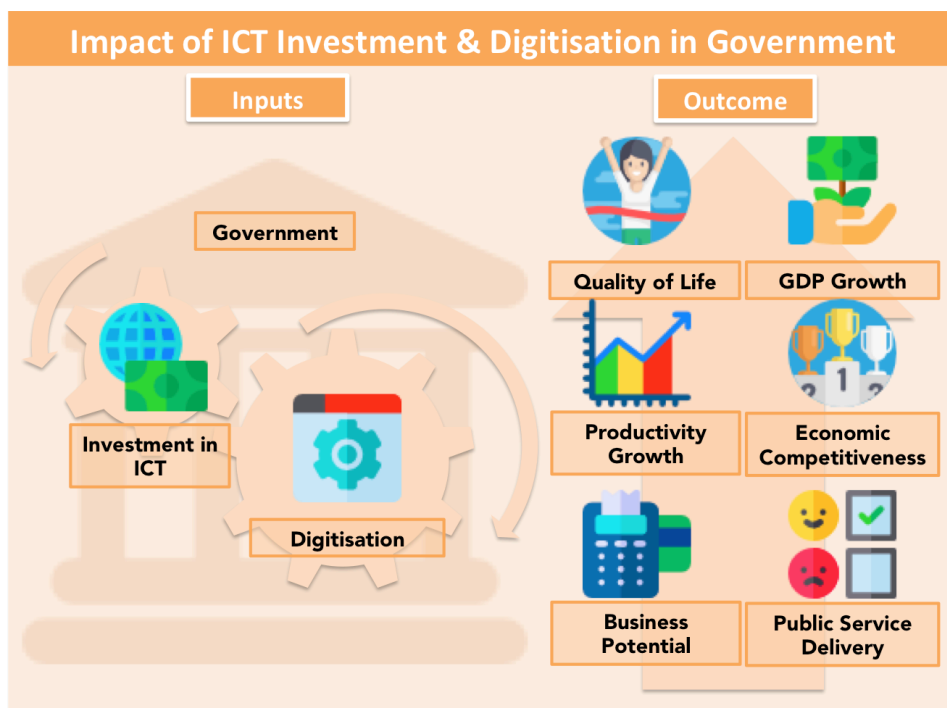
Although Mauritius has a vision of being transformed into a high income and smart country as advocated by the Vision 2030 blueprint and Digital Mauritius 2030 strategy, expenditure in ICT in the National Budget amounts to less than 1% of the GDP[3] of the country. G2G survey (Figure 39) revealed that there is inadequate funding provided to Ministries/Departments for digital government priorities.

Underinvestment constrains government's capacity to fund or put in place highly strategic digital government initiatives. Additionally, the budget allocated to digital transformation in each Ministry/Department should be in tune with the mandate, responsibilities and expected results of each Ministry/Department.

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[3] Calculated from capital and operational budgets of Government from Budget Speech 2017-2018

> The lack of adequate levels of funding can critically endanger government's capacity to steer change and drive digital transformation
>
> OECD (2016b)

Countries have established funding mechanisms to accelerate digital transformation. Denmark and Sweden have dedicated innovation funds to support public sector service innovation. In Denmark, the Public Welfare Technology Fund, administered under the Ministry of Finance, focus on the use of technologies to fully or partly automate labour intensive work (OECD 2016a). In Estonia, the government prioritises funding for digital projects that promises cross-department collaboration.

Funds to the tune of Rs 125M are earmarked annually in the national budget to support innovation, research and development in the country. These funds could also be leveraged to support digital government projects which have an element of innovation or use innovative technologies e.g. blockchain, Internet of Things, among others. Moreover, Annex B recommends where investments in ICT should be made in order to support achievement of the United Nations Sustainable Development Goals.

Recommendation 7.4
Government investment in ICT should be increased such that digital priorities be given adequate funding to match the vision of a high income and smart country

Recommendation 7.5
New funding mechanisms should be put in place to accelerate digital transformation that promotes innovation, cross-department collaboration, public welfare and end-to-end service delivery among others

12 Strengthen international co-operation with other governments

12.1   International Co-operation

International co-operation provides the opportunity to bridge the gaps between advanced and less advanced ICT societies by sharing skills, knowledge and experiences. Knowledge sharing among countries allows participants to enhance their digital capabilities and address any accessibility issues (OECD 2015).

Mauritius has signed Memorandum of Agreements (MoU) with countries namely, Estonia, India, Singapore among others for greater interoperability and comparability of data and information exchange of expertise. However, given that an MOU is only a statement of intent by parties rather a binding commitment to collaborate together, most of the MoUs have not been actioned.

To commit parties to work towards, and set out, ways in which they would collaborate, a number of countries have engaged in binding partnerships in the form of a charter instead of a MoU. The D7 is a group of the most digitally advanced governments in the world (Estonia, Israel, New Zealand, South Korea, UK, Canada and Uruguay), which have signed a charter, in which these nations commit to collaborate in the field of digital government, namely:
- Sharing of world-class digital practices
- Identification of improvements to digital services
- Collaboration to solve common problems
- Supporting and championing the group's growing digital economies.

Furthermore, Australia and UK have signed an official agreement committing both governments to share information and help each other in developing digital public services. Estonia and Finland have shared their resources, experience and expertise in ICT development through a bilateral agreement.

In order to strengthen its knowledge and expertise, Mauritius needs to tap on the experience of more digitally advanced governments in priority areas such as digital by default, once-only principle, among others.

Recommendation 8.1
Strengthen international/regional co-operation with other countries on priority digital themes, and operationalise existing MOUs through charters

12.2   Affiliation with international bodies

Government agencies can leverage on best practice and expertise of international bodies through affiliations subject to definition of clear needs and assessment of benefits (OECD 2015). The Computer Emergency Response Team of Mauritius (CERT-MU) is affiliated to different international organisations in the field of cyber security to be part of an international community for knowledge sharing, and alignment with standard practice.

Computer Emergency Response Team of Mauritius (CERT-MU)

The CERT-MU provides guidance and assistance to public and private sector constituents on how to adopt best practices in information security and also warns and educates system administrators and users about latest information security threats and countermeasures by means of information dissemination. The CERT-MU is affiliated to a number of different organisations across the world namely:

- Anti-Phishing Working Group (APWG), Team Cymru
- CERT Coordination Center, USA
- CERT-IN, JPCERT/CC, Malaysian CERT, US CERT, etc.
- Cybersecurity Alliance for Mutual Progress (CAMP), Malaysia
- Forum of Incident Response and Security Teams (FIRST)
- International Multilateral Partnership Against Cyber Threats (IMPACT)
- Symantec, Facebook, Microsoft (Hotmail), Yahoo, Google
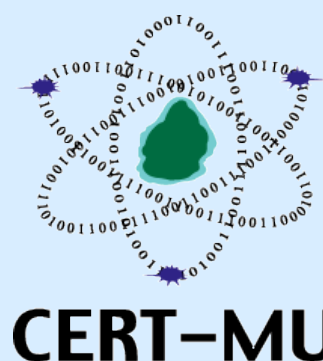
International affiliation allows the CERT-MU:

- To be part of a wider communication network exchanging incident handling information on information security risks and threats as well as remedial actions;
- To be endorsed and recognised by regulatory bodies;
- To avail of latest training programs on information security;
- To request specialised capacity building programs from pool of experts on information security domain;
- To be part of a network of domain experts, working groups and forums for exchange of best practices, latest trends, among others.

Similar to CERT-MU, governance agencies involved in the implementation of digital projects should seek partnership with international bodies having expertise and experience in respective domains (e.g. digital government, security, infrastructure, networking, data centre, among others) to improve their digital delivery capability. E.g. Affiliation with the Project Management Institute will allow project and programme managers to keep abreast with the project management profession and help to improve organisational success. Adherence to membership programs such as Gartner will provide agencies with extensive expertise and knowledge pool for better crafting of policies and strategies.

Recommendation 8.2
Government agencies involved in digital government should affiliate with international bodies to improve their digital delivery capability

13 Development of clear business cases

Countries often face difficulties, to establish objective and reliable measures to define, and to realise the benefits of their investments in digitisation.

13.1 Measurement of impact/benefits

A majority of G2G survey respondents (Figure 41) are unsure whether government agencies measure tangible (e.g. financial gains, reduction in paper consumption) and intangible benefits (e.g. improvement in service delivery times) derived from implementing digital government projects.

In the absence of performance measures, benefits derived from digitisation cannot be gauged and the outcome of initiatives is hard to define.

As an illustration, Mauritius has regressed in worldwide rankings in the Open Data Barometer from 53rd in 2015 to 59th in 2016 mainly due to the lack of evidence on the impact that open data is having on business, politics and civil society.

Figure 41: Mins/Depts measure tangible and intangible benefits derived from implementing digital projects
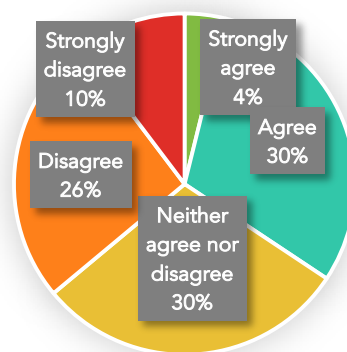
Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

Recommendation 9.1
Government should define key performance indicators and measure tangible and intangible benefits derived when going digital

13.2 Business Cases

Justifying public investments and proving the impact of ICT initiatives requires governments to prepare clear business cases for ICT projects (OECD 2015). Business cases are a well-tested and recognised approach to help governments guarantee the value proposition of investments in ICT at the project level. A business case is the vehicle and strategic tool for policy makers:

- To demonstrate that a proposed investment is strategically aligned, represents value for money, and is achievable;

- To support the allocation of funds to investments that create the most value; and

- As a reference point used in the "Review" phase to determine whether the benefits in the business case were realised.

In Estonia, the national Chief Information Officer approves projects within their mandate using the business case approach. In New Zealand, the use of business cases is mandatory for all large government ICT projects, which is also the case in Denmark. Around half of OECD countries have a standardised business model for ICT projects in place across government.

The increasing use of business cases can most certainly help support a more effective transformation of public service delivery. However, its application requires governments to develop internal capability and expertise. The use of business cases by New Zealand government revealed that the process is most effective when applied by experienced and knowledgeable people. To this end, New Zealand government are partnering with external training providers for capacity building and certification programmes on business case methodology based on United Kingdom's Five Case Model. The Five Case Model is the UK government's best practice approach to planning spending proposals and enabling effective business decisions.

Additionally, the OECD (2016a) recommends an open dialogue with all the relevant stakeholders about the implementation and realisation of the business case for digital government projects. In the case of the Mauritius e-Registry project of the Registrar-General department, working with a dynamic business case has helped the progress and preparation of stakeholders, especially notaries and law society, to fully commit to the change/innovation.

Recommendation 9.2

Develop capabilities in the public sector to use business cases for evaluation and monitoring of impact of projects

Recommendation 9.3

Government should engage with relevant stakeholders (from the public and private sectors, as well as from the service users' community) in the design and development of business cases for national projects

14 Reinforced institutional capacities

14.1   Future-fit teams in the digital ecosystem

Units and/or Departments operating under the Ministry of Technology, Communication and Innovation have different functions and provide services to other Ministries and departments. A high-level analysis (Table 7) of the core functions in the digital ecosystem was carried out to determine the areas where improvement is required for enhanced benefits and successful digital transformation.

Table 7: Analysis of functions in digital ecosystem

Function	Areas of improvement	Improvement Impact
Strategic planning at Ministries/Departments through formulation of eBusiness / eGovernment Master Plans	Decision-making authority to bring transformation and to ensure ICT advice, standards and policies are applied by Ministries and Departments.	Transformational
Advice on ICT matters		
Formulation of ICT policies & standards		
Digital Government Transformation Strategy development	Whole-of-government governance structures, leadership and authority to transform recommendations into project implementation at Ministries and Departments.	Transformational
Day-to-day, operation, administration, support and management of ICT (Application, System, Database, Network, Website) Application support	To respond to the lack of resources to support day-to-day ICT operational needs of Ministries/Departments, managed services can be contracted to service providers through framework agreements. Existing operational ICT staff could occupy a supervisory and governance role at Ministries/Departments to manage user-service provider contracts and ensure "the lights are always on".	Transformational
Design and development of digital services	Rapid development of digital services is required to respond to enforcement of digital-by-default principle. Ministries/Departments need to engage with public and private sector for co-creation of services. Forums such as hackhatons, web cups, etc. should be leveraged as platforms for engaging with public and generating value for the public.	Transformational
Marketing and awareness	Marketing and awareness is not presently carried out by service owners nor competencies are present in government to carry out such functions. New forms of marketing strategies using digital means to be conducted through communication agencies.	Transformational
Experimentation with new technologies and Research & Development	Research & development and experimentation of new technologies e.g. Internet of Things, Blockchain, etc. are practically inexistent in government.	Transformational
Oversee portfolios of project for Ministries and Departments	Build capacity in management of agile projects and new forms of project management through certification trainings.	High
Identifying issues and providing creative	Continuous update of technology skills, technology scanning and market research through capacity building to keep	High

Function	Areas of improvement	Improvement Impact
solutions to push ICT projects forward	abreast with latest technological advances and market offerings. This would ensure staff understand, propose and estimate project with latest and future-fit technologies.	
Conceptualisation and Design of ICT Projects		
Technical specifications		
Security audits	Implementation follow-up at line Ministries/departments following security audit recommendations.	High
Security Considerations	Critical and complex systems would require in-depth security design	High
Technical evaluation of proposals	Market research/sounding will provide for better estimates and benchmarking of proposals.	Moderate
Re-engineering Business Processes of Ministries and Departments	Domain knowledge to be able to understand and propose changes in business processes. New role of business analysts with domain expertise for reengineering of processes.	Moderate
Security awareness	Awareness material should be made available via new forms of delivery channels e.g. mobile app, blogs, social media	Moderate
Security incident response	Incident handling procedures should be integrated with a centralised service management system which handles both ICT service and security incidents	Moderate
Data Centre management	Disaster recovery especially for critical systems needs to be implemented. New services such as software as a service (SaaS) should be deployed.	Moderate
Hosting of websites, application and digital services	Dashboards and analytics provide a view statistic on the usage of digital services so that service owners can take appropriate measures to increase uptake.	Moderate

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Recommendation 10.1

Identify and address functional gaps, optimise the operating effectiveness and simplify coordination of each Unit/Department in the digital ecosystem

14.2 From inadequate staffing to building a digital workforce

Underinvestment as highlighted at section 11.4 applies to not just technology, but also the digital workforce. Maintaining current and relevant skills requires attention and investment, and digital transformation requires adequate human resources as much as or more so than funds for technology (Gartner 2018b).

In digitally advanced countries, governments have ensured that non-core ICT work force (e.g. administrative, finance, procurement, human resources, etc.) is adequately supported by core ICT skilled

ICT Staff and Non-ICT Staff Ratio in Government

Australia — **1:9** — **One** ICT staff supports up to **nine** non-ICT staff

World Average — **1:12** — **One** ICT staff supports up to **twelve** non-ICT staff

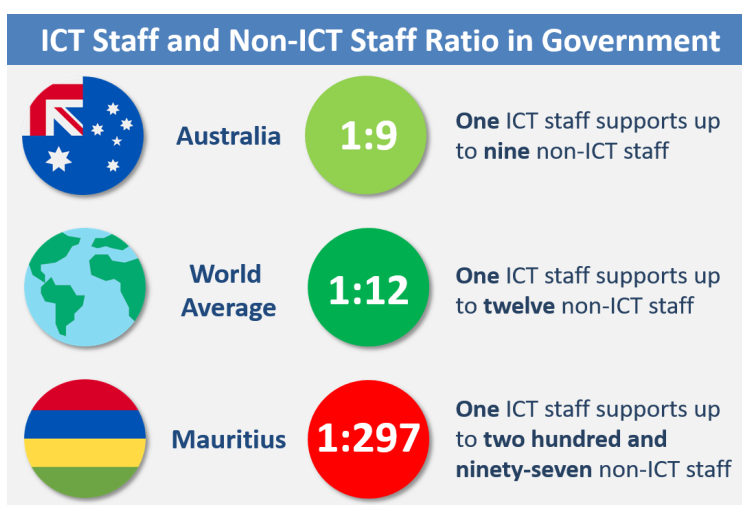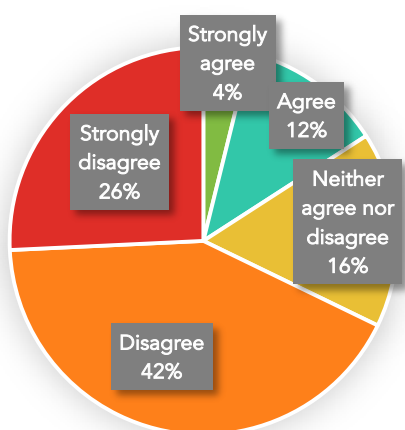Mauritius — **1:297** — **One** ICT staff supports up to **two hundred and ninety-seven** non-ICT staff

Figure 42: Ratio of Core ICT Staff to Non-Core ICT Staff in Governments

personnel (e.g. database administrators, network administrators, IT security, data centre operators, project managers, etc.) E.g. in Australia, one ICT staff supports up to 9 non-ICT staff (Australian Government 2016). On average, one ICT staff supports up to 12 non-ICT staff in governments worldwide (Gartner 2017b).

Figure 43: Number of ICT staff supporting line Ministries/Departments is sufficient

Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

Comparatively, in Mauritius (Figure 42), each ICT staff supports up to 297 non-ICT staff[4] in Government that is around 25 times more than the world's average. Moreover, between 2016 and 2017, Government employed an additional 3000 staff, but no increase in ICT staff was noted. This demonstrates that digital workforce supporting government functions in Ministries and Departments is not only inadequate but measures to address shortage of ICT staff have not been taken. The lack of ICT personnel to support Ministries and Departments is also underlined by 68% of government officials who participated in the digital government survey (Figure 43).

If the vital human and institutional digital capacities are neglected, there is a risk to government's proper functioning as the lack of employees in ICT and information services slows the pace of digitisation considerably, both inside and outside the government.

Recognising the importance of having necessary levels of digital workforce, Singapore staffed its digital government transformation agency, GovTech, with 2,000 people who are responsible for laying the foundations and delivering Singapore's Smart Nation/Digital Economy vision, in addition to digital government services, privacy protection and cyber security.

Recommendation 10.2

Review staffing requirements and prioritise recruitment at each unit or department delivering digital functions to address significant underinvestment in human resources

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14.3 Updating of skills is a basic need for the digital workforce

ICT staff are required, as part of their duty, to keep abreast with the latest trends and tools in technology. Yet, adequate technical training, capacity building and industry exposure on new technological projects implemented in other jurisdiction, are not provided. Without knowledge on latest technologies, government is not equipped to take advantage of latest advances in technology. There is also a risk that conceptualisation of projects involve technologies that may phase out. To mitigate such technological risks, ICT staff requires exposure on technological tools and continuous training on latest technologies to be able to propose, conceptualise, implement and support projects using these technologies.

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[4] Calculated using data sourced from the survey of employment and earnings of March 2017 from the Statistics Mauritius

Knowledge of the industry, sector or business domain in which the Ministry or Department is involved in, is also crucial for digital leaders to bring transformation. An effective technology strategy cannot exist without business process expertise. While the administrative staff may "own" its individual processes, digital leaders should understand the industry domain, i.e. how its processes integrate across the government agency and how the staff engage in them.

To succeed, the digital workforce, especially digital leaders require continuous update of both technology as well as domain-oriented skills.

Recommendation 10.3

Conduct continuous and customised capacity building programmes and facilitate industry exposure on technology and business domains to ICT staff supporting the digital ecosystem

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14.4 Transform computer rooms into ICT Departments

Political leaders, administrators and government employees agree that digitisation is important, but not necessarily urgent, but this is precisely what needs to change. Government officials must realise that ICT and digitisation is at the core of their primary processes and an important enabler for almost all work being carried out. Ministries/departments cannot function without email, Internet, network connectivity, desktop, printer, storage and/or server infrastructure availability. In public facing environment, digital systems have to operate smoothly without interruption because of public pressure on counter services. Yet, most government agencies still do not have a dedicated ICT department. ICT support is limited by the presence of one or two ICT staff sharing responsibilities at other Ministries and departments.

On the other hand, human resource, finance, procurement and registry functions in government agencies are delivered through respective sections headed by managers with the support of assistant managers and officers of varying grades. These sections are well structured, have staff dedicated to the Ministry/department, and provide adequate and immediate support without the need for routing of requests to their respective parent organisations. With the inevitable introduction of digital-by-default services with end-to-end facility, open data-by-default, once-only principle, among others, government is faced with no other choice but to transform existing computer rooms into structured ICT departments with dedicated personnel to support Ministries and departments' daily functions and journey to digital transformation.

Recommendation 10.4

ICT Departments similar to other departments such as Procurement, Finance, Human Resources, Registry, should be created within Ministries and departments and manned by dedicated personnel to support their daily functions and journey to digital transformation

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14.5   Enhanced ICT support to Ministries and departments

To effectively execute on the Digital Government Transformation Strategy, government agencies need the right skills to deliver. In-house technology skills in government are often flagged as the biggest challenge in transforming government to a digital model. The trend in governments is to recruit external but efficient expertise into government departments and to progressively develop relevant ICT-skills across levels of government trough knowledge transfer (Ernst & Young 2015).

The strategic use of outside resources to perform activities traditionally handled by internal staff and resources provides the following non-exhaustive benefits:
- Reduction and control of operating costs
- Improved organisational focus
- Access to world-class capabilities
- Freeing of internal resources for other purposes
- Streamlining or increasing efficiency for time-consuming functions
- Maximising use of external resources
- Sharing risks with service providers

As highlighted in the following case study, the outsourcing of managed services to a service provider greatly improved InfoHighway's capacity to handle data sharing requests in a short time period.

Case Study: Managed Services in Government

Government contracted the operations of InfoHighway and service deployment tasks to an external service provider in order to fulfill pending data sharing requests and expedite creation of data sharing e-Services that would enable the link between government agencies. A year into the managed services contract, i.e. from January 2017 to January 2018, the number of data sharing e-Services substantially increased from 8 to 248.

Elsewhere, the New Zealand government (2018) has opted for the IT managed services (ITMS) model where pre-determined service providers, selected by a framework agreement, provide front-line IT support services to government agencies. The list of services include:
- IT Service desk;
- User device support;
- Server support;
- Storage and archiving;
- Database management;
- Application support and
- Network management services

Moreover, agencies have the flexibility to choose the services they wish to use. Each service provider allocates service delivery personnel and support teams to meet an agency's ITMS requirements and ICT complexity.

An internal user group at each government agency oversees the ITMS service. The ITMS service is procured by a lead agency and is governed by confidentiality and service level agreements between government and service providers.

Taking the model of New Zealand as example and learning from InfoHighway experience, the day-to-day ICT operations in Ministries and departments can be serviced using a managed services model to respond to the inadequate support capacity experienced by government agencies. The existing in-house operational ICT staff can be part of the governance user group to ensure that the "lights are always on" by:

- Managing the day-to-day relationship with service providers;
- Monitoring service-levels and performance of service providers;
- Coordinating resolution of delivery issues; and
- Managing contract change request process

Recommendation 10.5
Leverage on service providers' managed services to support day-to-day ICT operations in each Ministry/Department

14.6   Digitally empowered service owners at Ministries and departments

With the introduction of digital-by-default principle, each government agency will be required to deliver its services via the digital channel as the default delivery mode. Capacity should be built within the agency to run those services so that staff can successfully embrace the digital modes of service delivery.

In UK, in order to deliver world-class digital service based on user needs, government services at each agency are managed by a team comprising service owners, product manager, delivery manager, user researcher, content designer, designer and developer. While the majority of the team play technical roles, the service owner plays the most important role from a government perspective. The service owner has the functional know-how, decision-making authority and overall responsibility in the government agency for managing, operating, continually improving and ensuring the maximum possible take-up of the service (Gov.uk 2017b).

In the Mauritian context, the empowerment of service managers and business owners having dedicated roles with digital capabilities will result in enhanced user commitment and ownership in the implementation and sustainable operation of digital services and systems.

Recommendation 10.6
Empower Service or Business Product Owners in charge of services and systems at line Ministries/Departments with digital capabilities and skills to design services around citizen needs and within customer journeys

15 Procurement of digital technologies

15.1 Information Systems in Ministries and Departments

Some Ministries and departments have implemented similar information systems namely document management system, fleet management system, stores packages, etc. to automate their administrative work.

This may have resulted in duplication of systems and procurement activities in government. Therefore, there is a need to create awareness of information systems running within government so that these can be extended to other government agencies whenever there is a need.

In the United States, the government has changed its ICT procurement to a "build once, use many times" approach. In this respect, US agencies must begin to look to shared solutions first and existing infrastructure when developing new projects, rather than procuring new infrastructure and systems for each new project.

Similarly, the Government of Australia has set as annual target for ICT procurement not to duplicate the building of platforms that have been built by other agencies (Queensland Government 2017).

A high number of respondents of the G2G survey (Figure 44) are of the opinion that systems successfully implemented in one public organisation should be rolled out to other public organisations for the sake of harmonisation and public investment. The rollout of such systems will accelerate the digitalisation of departments at a lower cost.

Figure 44: In what ways does procurement methods need to be adapted to enable digital transformation
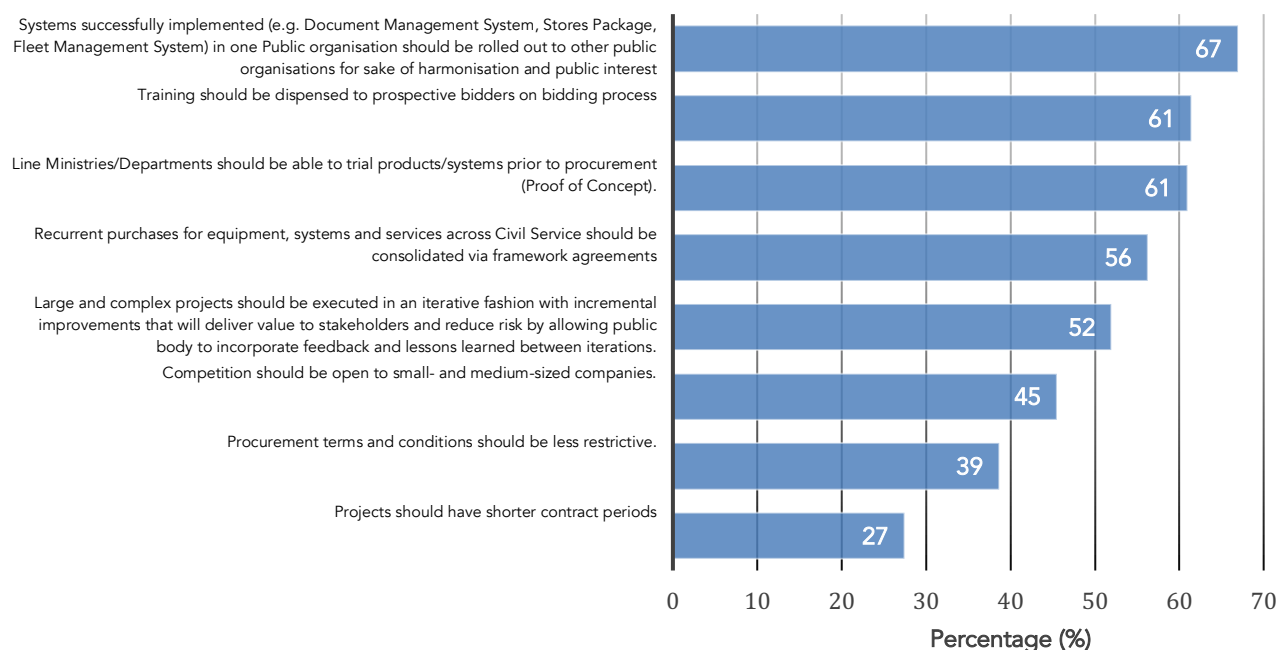
Note: Persons may report more than one answer

Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

Recommendation 11.1
Catalogue of information systems and services should be published so that Ministries and Departments can identify possibilities for re-use

The current legal framework in Mauritius does not explicitly facilitate the replication of existing systems. Ministries and departments have to go through a fresh procurement exercise to procure systems, which often result in disparate systems to cater for common needs.

In this context, procurement laws should be reviewed to facilitate the rolling out of existing systems with possibility of minor customisation of the system.

Recommendation 11.2
Review existing legal and regulatory frameworks to allow for replication of successful applications across Government

15.2 Harmonisation of e-Procurement

Countries with well-implemented e-Procurement systems have noticed improvement in work efficiency and streamlining of procurement processes, transparency leading to effective prevention of fraud and corruption, accessibility and reduced costs.

Case Study: Government e-Procurement System (e-PS)

The PPO has implemented an e-Procurement system to allow for digital submission of bids evaluation of bids and award of contracts among others. The e-Procurement system (e-PS) provides the following benefits:

- Increased transparency and minimisation of corruption opportunities
- Improved accessibility;
- Reduction in procurement costs and transaction costs;
- Improved work efficiency: reduces disputes; better enforcement of regulations; reduced procurement time; standardization and streamlining of procurement process.

PPO implemented an e-PS and carried out training, on a regular basis, of suppliers in the e-PS. Despite these initiatives, PPO highlighted that there is a low uptake on the e-PS. The problem is two-fold: On one hand, public bodies are not choosing the e-PS path, preferring to use the paper-based procurement method and on the other hand, suppliers are not registering in the e-PS path.

Thus, the number of suppliers registering on e-Procurement system is low which means fewer bids, less competition; less offers and reduced value for money for Government during procurement exercises. The low number or even absence of bids may eventually lead to cancellation of the Invitation for Bids through e-Procurement and the resort to traditional modes of operation.

To tackle the problem of take-up by both buyers and sellers, countries have enforced mandatory use of e-Procurement.

The Indian Government has made it mandatory for Government bodies to source goods and services from its procurement site, the e-Marketplace, in order to boost transparency and streamline public sector procurement.

In Georgia, e-Procurement through the Georgian electronic Government Procurement (Ge-GP) system has fully replaced paper-based tenders. The e-Procurement system, has increased competition among suppliers and resulted in bringing substantial savings to the Georgian government.

The eGovernment Action Plan 2016-2020 of the European Commission includes accelerating member states' transition towards full e-Procurement. I.e. E-Procurement becoming the norm.

Very often bidding exercises fail to yield responsive bids as bidders wrongly respond to bidding exercises. A high number of respondents (Figure 44) are of the opinion that training should be dispensed to prospective bidders on bidding process. Thus, training should be dispensed to both suppliers and procurement officials to fully use the e-Procurement system.

In addition, launching all tenders through the e-Procurement system will increase participation of both government agencies and bidders in using the existing system.

Recommendation 11.3
Government should adopt the "e-Procurement-by-default" principle and provide training and appropriate support to both public bodies and suppliers

15.3   Performance of Technology Providers

Effective procurement planning and monitoring of supplier performance is critical to controlling the risks and costs involved in procurement.

A large number of G2G survey respondents (Figure 45A) are of the opinion that performance of technology providers is low.

Figure 45: Performance of Technology Providers
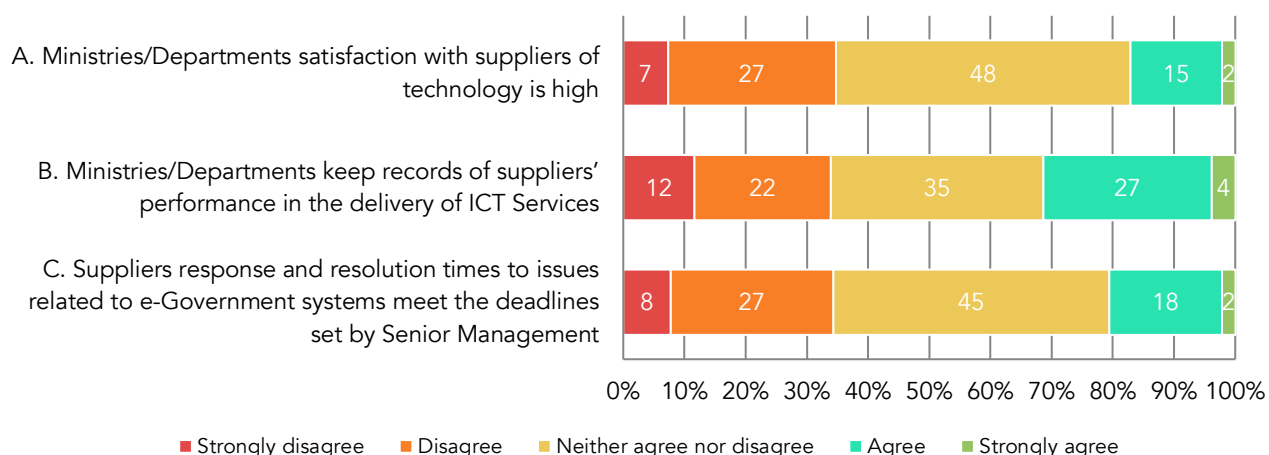
Source: Government-to-Government (G2G) Questionnaire, Digital Government Survey 2018

To tackle this issue, PPO has issued a directive, which allows for public bodies having suffered prejudice from poor performance of suppliers to exclude such bidders to participate in future procurement exercises. The PPO also recommends that a performance review system for continuous assessment of the supplier's performance be set up.

European Union has already set regulations, which provide for debarment of suppliers, discretionary exclusion, and 'self-cleaning' that is suppliers to take remedial actions and demonstrate that they can be considered reliable and suitable for performance of public contracts.

Government of Queensland has through its Procurement Policy put in place management and monitoring of supplier's strategies as one of its tools in order to improve supplier and purchaser performance.

In the Mauritian context, most respondents in the G2G survey (Figure 45B) either disagree or are unsure of the fact that Ministries/departments keep records of the suppliers' performance in the delivery of ICT Services.

Moreover, 35% of the respondents of the G2G survey (Figure 45C) disagree that suppliers' response to issues meet management deadlines. While it is important to monitor supplier performance, it is also necessary to define the minimum service expected and penalties to be taken by Government in case of non-performance. This should be clearly set out in Service Level Agreements (SLAs) customised for each ICT project.

Thus, in order to abide by PPO's directive, it is essential for public bodies to keep records of supplier's performance during execution of a contract.

Recommendation 11.4
Government should develop and publish an open database of supplier performance of ICT projects

15.4   Framework Agreement

Framework Agreements allow public bodies to enter into one or more contracts with one or more suppliers in the period during which the agreement or arrangement applies.

Framework agreements in procurement facilitate:
- Optimisation of volume purchasing discounts
- Reduction in repetitive purchasing tasks.
- Reduction of transaction costs
- Reduction of procurement lead time
- Reduced Inventory
- Rapid and secure supply of items

Framework agreement also allows for centralised procurement, as a central organization usually carries out the main procurement exercise for the framework agreement and other departments thereafter call off from the agreement.

Framework Agreements (FA) has become an increasingly popular procurement tool in many countries, particularly with the rise of electronic procurement. For instance in the US, FA accounted for more than 30 % of federal contracting in a year. The Finland government has put in place an electronic ordering system "Merkaattori" that facilitates the purchasing of goods and services under framework agreements.

Procurement of ICT products through framework agreements is being introduced in the Civil Service with the appointment of the Ministry of Technology, Communication and Innovation (MTCI) as "Lead Organisation" for procurement of commonly used IT Equipment E.g. PCs and Laptops.

The Ministry may also extend the framework agreement for other ICT products and services such as mobile apps or data cleansing services. The use of framework agreements ensures standards in terms of equipment, software etc.

> **Recommendation 11.5**
> **Use framework agreements in the procurement of selected digital products and services**

15.5   Agile Development

Government organisations are increasingly looking to partner with vendors who use agile methodologies to deliver software systems (Deloitte Digital 2015). But for government to successfully take advantage of what agile methodologies has to offer requires a change in linear procurement processes. Traditional procurement approach with functional specifications written up front is not always consistent with agile principles that allows for refinement of functional specifications.

Moreover, OECD (2015) recommends that more agile and iterative delivery methods be adopted in order to facilitate access to small specialised firms to compete for contracts on their area of expertise.

National governments in the United States, United Kingdom and Australia have adopted guidelines that endorse agile for software projects. Countries ranging from Brazil to Singapore are also pushing to incorporate agile into more of their government IT projects. In 2017, 80 % of major federal IT projects in US have described themselves as "Agile" or "iterative."

To procure software that is developed through an agile process, alteration will be required in the procurement process. Respective leaders need to embrace a new way of thinking about their role. Procurement and contracting rules should be updated, as appropriate, to make them compatible with modern ways of developing and deploying digital technology.

Recommendation 11.6

Procurement rules need to be reviewed to facilitate procurement of technology products and services that embrace Agile methodologies

As Government seek to take advantage of agile development, they need to consider how to define and support resources.

Italy has strengthened its co-operation with suppliers by setting up supplier training desks within the offices of suppliers' associations to provide training and assistance to local enterprises and in particular micro, small and medium enterprises on the use of electronic procurement tools.

In Québec, to ensure the success of agile transformation, Revenu Québec provided 20 experienced agile coaches who joined their forces with that of the internal specialists to bring the transformation.

Thus, bringing a professional agile coach can improve teamwork and increase productivity, enabling government to fully benefit from the agile framework. Therefore, to facilitate the adoption of agile development in Ministries/departments, government will necessitate putting in place appropriate training and supporting to both ICT and non-ICT staff.

Recommendation 11.7

Government needs to support agile development in Ministries/Departments through capacity building and appointment of agile coaches

16 Legal and regulatory frameworks

16.1   Legal and regulatory framework to support digital transformation

Implementation of the Digital Government Transformation Strategy 2018 – 2022 requires a sound legal framework to build confidence of citizens/businesses when interacting with government using electronic means. Appropriate legal and regulatory safeguards have to be put in place to manage the potential risks of digital technology, and protect privacy.

A number of legislations regulating the ICT sector are already in place, namely:

- Computer Misuse and Cybercrime Act
- Data Protection Act
- Electronic Transactions Act
- Information and Communication Technologies Act
- Copyright Act

Legislation in specific domains like procurement, registration etc., had to be reviewed to accommodate computerisation of service delivery. Thus, in its digital journey towards modernisation of service delivery, government departments like Registrar General's Department, Registration of Companies, and Procurement Policy Office had to bring about changes to their respective legislation.

The DGTS has made the following recommendations that will bring about in its wake legal constraints that will have to be addressed:

- e-Participation
- Enforce once-only principle
- Retrieve data, not documents
- National authentication framework
- Digital by default
- Rolling-out of applications across Government
- Agile development

Furthermore, emerging technologies like blockchain, artificial intelligence, drones etc. bring about new challenges that have to be addressed within the legal framework.

Several countries have experienced the impact of comprehensive legislations on their digital transformation journey.

In its e-Transformation journey Singapore has a set up a conducive legal and policy environment by revisiting its existing legislations (Springer, 2012).

Mexico has implemented an e-service for the issuance of birth certificates online (Champion for WSIS 2018). For this single eservice, Mexico had to update its Civil Registry legal framework to make electronic documents (birth certificates) valid as certified copies.

Thus, in the quest to become more digitally advanced, it is imperative that systematic analysis of existing legislation be carried out wherever an e-Service is being implemented or a system reviewed and appropriate changes made. In addition new legislation may have to be put in place to align with implementation of emerging technologies, new digital business models, and enabling digital compliance methods.

Recommendation 12.1

Analysis and review of existing legal and regulatory framework to support digital transformation

16.2   Legal Agreements

The Digital Government Transformation Strategy 2018 – 2022 has recommended for international and regional cooperation to be sought and formalised in the form of charters or agreements. In order to commit parties, these have to be drafted to define roles and responsibilities of each party concerned.

Additionally, implementation of computerised projects requires background support service where both users and suppliers have shared responsibilities. In order to ensure smooth operations, it is necessary that each party concerned is clear about its role and responsibilities. Thus, these should be defined and the minimum service expected of each party and penalties to be applied for non-performance should be clearly set out in Service Level Agreements (SLAs) customised for each ICT project.

Government need to have recourse to legal expertise to assist in the drafting of any specialised legal agreements required.

Recommendation 12.2

Legal expertise to be sought for drafting of specialised legal agreements (e.g. Service Level Agreements)

17 Action Plan

A well-crafted strategy without an implementation plan is wasted time, effort and ink. More than two-thirds of organisations have found making progress to implement strategies difficult to achieve (Gartner 2015). With this end in mind, the strategy will provide an action plan, which is separate from this report, for accompanying government agencies in the implementation of recommendations found in this report.

The action plan will:

- Set overall priorities in terms of classifying recommendations into timeframes;

- List concrete actions (with a roadmap inclusive of milestones);

- Include budget estimates associated with the various actions for supporting budgetary negotiations and ensuring funding; and

- Identify responsible actors for the various measures as a means to establish clear accountability mechanisms so that they become instruments for strategic planning.

As highlighted earlier in the report, the strategy requires endorsement and commitment across the administration and the political leadership, to help define key performance indicators, to monitor implementation and ensure accountability, and to deliver the expected results. A solid governance framework with clear coordinating powers and responsibilities is essential to follow up on the effective implementation of a strategy – e.g. through the implementation of the Action Plan.

18 Conclusion

The Government of Mauritius is committed to move from a successful e-Government to a digitalised government, which will see a seamless public sector that makes it easier for customers to do business with government, as well as delivering significant benefits.

The Digital Government Transformation Strategy 2018-2022 aims at paving the way for a 'Digital Government'. It provides a roadmap for each and every government entity to harness digital technologies to build and deliver efficient and innovative new online services while placing its customers at the heart of digital service:

- Develop skills and culture among government employees and leaders to enable services to be delivered in an agile manner, focused on outcomes for citizens;
- Provide better digital workplace tools and build processes to make it easier for government employees to work effectively
- Make better use of data across government in the pursuit of our digital transformation journey; and
- Use shared platforms and reusable business capabilities to speed up transformation.

It is projected that implementation of the Strategy will transform Mauritius into a SMART island as ambitioned by Vision 2030.

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20 Annex A – List of Recommendations

A consolidated list of recommendations along with an indicative timeframe and agencies responsible for implementing same are presented in the following table.

1	Openness, Transparency and Inclusiveness	Timeframe (FY)				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
1.1	Enforce "open by default" standard regarding non-sensitive government data		●			MTCI, SLO, NCB
1.2	Sensitize Government agencies on the importance of releasing Open Data as a means to achieve transparency in public sector operations and empower Government agencies to continuously release Open Data to foster creation of innovative solutions	●	●	●	●	MTCI, NCB
1.3	Organise public engagement campaigns on the use of Open Data via hackhatons, web cups, and mobile apps competitions that improves quality of life, solve social development problems or enhance public service delivery	●	●	●	●	MTCI, NCB, All Ministries & Departments
1.4	Digital Government systems should cater for stakeholders with different needs and include: a) Responsive mobile-friendly services b) Mobile Apps c) SMS-based notifications d) Help material provided in the form of audio and video for increased accessibility e) User friendly interfaces designed with user or customer experience in mind f) Assisted digital support desks for clients preferring counter services		●	●	●	MTCI, All Ministries & Departments
1.5	Review and adapt national digital skills programmes to cater for varying needs of digital natives and digital immigrants	●	●	●	●	MTCI, NCB, MOEHR
1.6	Conduct capacity building programmes for Public Officials to strengthen their skills and capacity to use technology and support e-Service delivery	●	●	●	●	Civil Service College, MTCI
1.7	Government agencies should be present on social media channel to connect with the Public and to communicate governments' decisions, programmes, etc.	●	●	●	●	All Ministries & departments, Civil Service College
1.8	Create awareness on digital initiatives implemented for the public with strong emphasis on digital marketing channels	●	●	●	●	MTCI, NCB, GIS, All Ministries & Departments

2	**Engagement and Participation in Policymaking and Service Delivery**	**Timeframe**				**Responsible**
		2018-2019	2019-2020	2020-2021	2021-2022	
2.1	Implement mechanisms to support the integration of citizens and other stakeholders' views in decision-making processes, design and improvement of digital services, data to be released in open formats, among others	●	●			PMO, MTCI, All Ministries & Departments

3	**Creation of Data-Driven Culture in the Public Sector**	**Timeframe**				**Responsible**
		2018-2019	2019-2020	2020-2021	2021-2022	
3.1	Data and analytics e.g. data-driven dashboards, service usage statistics, among others should be leveraged upon by top management in government agencies to monitor and continuously improve quality of digital services and enhance decision-making and policy formulation		●			MTCI, GOC, All Ministries & Departments
3.2	Enforce once-only principle in Government where citizens and businesses provide information only once to Government and the information is re-used for delivering services		●			PMO, MTCI, All Ministries & Departments
3.3	Promote high degree of interoperability in systems and enhance sharing of data especially registers such as citizen, company, property, address, etc.	●	●	●	●	MTCI, All Ministries & Departments
3.4	Instead of requesting copies of government-issued documents (e.g. copy of IDs, proof of address, birth/marriage/death certificate, etc.) during transactions, data should be sourced from Government agencies via InfoHighway, and any identification and/or verification be conducted electronically		●	●	●	PMO, MTCI

4	**Protecting Privacy and Ensuring Security**	**Timeframe**				**Responsible**
		2018-2019	2019-2020	2020-2021	2021-2022	
4.1	Develop partnerships with the private sector to collect data on security incidents and privacy violations		●			MTCI, CERT-MU
4.2	Work in co-operation with international organisations in the development of strong assessment and performance indicators regarding security and privacy	●				MTCI, CERT-MU
4.3	Implement a National Authentication Framework, which will allow both public and private sector to authenticate citizens in the delivery of digital services	●	●	●	●	MTCI, All Ministries & Departments, Private Sector

5	Leadership and Political Commitment	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
5.1	Digital government initiatives, with high public impact, should be championed by Ministers to show high political support and gain executive endorsement	●				All Ministries & departments
5.2	Agreements should be contracted between key stakeholders to ensure digital government projects are given the right priority and level of commitment		●			MTCI, AGO, All Ministries & Departments
5.3	High-ranking executives should be empowered with digital skills to lead the digital transformation		●	●	●	MTCI

6	Coherent use of Digital Technology across policy areas	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
6.1	Maintain electronic inventories of digital assets such as information systems, digital services, data repositories, and licenses		●			MTCI, All Ministries & departments
6.2	Reinforcement of policies and standards regarding the use of ICT in public sector	●				MTCI
6.3	Government should adopt the "Digital-by-default" principle where agencies proactively transform their services, using digital technology while at the same time ensuring assistance is provided to those who need help in accessing government services	●	●	●	●	PMO, MTCI, All Ministries & Departments
6.4	Ministries and Departments should ensure that they have a e-Business strategy/plan, which includes business process reengineering and a blueprint to achieve digital transformation of their services and processes	●	●	●	●	MTCI, All Ministries & Departments

7	Effective organizational and governance frameworks to co-ordinate the implementation of digital Government Strategies	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
7.1	Establishment of oversight and reporting mechanisms e.g. a High Level Digital Government Task Force, preferably chaired by the Prime Minister, who has the authority to engage stakeholders and make things happen in the implementation of technology-led national strategic objectives such as Digital Government Transformation Strategy 2018 – 2022 recommendations, integration and interoperability between agencies	●				PMO, MTCI
7.2	Minister-led committees should monitor implementation of digital transformation projects at the level of line Ministries/Departments and progress should be reported to and reviewed by the High-Level Digital Government Task Force	●	●	●	●	All Ministries & departments
7.3	Funding for digital government projects should be governed at the level of High-Level Digital Government Task Force and be aligned with the	●	●	●	●	PMO

7	Effective organizational and governance frameworks to co-ordinate the implementation of digital Government Strategies	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
	priorities set by overall Digital Government Transformation Strategy					
7.4	Government investment in ICT should be increased such that digital priorities be given adequate funding to match the vision of a high income and smart country	●	●	●	●	PMO (Task Force), MOFED, MTCI
7.5	New funding mechanisms should be put into place to accelerate digital transformation that promotes innovation, cross-department collaboration, public welfare and end-to-end service delivery among others	●	●	●	●	MOFED, MRIC

8	Strengthen International Co-operation with other Governments	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
8.1	Strengthen international/regional co-operation with other countries on priority digital themes, and operationalise existing MOUs through charters	●	●	●	●	PMO (Task Force), MTCI
8.2	Government agencies involved in digital government should affiliate with international bodies to improve their digital delivery capability	●	●	●	●	MTCI, MOFED

9	Development of Clear Business Cases	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
9.1	Government should define key performance indicators and measure tangible and intangible benefits derived when going digital	●	●	●	●	All Ministries & departments
9.2	Develop capabilities in the public sector to use business cases for evaluation and monitoring of impact of projects			●	●	PMO (Task Force), MOFED, MTCI
9.3	Government should engage with relevant stakeholders (from the public and private sectors, as well as from the service users' community) in the design and development of business cases for national projects			●	●	PMO (Task Force), MOFED, MTCI, All Ministries & Departments

10	Reinforced Institutional Capacities	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
10.1	Identify and address functional gaps, optimise the operating effectiveness and simplify coordination of each Unit/Department in the digital ecosystem	●				MTCI
10.2	Review staffing requirements and prioritise recruitment at each unit or department delivering digital functions to address significant underinvestment in human resources	●				MTCI

10	Reinforced Institutional Capacities	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
10.3	Conduct continuous and customised capacity building programmes and facilitate industry exposure on technology and business domains to ICT staff supporting the digital ecosystem		●	●	●	MTCI
10.4	ICT Departments similar to other departments such as Procurement, Finance, Human Resources, Registry, should be created within Ministries and departments and manned by dedicated personnel to support their daily functions and journey to digital transformation	●				MTCI
10.5	Leverage on service providers' managed services to support day-to-day ICT operations in each Ministry/Department			●	●	MTCI, PPO, All Ministries & Departments
10.6	Empower Service or Business Product Owners in charge of services and systems at line Ministries/Departments with digital capabilities and skills to design services around citizen needs and within customer journeys		●	●	●	MTCI, All Ministries & Departments

11	Procurement of Digital Technologies	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
11.1	Catalogue of information systems and services should be published so that Ministries and Departments can identify possibilities for re-use		●			MTCI, All Ministries & departments
11.2	Review existing legal and regulatory frameworks to allow for replication of successful applications across Government		●			PPO, MTCI
11.3	Government should adopt the "e-Procurement-by-default" principle and provide training and appropriate support to both public bodies and suppliers	●				PPO, All Ministries & departments
11.4	Government should develop and publish an open database of supplier performance for ICT projects		●			PPO, All Ministries & departments
11.5	Use framework agreements in the procurement of selected digital products and services		●	●	●	MTCI, PPO, All Ministries & Departments
11.6	Procurement rules need to be reviewed to facilitate procurement of technology products and services that embrace Agile methodologies		●			PPO, MTCI
11.7	Government needs to support agile development in Ministries/Departments through capacity building and appointment of agile coaches			●		MTCI

12	Legal and Regulatory Frameworks	Timeframe				Responsible
		2018-2019	2019-2020	2020-2021	2021-2022	
12.1	Analysis and review of existing legal and regulatory framework to support digital transformation		●			MTCI, AGO
12.2	Legal expertise to be sought for drafting of specialised legal agreements (e.g. Service Legal Agreements)		●			MTCI, AGO

Abbreviation	Agency
AGO/SLO	Attorney's General Office / State Law Office
CERT-MU	Computer Emergency Response Team of Mauritius
GIS	Government Information Service
MCSAR	Ministry of Civil Service and Administrative Reforms
MOEHR	Ministry of Education and Human Resources, Tertiary Education and Scientific Research
MOFED	Ministry of Finance and Economic Development
MRIC	Mauritius Research and Innovation Council
MTCI	Ministry of Technology, Communication and Innovation
NCB	National Computer Board
PMO	Prime Minister's Office
PRB	Pay Research Bureau
PPO	Procurement Policy Office

21 Annex B – Attaining Sustainable Development Goals through DGTS

The table below provides a non-exhaustive list of ICT applications as best practice for facilitating implementation of SDGs. In view of attaining SDGs, government agencies can adopt the ICT applications through the implementation of recommendations proposed in the DGTS.

Sustainable Goals	ICT Applications	Recommendation in DGTS
1 NO POVERTY	• Access to basic services by vulnerable groups can be improved when information on **public services** are available in an **online** form. • Integrated Social Assistance System (**e-Social Security**) encompassing all social assistance processes ranging from applications to payments can be carried out in an electronic platform. E-Social Security allows for great savings in time and resources, as well as increased transparency and accountability. • Mobile services such as **mobile banking, digital payments** and **mobile money** expand financial services to poor and marginalized populations and help ensure equal rights to economic resources. • **Online agricultural services** can help small producers to find the best markets for their products.	• Digital-by-Default services • Digital Inclusiveness • E-Business Strategies (Social Security, Social Integration) • Mobile-friendly services
2 ZERO HUNGER	• Hunger can be reduced and food security can be increased through **web or mobile** by giving farmers **access to market information**, weather forecasts, as well as planting, harvesting and targeted irrigation advice, logistics and storage, thereby helping to increase yield, restore soil, reduce waste and improve both productivity and effectiveness. • **Early warning agro-meteorological and agro-climatological applications** allow farmers to plan crop resiliency before natural disasters. Policy makers can identify food security challenges by monitoring up-to-date price fluctuations and market availability of vegetables. • **Alerting systems on mobile phones** provides timely animal disease field reporting to enhance surveillance and early warning of animal disease outbreaks.	• E-Business Strategies (Agriculture) • Mobile-friendly services
3 GOOD HEALTH AND WELL-BEING	• **e-Health information system** that seamlessly combines health reports, facilities-based services, electronic medical records of patients, real-time health dashboards based on health centres' reports, facilities-based data, and vital events data (births and death). • **Emergency transport services online** such as mobile phone-based calls for ambulance services. • **Facilities and Inventory management systems** to efficiently and sustainably manage health assets and facilities. • **Mobile technologies** can connect a patient in his or her own home with professional medical and healthcare personnel through video and audio channels, using Internet. • **Mobile apps/SMS services** provide pregnant women and new mothers with essential information that can also help them connect to local health services. The result is fewer	• E-Business Strategies (Health) • Digital-by-Default Services • Interoperability and Data Sharing • Mobile-friendly services • Open Data • Once-Only Principle

Sustainable Goals	ICT Applications	Recommendation in DGTS
	complications in pregnancy, as well as fewer childhood deaths. • Public can quickly access **health care services** (e.g. demographics of **health centres**) and be better informed on **outbreaks** (e.g. geographical locations of incidents and **treatment facilities**) when information on same are available **online and on mobile**. • **Online databases of diseases** and **good health practices** contribute to prevention of illnesses through the application of **analytics**. • **Telemedicine** with integrated **web-enabled video cameras** is increasingly making medical advice and treatment options available to a wider pool of patients irrespective of their geographical location. • **Online access** to **key performance indicators** of every health care service (e.g. average wait times for treatment, user satisfaction and fee structures by providers, among others) allow nation-wide improvement of health care services. • Training of doctors and other healthcare workers through **online instruction, virtual meetings and classes, with e-coaching and e-mentoring.**	
4 QUALITY EDUCATION	• **Connectivity** of all institutions, i.e. Primary, secondary and Tertiary to wireless broadband and video-link capacity. • Development of new **online curriculum** in appropriate local languages at lower levels and national languages at higher levels. • **Training** of teachers and students **in ICT (computers, coding, ICT applications, etc.**) at all levels of schooling and development of **online courses (MOOCs)** for high-school and tertiary education. • **Online libraries** with **e-books, e-journals and e-magazines** for use in all low-income countries, and use **of video-linked classrooms** to extend the reach of the nation's best teachers and schools. • **Online monitoring of schools** (teacher participation, student attendance, supplies and inventory management) • **Real-time cloud-based policy dashboards** for education managers, including school enrolments, attendance, and performance (including test scores). • **Online learning facilities** enable **lifelong learning** anytime and anywhere and supports knowledge societies by opening access to education for everyone including vulnerable groups. • **ICT technologies for special needs**, including **voice recognition, online Braille** and others.	• Digital-by-Default services • E-Business Strategies (Education) • Interoperability & Data Sharing
5 GENDER EQUALITY	• Offering **women-oriented e-Services** can cater for the needs of women in under-developed regions as well as facilitate **access to basic services.** • Access to **online information** on public resources that are useful for girls (e.g. schools, hospitals, police stations), productive, reproductive and community roles, **e-learning, online training programmes**, increased **participation of women in policy decisions** and **online discussion**	• e-Business Strategies (Gender Equality and Youth) • Digital-by-Default services • Mobile-friendly services

Sustainable Goals	ICT Applications	Recommendation in DGTS
	platforms (e-participation) can enhance women empowerment and sustainable livelihoods. • Capacity building of women in **mobile technologies** allow them to earn a living by creating businesses via the **mobile apps** channel e.g. delivery of lunch packages. • **Basic coding skills** at an early stage will encourage girls to take up Science, Technology, Engineering and Mathematics subjects at higher education levels and eventually solve talent gaps and gender inequality in tech companies.	• Open Data • e-Participation
6 CLEAN WATER AND SANITATION	• **Online services** to request for connection to water network and to report water-related problems can be useful for ensuring the availability and sustainable management of water and sanitation for all. • Complaints and water connection requests can be resolved faster if requests are **geo-tagged**. • Use of **smart water meters** and apps allow public to monitor and control home usage. • **Internet of Things** using **networks of sensors** can be used to measure groundwater levels, and **satellite imaging** helps give decision-makers a clear picture of how the water system is prepared to respond to people's needs.	• Digital-by-Default services • E-Business Strategies (Public Utilities) • Mobile-friendly services
7 AFFORDABLE AND CLEAN ENERGY	• **Online monitoring** of individual energy consumption and **online advice** on energy use can help users to improve their energy efficiency and lower energy consumption. • Usage of **online services** is more environmentally sound and less carbon-intensive than moving physically to counters and use of paper forms to avail of services.	• Digital-by-Default services • E-Business Strategies (Public Utilities) • Mobile-friendly services
8 DECENT WORK AND ECONOMIC GROWTH	• Public can be better informed of job openings in the government if vacancies are published in a **job portal** (**e-Employment**) in a consolidated form. • **Online education services** provide additional opportunities for training and skill improvement, thus favouring the development of a more skilled labour force. • **Making data available** that can be **re-used**, allows people to develop **new commercial services**, thus generating **new employment** opportunities and facilitating the creation of start-ups (e.g., new apps for public transportation).	• Digital-by-Default services • E-Business Strategies (Labour and Education) • Open Data
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	• Integration of **ICT applications** in national strategies for each SDG (e.g. **e-health, e-education, e-energy,** etc.) with ICT as a basic infrastructure. • Small and Medium Enterprises can benefit if they are able to access government facilities targeted to **businesses online**. • Moreover, **open access to academic research** and the power of **online collaboration** to support cross-sector and in-house co-creation, learning and work foster innovation in the knowledge society. • Government infrastructure including health and education facilities, as well as water access points can **be mapped using smartphones with Global Positioning System (GPS).**	• Business Cases • End-to-End services • E-Business Strategies (All sectors) • Interoperability and Data Sharing • Investment in ICT •

Sustainable Goals	ICT Applications	Recommendation in DGTS
	• **Internet of Things** allows extensive metering, monitoring, and remote sensing of physical infrastructure (E.g. power grids) and the environment.	
10 REDUCED INEQUALITIES	• Inequalities can be reduced if vulnerable groups (e.g. disabled persons, elderly people, uneducated persons, etc.) are provided with means to access relevant **government services over the internet.**	• Digital-by-Default services • Digital Inclusiveness • E-Business Strategies (Gender Equality, Social Security and Social Integration)
11 SUSTAINABLE CITIES AND COMMUNITIES	• Access to basic services and the sustainability of communities can be enhanced when information on **job vacancies, commuting timetables, transport routes** as well as **health-related** and **educational facilities** are available **online.** • In addition, public as well as stakeholders of government can be engaged through **online platforms for consultation** on government decisions.	• Digital-by-Default services • E-Business Strategies (Labour, Transport, Health and Education) • E-Participation • Open Data
12 RESPONSIBLE CONSUMPTION AND PRODUCTION	• Online information such as Open Government Data on various sectors and **consumer information** published on government **websites** and **mobile apps** ensure that people everywhere have the relevant information and awareness on sustainable lifestyles in harmony with nature. • The use of **3D printing** in production could slash the use of raw materials, dramatically cut waste and produce better products. • Providing **online information about bidding processes** and results through an **e-Procurement** online platform is an example of how governments can increase transparency and efficiency, ensure sustainable production patterns as well as unleash economic opportunities for all.	• Digital-by-Default services • E-Business Strategies (All sectors) • End-to-End services • E-Procurement-by-Default • Once-Only Principle • Open Data
13 CLIMATE ACTION	• Availability of **online knowledge repositories** on the protection of environment as well as climate change can help to create awareness on issues related to sustainable climate. • **Open Government Data** on **climate, weather, land and other natural resources**, combined with **Big Data analytics** and the **Internet of Things**, can help preserve the planet by tackling environmental issues in a more effective way.	• E-Business Strategies (Disaster and Risk Reduction, Ocean Economy, Environment, Fisheries and Agriculture) • Open Data
14 LIFE BELOW WATER	• Availability of **online data** on **oceans, seas and marine resources** can enable the application of **big data** on such data to analyse biodiversity, pollution, weather patterns and ecosystem evolution, and help plan mitigation and adaptation strategies. • Use of **mobile services and applications** to provide useful data (weather, tides, alerts, etc) to fishermen.	• E-Business Strategies (Ocean Economy, Environment, Fisheries and Agriculture) • Open Data • Mobile-friendly services

Sustainable Goals	ICT Applications	Recommendation in DGTS
15 LIFE ON LAND	• Availability of **online data** and **online reporting of terrestrial ecosystems** enables application of **big data** to analyse short- and long-term trends and plan mitigation activities. • **Online forest monitoring and alert system** that empowers people everywhere to monitor the situation forests. • Global Forest Watch unites the **latest satellite technology, open data and crowdsourcing** to guarantee access to timely and reliable information about forests.	• E-Business Strategies (Agriculture and Forestry) • Open Data
16 PEACE, JUSTICE AND STRONG INSTITUTIONS	• **Publication of laws and policies** on the Internet and engagement of public through **online platforms for consultation** on government issues or decisions contribute to peace, justice and strong institutions. • **Mobile apps** can empower public to report cases of **corruption** in public institutions. • **Online petition system** to enable people to raise, sign, and track petitions online • **Online access to judicial records** enhances transparency of the judicial system as well as trust in the legal system of a country. • **Digital law making system** ("e-Law") provides access to data in open standards for all stages of the legislative process (from the first draft to the promulgation of the law). The result is often greater transparency, collaboration, efficiency and public participation.	• Digital-by-Default services • E-Business Strategies (Judiciary and Police Force) • E-Participation • Mobile-friendly services
17 PARTNERSHIPS FOR THE GOALS	• **Online platforms** can be used to enhance international cooperation and coordination; promote **technology transfer; capacity building;** forge multi-stakeholder partnerships; and enable and improve data monitoring and accountability.	• Business Cases • Affiliation with International Bodies • Digital-by-Default services • Digital Governance • Interoperability and Data Sharing • International Cooperation

Source: United Nations Foundation (2015), United Nations (2016), Ericsson (2016), ITU (2017)

22 Annex C - Achieving Public Sector Business Transformation through DGTS

The table below describes actions recommended in the DGTS to achieve the strategic objectives and digital transformation pillar recommendations of the PSBTS.

PSBTS Strategic Objectives	PSBTS Digital Transformation Pillar Recommendations	Actions Recommended in DGTS
Highly efficient, where performance, accountability, excellence and results are the standard way of doing business	Use technology as an accelerator for improved quality service, efficiency, productivity, performance and results, new behaviours and mindsets	• e-Business strategies at each Ministry will encompass reengineering of processes into simplified and streamlined procedures, a blueprint to achieve digital transformation of their services and processes, change management to overcome cultural challenges and measures to gauge outcomes.
Adaptive and responsive with a continuous focus on being a catalyst, facilitator and enabler of nation building, socio-economic development and realising the government's vision	—	• Implementation of e-Business strategies, digital-by-default initiatives and higher investment in ICT in priority areas will ensure development in all government sectors in line with strategic directions. • The adoption of agile practices in procurement and implementation of projects will ensure Ministries/departments are adaptive and responsive to continuous changes.
Citizen-centred in policy development and service delivery, informed by research, evidence and client feedback	Use all available E-platforms (such as e-Procurement), tools, apps and technology to drive customer-centric digital transformation and e-Participation by the public and clients;	• Customer-centricity and e-Participation will be ensured by mechanisms to support the integration of citizens and other stakeholders' views in decision-making processes, design and improvement of digital services, data to be released in open formats, among others. • Use of assisted digital support desks, mobile-friendly services, help material provided in the form of audio and video and user friendly interfaces designed with user or customer experience in mind will increase citizen-centricity, accessibility and availability of services.

PSBTS Strategic Objectives	PSBTS Digital Transformation Pillar Recommendations	Actions Recommended in DGTS
Technology-enabled, open and forward-thinking, with smart practices and processes that continuously improve and have in-time adjustments	Be digitally curious	• Future-fit teams in the digital ecosystem embracing forward-thinking capabilities such as agile principles, technology scanning and experimentation, market research, research and development, continuous update of technology and domain skills will ensure sustainable progress in constantly evolving environment.
Cross-cutting and boundary-less in sharing information and knowledge, with a strong focus on integrated strategy and priority-setting, resource allocation, planning and execution; and	Share more information between all Ministries in a whole-of-government approach that crosses borders, jurisdictions and mandates, resulting in shorter decision cycles; Use centrally-pooled, accessible and re-usable data and information so that Public Officers can take decisions in a standardised and consistent manner, improving performance and results;	• Open data portal and enforcement of open-by-default policy will allow release of non-sensitive public information, which can be leveraged by government agencies to support decision-making. • The use of data-driven dashboards allows top management in government agencies to monitor and continuously improve quality of digital services and enhance decision-making and policy formulation. • Enforcement of once-only principle, sharing of base registries via InfoHighway, paperless transactions and interoperability between systems will allow for faster service-delivery, reduced transaction-processing time, pressure on counter services and errors in data entry, among others.
A merit-based workforce that is well-developed in both capacity and capability achieved through strategic human resource planning and talent development, learning, coaching and mentoring	Dedicate resources, time and effort in developing a new workplace culture/ethos that changes the mindset of Public Officers so that digital transformation is successful	• Capacity building programmes for government employees, service or business owners to support digital service delivery and digital skills introductory sessions for high-ranking executives will allow for a cultural change in favour of digital transformation. • Continuous and customised capacity building programmes and industry exposure on technology and business domains will allow

PSBTS Strategic Objectives	PSBTS Digital Transformation Pillar Recommendations	Actions Recommended in DGTS
		ICT staff to support the digital ecosystem. • Empowerment of computer rooms into structured ICT departments, review of staffing requirements to address underinvestment in human resources, managed services for ICT operations and optimisation of digital teams will ensure successful digital transformation.

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PSBTS Strategic Objectives	PSBTS Digital Transformation Pillar Recommendations	Actions Recommended in DGTS

Digital Government Transformation Strategy 2018 - 2022