

**GOVERNMENT RESOLUTION No. 9/2017
of 15 February 2017**

**NATIONAL INFORMATION AND COMMUNICATION
TECHNOLOGY POLICY (TIC)
(2017 TO 2019)**

Considering that Information and Communication Technologies (ICTs) are an essential tool in information and knowledge access societies, which promote social and economic development, economic diversification, citizens' well-being and quality of life.

Considering that the VI Constitutional Government intends to facilitate the use of ICTs through the provision of governmental services (e-Government), focusing on the involvement of citizens, in order to stimulate and diversify the domestic economy and integrate Timor-Leste in a more competitive way in the regional and global economy.

Given the importance of ensuring that Timorese citizens of all ages know how to effectively use ICTs to communicate with each other and with the Government, benefiting from a coherent and integrated legal regime that contains a set of laws that ensure a safe and "trustworthy" environment for ICT use, including laws on cybercrime, electronic transactions and data protection, as well as related regulations and institutions.

Considering the commitment to the implementation of e-Government, which will require the consolidation of planning, budgeting and operations of various government information systems, improvements in electronic security and the establishment of an interactive Government Portal.

Bearing in mind that it is important to develop efforts at the Government level and effective partnerships with the private sector in order to provide connectivity, as well as e-Government platforms, facilitating stable and accessible national and international broadband Internet connection, throughout the country, beyond the current domestic telecommunications networks and international satellite connections operating in Timor-Leste.

Given the importance of developing a cross-cutting Policy in the area of Information and Communication Technologies (ICT), for an extended period from 2017 to 2019, which aims to coordinate functions at the level of different entities with responsibility in the area, with a view to contributing to a more informed society, with more access to knowledge and to a more dynamic and diversified economy.

Thus, the Government resolves, under the terms of paragraph c) of article 116 of the Constitution of the Democratic Republic of Timor-Leste, the following:

1. To approve the National Policy for Information and Communication Technologies (ICT) for the period from 2017 to 2019, included in the annex to this Resolution, of which it is an integral part.
2. This Resolution shall enter into force on the day following its publication.

Approved by the Council of Ministers on February 7, 2017.

Be it published.

The Prime Minister,

Dr. Rui Maria de Araújo

ANNEX
NATIONAL POLICY FOR INFORMATION AND
COMMUNICATION TECHNOLOGIES (ICT)

(2017 a 2019)

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Executive Summary

The main objectives of this Policy are to:

- Facilitate the use of Information and Communication Technologies (ICT) in the provision of government services (e-Government), with a focus on citizen's involvement;
- Use ICTs to stimulate and diversify the domestic economy and to integrate Timor-Leste further into the regional and global economy; and
- Create a safe and quality ICT ecosystem in the country on which citizens can rely.

These policy objectives will be facilitated by the following elements:

- Guarantee that Timorese citizens of all ages know how to effectively use ICTs to communicate among themselves and with the Government, as well as in the economy, promoting digital literacy;
- Facilitating stable and accessible national and international broadband internet connection throughout the country. In addition to current domestic telecommunications networks and international satellite connections, Timor-Leste will require nationally coordinated fiber optic infrastructure (which offers much higher long-term capacity), as well as international fiber optic connection and redundant international broadband capacity, such as one or more submarine cables;
- Implementation of a coherent and integrated legal and regulatory regime containing a set of laws ensuring a safe, quality and "trusted" environment for advanced uses of ICT, including laws on cybercrime, electronic transactions and data protection, as well as related regulations and institutions;
- e-Government implementation, which requires the consolidation of planning, budgeting and operations of various government information systems, e-security improvements and the establishment of an interactive Government Portal;
- Development of effective partnerships for ICT services between the Government and the private sector to provide connectivity, as well as e-Government platforms.

The adoption of this Policy is expected to result in the creation of new functions and responsibilities at Government level, which will have to be executed and coordinated. Although it is expected that in the short term these coordinating functions and responsibilities will be assigned to the ICT Coordinator operating in the Office of the Prime Minister, it is foreseen that an institution such as an ICT Development Agency will be created to manage the implementation of the new ICT Policy in the long term.

I. Introduction and Background Scenario

1. Strategic Context

Following successful reforms in the telecommunications sector, which have given most Timorese access to mobile phone services today, the Government is now seeking to achieve advances in Internet-based information and communication technologies (ICT). With this, the Government aims to improve the quality of life of citizens, modernize delivery of Government services, diversify the domestic economy and make Timor-Leste increasingly integrated into the global economy. To this end, the country positions for a new National ICT Policy (the Policy).

The Policy is presented in accordance with the Strategic Development Plan 2011 - 2030, which stresses political will, economic potential, national integration and dynamism as essential elements of the country's progress. The Strategic Development Plan also outlines several specific targets for the telecommunications sector, which are shown in Table 1.

Table 1: Strategic Targets for the Telecommunications Sector

<i>Until 2015</i>	<i>Until 2020</i>
1. A reliable and accessible mobile phone coverage will be provided to all Timorese 2. There will be access to a high-speed internet network that is reliable, accessible and available in major cities of municipalities and surrounding areas 3. All schools, health posts and clinics will be connected to the internet 4. The regulatory framework to manage a competitive telecommunications market will be established.	1. The entire territory of Timor-Leste shall have reliable and accessible high-speed internet access 2. All students and health professionals will have portable Internet access 3. Timor-Leste will be part of the world connected to technologies

The mobile coverage referred to in the Strategic Development Plan has already been largely achieved, while mobile broadband (3G) coverage is also expanding rapidly. The telecommunications regulatory framework is also being developed, while several components are being improved. The question of implementation provisions will need to be addressed here. The remaining objectives remain generally unfulfilled.

2. A new National ICT Policy

The main objectives of the National ICT Policy are to: (a) facilitate the use of ICT in the delivery of government services (e-Government), with a focus on citizen involvement; (b) use ICT to stimulate and diversify the domestic economy and integrate Timor-Leste further into the regional and global economy; and (c) create in the country an ICT ecosystem that is secure and trusted by citizens. Achieving these goals will strengthen government delivery of services to the public sector, diversify the economy, and create new employment opportunities. To achieve these policy objectives, it will be necessary to ensure that Timorese citizens of all ages can effectively use ICTs to communicate with each other and with the Government, as well as in the economy.

3. Important Elements for the Policy

This Policy also outlines important elements that need to be addressed at the same time to enable the Policy to be implemented properly. These elements include ensuring:

- a substantially higher level of national and international broadband internet capacity available in Timor-Leste;
- greater capacity on the part of Timorese citizens to communicate and conduct transactions online (digital literacy);
- the adoption of an appropriate legislative and legal framework that addresses data protection issues, electronic transactions, cybercrime / cyber-security and access to information;
- the adoption of common technical standards for Government computer architecture, as well as common standards for the provisioning and management of IT services through Government;
- the adoption of a framework for private sector involvement in ICT service delivery, consistent with existing legislation on public-private partnerships and other applicable legislation and regulations.

Section IV of this Policy presents an organizational chart containing the main institutional interactions.

II. Policy Goals

A. Supporting Citizen-Centric e-Government

The first policy objective is the development of an effective, innovative and Citizen-centered Government that more effectively assures its fundamental responsibilities. This objective will be achieved through (a) effective use of ICT by Government in order to increase its efficiency and extend the services provided, and (b) providing Government services to citizens and interacting with them electronically as a substitute for paper, i.e., e-Government or digital Government. This will enable individuals and businesses to have easier access to more government information and services, while allowing them to send feedback and information to Government. These e-Government services will also serve to encourage users to develop their ICT capabilities to use these services more easily.

1. ICT Implementation in Government

While the private sector has a leading role in the provision of ICT infrastructure and services, through telecommunications and internet service providers, the Government has an important role in ICT development in Timor-Leste. In addition to being one of the main and potential users of ICT services, the Government employs about half of the ICT workers in the country. At the same time, it is necessary to make the Government more effective and more innovative, which is intended to be achieved through the implementation of a transforming Government agenda based on ICT. This in turn requires a more managed - as well as more uniform and coordinated - use of information systems by government officials through Government ministries, departments and agencies. This will benefit from the increasing adoption of electronic means by the Government, replacing paper.

The Government initiated this effort with the establishment of the e-Government Coordinator Unit (EGC) in the Prime Minister's Office. The "ICT for Government" initiative will be accompanied by broad and long-term initiatives for staff development. This training, in its various forms, will be designed to counteract the expected enticement by the private sector.

2. Main Organizational Steps

The EGC unit is a new unit that needs to be developed in order to fulfill its role effectively. It also needs top-down support and governance as well as horizontal coordination. This includes the measures outlined below. Accordingly, this Policy proposes that the EGC unit be transformed into an independent public entity, under the oversight authority of the Prime Minister: the ICT Development Agency of Timor-Leste.

Policy formulation will be done at ministerial level. The main responsibility of the ICT Development Agency will be to oversee the development and coordinated implementation of this ICT policy by the EGC and the ministries, as well as consulting the private sector. Accountability will be achieved by way of the ICT Development Agency reporting based on pre-determined metrics. The ICT Development Agency will be supported by an Advisory Board. The Board and its management will also be responsible according to certain Key Performance Indicators (KPIs).

- *The ICT Development Agency will implement the ICT Policy together with the Ministries. Some tasks will be conducted by this entity, while others will be conducted by the Ministries, with monitoring and support from the EGC unit.*

The ICT Development Agency will have authority to lead the ministries in the development and provision of ICT functions, as well as acting as a coordinating and supporting entity for the harmonization of ICT systems, intercommunication and data sharing by the ministries.

The EGC, as the head of the ICT Development Agency, will establish procurement standards and policies that ensure interoperability of systems and the similarity of tools, in order to provide efficient support in

terms of procurement and logistics. However, it is recognized that tailor-made approaches may sometimes be necessary in certain ministries, and in these cases the Advisory Board should analyze proposals to determine whether they contain deviations from the standards and procurement provisions.

- *In the short term, the Government will establish an ICT Working Group, to be chaired by the EGC, which will bring together representatives with practical responsibilities from key ministries for practical and expert discussions on the development of inter-ministerial issues, including priorities, compatibility and assurance checks, and the adoption of government-wide standards for systems and procurement.*

The EGC and the ICT Working Group will be autonomized to acquire support from technical advisors as needed, since developing a common approach to a Government's ICT services requires very solid knowledge of ICT systems (hardware, software, services, maintenance, etc.) that do not currently exist in Government departments.

- *Another important priority will be to strengthen the ICT Development Agency and to support the development of ministerial officials in key ICT functions to allow for centralized management of government ICT services in the short to medium term.*

The EGC will receive additional staff with appropriate experience and skills, including in process redesign and change management. As far as possible these staff members will be Timorese. However, given the current lack of ICT skills in Timor-Leste, particularly within the Government, the policy provides for external technical support with specific skills to work with the team, ensure key change management tasks and transfer knowledge. The development of these employees needs to take into account the risk of attraction to the private sector, so a long-term and continuous approach is needed.

- *Clear Terms of Reference for the ICT Development Agency will be determined; these will influence the staffing, staff development and budgeting for external consultancies.*

The EGC will ensure various functions directly related to the implementation of ICT policy, procurement, cyber-security, the Computer Emergency Response Team (CERT), ICT standards and policies, and regular review of progress. Some of these functions, including cyber security and CERT, will also require collaboration with existing government bodies. At the same time, the government recognizes that it will be difficult to implement the necessary ICT policies and strategies in a timely and satisfactory manner using government resources alone, given the bottlenecks in skills, human resources, available infrastructure, and management broadband.

- *Therefore, the ICT Development Agency will work with the private sector and development partners in fine-tuning, implementing, financing and updating Government ICT resources.*

This will also require the use of external resources on an outsourcing or consulting basis. At the same time, the medium- and long-term goal will be the systematic development of local IT administrative resources in the public and private sector, with local capacity building and skills transfer.

3. Identification of Main Ministries

This Policy will be implemented initially (in 2017) in those ministries that have so far more experience in managing and implementing ICT programs, such as the Ministry of Justice, Ministry of Finance and possibly the Ministry of Foreign Affairs and Cooperation, as they can demonstrate success, establish best practices and share knowledge with other ministries. Also, agencies involved in airport management, freight forwarding, logistics, immigration, etc., can be included in the first phase of implementation, as this may help facilitate international trade and investment.

The implementation of new ICT initiatives will focus on these key ministries and priority agencies. At the same time, some steps will be taken to update the less advanced parts of Government in terms of ICT. During 2017 a plan will be formulated involving the other ministries and government entities in the process of improving their ICT resources and functions during the second (2017 - 2018) and third (2018 - 2019) phases, including procurement standards and best practices. Each phase will have a preparation period (first year) and an implementation period (second year), which will allow the coordinators / managers of preparation activities in the ICT Development Agency to make the transition to a new set of ministries each year. The same will be true for coordination of the implementation phases.

The process of change within ministries will involve not only the financial / administrative directorates (where most formal ICT responsibilities are located) but also other directorates / divisions. Beyond this, ministries with specific interaction with citizens or businesses may have specific needs with respect to content, services and applications. However, they will need to follow general principles in terms of standards and design developed by the EGC unit through the inter-ministerial ICT Working Group.

This provision will allow the decentralized development of specific content for ministries/agencies that will meet technical standards and security requirements. For example, responsibility for the content of the e-portal will lie with the relevant Ministry, applying the standards and tools provided or defined by the ICT Development Agency. These include standards related to data interoperability, user software, content management systems and e-portal development tools, standard and website database architecture, look and feel / design standards, use of the country's domain name, security software, administrator-managed update procedures, and data and document procedures.

4. Other Main Requirements

With a view to the full deployment of ICTs in government, the EGC should define and implement a series of procedural, technical and budgetary measures:

- The definition of the domains and layers of electronic architecture for the whole Government, as a framework for the gradual implementation of the ICT strategy by the whole Government;
- The establishment of a Government data center (with backups), a well-managed government platform in the cloud, a government portal and managed services in the cloud.
- The definition and implementation of IT standards and interoperability, particularly in preparation for deployment of cloud services (placement of the government's private cloud);
- Information security / cyber-security measures;
- ICT training and skills development for government; and
- The development of an information classification system and information access policy. This will include at least three basic categories: "Public", "Official" (limited distribution), and "Confidential" (or "Secret" and should not be open even for official distribution).

The implementation of all aspects of this Policy will also entail some technological risks. Complex information systems dependent on vendor hardware and software may result in situations of dependence on certain vendors (so-called "vendor trapping"). Vendor trapping can result in substantial cost increases, reduced flexibility and sustainability, and system designs that are not suitable for the policy and development objectives for which they are intended. The use of open standards can help alleviate dependence on particular vendors, which in turn will reduce costs. It is essential to make a detailed assessment of local context and capacity, including past experiences with implementing IT systems. It is important to focus on the design and implementation of appropriate digital infrastructures capable of

ensuring interoperability and reliable systems for data sharing between different services and solution providers, data security and personal privacy, and long-term data accessibility and security.

In this way the ICT Development Agency will formulate robust and uniform IT procurement directives, including the use of open standards (where appropriate) and of common technological standards and frameworks to ensure that the programs and system anticipated by this Policy are built on a solid foundation capable of involving a wide range of actors (government agencies, business and citizens), each of whom will bring a block in building an expandable platform for improved service delivery. Government agencies will need to adhere to best practices and standards. The arrival of new technologies in environments where resources are scarce highlights the need for more efficient and effective information systems that can provide a platform for improved and modernized service delivery across all sectors of the economy.

5. Implementation of e-Government for Citizens

This policy also recognizes that more citizens have (or will have) access to the Internet via mobile phones or other mobile devices than via “traditional” PCs or laptops and seeks to address aspects of government ICT policy on the demand side. The specific objective is to develop an efficient, effective and citizen-centric e-Government that is defined by the following efforts:

- Government ministries and agencies are able to collaborate and coordinate service delivery using a common (digital) platform or a single Government Portal;
- Government services can be delivered through various platforms: written messages (SMS), smartphones, social networks.
- Telecom service providers and developers of mobile applications are mobilized to help government agencies take advantage of digital technologies and social networks, which are being adopted by much of Timor-Leste's urban population, as well as to increase their use in rural areas;
- e-Government activities concerning specific services (e.g. health care, educational resources, youth-oriented services, support to farmers, etc.) are effectively integrated with activities aimed at providing a wide range of information and increasing citizen participation; and
- As part of the design process the government consults with key stakeholders to obtain feedback.

An example of how this can be achieved is the Ministry of Health, whose portal already allows citizens and business representatives to download application forms and submit requests for information. The Government will extend this style of access to information to other ministries and add audio and video components, including demonstrations of how to submit requests for information and how to download this information, thus helping to address the computer constraints of some users. More importantly, materials available in one or more languages will also be available in others, including Tetum. These materials will also be adapted for mobile access via SMS, older mobile phones, basic smartphones and advanced smartphones. The Government will develop partnerships with telecommunications service providers and other institutions to develop information facilities to facilitate access to online information in areas where access by individuals / families to access devices or the internet is more limited. These facilities will be coordinated with other appropriate institutions. The managers of these facilities will be encouraged to provide information in traditional ways (pamphlets, in person, possibly community radios) and to mediate citizens' access to relevant electronic sites in cases where the computer literacy of these users is limited. Managers will be encouraged to provide training in the use of digital tools and resources.

6. Moving from Information to Interaction

The provision of information to individuals / families and business professionals is in the first stage of expansion of e-Government services. Developing capacity for online Government interactions is a medium- and long-term goal. However, developing this transactional capacity will facilitate consultation and feedback, for example with citizens and small businesses, including their ability to provide opinions and feedback on issues, request specific information, register complaints or relevant occurrences (e.g. floods or droughts on agricultural land), etc. This will involve the use of digital channels for financial transactions, such as mass payments of pensions or government salaries, payment of fines by individuals or companies, etc. An important element of these interactions with e-Government will be to ensure that there are secure and robust means to authenticate citizens. In this way the Government will implement common, unified and secure authentication, as well as optimize access to all Government online resources and transitional services. This will be accompanied by a training and awareness campaign that will explain how to use these means and identify some of the potential risks, explaining how they can be avoided. As soon as transaction applications become available, further advances in electronic and mobile banking will be required, as well as more widespread use of bank accounts where payments can be made. This in turn will require the coordinated implementation of operational steps and legal safeguards involving privacy, data protection, cyber-security and underlying liabilities, most likely as part of a wider e-Commerce framework and implementation initiative. The registration of SIM cards and mobile money accounts will also be included with respect to mobile transactions, as will the rules and safeguards with respect to Know Your Customer (KYC).

B. Stimulating Economic Development

The second objective of this Policy is to use ICTs as an engine for economic development in order to stimulate and diversify the Timorese economy and to integrate Timor-Leste more deeply into the regional and global economy. The objective is not only to diversify the economy by fostering the development of an ICT sector, but primarily to use digital technologies throughout the economy to make specific sectors more efficient and competitive. This will help support job creation and long-term economic development.

1. Use of ICTs for Economic Development

The EGC will work with other Ministries and existing economic planning committees to integrate ICTs into sectoral policies in order to foster greater use of ICTs by businesses. The Government will follow a strategic policy for implementing ICTs in the wider economy through close coordination with the private sector.

Initial sectoral priorities will be determined by the ICT Development Agency and the Advisory Directorate after consultations with stakeholders. The sectors to be considered initially include agriculture, public services, other services (including finance, transport / logistics, retail and tourism) and oil and gas. The EGC should identify priorities based on business studies and examples of international good practice.

- In the agricultural sector ICT can enable optimization of operations, business planning and coordination and extension services, as well as specific improvements in agricultural practices. The role of the Government will be to facilitate the use of ICTs in ministries responsible for the provision / dissemination of information, for example with regard to strategies to increase productivity, control costs, manage risks (e.g. risks associated with climate, pests and diseases) and improve distribution. In the medium-term partnerships with e-Commerce providers could also be considered.
- Tourism is an area where ICT (e-commerce) offers important opportunities in terms of sales, marketing and management. As tourism infrastructure and services improve in Timor-Leste, online visibility and

presentation to better package management and holiday capacity will be important aids to accelerate industry growth.

- The oil and gas industry is already a significant user of ICT. Standards of security, procedures, and operational efficiency are of paramount importance. The Government will work proactively with the oil and gas industry and the entire related value chain to promote ICT use and thus make the sector more competitive and a source of ICT-related business development, and this development can be harnessed later in other sectors.

Within this multi-pronged approach to development there will be a specific focus on supporting small and medium-sized enterprises (SMEs) because of their role in job creation and economic development. SMEs, including informal enterprises, will need specific support to be able to absorb new technologies, such as information on Internet-based job opportunities. The EGC unit will work with other ministries to identify priority areas for support with regard to funding incentives, capacity building, knowledge sharing and awareness raising.

2. Facilitation of Expertise and International Investment

This has two components. The first is the strategic use of technical expertise on ICT obtained at the international level. In order to successfully implement its ICT policies and strategies, Timor-Leste needs - at least initially - international capacity and expertise. This Policy foresees that in such situations the contracts of ICT consultants include the obligation to instruct local staff or otherwise ensure the transfer of skills. The second area concerns contracts with international firms that invest in Timor-Leste. In cases where technology firms make foreign direct investment (FDI) the benefits resulting from local investment will be associated with the development of local skills, R&D, innovative collaborations (including in the field of ICT) and innovative services. In this context, the EGC will also work with the One-Stop-Shop for Investment and Export Promotion of the Timor-Leste Investment Agency regarding investment incentives associated with these criteria.

3. Coordinated Development of ICT Qualifications

In coordination with the Ministry of Education and the private sector, the ICT Development Agency will help facilitate the development of ICT skills. This will focus on the development of creativity at the ICT level, rather than the use of ICT. It will focus mainly on the alignment and harmonization of approaches to skills development, content and capacity development, as well as general awareness of how Timorese companies and organizations can become builders of the new digital economy. These initiatives will be supported by the already large Government presence in information-based activities, as well as the leadership of the mobile industry in communications technologies and applications

4. Support and Consolidation of the Telecommunications Industry

Private sector telecom service providers are at the forefront of ICT development in Timor-Leste. The Government will seek to develop partnerships with these companies to address issues such as the development of ICT services and skills. Private sector partners will be encouraged to provide citizen-oriented services through joint ventures or outsourcing agreements with government agencies. The implementation of these initiatives will also be coordinated with the digital literacy program outlined below.

5. Mobile Banking and Transactions Support

Recognizing its importance, the Government will also support the development of mobile financial services provided by the private sector, including potentially by telecommunications service providers. The role of the Government will be that of an organizer of the actors (mobile operators, banks, money

transfer services and other financial services, retailers, etc.). On the consumer side the Government will examine the feasibility of executing mass payments (e.g. pensions in mobile accounts) and receiving government charges through these accounts.

The government will also play a facilitating role, as the existence of several regulatory authorities (i.e. telecommunications, banking, data protection and possibly insurance) with unclear or potentially overlapping roles in this area could impede the development of mobile banking. Finally, the Government will pass legislation for aspects of a mobile payments framework that will ensure the overall development of this important platform, covering areas such as SIM registration (to help ensure banking security), network interoperability, accountability, privacy, data security, transaction limits and other KYC requirements.

6. Support to the Further Development of Digital Content

Another way to stimulate the economy will be by making more digital content available. This may include making global content available in local languages, encouraging the creation and use of local websites, offering oral portals for internet content, etc. The EGC will work with other government agencies, universities and business associations to identify priority content. The EGC will assess the feasibility of an automatic content translation engine managed by a university or center/institute established for this purpose and for other related purposes.

C. Developing a Secure ICT Quality Ecosystem

1. Need for a Safe and Quality Environment

The third objective of the National ICT Policy is to ensure a secure environment for ICT infrastructures and ICT-related services. This will involve the physical security of ICT networks and network elements, including the Government data center and other critical infrastructures, as well as the security and integrity of data, content and communications from physical infrastructures. Network stability and security and the security felt by users will be determinant for increased use of ICT, as foreseen in this Policy.

However, stability and security need to be balanced with the potentially competing stakeholders' interests in terms of privacy and expression. This section addresses the creation of a "trusted" environment for the Internet to realize its full potential. The ICT-based economy, which is the basis of this Policy, will benefit from the open exchange of information and freedom of expression. These concerns are usually covered by the term "cyber security", which covers a complex set of issues. As a rule, it refers to systems and actions to protect data and communications on the Internet and even the Internet infrastructure itself. It sometimes includes cybercrime", including the most common threats of malware, denial of service and phishing attacks, as well as other electronic incidents caused by disaffected elements in the environment. Online personal security threats, such as online identity theft, are also an increasingly present reality. This can undermine public confidence in e-commerce and e-Government applications, making the Internet less attractive and thus eliminating the use of certain applications. Similarly, cyber security can include protecting critical information infrastructures from acts of nature, such as developing backup facilities in alternative locations. The increasing centrality of the Internet in daily lives around the world and the increasing use of mobile devices, together with the Internet of things, increase exposure to computer risks. The protection of personal data online is essential for a data-driven economy, as it will increase confidence in the Internet and this confidence will be reflected in greater use.

Just as public security in the "real world" is considered a public good, guaranteed by the government, so data, communications and critical infrastructure protection is increasingly important. Most communications and almost all ICT infrastructure in Timor-Leste is controlled by the private sector, which requires close collaboration on legal, regulatory, and administrative issues regarding cyber security.

Beyond this, given the global nature of the Internet and the cross-border nature of computer incidents, Governments will need to cooperate on these issues internationally, for example through the exchange of threat information.

Cybersecurity is an important component of investment in ICT infrastructures, in particular broadband infrastructures. It is an essential foundation for activities in the financial, energy, transport and water sectors (e.g. affecting critical infrastructure), as well as social and health programs. Beyond ICT infrastructure and sector-specific applications, cyber-security considerations also affect e-Government programs, including digital identification, open data, etc., which the government may carry out in the future. Training of government officials and citizen awareness of cybersecurity, including the importance of adopting safe and responsible online behaviors, will be part of the overall cybersecurity environment.

2. Organizational Strategy for Cybersecurity

Cybersecurity and the environment of “trust” in ICTs in Timor-Leste will be based on a government-wide approach that will have the EGC at its center. Based on a robust process of consultation with the public and stakeholders, the EGC will develop protocols and procedures to improve Government cybersecurity. The Government will establish a Computer Emergency Response Team (CERT), under the auspices of the EGC, based on a Public-Private Partnership (PPP) model or through partnership between Governments. This approach will allow cybersecurity actors across government to share and benefit from the experience of colleagues. It will also allow the application of a common approach across ministries to solving cyber-security issues. Beyond CERT, the government will need to allocate resources to improve the capacity of police officers, prosecutors, and magistrates to combat cybercrime.

III. Important Policy Elements

To support the implementation of the National ICT Policy, the Government will implement a series of measures to facilitate the expansion of broadband internet access, promote a society with greater computer knowledge and introduce a robust legal framework for online transactions.

A. Broadband for All

The first important element for the Policy is to ensure that citizens, businesses and other organizations are able to participate effectively in the local and global digital economy and in public services delivered through digital means. Although the success of telecommunications reforms since 2012 is considerable, Timor-Leste needs a ubiquitous, cheaper, and more stable broadband internet connection. In addition to existing domestic telecommunications networks and international satellite links, Timor-Leste will need fiber optic infrastructure (which offers much greater capacity over the long term), as well as international fiber optic connection and redundant international broadband capacity such as a fiber optic cable.

Improving broadband connectivity will require improving access to connectivity, improving the quality of connectivity (no interruptions, deterioration, etc.), increasing connectivity speeds, and reducing the price of connectivity - keeping in mind the essential objective of facilitating participation in the digital economy and in digitally provided public services.

The issues to be resolved for this Policy to be effective include:

- Through regulatory actions, use of the existing Decree-Law (2012) and the associated regulatory framework, facilitating the continued placement of broadband to serve most individuals / families and small businesses;
- Promoting the placement of fixed broadband (fiber optic) where appropriate and feasible in order to provide greater capacity to organizational users, including government offices; and

- In partnership with the private sector, obtaining greater and redundant access to international broadband capacity at lower cost and empowering the regulator to ensure open access and non-discriminatory pricing for all users.

1. Increasing Access to Connectivity

In addition to the improvements in international connectivity necessary for the success of Timor-Leste's digital development, attention is also needed to expand domestic broadband access. This requires a balanced mix of mobile and fixed broadband, in line with development progress and Timor-Leste's needs, as well as support infrastructure at the initial, intermediate, and final levels. This infrastructure is usually provided by private operators but can also be achieved through Public-Private Partnerships if an exclusively private approach is not feasible.

Through a combination of supportive regulation and selective investment, where appropriate to fill market gaps, a dual strategy will be pursued to support mobile broadband connectivity for individual use and fixed (mainly wireless) broadband connections for businesses, institutions and community facilities (e.g. through WiFi). This approach will support more uses and users - and will be more robust and more redundant - than a one-size-fits-all approach.

2. Achievement of Rural Connectivity Goals

The challenge of improving connectivity for the benefit of the digital economy and public service (in other words, e-Government) is of particular importance in rural areas of Timor-Leste. A number of specific initiatives and objectives will therefore be followed, including:

- Encouraging operators to provide low cost/subsidized telephones and especially fixed mobile terminals subsidized with solar charging, possibly through (partial) reimbursement of licensing fees.
- Adoption and implementation of supporting regulations in areas of infrastructure sharing and spectrum allocation to facilitate a more widespread expansion of broadband in rural areas.
- As foreseen in the Telecommunications Decree Law (2012) and the regulatory regime, the activation of a national registration program for a fixed broadband service should encourage the existence of broadband connectivity for rural - as well as urban - enterprises and the provision of associated spectrum for this use.
- Although spectrum availability is not currently an issue, it may be necessary to consider refarming of spectrum in the future, which already happens in principle for the 850 MHz band in rural areas and for the 900 MHz band in general. It may be useful to address this issue together with the introduction of digital television.

3. Government connectivity

Given the current shortage of institutions connected to broadband, various measures will be initiated to ensure the necessary connectivity, in particular with regard to government and community institutions. In particular, the following steps will be taken in the short term:

- The EGC will establish a plan indicating which government offices, secondary schools and health posts should be connected by what year (2017, 2018 and 2019). This in turn will determine the initial and intermediate routes and capacity levels that will need to be established. The EGC will be charged with exploring options for initial and intermediate capacity that can be obtained from one or more private operators.
- The plan will include a feasibility assessment for Community / localized facilities with a view to facilitating public access to the Internet. This will include a program of training and support for

government officials, teachers and educational and professional administrators in clinics and health posts on the use of broadband services and applications.

4. Ensuring International Connectivity and Competitive Access

The provision of international broadband connectivity with high speed and low latency is necessary to support all policy and strategic objectives outlined in this Policy. Some options for the provision of fiber optic connectivity (submarine cables) are currently being considered.

Regardless of the option chosen and whether it is implemented exclusively by the private sector or through a PPP, the approach to international connectivity will be based not only on access to infrastructure but also on institutional arrangements and a market structure that ensures price reductions that benefit Government, businesses and citizens.

To ensure that Timor-Leste enjoys the benefits of non-discriminatory and pro-competitive access to international connectivity as provided for in the 2012 Telecommunications Decree Law, it is essential that the National Communications Agency or other designated institution has the necessary regulatory capacity and motivation to ensure that current and future access to international connectivity is available to all operators on fair, reasonable and equivalent terms.

5. Establishment of a Traffic Exchange Point (TEP)

The establishment of a Traffic Exchange Point (TEP) in Timor-Leste is another way to foster competition and reduce the costs of international access in Timor-Leste. The TEP reduces demand by international means and improves the performance of some interactive applications by passing traffic from or to local destinations (e.g., use of social networks and intra-government traffic) without the need to send this traffic in advance to an international switching platform outside Timor-Leste. The presence of a TEP will reduce the use of expensive international capacity as the traffic will be kept local. This will also serve to attract content creators. Similarly, the TEP will not be expensive from a financial perspective. However, it will need the cooperation of private operators.

B. A Digitally Literate Society

1. Promotion of Digital Literacy

Digital literacy has two facets - the ability to use digital tools and, separately, the ability to create the tools. Increased competence in the use of digital tools is encouraged by applications that attract users who teach themselves by using them. The second facet is addressed through the formal education process, and educational institutions will be encouraged to extend their coverage in this area. The goal of supporting the development of a more digitally literate society is to significantly increase levels of digital literacy over the next three to five years in Timor-Leste, including among the rural population. Currently individuals aged 15 or older in Timor-Leste, with advanced digital literacy, represent about 2% of the population; those with intermediate digital literacy about 10%; and those with basic digital literacy (involving minimal use of social networks) about double this number. Although the Government has considered the adoption of formal “Digital Literacy” campaigns involving various stakeholders as a collective effort involving the private sector, the Ministry of Education and NGOs, a more pragmatic approach will be to facilitate digital literacy by encouraging the use of applications (including e-Government services) and social networks, with more systematic integration of ICT use in the education system. This may include a combination of measures such as facilitating more accessible connectivity by schools, providing resources for equipment purchase and maintenance, and supporting professional development of teachers in the use of technologies for teaching and learning.

The ECG, in consultation with the Ministry of Education and telecommunications service providers (who have access to measures such as uploading on social networks, counting downloaded data, extending the use of electronic forms, etc.), should undertake a national baseline and follow-up study of the digital literacy situation among different segments of Timor-Leste's population - and the response of these segments to alternative ways of improving their digital literacy capabilities.

C. A Legal Framework for ICT based on Trust

To make e-Government effective, economic diversification and integration for Timor-Leste's cyber security, the Government will also draft a set of laws to ensure the legality of electronic transactions and forms and the creation of a safe and “trusted” environment for advanced uses of ICT, including laws on cybercrime, electronic transactions and data protection, as well as related regulations and institutions.

1. Legal Framework for Electronic Transactions

The legal framework for the country will consider Timor-Leste's unique circumstances and reflect international trends and best practices. For example, for Timor-Leste to be successfully integrated into the global economy driven by the Internet, any options and solutions to be implemented will need to be familiar with the trends followed in international markets. This approach will ensure that the legal framework to be adopted promotes, rather than hinders, the provision of electronic services and electronic products in the country, the promotion of innovative technologies and investments. At the same time, it will be important to give due attention to international best practices, facilitating international cooperation and assistance, including for capacity building purposes, as needed to mitigate electronic risks.

Good public administration, the provision of essential government e-services and the smooth functioning of business and commercial applications depend on trust in the use of ICT infrastructure and services. Secure and confidential sharing of personal information between government agencies may be appropriate and desirable for well-defined purposes. The legal and regulatory framework needs to reconcile the tension between freedom of information, transparency and government accountability on the one hand, and the need to protect personal information and cyber security on the other, on the basis of a legal framework that reflects the following fundamental principles:

- *Good governance provisions* that support a holistic approach across government ministries, agencies and institutions;
- *Free flow of information* to ensure the timely capture and dissemination of accurate information, enabling effective policy decisions, effective resource allocation and accurate evaluation and monitoring;
- *Transparency* to ensure that systems are implemented and managed according to clear rules that promote accountability for the fair handling and use of information;
- *Individual privacy rights* to protect individuals, give them access to their personal information and allow them to challenge and correct any inaccuracies; and
- *Public safety* (cyber security) to support the safe use of applications.

Confidence that the Government will deal responsibly with personal information is an important factor in ensuring good administration and user acceptance. If the Government allows, or does not restrict, the use of the information for other purposes, citizens may feel harmed or dissatisfied by the loss of privacy. This feeling damages both good public administration and the Government's ability to promote e-Government use. If citizens fail to trust the Government to maintain the confidentiality of personal information, this distrust may lead them to withhold information or to provide wrong or inaccurate information. Therefore, legislative measures (discussed below) to ensure confidentiality and protect against misuse are essential,

among other reasons, to promote trust in the system, thereby maximizing the likelihood that the public will support and comply with obligations to provide timely, complete and accurate information. The legal framework will be conducted in a holistic manner in order to strike a balance between security and respect for human rights.

This Policy provides for the development of different laws in each of the areas affected for the following reasons: Firstly, these matters are considered to be sufficiently distinct to merit an autonomous approach; secondly, these matters require different types of laws (mainly issues concerning personal data that need to be approved by a parliamentary law, whereas issues concerning e-commerce can be regulated by a Decree-Law, and issues concerning cybercrime can be dealt with in a Decree-Law, but only if authorized by the National Parliament); third, the establishment of separate laws gives more flexibility in the future if amendments are needed; and finally, international best practice shows that these matters are usually dealt with independently. Therefore, the main areas to be included in a legal and regulatory framework include e-commerce / electronic contracting, data protection / privacy, cyber security and above all the fight against cybercrime. These areas are discussed in more detail below:

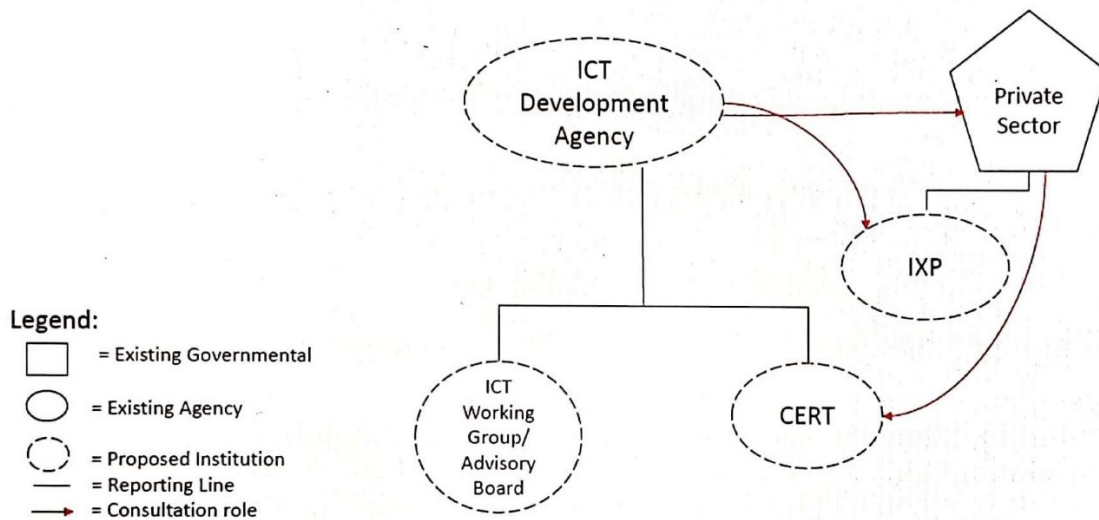
- ***e-Commerce / e-Procurement Contracting.*** The legal framework here will ensure the granting of legal equivalence to online hiring and other online transactions (including e-Government transactions) and will deal with issues of citizen authentication in online transactions and the evidential value of electronic evidence. The Government will draft a separate law covering all e-commerce issues (electronic documents, electronic contracts, electronic signatures and electronic providers). This is without prejudice to the possibility that other more detailed or technical aspects (e.g. electronic signatures) will be addressed in regulations developing the main law, based on good practice reflected in existing international precedents and models.
- ***Privacy and data protection.*** The legal framework will protect against (a) incorrect or inaccurate data leading to mistaken identities exchanged or unfair processing; (b) "abuse of office," whereby data is collected for a purpose for which the data subject has not consented; (c) profiling, by linking data records in unauthorized or improper ways, including for surveillance purposes; (d) unauthorized or improper access, use or disclosure of information, including disclosure within agencies, within government, to third parties or to the public. The Government will draft comprehensive data protection legislation in general in an autonomous law complemented by sector-specific rules. It is envisaged that this legislation will define an authority dedicated to the supervision of privacy and data protection rules. The proposed law will be based on known international best practice.
- ***Cybersecurity / Cybercrime.*** The legal framework surrounding cyber security will focus on efforts to combat cybercrime. Nevertheless, the establishment of the CERT is an important part of this Policy. With respect to cybercrime, the Government will draft an autonomous law consistent with international best practice that will be in harmony with (or at least interoperable with) international treaties, including safeguards for data protection and freedom of expression.

2. Organizational and Institutional Issues

This Policy establishes that, at least in the short term (this issue will be addressed in each of the respective laws), the supervisory competencies, if any, contemplated by these draft laws will continue with the current ministries. This is in view of the current limited human resources and capacity in these areas in Timor-Leste. With respect to cybercrime, no supervisory body is required, but the need to develop capacity at the level of police officers, prosecutors and magistrates is reiterated.

IV. Institutional Provisions

Figure 1 summarizes the current institutions and proposals discussed in this Policy.



The Policy provides for the EGC Unit to be transformed into a new and independent ICT Development Agency. The ICT Working Group, and later an ICT Advisory Board, will assist the ICT Development Agency in implementing various aspects of this policy, including the expansion of e-Government and computer training initiatives. A Computer Emergency Response Team (CERT) will be established under the EGC to coordinate the issue of e-Security. Since networks affected by e-crime and other electronic incidents are owned and operated by the private sector, the latter will play an important role in e-security. A Traffic Exchange Point (TEP) will be created and will be maintained mainly by the private sector, but with input from the ICT Development Agency.