LEBANON
DIGITAL TRANSFORMATION STRATEGY
2018

For many years, the public administration in Lebanon has been overstretched suffering from bureaucracy, poor service delivery, perceived corruptions, outdated technology, ineffective processes and inadequate governance structures. These problems have gradually eroded the citizen's trust in the state, undermined Lebanon's economy and hampered its ability to cope with the fast pace of digital changes in this Internet age. The gap is continuously widening between the expectations of the citizen, especially the digitally savvy young generation, and the ageing mechanisms underlying current provisions of most government services. Over the past two decades, consecutive governments have repeatedly acknowledged the importance of technology as a vital ally to foster innovation in governance, reform public management and transform the delivery of public services. Substantial amount of money has been spent on projects to improve the status quo but, judging by users' expectations and experiences, the overall situation is not encouraging. Too much emphasis has been on buying technology but the name of game should be on effectively transforming services. There is a growing realization among all the stakeholders in Lebanon that the current digitization approach of making fragmented, incompatible and uncoordinated small-step changes is unsustainable. It is less favorable to the citizen, more expensive to the government and harmful to the national digital industry. Therefore, it is time to profoundly scrutinize the causes hindering our progress, develop strategic enablers to overcome these problems and do not shy from adopting the best solutions even if these solutions seem too radical at the first sight.

Our digital government strategy sets out our ambitions to reform government. These are very high ambitions. We aim is to transform government into a truly digital organization making interactions with users seamlessly simple and providing a platform to enable innovation and to invigorate the whole national digital eco-system. For the first time we have a strategy that prescribes how to achieve these great ambitions in a coherent, organic, sustainable and speedy manner. Digital transformation is placed at the heart of public service reform. The outlined approach focuses on user's convenience, emphasizes joining up services, developing sustainable in-house digital capability, building strategic resources and, in short, building strong foundations for a future digital nation within a relatively short time frame (four years).

There has been a broad consensus for embarking on the "Digital Government" journey in Lebanon. This commitment has been emphasized on many important occasions at the highest official levels. For instance, it was pledged in the inaugural speech of His Excellency the President of the Republic. It was also a key item in our Council of Ministers Statement formed under the banner of "seeking to restore trust between the state and the citizen". The outlined digital transformation strategy provides a clear roadmap for achieving our high ambitions. Therefore, we rely on the momentum of our current government's drive for fundamental institutional reforms to adopt this strategy in its entirety. In particular, we would like the government to grant the much-needed mandate and to provide appropriate investment to enable the successful implementation of the strategy. This will be good for our sovereignty, good for regaining citizen's trust, good for our digital economy and good for the future of the nation.

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Focus Areas:

Motivations and Actions

FOCUS AREA: INFORMATION

What are the issues?

Citizens and businesses cannot easily find information that they are looking for in current government websites. Firstly, it is difficult to locate in which government's ministry or agency the information could reside; there are hundreds of different government Web addresses. Government' information is usually organized to suit the internal management structure of the supplying department rather than to effectively serve the citizen. Secondly, web content, usually written by legal experts or IT specialists, is often difficult to comprehend by ordinary citizens from diverse backgrounds. Thirdly, the reliability of information is sometimes an issue. Information about the same topic could be found in several places but in different forms and subject to confusingly different interpretations. Fourthly, websites may not necessarily be responsive to hand held devices, such as mobile phones and tablets, that the majority of citizens' use.

WWW.GOV.LB: A WHOLE-OF-GOVERNMENT CITIZEN-FACED PUBLICATION PLATFORM

To address these concerns, we will adopt a **whole-of-government** approach to the publication of government information and digital services using the common platform: **www.gov.lb**.

Action 1: Make the single domain www.gov.lb the front-end for all citizen-faced government information and transactional services. This will be the single window to the government's information and services facing all citizens and businesses.

The publication platform **www.gov.lb** is a one-stop shop that enables clearer, simpler and faster access to all citizen-faced government information and transactional services. This single window will make it much more convenient for citizens and businesses to seamlessly find government information and to interact with a growing portfolio of online services. Users will also have the assurance of government authenticity. The information will be carefully structured as hierarchical categories that can be intuitively navigated to quickly locate what the user is looking for. The presentation of the content will be greatly simplified to ensure clarity and ease of use by citizens with diverse backgrounds. In close partnerships with citizens, businesses, government ministries and agencies, www.GOV.LB will be developed as a quality brand equated with clarity, simplicity, accuracy, ease of accessibility, user convenience and responsiveness.

GOVERNANCE OF WWW.GOV.LB

The platform will be centrally managed and collaboratively delivered through a protocol that guarantees authenticity and authorization of every piece of information from the source accountable for it. Hence, each government agency will keep full accountability and control of the information under its ownership. The protocol will be implemented as a distributed workflow.

An initial prototype of www.gov.lb (alpha stage) is available for feedbacks at www.portal.gov.lb.

FOCUS AREA: STANDARDS

What are the issues?

The citizen views the government as one single entity and, as such, it is far more convenient to deal with it as a whole integrated unit as opposed to hundreds of fragmented sections and subsections of existing ministries. The internal organizational structures between government sections within and across ministries are irrelevant to the citizen's digital journey and constitute the biggest barrier to using the government's digital channel. Therefore, we need standards embodying best practices to empower all government departments to offer the same high quality consistent digital experiences to users.

Standards enable technical interoperability, reuse of digital components, sharing of data and assurance of quality across government. They facilitate the deployment of more efficient, interoperable ICT that keeps pace with technological change. Standards are the vital ingredient enabling a joined-up government. They facilitate the provision of better public services for citizens and businesses by providing the means to deliver cross-government integrated services.

Action 2: **Set government standards for citizen-centered information content, digital services and data classification and help transformation teams across government to enforce them.** This will improve quality; ensure consistency of the user's digital experience and guarantee compliance with international norms where applicable.

INFORMATION STANDARD

All information in GOV.LB must conform to a new Information Standard that embodies current best practices. The standard indicates a strong commitment to deliver clear, authoritative and easily accessible content and will be published as early as possible. It provides a framework for assessing compliance and helps both government agencies and suppliers to understand what is expected from their contents and services.

A new "Digital Service Standard" will also be mandated on all citizen-faced services. Complying with the services standard will facilitate ease of use and ensures transferability of user experience: once the citizen tries one service and learns how to use it, it will be much easier to use any other service the next time. This is because by satisfying the same standard, all services have the same design features with regards to interface, style, structure, clarity, privacy, quality and run on the same platform.

A number of standards, guides and frameworks focusing on areas of high importance for synergy among government agencies such as cybersecurity, cloud security, use of personal data, digital assurance, change management and governance will be collectively developed and mandated for all government agencies. We will also provide supporting tools to make it easier

for teams to ensure compliance with the standards. Open International Standards will be adopted if available.

FOCUS AREA: DIGITAL SERVICES

Transforming transactional services to the digital channel offers the greatest opportunity to improve efficiency in government and to provide better user experience. The actual cost of an online transaction[1] is estimated to be 57 times cheaper than a face-to-face transaction and 18 times cheaper than a telephone transaction. So by enticing more people to use online services, the potential for government savings is huge.

WHAT IS PREVENTING MORE PEOPLE FROM USING DIGITAL TRANSACTIONS?

Firstly, current services rely on digitizing pre-Internet paper-based business processes that are not best suited to the digital era. Secondly, most services do not offer end-to-end transactions; that is, the user still needs to go through the inconvenience of a face-to-face part in order to fulfill the whole transaction. Thirdly, each service has been independently designed with its unique user interface and set of assumptions. This leads to inconsistency in the user experience of interacting with government and to unnecessary confusion. Finally, most valuable services involve multi parts from different government agencies and this is very difficult to achieve in the current digital setup.

DIGITAL BY DEFAULT

The ultimate aim of the strategy is to transform public services to be digital by default and to dramatically increase user uptake.

Action 3: **Proactively transform transactional services to be digital-by-default thriving to make service's convenience to users the top design priority and to be more responsive to their needs.** Bearing in mind that digital transformation is not about digitizing existing paper-based processes but it is about inventing the best new "Internet era" way to deliver the service.

To achieve this effectively, it is vital to have a whole-of-government user-centered approach to service design. Relentless emphasis is put on enhancing convenience for users and on bringing uniformity and coherence to all government digital offerings. The objective is to make transformed digital services so good that they will deservedly become the user's preferred choice for interacting with the government.

DIGITAL SERVICE STANDARD

A new "Digital Service Standard", a draft is appended in Appendix 1, will be mandated on all citizen-faced and business-faced services. The standard is a clear statement of ambition in

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[1] http://www.socitm.net/info/214/socitm_insight/53/briefings/1- visited March 2018.

delivering excellent services. It places users at the heart of service design, incorporating their feedback at every step of the way. It sets out a method of working that has been shown to produce real benefits. It is a means to share good practice, ensure synergy and facilitate integration. It also provides a framework for assessing compliance.

AGILE SERVICE DESIGN AND DELIVERY

The Digital Service Standard requires new services to be designed and built taking an agile and user-centered approach. This approach considers users as an essential partner at all the stages of the design and delivery process. Agile development is about iterating quickly to deliver value to users and managing risks proactively. Agile development requires continuous delivery, improvement and feedback from users and business owners. The benefit is that delivery teams can quickly adapt and align services with user needs in rapidly changing environments. The Digital Service Standard sets out a four-staged service design and delivery to assist agencies in adopting an Agile development approach.

TRANSFORMING BUSINESS PROCESSES

In digitizing services, we will adopt the user's perspective and look for innovative ways of improving the experiences of citizens and businesses. This involves challenging long-held assumptions and being willing to remake products, processes, and policies. To digitize a business process effectively, it is recommended to digitize the entire chain of activities that make up the process resulting in a valued end-to-end multi-stage transaction. There is a need to streamline inefficient or hard-to-automate business processes before digitizing them.

The government also recognizes that not all members of the community can access digital services equally and that consideration will always need to be given to their particular needs.

GOVERNANCE OF CROSS AGENCIES SERVICES

Each transformed digital service will have an empowered service manager accountable for it. When the service uses APIs to access data from various agencies, the security of the APIs is controlled by the data owners. Appropriate security privileges will be formally authorized by all the relevant data owners at the design stage of the service.

FOCUS AREA: MODERNISING INTER-GOVERNMENTAL SERVICES FOR STAFF AND MANAGERS

What are the issues?

Every government department has to deal with essential services for its employees such as human resource functions, financial reporting, performance management, payroll, document archiving, job vacancies and procurement. In addition, there are very basic services such as secure email, document editing, management reporting and video conferencing. Currently, each department provides some of these services on closed legacy systems with different levels of effectiveness and convenience to its users.

INCREASING THE SCOPE OF SHARED SERVICES

The identified services are not designed for sharing. They are usually tied up to different technology preventing them from being easily upgraded or used outside their silos. Increasing the scope of sharing these services through common government-wide platforms will achieve efficiency and deliver better user experience for the employees while at the same time keep pace with technology, improve security and enhance assurance for the government.

Action 4: Consolidate and modernize shared digital solutions to common core services such as Human Resource functions, financial reporting and secure email. A key to success will be the adoption of standards reflecting convergence around streamlined processes and simplified data. A gradual implementation programme prioritizing the digital transformation of most labor-intensive and expensive back-end processes will cut cost, increase productivity and promote convenience for both staff and managers.

ENABLERS FOR SHARING UNIFIED SUSTAINBLE SERVICES

Modernizing these services requires firstly separating the application part from the technology part upon which they operate. This will lead to wider long-term value, drive efficiency and provide flexibility to pursue modern options. For instance, opting for cloud computing or software as a service solution where appropriate will facilitate authorized access from anywhere at any time, and simplify upgrading at scale. Secondly, agreeing and mandating standards reflecting cross-government convergence around simplified processes and data for these services. This will enable inter-operability and facilitate horizontal collaboration. Thirdly involving the actual users, particularly finance and human resources in all ministries, in defining common roles, agreeing global practices and coordinating governance. This will make it much easier to enforce the unified practices across all government departments and promote convenience for staff and managers.

This approach of decoupling applications from technology and standardizing simplified processes and data for core services will not only result in greater consistency and satisfaction for the end users but it will enhance staff productivity, improve management reporting, drive new innovation insights, contribute to a more joined up government, lead to stronger data governance and boost the ability to keep pace with the best available technology.

Strong Digital Foundations

for a future digital nation

What are the issues?

Some functionality such as identity verification and payment are common to all valuable transactional services. Because each service is currently commissioned separately for a particular government agency, the taxpayer has paid for direct implementations of these functionalities many of times. Each implementation is usually hard-wired into a particular service by a particular vendor; so they cannot be reused. More alarmingly, because each implementation has a different interface, the user needs to learn how to use each service from scratch making the user journey much harder and less convenient.

Action 5: Transform vital software components with massive utilizations, such as identity verification and payment, into common digital platforms that any service can easily, swiftly and cheaply reuse. We will do each platform only once; do it correctly, do it securely, do it with a good user experience, do it at a low cost and then reuse, reuse, reuse, reuse!

The obvious insight is to implement each of these functionalities once as an independent building block and then reuse. We don't need to reinvent the wheel and repay for the reinvention every time. With an Internet-era mindset, comes the realization that these building blocks are likely to be integrated in thousands of new services. So, firstly, it is important to design them right and, secondly and equally important, to make their integration into new services seamlessly easy. Hence, we will provide them as ready to reuse platforms; typically, within gradually widening scope benefiting government, local government and the digital industry.

With economy of scale, we can afford to invest in development to make these platforms excellent products. Hence, we will design them collaboratively in partnership with users. Their development will be driven by the needs of citizens and service teams across government. This approach will give confidence to all stakeholders that it is the preferred product to use. It will be reliable, secure, flexible and adaptable to easily keep up with future needs. The common platforms will be a central part of the digital government's infrastructure. They are enablers for seamlessly joining up multiple services across government departments; thus, allowing end-to-end integrated long running multi-stage transactions involving several ministries. Common platforms will seamlessly help to make services interoperable and ensure swift and consistent enforcement of government policies. For instance, if the payment policy changes, only the common platform needs to be quickly modified, instead of hundreds of separate integrations, to ensure consistent enforcement government wide.

The range of common components includes platforms for (1) identity verification, (2) payment, (3) notification, (4) service performance and (5) publication. This approach, of factorizing common important functionalities and providing them as modular platforms for massive easy reuse, is being increasingly known as "Government as a Platform". That is, the government will

offer tools to help civil servants, stakeholders, businesses, communities and society to interact, innovate and do things together that were unimaginable before.

In addition to its enormous cross-government financial savings, common platforms are key enablers for much faster services' design and for much happier users' experiences. For instance, once the user makes payment in one service, and learns how to use it, it will be much easier to make payment in a completely different service the next time; since although these services are different, they all do connect to the common payment platform with the same user interface. So, the user journey is repeatable.

There are also major longer-term benefits to adopting common platforms, such as payment. The system will continue to evolve with feedback from citizens and teams across government. So, when new needs emerge they will be quickly incorporated in the platform. By doing the improvements to the platform, thousands of services that connect to it will automatically benefit from these improvements.

IDENTITY PLATFORM

Digital identity platforms are crucial for modern governments. Across the world, officials are building secure ways for citizens and businesses to identify themselves online. But issues of security, privacy, data sharing and efficiency are all tied up in this tricky bundle. Digital identity is the "backbone" of the whole digital movement in Lebanon. So, it is massively important to agree its main purpose, clarify implicit cultural assumptions, identify the operations that will be provided, the trust mechanisms, security controls and privacy principles in order to get its design right. The rollout of online government services such as voting, healthcare claims and tax payment is tightly interlinked with the rollout of digital identity as a service. The digital identity will be trusted across all government departments. The identity platform will provide facilities to authenticate users and to verify specific identity attributes to enable them access to personalised digital services in line with pre-defined government policies. Because the platform is shared by all government services, once the user changes an attribute such as address or phone number, this change will immediately propagate to all services.

The identity platform is crucial in the journey towards the realisation of the "Digital Citizen" in a future digital Lebanon. In addition to digital identity, the eco-system will enable secure personalized dashboards that allow citizens to easily track all their transactions with government, conveniently maintain certified digital proofs of their assets and control their privacy setting within a setup that ensures secure communications and retains irrefutable evidence.

Historically worldwide, citizens do not have high trust in government's ability to access vast amount of their personal information. To increase citizen's confidence, it is important for the government to be transparent, run awareness campaigns, engage with citizens in the co-development of the identity platform and ensure that their personal data are well guarded and will only be used as expected by them.

PAYMENT PLATFORM

Payment is often required in order to complete transactions such as renewing a passport or applying for a driving license. We would like to make it easier for citizens and businesses to pay for government services by offering them a consistent set of payment options. Instead of hundreds of different direct integration from government services straight into payment providers, the platform will provide a common solution that is simpler for citizens, cheaper for government, more efficient for agencies to reconcile payments, faster for creating new digital services and better for innovation. Because all payments within digital services are plugged into the same platform, once improvements are made to the platform, all the services connected to it will be updated across the government. Hence, it will be much easier to maintain consistency across government.

NOTIFICATION PLATFORM

Many government services need to connect quickly with users, for instance to confirm authenticity or to notify the status of a pending transaction. Because mobile penetration is high in Lebanon, it is most convenient to message users on their mobile phones. The Notification Platform is a common solution that will be designed to integrate smoothly with all government services requiring to message users. The platform will be built in collaboration with mobile providers in Lebanon and its development will be driven by needs of service teams across government. This will give them confidence that it is the right product to use. It will be citizen-centric, reliable and cost effective. It will follow the ONCE principle; that is, once a user changes her number, all services will use the new number. There are longer-term benefits to adopting Notify too. The platform will continue to evolve with feedback from teams across government. This means that when new needs emerge they will be quickly met.

PERFORMANCE PLATFORM

The performance platform will publish a number of dashboards that transparently track the performance of government services against key metric indicators such as user satisfaction, digital take-up, and user completion rate. The dashboards also provide useful factual details about actual devices and technology that users use in order to interact with each service. The publication encourages continuous improvements of public services. Transparency of service performance also allows for the highest impact services to be prioritised for improvement. These metrics contribute to better informed, evidence-based decision making about investment and avoid waste as a result of incorrect assumptions.

PILLARD 2: DATA PLATFORMS

What are the issues?

Action 6 **Collectively with data owners across government, disentangle persistent data from their hard-wired specific applications and environments; simplify, enhance, make them canonical and convert them into reusable openly accessible secure data platforms to power innovative applications and services that we can hardly imagine today**.

We will publish open data by default and use data analytics to support future evidence-based government policies and performance metrics. We will develop comprehensive standards; guidelines, governance and supporting tools to deal with the full lifecycle of the "modernized" data. We will provide a catalogue of meta-data to enable their discovery and accelerate their use. We will create a cross government framework for data governance.

DATA PLATFORMS

Digital services are the engines but data is the fuel powering the new digital eco-system. The most valued transactional services, by citizens, employees and businesses alike, usually involve access to one or more specific databases. Typical exemplars include: Birth Records, Identity Card Records, Tax records, Health Records, Insurance Records, Academic Qualification Records, Criminal Records, Electoral Registry, Land Registry, Company Registry, Mobile Mast Location Register; Vehicle Registry, Driving License Registry, Visa Records, Work Permit Records, Certified lawyer Registry, Certified Medical Doctor Registry, Approved Government Supplier Register, Bankruptcy Register and Social Benefit Records; Just to name a few but a realistic list may include hundreds in central government and possibly thousands in future Lebanese smart cities and municipalities.

Data platforms are the pillars upon which the new Digital Nation is founded. Each data platform is the single source of truth about something, such as car ownerships or revoked driving licenses. They are canonical, authoritative, can be checked for integrity and be made available to services gaining the consent from the data owner. You have to have a new mindset to think digitally to have thousands of services making use of a single data platform. Governance, control and risks will stay within the remit of the legal owner of the data.

DATA SECURITY, PRIVACY AND GOVERNANCE

Making the big jump from working within closed world or even pre-internet technology to working in the open world is a serious challenge. However, technical issues can be overcome and risks can be mitigated. Outdated technology can be upgraded; legacy systems can be wrapped up with appropriate (API) interfaces to make them available outside their silos; and further customizable security wrappers can be added to grant access only to authorized entities.

Data will be encrypted at source instead of only relying on boundary firewalls to protect them. This opens up new ways to store data on the clouds and to mitigate insider cyber threats.

Services' design will abide by the principle of having minimal access to personally identifiable information from the data platform in order to run.

DATA STANDARDS

In consultation with data owners in major ministries, we will develop a standard approach to structuring information effectively across government. Adopting an agreed data classification standard will enable data usage policies to be effectively and consistently enforced across government. This provides a firm basis for a common approach that safeguards citizen's privacy, in transactional services that use personal data, and protects government confidentiality, in shared services that use sensitive information. Equally important, data classified as public will be systematically archived in appropriate Open Data repositories and, thus, hugely facilitating the implementation of the freedom of information law that was passed by the Lebanese Parliament in January 2017.

APPLICATION PROGRAMMING INTERFACES (APIS)

APIs are pieces of software codes, primarily intended for software developers, that provide a set of technical specifications to efficiently interact with and ultimately integrate applications and systems. APIs are driving the current revolution in digital business as means to interface back-end systems to the open world. So, why does all this matter? It all comes down to the word "service"! Firstly, APIs make the data platforms technology independent. So, developers are not restricted to a specific technology nor locked in to a specific vendor to make use of the data. Secondly, it makes machine-to-machine interactions possible. Thirdly, it allows the data to be discovered and used by external commercial developers to provide new innovative services. Finally, with the advent of Artificial Intelligence, APIs open up unimaginable new opportunities for the new generation.

Each API will ensure security of government information as well as privacy of the citizen's personal data and consent to use for the intended purpose. This approach will seamlessly get integrated with similar data platforms provided by provincial councils.

DATA ANALYTICS

The opportunities created by sharing and analysing data are immense. Access to data increases transparency and allows individuals and institutions to make informed decisions. But more importantly it allows us to see and make connections that are otherwise hidden away. Data analytics insights have resulted in spectacular success in areas such as fraud detection and cutting corruptions. Techniques will be used to address a range of social and economic challenges across government, driving innovation and supporting evidence-based policy. Critical to this work is establishing partnerships with industry, government agencies and research institutions.

PILLAR 3: TECHNOLOGY

What are the issues?

Information and Communication Technology (ICT) provisions are at the heart of public services. Until fairly recently, government agencies designed, built and operated their own technology solutions and stored their own data. Such an approach is no longer necessary or desirable. The accelerated pace of disruptive change generated by cloud computing presents an opportunity to change the way the public sector operates and acquire technology to deliver public services.

CLOUD COMPUTING OPPORTUNITIES

New advances in technology have brought enormous innovations rapidly accelerating digital disruption. Game-changing cloud computing technology have driven profound transformation to ICT provisions. Cloud has increasingly become the new industry standard for how technology is provided to support digital service delivery. Cloud computing provides a commodity service for government, underpinned by a dynamically growing marketplace. It removes the big upfront investments in technology to enable scaling up or down quickly. The implementation of cloud computing models increases the agility, flexibility, scalability, robustness and speed of delivery of digital services. This will transform government's ICT into one that is agile, cost effective, economically sustainable and dynamically responsive to changing demands.

CLOUD RISKS

Cloud computing, however, is a new way of sourcing Information Communication Technology (ICT) services and many agencies will have to change the way they operate to make the most of this new model. There are significant security risks; so it is important to understand them and to help agencies make the right decisions. There is a shortage of knowledge and experience in assessing the risks, devising the right service level agreements and putting appropriate controls to monitor them. There is also resistance to change outdated operating models.

The priority is to work collectively with government agencies, key stakeholders and private cloud computing providers to devise a comprehensive government strategy to develop and sustain its ICT infrastructure and capability.

Action 7: Develop a strategic whole-of-government approach to ICT provisions embracing new innovations in cloud computing, datacentres and virtualisations. Provided relevant risks are adequately mitigated, this will facilitate secure sharing of resources, improve delivery of digital services and enhance resilience.

The Cloud strategy will give agencies a clearer understanding of how government can harness the opportunity of cloud to increase agility, reduce duplication, improve efficiency and deliver better services. It will provide the frameworks and platforms for agencies to ensure they have the confidence and capabilities to securely shift (some of) their services to the cloud and deliver the most value for the government, citizens and businesses.

What are the issues?

Cybersecurity is a substantial risk that could potentially affect state sovereignty and, at the same time, it is a key enabler for delivering immensely better public services. Confidence in the governments' cybersecurity measures and transparency in the use of personal information are vital for gaining citizen's trust and for attracting more people to do business online. Major issues from the government's perspective include in the short term uplifting current security practices in all ministries and establishing cross-government Internet era structures, capability and institutions that focus on protective security, privacy and resilience matters; in the long term, to implement best international practices to deal with continuously evolving and newly emerging cyber threats and to enable an assurance security culture in which security policies are easily and consistently applied across government. From the citizen's perspective, is important to have control of their own private data and to have confidence in the safeguards that prevent their personal information from being used for different purposes without giving consent.

BACKGROUND

Modern organizations widely consider digital information as their most valuable asset. Mature governments usually hold the same view albeit with more vigor. Government accumulates massive amount of sensitive state information and is trusted with private details about every one of its citizens. Digital technology offers many benefits, but also brings serious cyber risks. Concerns about cyber-security are one of the main pacing factors governing the rate of digital innovation by public and private sector organizations. Digital transformation will make more government information accessible over the Internet and will, therefore, increase the surface of exposition to potential cyber risks. Cyber threats originate from a variety of sources including insiders, hackers, organized crimes and hostile states. Impacts of cyber-attacks that have been witnessed in the past decade vary from website vandalisms, personal data breaches, monetary losses, reputational damages to state-sponsored cyber wars. With the blurring of the line separating the physical and the digital worlds, ensuring confidentiality, integrity and availability in government digital information is considered a matter of critical importance to citizens, businesses, society, democracy, national security and state sovereignty.

APPROACH

Good practice in privacy, protective security and resilience underpins government's ability to safely and appropriately use, reuse, and share information to transform citizen-centered services. It also means government security practice can keep pace with a constantly evolving threat environment.

Action 8 Collectively with government agencies, develop and implement a program embodying global good practices in cybersecurity and privacy across the whole government.

To protect its digital assets, the government must invest the time to know the cyber risks, be clear about what to protect, know the threats to protecting against, train and educate staff and keep up-to-date with international best practices. Cyber security risks need to be comprehensively addressed and adequately mitigated all the levels: infrastructure, software, systems, people and processes. It is essential to have a growing cross-government cyber security capability to strategically plan and adequately prevent, detect and respond to cyber threats. Digital transformation to the Open World must be secured through:

- Building capability to prevent, detect and respond to cyber-attacks, manage incidents and secure services.
- Pursuing a systematic, collaborative and comprehensive cybersecurity approach that embraces international best practices. This includes continuous security enhancement to network, product, system and application security as well as operating within a strong governance framework.
- Guarding citizen's privacy, providing transparency in the use of personal information and ensuring that security is usable in digital services.
- Raising awareness, increasing knowledge, promoting expertise and strengthening international cooperation
- Improving the technical, legal and cultural means of preventing and combating cybercrimes

INITIATIVES

In line with international best practices, government capability should include:

- a national Cyber Emergency Response Team, CERT-LB, to provide benchmark advice and assistance focussing on cyber incident prevention, handling and reporting. CERT-LB will also collect and share cyber-threat intelligence within Lebanon and with national CERTs in partner states.
- a government Cybersecurity Operation Centre (CSOC) to monitor real-time digital operations, identify cyber risks and execute mitigating actionable plans in response.
- a cybersecurity assurance entity that provides comprehensive confidential security testing services for digital government programmes including hardware devices, networks, products, software codes and digital services.
- a lightweight scheme (Cyber Essentials) to encourage adoption of basic cybersecurity 'hygiene' in public and private sectors
- a Cybersecurity education campaign for citizens and employees as well as including the cybersecurity subject in school and university curricula to address the shortage of skills.

Government Reforms

in Support of

Digital Transformation

What are the issues?

Current procurement processes inhibit local digital SMEs from being a significant player in the government's supply chain; not only this is an obstacle to quickly bringing innovations to government but unhelpful to a budding digital sector with potential for exponential economic growth.

Digital technologies are profoundly affecting the way we live, work, interact, learn, consume and create. The digital economy pioneering innovative data driven products, services and platforms has a potential for tremendous growth at rapid speed. Tapping on a well-educated, multi-lingual, creative and technology savvy new generation, Lebanon is in a good position to be an international digital hub that accelerates the prosperity of the regional digital economy. Tens of thousands of new jobs could be created every year. Policies supporting our digital economy to thrive will not only benefit the prosperity of this industry but will tremendously help to digitally transform our businesses and institutions making them more innovative, efficient and internationally competitive.

Action 9: Promote policies that make Lebanon's digital industry a substantial part of the government's supply chain and accelerate its growth into a digital powerhouse that fuels the new regional knowledge economy.

We aim to simplify our current procurement processes making them more agile, open and responsive. We will use technology to support this aim whenever possible. We will pursue the following activities:

DESIGNING LARGE IT PROJECTS AS A COMBINATION OF MINI-PROJECTS SUITABLE FOR SMES

Our strategy is to assemble complex services out of small pieces. These in turn, can be developed in-house or procured independently to SMEs. So, instead of procuring one large monolithic system to an external company, this will be strategically broken down into smaller modular pieces. Hence, the size, length and value of the contract will significantly change to attract more bids from SMEs; the digital strategy implies much higher number of (outcome driven) short-term contracts at relatively modest values. Availability of commercial technology infrastructures, such as Azure, Amazon Cloud or a future Lebanese Cloud; that are trusted by government will make it easier for SMEs to work with government.

DIGITAL MARKET PLACE PLATFORM

The "Digital Market Place" platform will be created to help matching digital supplies to demands. Several advanced digital governments that use a "Digital Market Place" platform have reported steep increase in the number as well as value of contracts won by SMEs. Pre-vetting companies, publishing their ratings and feedbacks given by real users help to increase confidence and to speed up automated agreements.

STREAMLINING AND AUTOMATING PROCUREMENT PROCESSES

Building on a current project to automate existing procurement processes, we will carry out a programme of improvements to streamline these processes ensuring increased openness, guaranteeing fair play and providing SMEs with as good a chance to be awarded a contract, as is the company's bid and reputation merit.

OPENING UP DATA THROUGH APIS TO ACCELERATE DIGITAL INDUSTRY'S INNOVATIONS

Development of APIs will significantly fuel the digital SMEs economy in two folds. Firstly, mandating the provisions of APIs to enable controlled access to central and local government open data, as stipulated in the Foundation Architecture, will stimulate a whole new digital eco-system of established companies and newly formed start-ups to co-create applications, present content and offer transactions on behalf of the government. Secondly, as stated in the outlined multi-speed digital government architecture, there will be very large number of legacy back-end database systems needing to be transformed into canonical registers and interfaced to the Open world through APIs. Each of these could be done as a separate contract suitable for an SME.

SUPPORTING MORE BUSINESSES TO BECOME DIGITAL

Promotion of collaborative schemes funded by government and donors to support local councils, institutions and businesses to adopt and effectively use digital technologies.

FOCUS AREA: DIGITAL SKILLS

Digital transformation is pioneered by creative digital minds, thus it is highly important to get the right skills and experience to support new ways of working in digital government. Currently, most ministries rely on the number of employees in their planning; however, skills are vitally important to the successful delivery of their programmes. Digital skills in modern government are indispensable to sovereignty and national security. They are essential enablers that underpin citizen trust in government. Digital government services will be conceived, transformed, delivered, operated and continuously improved largely by "in-house" government employees. Hence, successful transformation will heavily rely on retraining existing human resources to fulfill various functions in the digital government.

Jobs may change dramatically or become obsolete. However, different kind of exciting job opportunities will arise, we will set up cross government initiative to up-skill and re-skill to seize these opportunities. These initiatives will open opportunities for youth for early exposure to technology, problems, exemplars and skills. Additional schemes could be set up to help businesses to cope with digital disruptions. The intention is to help businesses adopting new digital technologies and transforming to new business models to achieve competitive advantage at nationally and regionally.

Appropriate level of digital skills involves everyone in modern government: policy makers, programme managers, service managers, administrators, employees, businesses and citizens. The role of newly recruited digital leaders (new blood), within a shared pool of expertise and across government departments, is a vital catalyst for delivering the strategic vision and for digitally up-skilling the existing workforce. The strategy will achieve this objective through a combination of several mechanisms:

DIGITAL ACADEMY

We will establish the "Digital Academy" whose mission is to create digital capabilities, enhance collaboration, propagate best practices and support new ways for doing things across government. It provides civil servants with the skills they need to embrace the digital transformation changes. It offers a range of workshops at various level of technical depths, with introductory sessions for non-specialists, specialised courses for people in digital roles and training for managers responsible for digital services. It delivers learning by doing, encourages creativity and demonstrates how to put powerful principles into practices. It harnesses knowledge and experience from diverse expertise in the public sector that design, deliver and operate government services. The foci of the initial workshops will be on understanding what

digital means in government, appreciating new opportunities offered through digital transformation, valuing the emphasis on user experience and exploring how to deliver digital services using agile principles. Each workshop will be specifically tailored to achieve the best outcome for its target participants. The Digital Academy will also offer complimentary skills that are essential ingredients to digital transformation success such as strategic planning, operational management, delivery of large projects, financial accounting, contract monitoring, understanding user requirements, governance and process transformation.

In the first year, the Digital Academy will focus on training public service employees that are involved in priority digital transformation projects but will significantly widen the opportunities in each subsequent year. It will be agile, adapt to newly emerging requirements and respond to rising demands.

- Develop extensive bespoke training and support for managers of digitally transformed services and data platforms.

- Work with departments to develop digital awareness training for employees and with civil societies to improve digital literacy and encourage wider take up of digital services.

INTERNSHIPS

OMSAR has initiated a new Internship programme to enable graduate students within a variety of disciplines to gain insights into how government works, appreciate the nature and scale of the real problems faced by digital government, use their knowledge in new technologies to contribute to innovative solutions and to expose them to possible government employability opportunities.

DIGITAL ASSISTANCE

This programme will target citizens in specific groups that need help in order to do more online activities. We will support coordinated activities from civic societies, charities, universities, non-governmental organisations, digital sector and private companies to get more people online.

PUBLIC ENGAGEMENT

Promote cross government shared digital tools and good practices to engage the public.

FOCUS AREA: PERFORMANCE MANAGEMENT

Rooted in the desire to improve government transparency and efficiency, OMSAR has been tasked to drive a modern performance management approach across government. An ongoing, systematic approach aims at improving results through evidence-based decision-making, continuous organizational learning, and a focus on accountability for performance. A comprehensive performance management program requires organizations to both measure performance and use those measurements to budget and plan strategically. So far, a realistic, systematic, fair and fit-for purpose government wide approach has been out of reach because of substantial barriers. The major one is lack of vital operational information and financial data, since these are often inaccessible in silos, scattered or inconsistent.

A future joined up digital government exhibiting seamless secure access to shared data with supportive horizontal cooperation and an embedded culture of transparency will dramatically improve the situation. As we develop with digital transformation, we will standardize performance data, clarify accountability, increase transparency, produce data-driven insights, evaluate goals and continuously thrive to improve performance over time. These game-changing developments stimulated by digital transformation will make true performance management more feasible than ever. It will be integrated into all aspects of government's management and policy-making processes, transforming our practices so it is focused on achieving improved results for the public. Modern performance management is as dynamic as the challenges current facing government. By harnessing data, it will be possible to have real-time dashboard of all the things that matter to civil servants. Digital transformation has the potential of providing relevant data at decision-makers' fingertips enabling them to make better day-to-day adjustments and undertake long-term planning. Embracing digital transformation will make it much easier for public employees to ensure that their departments can rise to evolving challenges.

Transparency is built in but fraud is designed out of digital government. For instance, government payments and refunds are done through one platform, as planned for the payment platform. With consent from the budget holder, it will be possible for stakeholders to have an instant snapshot in real-time of all payments made to a particular entity.

Performance management will include staff, services, projects and whole departments. With job description and accountability, we will start with new structure at OMSAR and collaboratively develop common job descriptions to all digital roles.

FOCUS AREA: DIGITAL ASSURANCE

There are serious concerns that the current approach to the provision of ICT assurance is fragmented resulting is unnecessary duplication of efforts, waste of investment, inefficiency, delay, non-interoperability, security breaches, lack of proper governance and in some cases failure. For instance, there is no systematic assessment of the current risk status of digital projects and systems within each government agency; no agency has responsibility for intervening, where necessary, to help owners to take corrective actions; and information, experience and good practices from current ICT assurance processes is not widely shared. There is a need to establish coordinated cross-government assurance processes to better inform accountable ministers about relevant concerns and options for possible courses of actions and to raise public trust and confidence in digital government.

DIGITAL ASSURANCE GROUP

The Digital Assurance Group (DAG) will be set up within the DTU to provide coordinated assurance oversight of all significant ICT and digital investment projects across government. The group will develop a standardized process and a more rigorous governance model to oversee the government's investment in ICT projects. By developing a more strategic approach to investment analysis, governance, risk management and program and benefits management, the group will be able to provide greater transparency and optimization of the government's investment portfolio.

DIGITAL ASSURANCE FRAMEWORK

In consultation with the CIOs of government agencies, the group will establish a Digital Assurance Framework (DAF) and a supporting tool to help its implementation and to enable cross government project reporting. The framework will be designed to improve strategic alignment and assurance for digital projects across the project lifecycle through the implementation of a risk-based process embodying best international practices. The purpose of the framework is to ensure that Government's ICT projects are aligned with the government's digital transformation strategy and delivered on time and on budget. It sets out reporting processes and assurance requirements for digital projects including mandatory due diligence reviews, health checks, deep dive reviews and project status reporting. The framework is designed to deliver: improved service delivery for citizens; value to the Government; greater return on ICT investment; reduced risk; on-time and on-budget delivery and standardized metric-driven project status. The framework applies to all ICT projects with an estimated cost of one million USD and above that are in-flight, about to commence, or are planned for the next financial year.

INDEPENDENT ASSURANCE PANEL

The Digital Assurance Group will focus on forging ongoing strategic partnerships across government to provide independent assurance and improved benefits delivery for both agencies and people that use government services online. It will establish an impartial panel of Independent Quality Assurance and Technical Quality Assurance providers. The purpose of the panel is to improve the quality, consistency and independence of Assurance Services provided to government agencies in order to make better informed investment decisions and to provide a higher level of confidence to ministers and the public that digital investments are well managed and will deliver expected benefits.

DEVELOPMENT OF LEBANON'S CYBER LEGISLATIONS

The Digital Assurance Group will coordinate with Lebanon's Parliamentary Committee on Cyber Legislation and with the government agencies' chief information officers to improve current cyber legislations, address legal issues of national concerns and keep pace with international developments. The group will also act as a focal point for cross government legal advice on transforming existing paper-based business processes into innovative digital ones.

Open government is the simple but powerful idea that governments and institutions work better for citizens when they are transparent, engaging and accountable. Open government is the major building block for a more democratic, equal and sustainable society. It is no coincidence that the top ten world leading governments in efforts to tackle corruption, according to the 2017 corruption perception index[2], are almost identical to the top ten most digitally advanced governments, according to the most recent UN e-government survey[3]. The digital revolution is fundamentally changing how we share information, the speed and scale of human connections, and ultimately how power is distributed. These changes don't just make unprecedented transparency and engagement possible, they demand it.
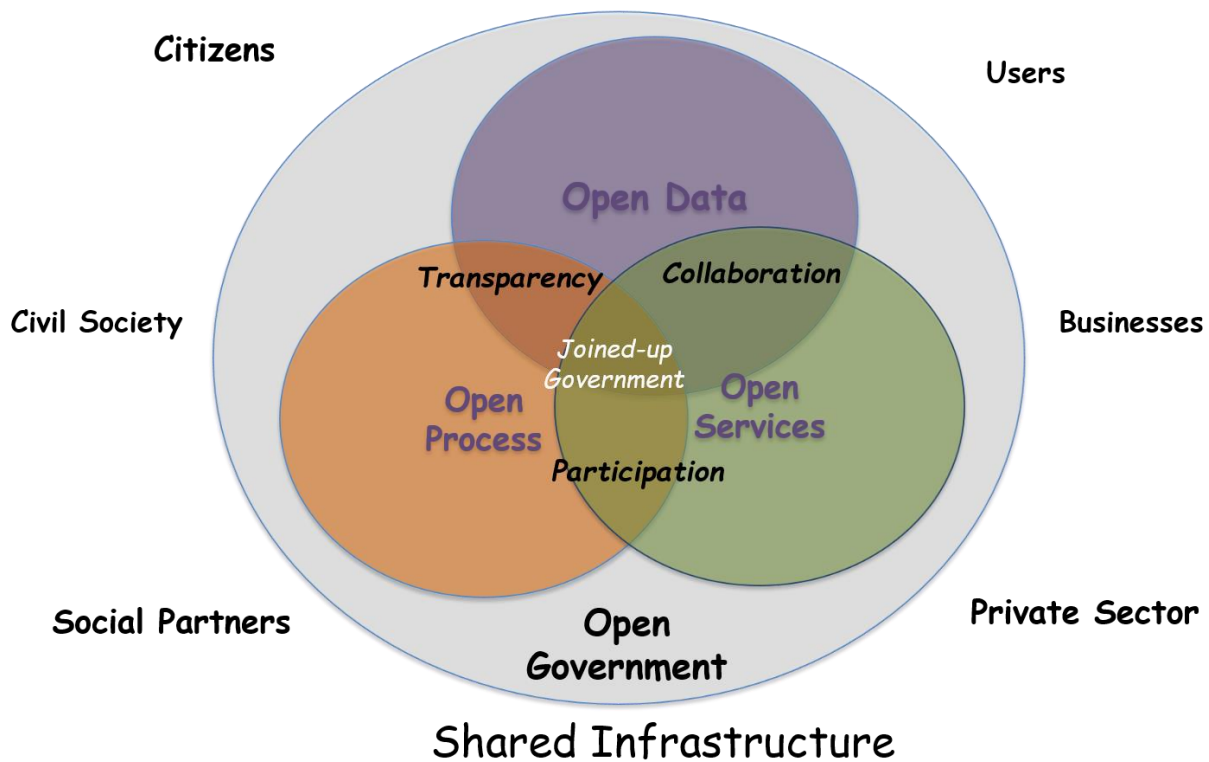

Figure 1: Opening data, services, decision towards stakeholders

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[2] Published by Transparency International on 28 February 2018.
https://www.transparency.org/news/feature/corruption_perceptions_index_2017#table
[3] https://publicadministration.un.org/egovkb/en-us/reports/un-e-government-survey-2016

Action 9: Establish the open data platform www.data.gov.lb and help agencies to publish high quality open datasets to promote transparency in government and digital to enable entrepreneurs to innovate in the co-creation of public services.

OPEN DATA & TRANSPARENCY

Transparency in government is about openness and an overriding commitment to release trustworthy information of public interest. The implication of transparency is that all of the government's actions should be visible enough to bear public scrutiny. The consequences of opaque and unaccountable government are clear to see. Secrecy enables corruption, injustice, and negligence to go unchecked. Transparency is, therefore, the bedrock underpinning future agendas for government's reform. Transparency is enabled through three foundation elements. Firstly, Open Information focusing on materials particularly relevant to citizens, businesses and society. Secondly, Open Process focusing on the publication of how to get things done in government including how decisions are made. Thirdly and most importantly, Open Data, the raw material of the 21st century. Open data include all kinds of data relevant to any aspect of society and, in particular, fiscal data in order to hold government to account. The platform data.gov.lb will be developed to provide open data whilst www.gov.lb will be devoted to open information, open processes and open services. Open data drives efficiency, accountability and good governance in government. By increasing visibility and permitting deeper scrutiny based on hard evidence, bad practices will be exposed and, hence because of fears of being exposed, open data become a major deterrent in the fight against corruption. The measure for transparency success will be reflected by the amount, quality, usefulness and usage of the published data sets.

OPEN SERVICES, COLLABORATION AND CO-CREATION

Releasing data that would have previously been left under-analysed and under-used, to a new generation of innovative data entrepreneurs will drive economic growth and motivate continuous improvement of public services. Providing digital-by-default Open Services, opening up relevant data and being responsive to citizen feedback means that the citizen is an essential partner in the collaborative design of digital services. Open government recognizes that the authority doesn't have all the answers and is willing to put data and power in the hands of people who might help in the co-creation of good solutions. Digital services based on open source are typical examples.

OPEN PROCESS, INCREASING PARTICIPATION AND SOCIAL INCLUSION

The combination of opening up how to get things done (Open Process) together with providing the means to execute the process steps online (Open Service) offers convenience, leads to increased participation, enhances social inclusion and strengthens civil society.

National Digital Capacity

for delivering

Digital Transformation

FOCUS AREA: COLLABORATION

INTERNATIONAL COLLABORATION WITH ADVANCED DIGITAL GOVERNMENT

Several countries have committed themselves to this endeavor and currently are at different stages of this long journey. Notably: UK, France, Estonia, Norway, South Korea, US and New Zealand. This strategy has greatly benefited from experiences in these countries but was particularly inspired by the pioneering work of the UK team. We will network, cooperate, share experience, exchange insights and evaluate practices with teams solving similar problems in these countries. According to current International OECD evaluation, UK is leading the digital government ranking as it comes top of almost every key indicator. UK has coded its digital government in the Open. That is, all the programs are been made publicly available on, Github, an open software development platform. We aim to reuse the UK codes and develop stronger cooperation relationship with the UK team responsible for digital services.

INTERNATIONAL COLLABORATION WITH INTERNATIONAL AGENCIES

We will strengthen our existing cooperation with international agencies working in the same field, in particular OECD and UN ESQUA.

DIGITAL INDUSTRY PARTNERSHIPS

We will establish strategic partnerships with designated international suppliers to have off-the-shelf technology solutions while adding flexibility to our processes to nurture relationships with local small and medium enterprises.

ACADEMIC COLLABORATION

We will establish stronger relationship with academia and research institutions to cooperate on issues mutually beneficial benefits. On the one hand, government can expose them to raw impactful problems. On the other, government will benefit from horizon thinking, new kills and, as massive open data become available, insights into new ways of tackling environmental, economic, and societal problems.

DIGITAL TRANSFORMATION UNIT

The Digital Transformation Unit (DTU) will be a national critical mass of digital experts and a fusion of specialists from technical as well as assurance, management, and communication backgrounds. It will be the catalyst for digital transformation and for co-creating smart ways for doing things across government. It will assume ultimate responsibility for user experience and will advocate modern approaches to the delivery of citizen-centered services. DTU will have specialist Internet-era knowledge hubs that operate horizontally across government. Strategic areas of foci include technology, data, digital services, cybersecurity and digital skills. In addition to DTU specialists, the knowledge hubs bring together expertise in strategic areas from various ministries and harness their talents to enable synergy in solutions to shared problems across government.

This central team will have a major role in developing in-house government digital expertise and in propagating internationally recognized best practices in digital transformation across government. It will collaboratively work with government departments and relevant agencies through a hub and bespoke organizational structure.

DTU will adopt an agile approach that harnesses the power of data, technology and digital competence to accelerate the co-creation of innovative government wide solutions. It will promote collective coherent policies to open up data and to support the deployment of new powerful mechanisms that enable secure access to information.
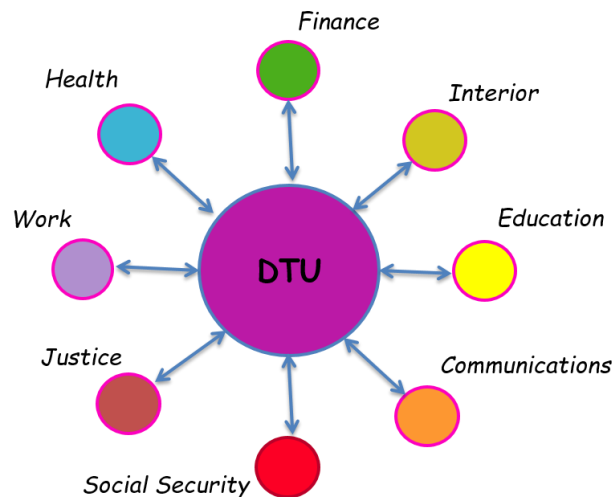
Government Digital Service will:

- Champion citizens' needs and ensure that a comprehensive user-centric culture is enshrined in all government digital activities; particularly, in relation to citizen-faced information and transactional services.
- Help the government operate effectively as ONE coherent healthy digital body. DTU will introduce much-needed horizontal structures specifically designed to enable speedy integration of information and to support seamless assembly of joined up transactional services.
- Set standards for data and digital services across government to ensure quality, consistency and compliance with international norms where applicable. It will provide a programme of support, guidance and tools to help service teams meet the standards throughout development and life of each service.
- Oversee the development of shared products, common platforms and tools for cross government usage.
- Use agile methods to deliver and continuously improve services for users.
- Support government departments and relevant agencies in the transformation, delivery and continuous improvements of their transactional service projects making them user-centric, interoperable, secure, and adaptable to newly emerging requirements.

- Assist agencies to work across boundaries to enhance technology-enabled service delivery.
- Ensure alignment of IT projects in each ministry with the overall government digital transformation strategy and agree digital transformation priorities with each department.
- Help to grow digital skills capability across government by effectively sharing technical knowledge and assisting with recruitment, training and career development of digital specialists.
- Help departments to share what they learn from exemplar digital transformation projects.
- Provide greater transparency to government on digital projects, assurance, costs, risks and opportunities.
- Improve the way government uses technology, runs projects and procures systems.

DEVELOPING IN-HOUSE GOVERNMENT DIGITAL CAPABILITY

DTU will have a major role in developing in-house government digital expertise and in propagating internationally recognized best practices in digital transformation across government. It will collaboratively work with government departments and relevant agencies through a hub and bespoke organizational structure.

Figure 1: DTU coordinating role

Skilled staff are crucial to delivering effective digital services. But as technology advances, so do the kinds of skills and capabilities needed. To keep up, government agencies need to attract and

retain staff with specialist digital skills, improve the digital literacy of senior leaders, and make sure existing staff have access to the tools and resources they need to deliver modern, easy-to-use and effective digital services. An agency that is innovative, curious and digitally savvy will galvanise the government's ability to realise its vision for digital transformation. Skilled digital employees can design the best digital experiences for customers and champion the adoption of digital service delivery channels. Building internal digital capability makes the public service less exposed to increasing market rates for contractors, reduces design and delivery risk, and will encourage innovative thinking.

OVERALL STRUCTURE OF THE DIGITAL TRANSFORMATION UNIT

The overall structure of DTU comprises four technical Internet-era knowledge hubs specializing in **Technology** (ICT), **Data**, **Cyber security** and **Common Platforms**. These correspond to the pillars upon which Lebanon's Digital Government Architecture is founded. The fifth hub focuses on agile software development for designing, implementing, enhancing and maintaining citizen-centered **digital services**. All these hubs operate horzontally across government.
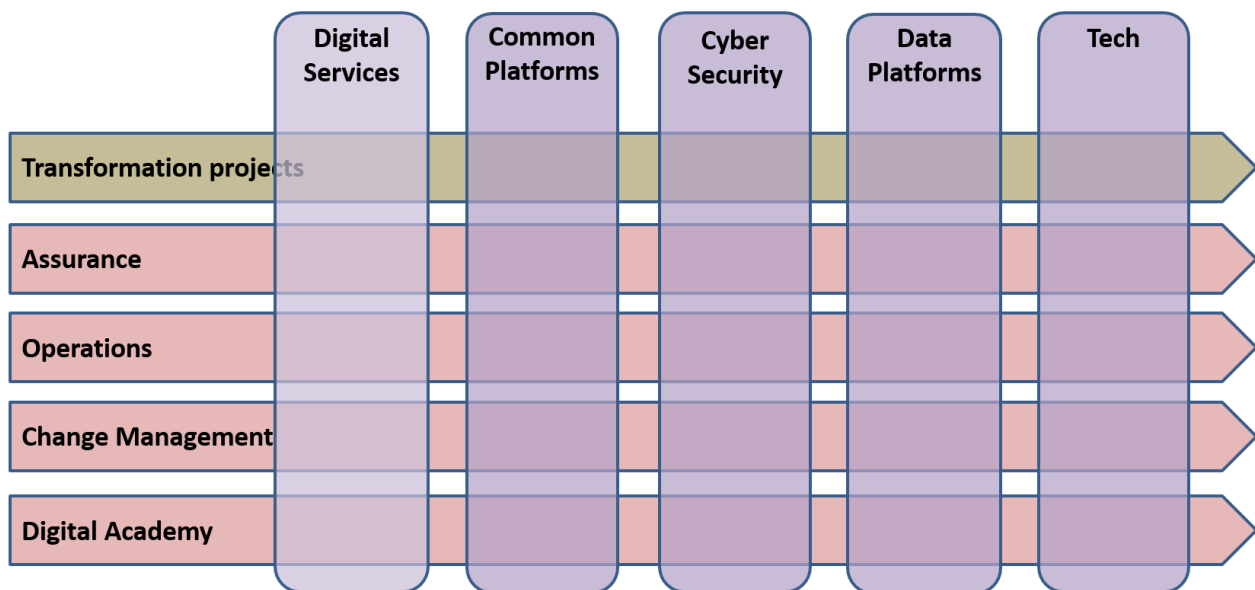

Figure 2: Overall structure of DTU

ASSURANCE

The Digital Assurance Group (DAG) will be set up within the DTU to provide coordinated assurance oversight of all significant ICT and digital investment projects across government. The group will develop a standardized process and a more rigorous governance model to oversee

the government's investment in ICT projects. By developing a more strategic approach to investment analysis, governance, risk management and program and benefits management, the group will be able to provide greater transparency and optimization of the government's investment portfolio.

The Digital Assurance Group will coordinate with Lebanon's Parliamentary Committee on Cyber Legislation and with the government agencies' chief information officers to improve current cyber legislations, address legal issues of national concerns and keep pace with international developments. The group will also act as a focal point for cross government legal advice on transforming existing paper-based business processes into innovative digital ones.
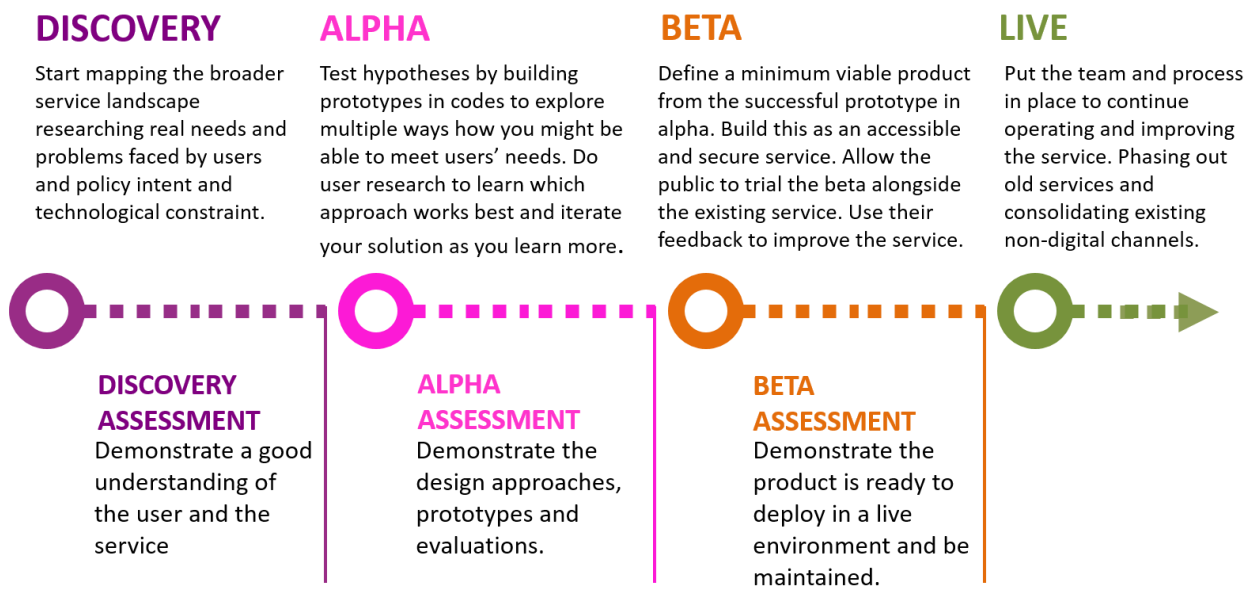
OPERATIONS

The Operations Group focuses on the day to day efficient execution of live services such as web hosting, maintaining www.gov.lb, running common digital platforms, monitoring of cloud service level agreements, dealing with security incidents, analyzing users' feedbacks and improving system performance as well as on the operational management of relevant projects such as procurement processes, communications and digital awareness campaigns. The portfolio of the projects varies in substance, size and quantity from time to time to reflect the priorities of the relevant period.

DIGITAL TRANSFORMATION PROJECTS

The typical purpose of a digital transformation project is to transform the delivery of an identified service. The service could reside in a single department or it may involve several different government agencies. At any given time, there could be several different projects running at various stages of their digital transformation journeys. After initial discovery, a proposed project is assessed based upon its strategic importance, its customer-experience impact, its potential for economies of scale, the regulatory and technological hurdles facing it, and the stakeholders' readiness to commit adequate financial and leadership resources to it. Once the decision is taken to go ahead with the project, a sustainable multidisciplinary team is established to design, build, operate and iterate the service. The team is led by an experienced product manager with decision-making responsibility. The composition of the team draws from the expertise at DTU and other agencies. The design and delivery of every digital service is expected to adhere to the "Digital Service Standard" outline in the Appendix.

AGILE SERVICE DESIGN AND DELIVERY

The proposed Digital Service Standard requires new services to be designed and built taking an agile and user-centered approach. Agile development is about iterating quickly to deliver value to users and managing risks proactively. Agile development requires continuous delivery, improvement and feedback from users and business owners. The benefit is that delivery teams can quickly adapt and align services with user needs in rapidly changing environments. Agile practices don't guarantee success — you can still fail, but failure should be treated as an opportunity to learn. The ideas of learning by doing, failing fast, and adapting and adjusting to changes are all core agile practices. In contrast, the waterfall approach progresses projects along a linear path. It provides easily identifiable milestones in the development process and is best suited to projects where the requirements and scope are fixed. A waterfall approach works well in scenarios where benefits are realised at the end of a project, such as in the construction of a building or bridge, but does not effectively deliver incremental benefits throughout the life of a project. The Digital Service Standard sets out a four-staged service design and delivery to assist agencies in adopting an Agile development approach.

DISCOVERY
Start mapping the broader service landscape researching real needs and problems faced by users and policy intent and technological constraint.

ALPHA
Test hypotheses by building prototypes in codes to explore multiple ways how you might be able to meet users' needs. Do user research to learn which approach works best and iterate your solution as you learn more.

BETA
Define a minimum viable product from the successful prototype in alpha. Build this as an accessible and secure service. Allow the public to trial the beta alongside the existing service. Use their feedback to improve the service.

LIVE
Put the team and process in place to continue operating and improving the service. Phasing out old services and consolidating existing non-digital channels.

DISCOVERY ASSESSMENT
Demonstrate a good understanding of the user and the service

ALPHA ASSESSMENT
Demonstrate the design approaches, prototypes and evaluations.

BETA ASSESSMENT
Demonstrate the product is ready to deploy in a live environment and be maintained.

Figure 2: Transforming government services using agile four-stage design process

DIGITAL ACADEMY

Its mission is to create digital capabilities, enhance collaboration, propagate best practices and support new ways for doing things across government. The digital academy provides civil servants with the skills they need to embrace the digital transformation changes. It offers a range of workshops at various level of technical depths, with introductory sessions for non-specialists, specialised courses for people in digital roles and training for managers responsible for digital services. The ultimate aim is to gradually propagate digital skills across the whole government.
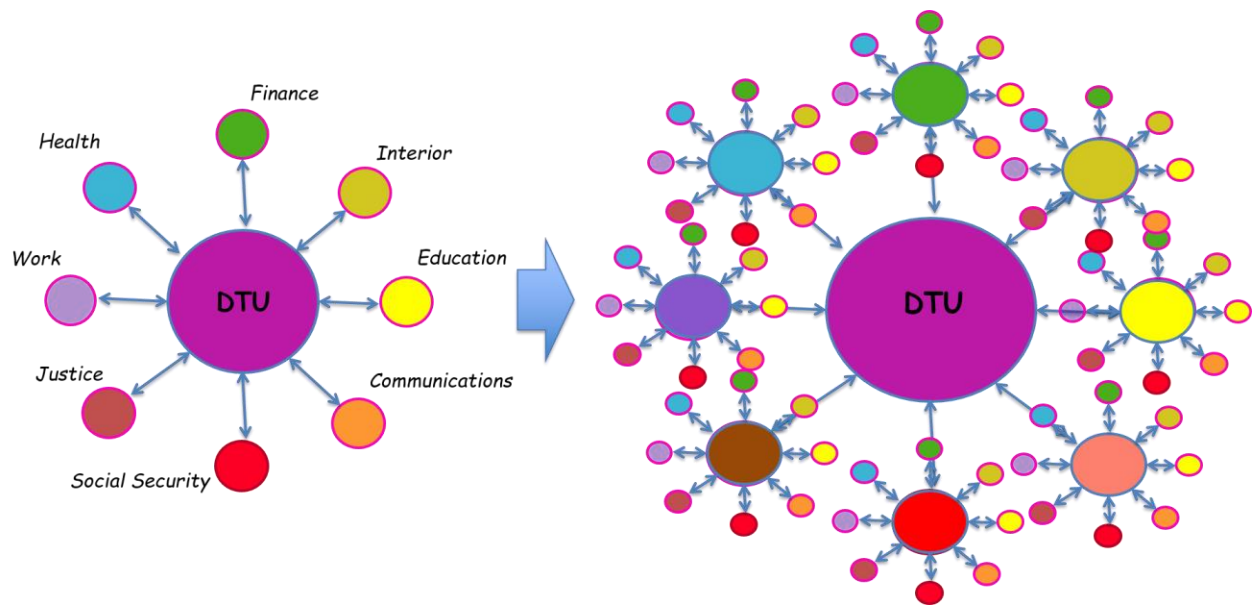
Figure 3: Digital Skills Transformation

CHANGE MANAGEMENT

Digital Transformation will profoundly change how the government works. For it to sustain, it needs to be supported by fundamental organizational, management and culture changes. This includes acquiring digitally oriented talent and developing their capabilities. It also includes rethinking and streamlining governance, management, and budgeting processes so that agencies can move quickly and innovate.

ACADEMIC COLLABORATION

We will establish stronger relationship with academia and research institutions to cooperate on issues that are mutually beneficial. On the one hand, government can expose them to raw impactful problems. On the other, government will benefit from horizon thinking, new kills and, as massive open data become available, insights into new ways of tackling environmental, economic, and societal problems.

Development of new government digital services are expected to adhere to the Digital Service Standard. Here is a brief summary.

1. **Understand user needs**
   Understand user needs. Research to develop a deep knowledge of the users and their context for the service.

2. **Have a multidisciplinary team**
   Establish a sustainable multidisciplinary team to design, build, operate and iterate the service, led by an experienced product manager with decision-making responsibility.

3. **Agile and user-centred process**
   Design and build the service using the service design and delivery process, taking an agile and user-centred approach.

4. **Understand tools and systems**
   Understand the tools and systems required to build, host, operate and measure the service and how to adopt, adapt or procure them.

5. **Make it secure**
   Identify the data and information the service will use or create. Put appropriate legal, privacy and security measures in place.

6. **Consistent and responsive design**
   Build the service with responsive design methods using common design patterns and the style guide.

7. **Use open standards and common platforms**
   Build using open standards and common government platforms where appropriate.

8. **Make source code open**
   Make all new source code open by default.

9. **Make it accessible**
   Ensure the service is accessible to all users regardless of their ability and environment.

10. **Test the service**
    Test the service from end to end, in an environment that replicates the live version.

11. **Measure performance**
    Measure performance against KPIs set out in the guides. Report on public dashboard.

12. **Don't forget the non-digital experience**
    Ensure that people who use the digital service can also use the other available channels if needed, without repetition or confusion.

13. **Encourage everyone to use the digital service**
    Encourage users to choose the digital service and consolidate or phase out existing alternative channels where appropriate.