Chapter 3

e-Governance Management – Critical Success Factors

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Successful e-governance not only depends on the existence of prerequisite conditions, as highlighted in the previous chapter, but also on the ability of the government to implement e-governance and the ability of citizens to adopt and use it. This chapter highlights good practices in terms of leadership, corporate governance, consolation processes, financing, monitoring and evaluation, and ICT capacity building.

3.1 A clear vision

E-governance is traditionally seen as a reinvention of how a government delivers its services, interacts with its citizens and maintains transparency and accountability. This is a definition that fits well with an advanced society, wherein the level of ICT infrastructure is well-developed, legal instruments are in place, trust and confidence in the governing institutions is stable, literacy is high, health institutions are well-established and the digital divide is far less pervasive.

An agreed national vision for e-government is a unifying mechanism to promote development. The national vision:

- minimises the possibility of overlooking important factors in various sectors;
- ensures the maximising of linkages within and between sectors; and
- provides for the unified participation and 'ownership' of the e-government strategy.

3.2 Political leadership

The presence of political leadership to sponsor the strategy and, subsequently, steward its implementation is of paramount importance. While this applies to any major policy design and implementation process, the presence of a powerful political champion for e-government carries greater importance, given that the implementation of e-government transcends different ministries or departments, as well as policy sectors. Moreover, as e-government is a government transformation initiative – not a technology project – it should not be led by technicians, but by policy-makers.

This raises the question of whether political leadership for e-government should be at a central, co-ordinating level or whether it should be decentralised. The experience of Organisation for Economic Co-operation and Development (OECD) countries with e-government shows that decentralised e-government leadership can lead to uncertainty about overall direction if this is not counterbalanced by clear identification of leaders' roles and responsibilities. Unco-ordinated development – with advancement in narrow areas and no progress in remaining areas – restricts broad-based progress and has contributed to the continuing widening of the digital divide within countries (OECD 2005). If elements that are of critical importance to the development of e-government are decentralised to different political responsibility holders, then the approach to e-government will be disjointed at best and fragmented at worst.

Box 3.1 A politically centralised approach to e-government: New Zealand

The minister responsible for the successful delivery of e-government is the minister for state services. The State Services Commission (SSC) was given the following role in the e-government programme:

Strategy: Develop and manage the delivery of an overarching e-government strategy, as well as supporting policies, standards and guidelines

Leadership: Facilitate uptake by government agencies of the e-government vision

Co-ordination/collaboration: Identify opportunities for collaboration across government agencies; leverage existing information management and technology investment, and provide co-ordination for multi-agency e-government projects

Policy: Provide e-government policy advice to the minister of state services

Monitoring: Monitor progress toward achieving the e-government vision

The SSC has a central role in defining and achieving the government's objectives for e-government. The delivery of e-government is the responsibility of all government agencies in partnership with the SSC.

This means that with regard to the technological aspect of the e-government framework, unless policy relating to technology is already centralised, a policy change will be required. Experience shows that a policy towards a centralised ICT framework approach will be resisted, as ministries and agencies will see this both as a brake on the ability to deliver on policy goals, as well as a loss of line authority to the centre. Thus, the identification of a strong minister as the loci of political responsibility for e-government in the first phase of the e-government development journey is believed to be key.

In certain jurisdictions, responsibility for e-government and ICT has been assumed by the prime minister. In other jurisdictions, it has been the minister for finance or the minister responsible for public services/state services. In any event, e-government must be closely identified with the national leadership.

In states where ICT policy, for different reasons, may have been seen as a sector of secondary importance, or where there are highly-skilled human capital gaps, the creation of one organisational entity with a mandate for e-government is appropriate. This may consist of the establishment of an information society and economy or an e-government portfolio, as the case may be, as either a separate portfolio or part of another portfolio – for example, of a telecommunications and information society. This would constitute far more than a symbolic message. It would demonstrate that the government is sincere in its commitment to transform the country into an information society and economy through the implementation of an e-government strategy, as well as – by default of the fact that a ministry is created – that funds will be made available to it to meet policy goals.

3.3 Administrative leadership

In many advanced states, the presence of an extensive legacy environment that was designed in silos, and which responded to each agency's particular demands or preferred technology environments, often slowed down implementation of e-government initiatives. This has required considerable investment to retrofit solutions to enable them to become interoperable.

Potentially, small states have less of a legacy problem than advanced information societies. This provides such countries with excellent opportunities to mobilise fast for e-government. Moreover, such a landscape will be less encumbered with power centres, by existing ICT cultures, by fixed mind-sets etc. This creates a unique opportunity as both the design process, as well as the subsequent implementation process, will be less subject to turf and resistance issues, ingrained positions and so on. Experience tends to show that major social and institutional reform programmes such as e-government have a far greater chance of success if they are embarked upon in a 'green field' environment, rather than in an environment that is lumbered by existing technologies, milieu etc.

3.3.1 Corporate governance framework

Lessons from advanced information societies have shown a correlation between the success of e-government and the presence of a corporate governance framework. Therefore governments have sought to consolidate policy decisions in this regard within the centre.

The administrative mechanisms to achieve this are various. Some jurisdictions have consolidated authority within central agencies, while others have moved towards a hybrid approach. The latter approach has resulted in the introduction of the *Office of*

the Chief Information Officer for Government, supported by a network of chief information officers within each ministry portfolio.

The Chief Information Officer for Government is provided with full authority on all corporate aspects that relate to ICT – which also includes e-government. Responsibilities generally relate to architecture, standards, security, interoperability, single connectivity highways, consolidated technology environments etc.

However, chief information officers (CIOs) assigned to ministries are provided with full authority for ICT in their respective ministries in so far that they act within the corporate policy, standards and architecture directions established by the centre. Moreover, the CIOs act as e-champions on the behalf of the central authority within their respective ministries. In order to ensure that CIOs do not create separate fiefdoms and that they implement corporate directives, they are accountable to the Chief Information Officer for Government for such matters – while continuing to be accountable to the appropriate permanent secretary for ministry-specific ICT activity.

CIOs should delegate authority within a controlled environment. For a major programme such as the implementation of e-government, a *Programme Management Office* should be established within the Office of the Chief Information Officer for Government. The purpose of a Programme Management Office is to ensure that multiple project performances and implementation of the e-government programme are handled as effectively and as efficiently as possible, to ensure that projects are delivered within time, within budget and within the quality level established.

Box 3.2 Main aims of programme management

- Set out lines of responsibility and accountability within the Authority for the delivery of the project
- Give stakeholders in the Authority the ability to manage their interest in the project
- Support the Authority's project team to deliver the required outcomes by providing resources, giving direction and enabling trade-offs and timely decision-taking
- Provide a forum for issue resolution
- Provide access to best practice and independent expert advice
- Disseminate information by reporting to stakeholders so that they can effectively fulfil their roles
- Provide a framework for monitoring and evaluation, and project disclosures

Source: HM Treasury 2007

Small states, due to their size and constraints, may have gaps in highly-skilled human capital. Therefore, the creation of agencies with specific mandates may result in a situation where resources are too far stretched to create a sustainable mass. Moreover, this could also lead to the fragmentation of resources between programmes and ministries, as well as the scenario where programmes become dependent on individuals and the departure of a key individual may result in delay or collapse. Thus, it is considered to be far more appropriate if the information society, e-government and corporate technological components are integrated within one organisational entity.

3.4 Consultation with stakeholders

A reform can only succeed if the stakeholders that it will affect buy into said reform and own the process of implementation. E-government is a major transformation process. It not only affects how government interacts with its citizens, but also how citizens interact with government.

Too often, the government is seen as a monolithic entity. It is not; it is an institution constituted of sub-institutions with numerous government entities in various forms and personalities: departments, authorities, corporations, special operating entities, agencies etc. Every single entity has its own set of priorities and turf to manage, administer – and protect. What is more, governments may be organised on a multi-tiered basis: federal, regional and local. The challenges that each tier of government face differ from tier to tier, as well as within tiers.

Neither is the 'citizen' a faceless representation of society. Younger members of society are likely to be more ICT literate than elderly people. Youths in urban communities are also likely to have a higher degree of literacy than their counterparts in rural communities.

The above is a light overview of the multitude of stakeholders that will be affected by an e-government transformation process. The priorities of stakeholders will differ, as will expectations of the desired outcomes. Thus, consultation should be at the heart of both the design of an e-government strategy, as well as during the implementation of the strategy.

3.4.1 The working group

If appropriate to the social and political culture, the government should delegate drafting of the e-government strategy to a working group. This could consist of internal stakeholders only or joint government and external stakeholders. Such an approach will graft consultation within the design process, as consensus would be required for that strategy to be presented to government with the unanimous consent of all those involved.

The working group assigned responsibility for drafting the e-government strategy should undertake a broad consultation process, including as many stakeholders as

possible, in order to graft into the document views, concerns and solutions as they arise. In this regard, there are various forms of consultation approaches that can be adopted. The extent and depth of the consultation process during this stage depends on the profile that the government wishes to place on the e-government strategy.

Box 3.3 Working group consultative process

The consultative process could include:

- The undertaking of surveys across a cohort of the population to identify which service citizens view as the most important to be addressed, and which delivery channel they are best prepared to use. The carrying out of such surveys will allow the designers to focus on priorities as citizens actually see them, rather than as the designers think they are – which is not necessarily the same. This will allow for a more immediate impact in the early stages of the e-government strategy implementation, as solutions are directed towards areas that are most frustrating to citizens.
- The undertaking of surveys across different types of enterprises – micro, small and medium enterprises (SMEs) and large – and to understand whether they are equipped to e-commerce (G2B) activity and identify issues, as well as identify the services they prioritise.
- The undertaking of focus groups with different cohorts of the public, both at citizen and entrepreneur levels – tourism, health, education, commerce etc. This will allow for further segmentation of sectoral expectations and hence for a more effective strategy design.
- The undertaking of workshops at ministry and agency levels within government, to understand the level of preparedness, what is realistic and doable in the immediate and short terms etc. This will assist in securing ownership of the strategy by the government's internal stakeholders.
- The undertaking of meetings with civil society and non-governmental organisations to obtain their views, particularly with regard to the 'soft' infrastructure issues.
- The holding of meetings with financial institutions to obtain their views on e-payment transactions.
- The holding of meetings with providers in the telecommunication markets to understand their concerns, the arising implications, and if their proposals for liberalisation can be carried out.
- The holding of meetings with regional offices or local councils to understand how they see themselves within an e-government framework.

3.4.2 Public consultation

Once the strategy has been designed, the government should publish it as a White Paper for public consultation. The White Paper should be made available to any person electronically from the main government website. However, the placement of a White Paper in the public domain is not in itself public consultation.

To secure public consultation, the government should synthesise the key parts of the e-government White Paper and make them available to every citizen by regular post. Furthermore, the government should use the media to bring the White Paper to the public's attention.

In tandem with communicating the White Paper through the media, the chair of the working group responsible for drafting the strategy should carry out a comprehensive 'road show' in order to hold discussions with as many stakeholders as possible. This can be achieved in a number of ways, which include holding meetings with the public, with constituted bodies representing different sectors and/or with civil society.

3.4.3 Final draft

It is imperative that once the feedback from the public consultation process triggered by the public issuance of the White Paper is received, this is not only analysed but – more importantly – communicated to the public.

Thus, the drafters of the strategy should subsequently review the original draft published as a White Paper and present a new draft to government, setting out departures from the original as well as a transparent assessment of the feedback received.

The government should publish the final draft of the e-government strategy, together with the feedback received. If the circumstances of the country permit, it should debate the strategy in parliament to obtain political consensus and ensure that e-government as a policy will be retained, as governments may change.

3.4.4 Implementation

Once the e-government strategy becomes policy, implementation commences. Implementation, however, is the start rather than the end of the journey. As mentioned earlier, the implementation of e-government is carried out over a generational horizon. This means that consultation does not stop once the implementation stage is initiated. Rather, the process of ensuring that key stakeholders constitute part of the implementation process, and are involved in the development of the information society, potentially assumes greater importance at this stage.

A strategic approach to e-government that embraces government, society, business and non-government organisations is more likely to succeed. Such an approach ensures that all of the key components that render e-government successful – affordability and

accessibility, or e-literacy, for example – are brought together and developed in tandem with the technology framework necessary to promulgate e-government.

3.5 Financing e-government

Small states should consider placing the funds required to propel e-government forward with the central agency assigned responsibility for e-government. There are various advantages with regards to the adoption of such an approach. First, a central fund will provide a 'critical mass', which may not be possible if the financing for e-government is placed across many votes. This will allow for better planning and utilisation of funds, particularly with regards to ministerial cross-cutting initiatives.

Second, the establishment of a robust e-government framework requires time to achieve. Individual ministries or agencies may perceive this as a brake on introducing improvements within their respective domains. Frustration may bubble over into a separate and ad hoc approach.

Third, the key technological building blocks must be unified, consistent, coherent, standardised, inter-connected and based upon shared services. And fourth, the government's priorities in the roll-out of e-government may be directed towards one or more particular segments or cohorts of society or the economy. A central funding vote will ensure that focus in this regard will be maintained.

Box 3.4 Key e-government building blocks for centralised financing

- The setting up of the e-government middleware (that is software that mediates between the e/m delivery channel (tablet, desktop, smart phone, etc) and the back end applications) architecture and the e-government technological framework
- The setting up of the e-government payment gateway
- The setting up of the e-government security framework
- The setting up of the m-government gateway
- The setting up of the e-government portal
- The government process re-engineering exercises, both formal and virtual, that will have to take place

3.6 E-governance monitoring and evaluation

It is necessary to monitor and evaluate e-government to understand demand, assess the benefits to users of alternative proposals and evaluate the effectiveness of proposals in meeting their objectives. Evaluation is needed to argue the case for new projects and expenditure, to justify continuing with the initiatives, to allocate additional IT funds, to assess progress towards programme goals and to understand impacts. Additionally, monitoring and evaluation can assist with programme consolidation and selection of standards.

Following the prioritisation of e-governance as a key strategy to attain a particular national vision and strategic objectives, specific and measurable key performance indicators need to be identified in order to monitor and track progress towards stated objectives throughout the lifecycle of the project. E-government indicators should be designed to reflect programme goals, and a framework for monitoring and evaluation should be prepared prior to initiation.

A performance indicator or key performance indicator (KPI) is a term that denotes the *measure of performance*. KPIs are commonly used by a country or organisation to evaluate its success or the success of a particular activity in which it is engaged. Sometimes success is defined in terms of making progress toward strategic goals, but often success is simply the repeated achievement of some level of operational goal.

Accordingly, choosing the right KPIs is reliant upon having a good understanding of what is important to a particular sector of an organisation. Because of the need to develop a good understanding of what is important, performance indicator selection is often closely associated with the use of various techniques to assess the present state of the sector or business, and its key activities. These assessments often lead to the identification of potential improvements; and as a consequence, performance indicators are routinely associated with 'performance improvement' initiatives.

With regards to e-government, a country may seek to tie its KPIs with international benchmarks, or design an internal KPI framework that is directed towards what it identifies as key priorities. International frameworks are often indices made up of multiple performance indicators, which can provide more precise measures of governance than single indicators and allow for cross-country comparisons, but are dependent upon the availability of data on robust indicators.

An example of an international e-government KPI framework is the United Nations' E-Government Development Index (EGDI). The EGDI is built around a number of indexes: the telecommunication infrastructure index; the human capital index; and the supplementary e-participation index.

The E-Government Development Index (EGDI) is a comprehensive scoring of the willingness and capacity of national administrations to use online and mobile technology in the execution of government functions. The EGDI is not designed to capture e-government development, but rather rates the performance of national governments relative to one another. While the methodological framework for the EGDI has remained consistent across survey periods, survey questions are adjusted to reflect evolving knowledge of best practices in e-government, changes in technology and other factors, and data collection practices have been periodically refined (UN 2012).

As stated, international benchmarks provide a reference with regards to how a country is proceeding with the implementation of e-government relative to other countries. However, they do not provide a framework against which a particular country can spur implementation, gauge progress, identify gaps and take corrective measures. To achieve this, a government would need to design its own national e-government KPI framework.

The breadth and depth of a KPI framework can be as broad and as deep as the government needs it to be. Thus, if the government wants to establish a holistic KPI framework, it would need to target five primary areas:

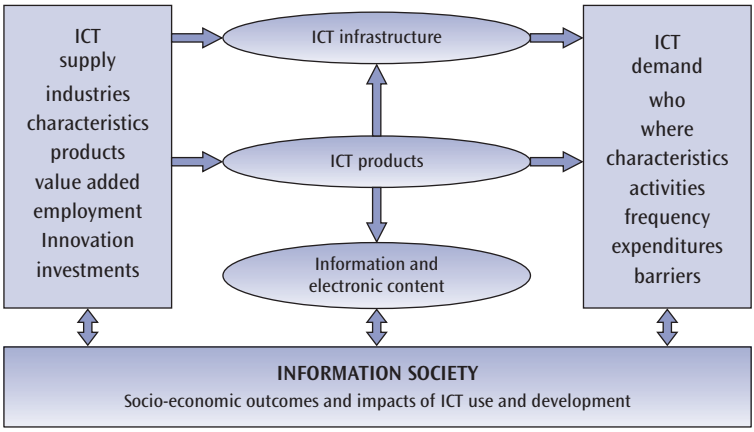
1) ICT supply
2) ICT demand
3) ICT products
4) ICT infrastructure
5) Information and electronic content

Nevertheless, it is not recommended that a country introduces a holistic KPI framework at the outset of the e-government implementation process. This is primarily for two reasons. First, such a holistic framework is ambitious and will require considerable resources from the entity responsible for national statistics. Second, the indicators required in the early stages are potentially different to those required during the middle part of the implementation process, which again will be different to the indicators required as the e-government process matures.

An evolutionary approach that starts small and is focused, and which over time evolves into a holistic KPI framework, would potentially add more value.

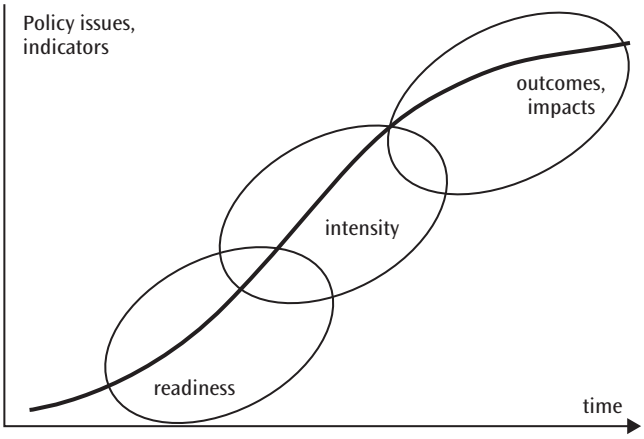
Initially, the e-government KPI framework could be introduced to target key components of the strategy.

Figure 3.1 A general framework to organise indicators



Source: Spiezia 2010

Figure 3.2 Approach to indicator development to measure the e-government implementation process



3.7 ICT capacity building

In the information age, knowledge is power. The knowledge economy is based on a paradigm that focuses on intellectual capital as a prime mover. With knowledge replacing physical and natural resources as the key ingredient in economic development, education and human resource development policies require rethinking. While there is no standard definition of a 'knowledge economy' as such, the UK Department of Trade and Industry defined it as 'a knowledge-driven economy in which the generation and exploitation of knowledge play the predominant role in the creation of wealth'

(Bedford 2013: 279) Meanwhile, the OECD defined a knowledge economy as 'an economy that is directly based on the production, distribution and use of knowledge and information' (Mustafa and Abdullah 2004: 51).

Investment in human capital is critical in a knowledge economy. Education and training are fundamental to the widespread and effective use of new technologies. Since a networked society is essentially a knowledge society, many of the potential benefits of ICT relate directly to the capability to use data and information to create new knowledge. Therefore, human resources development is considered to be a core component of an ICT strategy and one of the most challenging bottlenecks for developing countries seeking to engage successfully in e-business.

In many developing countries, the literacy rate is low, especially among women and girls, and the level of education is insufficient for full implementation of the changes in work organisation that are required for the efficient adoption of ICT. Given the relatively fast technological change related to ICT, continuous learning is required. This means that even adults need to improve skills or acquire new ones on a regular basis (UNCTAD 2003).

Human capital theory views education and training as an investment that can yield social and private returns, through increased knowledge and skills for economic development and social progress. The economic argument in favour of knowledge-based education and training is linked to the perceived needs of the global economy. It is based on the assumption that economic growth and development are knowledge driven and human capital dependent.

Additionally, evidence shows that a nation's ability to prosper is correlated to its level, quality and application of IT. Thus, a country that does not mobilise its resources to transform its society into an ICT society will get caught in a digital divide when compared to a similar country that does successfully transform its society into an ICT-literate one.

Moreover, unless businesses and consumers are educated about the opportunities and benefits offered by ICT, and unless they are trained to use the internet, e-business will not take off. While access to computers and the internet is essential, it is not enough. It is equally vital to create a demand for the new technologies and for e-commerce. Some have even argued that education, and not connectivity, is the main challenge for most developing countries seeking to participate in the digital economy.

Transforming a society into an ICT-literate one requires a series of measures – both in the short term and long term.

3.7.1 Short-term strategies

Immediate action can be taken to increase the level of ICT literacy. One effective measure is the establishment of an accredited ICT level of education, and the provision

of free or highly-subsidised tuition to citizens in both rural and urban communities to obtain said accreditation/certification. The attainment ICT accreditation can also be spurred by establishing such accreditation as a mandatory criterion to enter employment with government.

The attainment of industry-specific accreditations, such as CISCO, Microsoft and other such accreditations, will be expensive if the training delivery channels are not present in the country or are run on purely a private sector basis. Governments should seek to enter into vertical partnerships with industry players so that they establish academies with a government institution and/or NGO to deliver training for their respective industry accreditations at affordable local rates.

Such measures will assist in securing a high degree of ICT literacy, particularly with regard to people entering the labour market for the first time or those who are already active participants. The government should ensure that its senior employees are trained in information management, as well as the business application of ICT.

3.7.2 Long-term strategies

For ICT to become part of the milieu of a country's society, a more pervasive and fundamental approach is required. In essence, the education system across the primary, secondary and tertiary levels will need to be reformed in order to leverage ICT as a tool for education, as well as to integrate ICT within the country's curriculum.

ICT itself is an important tool for education. Indeed it brings in a new ethos (Camilleri 1994); for example:

- it enriches existing areas of the curriculum by improving their nature and content;
- it facilitates teaching and learning by helping teachers and students to concentrate on high-level, non-routine cognitive tasks;
- it provides a platform for collaborative learning, as well as virtually joining classes with other schools within and outside the country;
- it promotes active, rather than passive, learning;
- it increases interaction through sound, video, animation etc.; and
- it exponentially opens up access to research resources.

Box 3.5 UNESCO's ICT in Education Policy-makers' Toolkit

The UN Educational, Scientific and Cultural Organization's (UNESCO) ICT in Education Toolkit provides education strategists with six toolboxes – containing a total of 18 tools – that cover the following areas:

1. Mapping the present situation in terms of national goals, educational context, ICT in education and the dynamics of change
2. Identification of educational areas for ICT intervention and formulation of corresponding ICT in Education policies
3. Planning for implementation of infrastructure, hardware and personnel training
4. Planning for content
5. Consolidating implementation plans and their financial and managerial implications into one master plan
6. Assessment of implementation, effectiveness and impact of ICT interventions and subsequent adjustments and follow-up actions

Source: UNESCO 2006

3.7.3 IT in primary and secondary education

The use of ICT for education purposes should not be confused with the provision of computer or ICT studies. The use of ICT for education means the provision of learning through the utilisation of ICT as a tool – today termed as 'e-learning'. However, a number of foundation stones need to be put in place in order to leverage ICT for education.

First is the training of teachers who will be affected by the resulting necessary changes in curriculum and methodology – particularly those teachers who are already in service. In-service training could be directed as follows:

- the provision of IT training so that teachers who are not IT literate obtain the appropriate level of competency; and
- the provision of training in the use of IT as a teaching and learning resource within their particular area of specialisation.

With regard to students who are learning to become teachers, the appropriate university or teachers' college should review their curriculum to introduce the relevant modules so that students will graduate with appropriate knowledge in the use of IT for education.

Second, is the pedagogical content to be used for e-learning. The design of pedagogical content is challenging and should not be underestimated. Courseware may be available and secured through inter-school agreements with foreign schools, and perhaps in certain subjects it may be used with little customisation (mathematics, physics, etc.). However, this may not be the case with other subjects, or the way ready-made courseware is designed may not be applicable for the country in question. Introducing ICT for education without the appropriate pedagogical content is unlikely to succeed. It is also difficult to expect each school or a teacher to develop such content on their own stream. A particular way forward would be to create an e-learning unit within the central entity responsible for education. This unit will be responsible for the preparation of the content, as well for training teachers in the use of the content through ICT tools.

The third of the foundation stones that need to be in place in order to leverage e-learning is that teachers should be provided with a laptop computer, which will serve as the medium through which they will prepare and deliver their lectures. Most international computer companies provide special rates for equipment and licences used for educational purposes. Negotiations should be conducted with local agents to secure good value for money deals in this regard.

Fourth, the gradual introduction of IT for education should be supported by a review of the national education curriculum. IT could be viewed as a platform for a radical change in curricular activity, to support group work and fast and easy access to knowledge in its various forms.

Fifth, students are to be provided access to technology and the internet. Access to technology can be provided in various ways – the placement of a number PCs in every class, the establishment of computing laboratories, the establishment of a number of designated e-learning classrooms, converting school libraries into an IT access library etc. Moreover, students should be provided with an email address to allow them to interact electronically with one another and their teachers, as well as a 'My Learning' web space where they can electronically lodge their homework, assignments and other material relating to school activity. Access to the internet should be through a gateway that creates a 'Chinese wall' against full web availability, thereby ensuring access to only those sites which will be designated as appropriate by the central education agency. Specialised web filters for school purposes exist and can be procured at a relatively low cost.

Box 3.6 Red Enlaces: ten years of IT education in Chile

Launched by Chile's Ministry of Education in 1992, the Enlaces programme is an example of one of the early efforts by a government to prepare students for the information society and to introduce ICT into a country's basic education system. The programme provides infrastructure (computers and internet access), capacity building (for teachers) and content (educational software and websites). Enlacesa is the main provider of ICT equipment in the country's schools; in 2001, it provided 80 per cent of equipment in primary schools and 59 per cent in secondary schools.

In 2008, at least 87 per cent of the school body in Chile had access to ICT thanks to this initiative; with an expected ratio of 10 students per computer (2010), one of the most crucial aspects of Enlaces is its appropriate educational content which includes the Chilean curriculum – supported by the state educational portal (http://ict4bop.wordpress.com/2012/02/09/ict-and-education-in-chile).

The programme aims not only to provide access to the internet and new technologies, but also to introduce the use of ICT into school curricula as a support medium for teaching. Results in this area have been limited thus far, since the programme has mainly focused on training staff members to use the system, rather than encouraging teachers to use ICT as a pedagogical tool. This remains one of the most important challenges for the future development of the programme.

The measures discussed above are not short-term activities. They will take a generation to achieve. This means that the process of implementation will have to be gradual and prioritised. Prioritisation will reflect a country's culture and norms. Should the focus be initially directed towards students in the last year of upper or secondary school, and roll-out subsequently implemented with regards to secondary school to fourth, third etc. grades? Or should implementation be directed towards students in primary school? An advantage of a primary school-based approach, particularly in a country where a family gives considerable importance and attention to a child's education, is that it will have a ripple effect on the parents. As parents sit with their child or children, they too will become exposed to IT.

3.7.4 IT in higher institutions

The role that higher institutions play with regards to inculcating IT literacy is different from that played by primary and secondary institutions. Whilst the latter is primarily concerned with the development of an IT literate society by ensuring that students during their formative years are armed with the appropriate skills to successfully manipulate the electronic age and the knowledge economy, the role of higher institutions is directed towards the development of skills to meet demand and supply of IT labour.

Too often, IT education at higher institutions is directed towards preparing students to follow specialised IT degrees at an undergraduate level. IT, however, has rapidly grown into a field that transcends traditional disciplines. This means that an effective education strategy to build IT labour skills that will service the labour market must be two-pronged.

The first prong is the delivery of technical IT skills. Technical colleges should deliver industry-accredited programmes, as students who follow such accreditation or certified programmes are then 'industry' prepared. They are likely to find employment, as employers have no need to invest in order to orient such a skilled individual to a particular technical or software-based position.

The second prong should be directed towards the building of appropriate capacity within a university in relation to encouraging IT proficiency in every discipline, as well as targeting key IT disciplines. A university with an IT Department should maintain strong links with the IT business sector, to ensure that it is producing graduates in disciplines and with the level of knowledge required by industry.

3.7.5 IT in government

The possibility exists that as an IT industry starts to develop, the supply of IT human capital in a country is not sufficient and will not meet local needs under normal circumstances. In the event that supply is scarce, industry will start to poach employees from one another. Inevitably, the cost of labour will rise. This could be damaging to an emerging, indigenous IT industry.

A potential solution in this regard is for government to enter the training market over and above its normal education streams discussed above, by establishing public–private partnerships with private industry trainers in order to boost training infrastructure.

Such a strategic move, which should be temporary in nature, may be beneficial to the country, particularly when the IT industry is at its most vulnerable. This is because it will bring the focused resources of both government and the private sector to increase the supply of IT labour, and in doing so will stabilise the IT labour market.

The government should ensure that its senior employees are trained in information management, as well as the business application of ICT. Too often, people who occupy senior positions in government are 50 years and over – particularly if the selection criteria is that of seniority. The older the person who occupies a senior position is, the higher the possibility that such a person will be unfamiliar with the management aspects of ICT.

A direct consequence of this is that too often the investment made in ICT is not maximised beyond the basic processing transactions of the application. Yet the data resident within a system and across systems provides valuable information, which if

maximised should improve the intelligence that is so important in the design of a policy instrument.

3.8 Conclusion: keys to overcoming challenges

The challenges that policy-makers will face and will need to overcome are many. They include, though are not limited to, the need to obtain political support, maintaining that support over time as policy priorities change, and securing continuity in government financing in the face of shifting policy priorities and times when the economy may be facing difficulties.

Furthermore, key challenges in many e-government projects include:

- unrealistic project design and goals;
- lack of time spent on planning and design;
- lack of clear and measurable project goals, objectives and anticipated benefits;
- minimal focus on key project enablers (e.g. GPR, people change, capacity building);
- poor communication to stakeholders and users on objectives and benefits;
- inadequate resources for the project (in terms of people and funding);
- lack of capacity to conceptualise and manage e-government projects;
- minimal leadership and prioritising of e-government initiatives; and
- lack of stable and permanent project leadership with managerial powers to drive projects.

In order to address the above-discussed challenges, a comprehensive approach for conceptualisation, implementation and maintenance of an e-governance project is required. Such an approach would support government to: get it right the first time; orient project designs with customer focus and needs; achieve heightened focus and prioritisation of business and stakeholder benefits; support the adoption of best fit practices; and to manage delivery of results.

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