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Chapter 3

Taking a whole-of-government approach

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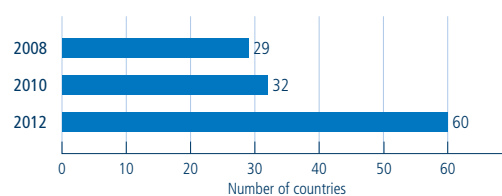
In recent years, there has been a change in emphasis away from structural devolution, disaggregation, and single-purpose organizations towards a more integrated approach to public service delivery.¹ Various terms “one-stop government,” “joined-up government” and “whole-of-government,” the movement from isolated silos in public administration to formal and informal networks is a global trend driven by various societal forces such as the growing complexity of problems that call for collaborative responses, the increased demand on the part of citizens for more personalized and accessible public services, which are to be planned, implemented and evaluated with their participation, and the opportunities presented by the Internet to transform the way the government works for the people.

The ability of agencies to work together and citizens to engage in wide-ranging dialogue with government become especially important in the context of putting e-government to the service of inclusive and people-centred sustainable development. Integrated policy approaches, enabled by cohesive institutional mechanisms and modern technology, contribute to the overall objectives of long-term development while lending greater legitimacy to government activities. The absence of a whole-of-government approach, by contrast, can inhibit progress in many areas, notably in low-income countries where limited coordination can undermine delivery of social services, provision of physical security, sound economic management and inclusive political processes.²

What needs to be clear, however, is that whole-of-government is not the same as e-government even if the use of ICT can be useful to the practice of whole-of-government. Three questions need to be answered separately. One concerns how the application of ICT can help the practice of whole-of-government. The second is about the institutional reorganization governments need to carry out in order to make whole-of-government effective. A third question concerns what whole-of-government has to do with sustainable development and how whole-of-government can help in implementing it.

Taking the United Nations E-Government Survey 2012 data, this chapter attempts to shed light on these questions. It assesses trends in whole-of-government for all 193 United Nations Member States and analyzes whether governments around the world are employing online tools to enhance institutional coordination and strengthen public services that respond effectively to people's needs and does so with their effective participation.

Figure 3.1 Countries with CIO or equivalent overseeing e-government



3.1 E-government harmonization in practice

The entry point for an integrated approach to whole-of-government is to determine the baseline conditions which allow for collaboration, across and between departments, through institutional arrangements so that the ensuing system is holistic, synergistic and coordinated in the delivery of public services.

3.1.1 National coordinating authorities

To realize a national strategy, strong leadership is required. Among other things, top e-government officials can bring together key stakeholders across ministries and agencies, define shared needs, identify potential gaps and redundancies in implementing strategic goals, and guide e-government innovation in service delivery. They can also steer process redesign efforts, facilitating communication among departments, highlight best practices, and leverage shared solutions. Given the mandate to do so, they can identify and remove common barriers to one-stop service provision as well. It is therefore vital to e-government transformation that governments appoint an official with real authority across departmental and ministerial boundaries to facilitate strategy and decision-making regarding the country's ICT architecture, and assist agencies in their efforts to run more effective and efficient programmes.

One measure to be taken is the establishment of a coordinating authority in the form of a chief information officer (CIO) or equivalent at the national level. Since 2008, United Nations E-Government Surveys have assessed governments' organizational commitment to a whole-of-government approach by asking whether they have identified a government-wide CIO or similar official responsible for overseeing e-government strategy. As seen in figure 3.1, the number of countries publicizing such a post has steadily increased. In the current Survey, 60 countries – 31 per cent of Member States – were found to have an e-government CIO or equivalent. This is up from 32 countries in 2010 and 29 countries in 2008.

Table 3.1 Chief information officer or equivalent by region

	Countries with CIO or equivalent	Number of countries in region	% of countries with a CIO or equivalent
Africa	9	54	17%
Americas	12	35	34%
Asia	19	47	40%
Europe	18	43	42%
Oceania	2	14	14%

As shown in table 3.1, Africa and Oceania lag behind the other regions with only 17 per cent and 14 per cent, respectively, of countries identifying a CIO or equivalent. The percentages of countries installing a CIO or equivalent in the Americas (34 per cent), Asia (40 per cent), and Europe (42 per cent), however, are roughly comparable.

In developed countries, the CIO or equivalent is typically responsible for providing policy leadership, supporting and monitoring open government initiatives, coordinating ICT projects across government to ensure they are aligned with overall strategy, and monitoring and reporting on spending. In developing countries, the role is often described in similar terms, but with the addition of building technology competence among government officials and improving and expanding ICT infrastructure and international cooperation with donors and NGOs on e-government initiatives.

The CIO function may be situated at any level within a national administration, from a technical support group to a ministerial office. Given the emphasis on ICT inherent in CIO functions, responsibility for e-government coordination at the national level is assigned to a technology unit more often than not, frequently within a communications department. Only some 10 per cent of countries have a CIO or equivalent official placed in a senior position in the cabinet office, finance ministry or public administration department, among them many top-performing high-income countries such as the United States, the Republic of Korea, the Netherlands, Canada and France.

Association of the national coordinating authority with the executive or reform elements of public administration serves a dual purpose. First, business ownership of e-government at a high-level assigns responsibility for government modernization to those

responsible for the design and management of public services. Second, it imparts to the CIO function a significant convening power that facilitates national strategy development and ongoing collaboration. The authority to bring different constituencies together to address common problems may be especially important in large countries having a substantial number of administrative divisions. The institutional realignment needed for effective e-government echoes responses to questions of coordination and participation that arise in other areas. In particular, the e-government experience can be taken as an important lesson learned in the design of institutional frameworks for sustainable development.

However, despite its evident value, the CIO or official with an equivalent function is not always easy to identify. Fewer than 10 per cent of leading e-government officials use “Chief Information Officer” as their functional title, preferring instead appellations such as “Director-General” or “Head” of the organizational unit mandated to undertake e-government coordination activities. The variety of arrangements and difficulty establishing exactly who is responsible for overseeing administrative reform processes at the national level is indicative of the evolving nature of the institutional frameworks for e-government development and the absence of global norms in this area.

3.1.2 Public sector interoperability

A whole-of-government strategy necessarily implies that the systems deployed throughout government are able to communicate with one another. However, different government entities have different technology needs. A treasury department has little need for a database of geo-spatial and seismic data; while conversely, a mining ministry likely has little use for a system that detects suspicious financial transactions.

Many governments may bear sunk costs from significant historical technology investments that, along with new purchase and implementation costs, prohibit migration to entirely new systems. The challenges above are only exacerbated when multiple levels, such as regional and/or local governments, are involved. Thus, interoperability and integration are at a premium with respect to both new technology purchases and upgrading existing systems.

Interoperability in the public sector is defined as the ability of government organizations to share and integrate information by using common standards.

The 2012 Survey includes several indicators focused on the degree to which countries have implemented systems that can seamlessly exchange information. One such indicator looks for identity management features. To be counted, the feature must enable the government to positively identify an individual citizen in the course of an online transaction. At a minimum, the availability of such a feature implies that the government has dynamically connected its repositories of uniquely identifying information – such as birth certificates, passports, and/or citizen ID numbers – with the system or systems offering a particular service.

Specific countries with an identifying management feature include Albania, the Bahamas, Bulgaria, Canada, Colombia, Finland, Georgia, Japan, Kazakhstan, Maldives, New Zealand, Qatar, Serbia, Singapore, and Ukraine. In some cases, particularly among European countries, the system is also integrated with an electronic ID card database and/or tied to the citizen’s mobile phone. One such example is Austria, where citizens can get personalized information and services by signing on to the services portal (<https://www.help.gv.at>) using their ID card or mobile phone, and can even electronically sign documents using their mobile phones.

Another interoperability indicator is an online tracking system that permits citizens to check on the status of online transactions. As with an identity management feature, such a system implies that the citizen-facing system – the national website or portal – is able to communicate with the system that government officials are using to process the transaction.

Given the expense and difficulty of achieving interoperability that is required for these features, it is unsurprising that a relatively low proportion of countries offer them. Only about a quarter of countries offer

electronic identity management, while slightly more than a third have an online tracking system. Examples of countries with an online tracking system include Argentina, Bangladesh, Cape Verde, China, Colombia, Croatia, Denmark, Greece, India, Japan, New Zealand, the Russian Federation, and South Africa.

3.1.3 Online service integration

Some countries have set up portals that aggregate large amounts of information and services into a single website. A key objective of such portals is to facilitate citizen navigation and use of the content. Although during the Survey assessment period no country’s portal completely integrated all information, services, and features assessed, several came close. Some of these vanguard countries include: the Republic of Korea, the United Arab Emirates, and the United Kingdom.

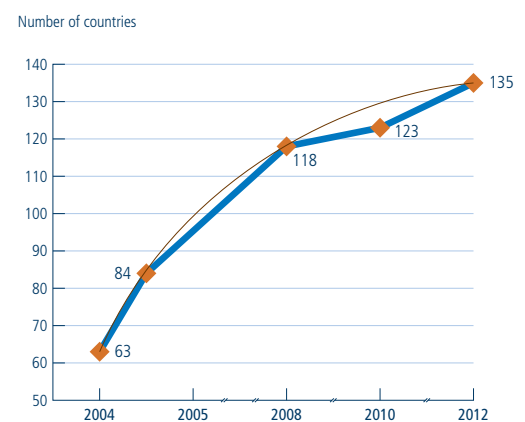
A common approach in this model includes organizing content around life themes and/or specific audiences, such as the young, elderly, women, job seekers, students, etc. These portals also typically include an advanced search feature that may index content from dozens of government websites; usa.gov includes all of these features.

The 2012 Survey includes a specific indicator that assesses whether a country has integrated portals under the rubric “one-stop-shops.” The Australian Government has been one of the early

Table 3.2 Interoperability and back-office integration

	Countries	Percentage
Electronic identity management	52	27%
Online tracking system	66	34%

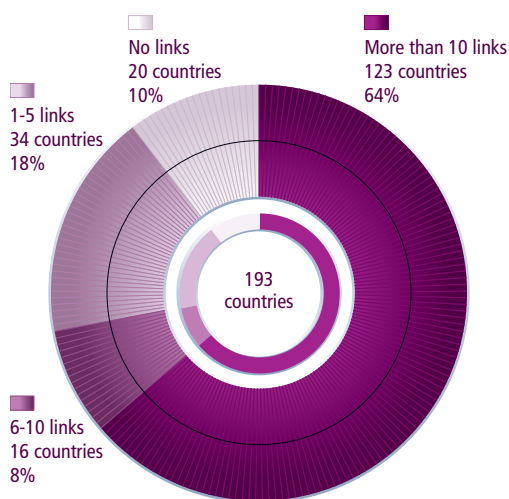
Figure 3.2 Countries offering a one-stop-shop



adopters of a one-stop portal. Its portal offers citizens numerous interactive services ranging from birth certificates to registering on the electoral roll. It offers three ways to access services: by service type (paying a bill, applying for a grant); by life event (giving birth); or by location (of government agency or department). Now, one-stop-shops are the norm in most developed countries such as Austria, Belgium, Japan, and Singapore. Further, the trend has been increasing. As seen in figure 3.2, the number of countries deploying one-stop-shops increased in the past eight years from 63 in 2004 to 135 in 2012. Among developing countries, Angola, Costa Rica and Egypt all have developed one-stop-shop portals.

While not all countries may yet be able to achieve substantial interoperability, the Survey includes a proxy for intent to move in that direction: the number of government websites linking to the national page or portal. By providing such links governments not only aid citizens in finding the information and services they seek, but demonstrate that their different branches are in fact collaborating in the online sphere. By this measurement, the majority of coun-

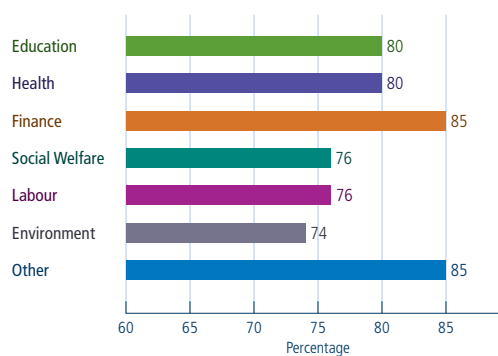
Figure 3.3 Countries with government websites linking to a national website or portal



tries are making a strong effort in this area, with 123 countries having at least 10 government sites linking to their national site or portal and only 20 countries having no government sites with such a link.

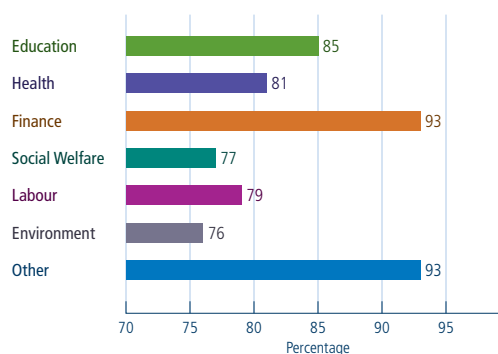
The Survey also measures how many countries provide a gateway to regional and/or local governments by linking to them from their national page or portal. Roughly half of all countries – 96 – provide such links. Some specific countries providing this feature include Armenia, Australia, Belgium, Plurinational State of Bolivia, Bosnia and Herzegovina, Canada, Chile, China, Egypt, France, Germany, India, Kenya, Latvia, Nigeria, Norway, Peru, the Philippines, the Russian Federation, Uganda, the United Kingdom, the United States, and Venezuela.

Figure 3.4 Percentage of national sites or portals linking to government ministries



Another way in which the 2012 Survey measures whole-of-government strategy execution is by assessing how many government websites provide information and services in key government portfolios covering citizens' basic needs. As can be seen from figure 3.4, the vast majority of countries provide links from their national portal to their

Figure 3.5 Policy information online



Box 3.1 **Usa.gov leads in integrated portals**



Usa.gov is perhaps the best example of a highly integrated portal. It is carefully organized, starting from a sufficient level of abstraction for the citizen who does not need to know, say, exactly for which form he/she is looking. Yet by drilling down through increasing levels of specificity, the citizen ultimately – and with remarkably little effort – arrives at a very specific item or service. This process is aided on virtually every page by “Popular Topics,” “In Focus,” and other helpful boxes that bubble up content

that is likely to be relevant. In the event that the citizen cannot find what he/she needs by browsing, a comprehensive, detailed and searchable FAQ is available. Failing that, the citizen can use the general advanced search feature, which indexes dozens of federal and even state and municipal websites. Finally, the site provides myriad ways for the citizen to communicate with the government on any topic, ranging from technical support for the site to substantive policy issues. ♦

ministries having education, health, finance, social welfare, labour, and environmental portfolios. The differences in percentages are largely reflective of the fact that some countries do not have websites for all of their ministries: where the national site provides any links to ministry websites it usually links to all of them. Among the basic needs sectors, the highest proportion of countries link to a finance ministry (85 per cent), while the lowest proportion link to a social welfare (76 per cent) or labour (76 per cent) ministry.

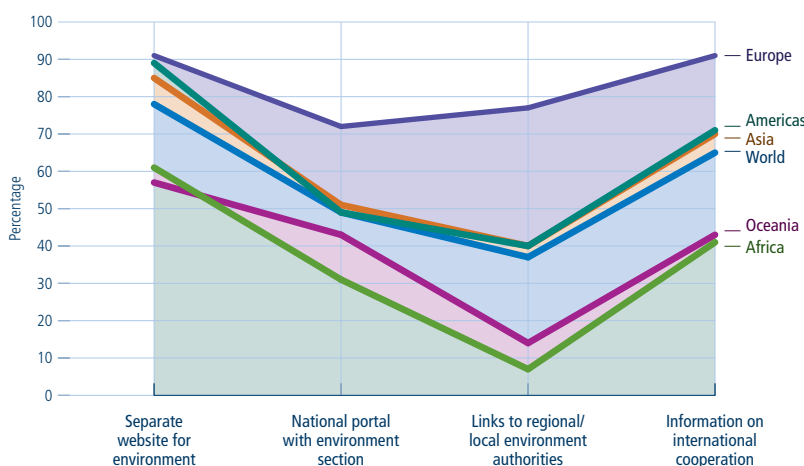
Similarly, a large majority of countries provide information on policies and laws for each of the key portfolios on their websites. Among the basic

needs sectors, the highest proportion provide information on finance (93 per cent), while one of the lowest proportions provide information on social welfare (77 per cent).

Overall, 78 per cent of countries have a separate website for the environment, and in all regions a majority of countries scored this question. Far fewer countries – only 49 – have taken the additional step of integrating environmental information into their national and sub-national governance structures. Only in Europe have a clear majority of countries progressed to this point. Roughly half of the countries in the Americas and Asia include environmental information in their portals, while Africa trails substantially.

E-government can support environmental institutional integration not only by including environment ministries/departments but also by linking vertically and horizontally institutional structures responsible for environmental governance so that information and service flows are consistent, efficient and effective. While the e-government Survey does not focus on G2G interaction per se, certain aspects of governments’ online G2C offerings may be taken as proxies for this type of information flow. While G2C offerings necessarily will overlook dedicated, login-protected websites containing sensitive information for government officials only, it seems likely that government officials from various institutions will make at least as much use as citizens of the publicly available information.

Figure 3.6 **Institutional integration efforts in environment**



The Survey asked specifically whether Member States help support vertical institutional integration by providing a gateway to regional and/or local environmental authorities as well as providing information on international cooperation on environmental issues. Once again Europe is a leader in this area, with 77 per cent of countries providing the former and 91 per cent the latter. Very few countries in Oceania and Africa provide a gateway to local authorities. This may be explained in part by a lack of multilevel governance in general in these areas, particularly among the small island nations of Oceania. After the question on a separate website for the environment, information on international cooperation is the most commonly scored question, with 65 per cent of countries providing this information overall.

3.1.4 Overall commitment

As measured by factors that focus on commitment to a whole-of-government approach, several countries stand out. The top performers can be seen in table 3.3. Specific factors in the 2012 Survey encompassing the whole of government approach include: 1) identification of an e-government CIO or equivalent; 2) the number of links to and from the cabinet level and other government and regional/local websites; and 3) whether a one-stop-shop is offered. The commitment to a whole of government approach among these countries is evident by their higher scores even though some of them remain at a lower level of overall online service delivery.

Table 3.3 Whole-of-government top performers

Country	Country	Country
Republic of Korea	Malaysia	Serbia
Singapore	New Zealand	Cyprus
United States	Spain	Uruguay
Netherlands	Germany	Argentina
Canada	Austria	Peru
France	Mexico	Slovakia
Bahrain	Lithuania	Indonesia
United Arab Emirates	Luxembourg	Philippines
Japan	Oman	Costa Rica
Norway	Slovenia	Iran (Islamic Republic of)
Israel	Russian Federation	Mauritius
Colombia	Malta	Viet Nam
Sweden	Egypt	Sri Lanka
Saudi Arabia	Latvia	

As seen in figure 3.6, the majority of countries provide links from their government websites to the cabinet level as well as sub-national websites. A majority of countries also link other government websites to the portal. In addition, there is a trend toward installing more e-government CIOs and deploying more one-stop-shops. Finally, the specific countries that display the greatest commitment to the whole-of-government approach include many with relatively low levels of e-government development.

Taken together, these indicators suggest that countries are generally motivated to pursue a whole-of-government approach by integrating services and information as much as possible. The particular form of integration is affected by

Box 3.2 Mauritius, an A to Z thematic approach



The “Citizen” portion of Mauritius’ integrated portal is organized primarily around key services, but also groups information by audience and includes an A – Z thematic index. Additional features that aid the citizen in quickly finding content include a “Quick Links” box, a “Related Subject Areas” box, and a government directory. The directory can be displayed according to hierarchy or in alphabetical order by ministry or department name. ♦

Box 3.3 Germany chooses integrated services on multiple portlets



One portlet, Die Bundesregierung, focuses primarily on information. It includes news from across the government, links to laws, policy documents, thematic websites in particular policy areas, and links to all government ministries. A second portlet, Bund De, focuses primarily on services. It includes a searchable directory of government offices, services and links, as well as links that direct citizens to the specific services or offices they are seeking. ♦

considerations of: the technical challenges involved in linking dramatically different systems of varying provenance and vintage; the technical complexity of setting up authentication and security systems that can be scaled up to adequately protect an increasingly integrated infrastructure; the costs involved; and political and organizational tensions that may inhibit different organs within governments from cooperating effectively.

A common variation on portal organization is to segregate information into categories for citizens, businesses, government, and sometimes foreigners. Bahrain’s portal and Mauritius’ portal (box 3.2) are both organized according to this principle.

Following closely behind such portals are those of countries that may not have a single integrated portal but integrated ‘portlets’ each with multi-sector, multifunctional integrated services or information from across multiple departments and agencies. Many European countries appear to follow this model, with separate information and services portlets, each integrated across thematic and functionally relevant sectors. One example is Germany, described in box 3.3. Other countries pursuing variations of the portlets model include the Netherlands, France, Spain, and Portugal.

Box 3.4 Malaysia “no wrong door” policy



A whole-of-government strategy, introduced in the 10th Malaysia Plan for development covering 2011-2015, urges public sector agencies to work across portfolio boundaries to provide high quality public services to citizens across all areas of economic activity, and ultimately to improve the capacity of public sector agencies to work together to address the economic, social and environmental challenges of globalization. A “one service, one delivery, no wrong door” policy is intended to enable easy access to public services by ensuring that

government agencies are well-coordinated, well-informed and customer-friendly. Using various service delivery channels, it is expected that citizens and businesses will be able to deal with government agencies in a fast, simple and transparent manner, resulting in increased customer satisfaction. One of the most visible manifestations of the policy is the country’s myGovernment website providing one-stop access to a variety of services from a multiplicity of agencies. ♦

Source: The Malaysian Public Sector ICT Strategic Plan: Powering Public Sector Digital Transformation 2011-2015, 7 July 2011

3.2 Challenges and opportunities of integrated e-service delivery

In the section below, we examine how e-government harmonization requires strong leadership and commitment in order to achieve interoperability and integration of the various public sector organizations, which is a crucial pillar of whole-of-government practice.

3.2.1 Revisiting institutional arrangements

As the 2012 Survey findings show, the vertical and horizontal fragmentation, which is typical of public administration, constitutes one of the key challenges of one-stop government implementation. Public sector initiatives where services cross departmental boundaries present a formidable challenge. The fragmented and 'siloed' government structure complicates easy communication among persons in each silo, which might result in customer dissatisfaction. Service delivery channels might not be developed based on a shared vision and could have different objectives.³

For example, whereas one channel might focus on personal interaction, another channel of the same organization could emphasize efficiency. Furthermore, there might be a gap between strategy and operational processes. Strategies are high level and can be interpreted and implemented in many, sometimes even conflicting, ways. Also, strategies are often formulated by politicians. They may reflect their political ambitions but fail to consider limiting factors like scarce resources, path dependencies, legacy systems and public agencies' time constraints.

The issue here is to overcome existing power structures and build a culture of cooperation. Department/agency heads may fear losing power over human and financial resources and thus fail to make them available for advancing one-stop government. Building trust among departments and agencies is therefore key to successful one-stop e-government implementation, as is incorporating

change management mechanisms in the whole-of-government programme.

One important step towards this end is the development of a national strategic framework that articulates the government's vision, objectives and milestones, as well as basic roles, technical standards and constraints for realizing a one-stop e-government system. Such a framework also addresses issues of privacy and security, maintenance, and interface standards. The strategy should help departments and agencies in both central and sub-national government to cooperate in new partnerships that will enable them to offer their services in ways that make sense to the customer. Such a strategy can usefully point to partnerships with innovators in the private sector who can find new ways of meeting changing patterns of demand.

To realize the national strategy, a high level of initial investment may be needed, which must be embodied in long-term vision and strategic planning in order for an integrated and sustainable e-government solution to be successfully implemented. Service delivery platforms often require the integration of telecom and IT capabilities and the creation of services that cross technology and network boundaries. In this process, established, hierarchical and bureaucratic structures must be supplanted with horizontal one-stop government network structures that facilitate customer orientation and increase levels of transparency and accountability. The end result must be seamless, knowledge-enhanced e-government solutions that are sustainable.

At the same time, governments need to guard against creating parallel structures or institutions because these further complicate the difficult job of coordination and go contrary to the requirements of the whole-of-government approach. Creating parallel institutions would also be more of a throw-back to traditional hierarchical governmental organization. The practice of whole-of-government mainly requires the establishment of networks and partnerships within government agencies, as well as with other key players, such as those in the non-government sector. Beyond the engagement of leading e-government officials and institutions, one-stop government may require the acquisition of new skills by public employees and customers alike.

Vertical and horizontal fragmentation, which is typical of public administration, constitutes one of the key challenges of one-stop government implementation.

Alongside analysis and interpretation skills, which are necessary at every stage of an e-government project, skills in information management can ensure that information is treated as a valuable organizational resource with due regard for content, quality, format, storage, transmission, accessibility, usability, security and preservation. Depending on the type of e-government challenge an organization is facing, higher order technical skills may be required to implement the chosen solution. Communication skills are important because of the need throughout the project to convey goals, progress, issues and results. Finally, project management skills are essential to plan, organize, allocate resources, negotiate, track progress and measure results.⁴

An analysis of 40 case studies on interoperable government collected in Europe points to three further conclusions regarding human resources. First, strengthening of existing collaborations in order to create new ones; interoperability (vertical or horizontal cooperation) is easier to implement when the actors are used to collaborating. Even then, it takes time. Second, collaboration yields better results than imposition: “things change naturally and it is not necessary to inflict them. Changes impact the heart of organizations, practices and culture. This can only be done gradually.”

Third, project implementation, in almost all the cases analyzed, is based on extensive training sessions. Training in the implementation process is essential. Training contributes to cultural change, to knowledge transfer, and to enabling civil servants to use the technology.⁵

Notwithstanding common issues that arise in the design of effective institutional frameworks for e-government development, there is no one institutional arrangement that can be recommended for all governments. Much depends on the national context and the interplay of organizational changes that may be advised in the pursuit of a whole-of-government approach as table 3.4 suggests.

3.2.2 Promoting citizen-centric design

The distinguishing characteristic of the whole-of-government approach is that government agencies and organizations share objectives across organizational boundaries, as opposed to working solely within an organization. It encompasses the design and delivery of a wide variety of policies, programmes and services that cross organizational boundaries.⁶ From the citizens’ perspective, a whole-of-government approach to e-government permits them to access information and services without needing to know anything about the structure of government. It ‘flattens’ government structure so that even if a particular administrative process involves two or three government departments, the citizen need have only a single point of contact with the government. One way to implement a whole-of-government approach is to aggregate government services and information into a limited number of websites. Another is to deploy advanced search technology that indexes websites throughout government.

One-stop government refers to the integration of public online services from a customer’s viewpoint via a single entry point, irrespective of whether these services are actually provided by different departments or authorities. The customer may be a citizen or a business. One-stop online service provision requires the interconnectedness of all public authorities, with the effect that customers are able to

Table 3.4 Selected organizational changes needed in the pursuit of a whole-of-government approach

Objective	Strategy
Adopt a new and different culture and philosophy	Incorporate whole-of-government values into all departments and agencies
	Promote information sharing and cooperative knowledge management
	Effectively align top-down policies with bottom-up issues
Adopt new and different ways of developing policies, designing programmes and delivering services	Pursue a collegiate approach
	Focus on whole-of-government outcomes
	Consult and engage with clients and users
Adopt different working methods	Exercise shared leadership
	Emphasize expertise
	Apply flexibility and promote teamwork
	Focus on outcomes
Employ new incentives and accountability mechanisms	Recognize and reward shared outcomes
	Promote horizontal management
	Be flexible around service outcomes

access all available public services through a single entry point. Since from a customer's perspective knowledge of the functional fragmentation of the public sector is irrelevant in terms of accessing information, customers should be able to access one-stop online services in terms of life events and business situations directly from the responsible unit.

The one-stop-shop should offer a point of entry for citizens and businesses to all relevant services from the central and sub-national governments. It should be capable of personalization, matching citizens' and businesses' circumstances and needs. It should also facilitate push technology, so that at citizens' and businesses' choices, it can send reminders about services or information by email. Government online resources should also be well indexed and easy to find.

Some additional characteristics include a well thought out structure, a comprehensive navigation system, and a consistent look for the web pages – all cornerstones of an effective government website. It is also necessary to present the content in a way that is understandable for a normal user according to life/business events. Personalization is likewise very important to improve the acceptance of a national website. Since authentication of a citizen is necessary for transactions anyway, the same mechanism can also be used for personalization purposes. The demand of businesses for personalization is even higher than that of citizens, since a business is likely to use the portal more often. The user needs to be informed as to what happens with his/her data, for whom it is accessible and how it is protected. This creates confidence in the site.⁷

Another requirement for a one-stop-shop is that it be intuitive. For example, if a user wants to use a specific public service, she/he should be automatically connected to the right agency (e.g., marriage – registry office) in the right jurisdiction. Use of more advanced e-services can be described as a set of phased transactions corresponding to the citizen's view of the exchange. In the information and intention building phase, users search for information regarding possible intended public services. In the contracting phase, the user already knows what she/he needs to do and either fills in the online application form or downloads the corresponding form from the server and completes it. In the service

delivery and payment phase, the processes to complete the service are performed, the results are conveyed to the customer and the customer pays for the service. The last phase addresses aftercare, where aspects of citizen (or customer of public administration) relationship management and complaints management are addressed.⁸

While general principles such as the foregoing together constitute a helpful guide to e-government development, the quest for citizen-centric design implies an understanding of the specific needs of different segments of society and their capacity to benefit from online and mobile services. How these needs are matched with available channels, taking into account characteristics of the various phases of service delivery, is explored in Chapter 4. Differentiation in e-service design can, moreover, reinforce efforts to bridge the digital divide by reaching out to vulnerable populations, as discussed in Chapter 5. More generally, citizen-centric design with a strong user focus has a direct bearing on increasing usage of e-services to realize their full potential benefits, a subject explored in detail in Chapter 6.

3.2.3 Standards setting and systems integration

Citizen-centric design is dependent on a fully-integrated operational model usually requiring significant systems integration and accompanying transformation of business processes. Two types of integration can be discerned: vertical integration involving cooperation among different tiers of government, for example between national and local authorities engaged in environmental management; and horizontal integration within a single jurisdiction, such as connecting the finance ministry with government departments involved in provision of social services. In both cases, citizens and businesses are best served when responsibility for the requisite communication among different agencies is assumed by government, subject to applicable legal and regulatory constraints, rather than transferred to individual actors.

Building a common architecture for a one-stop government portal requires secure and trusted interoperable systems that adopt existing Internet

standards for government agencies at all levels. Establishing an interoperable system within one government means that agencies can easily “talk to one another” whether by sending email or exchanging information, without any technical problems that hinder the smooth operation of government. In practice, various approaches to interoperability are possible with tighter and looser forms of integration. Three principle types of interoperability can be identified:⁹

- *Organizational interoperability* is the ability of systems and interfaces to overcome different business processes in different regions, in order to process a certain transaction or request. All three types of interoperability are of great importance if one wants to achieve the goal of a one-stop e-government portal.
- *Semantic interoperability* is about the ability of systems to exchange information, to combine it with other information resources and to subsequently process it in a meaningful manner. When semantic interoperability is achieved, information is made understandable for different applications and consequently it can be reused in different settings.
- *Technical interoperability* of e-government solutions for sustainable development demands the establishment of an IT infrastructure that allows for the efficient exchange of information among different levels of administration, both horizontal and vertical. It also presupposes that there is homogeneous equipment among all the actors involved and a significant number of end-users.

Many governments have started creating interoperability frameworks spanning agency boundaries that, among other things, facilitate the deployment of multichannel delivery of government services. Achieving interoperability in government organizations is difficult. In many cases, agencies are reluctant to change existing processes, open data and services to external parties, and renegotiate their way of operating with external parties. Open standards are particularly recommended as they are platform independent and cannot be controlled by any single agency. Legal offices, academia, and other organizations involved in interoperability can be invited to discuss key issues. An inter-ministerial board can also be set up as a working group to agree

on interoperability standards. Other measures can include getting political support from top management and developing policy and regulation in support of interoperability within the government.

As far as online services are concerned, there is what is known as the ‘portal’ approach, which is designed for information provision and sharing. It aggregates content coming from various sources and allows the easy localization of information delivery by use of co-branding solutions. This solution, however, needs significant investment supported by a single main actor and an efficient networking of all other actors involved, which influences the quality and updating of information. A basic requirement for a one-stop government portal is that there should be a government information infrastructure (GII).¹⁰ This is a network that connects all government agencies. Building a GII however is a costly undertaking that requires cross-agency, cross-government planning. In order to assess the cost implications of such an undertaking, a financial feasibility study should be conducted.

There is also a so-called ‘platform’ approach. The platform approach does not aim at centralizing and dispatching the data but provides common tools and common functionalities (security, data exchange mechanisms, electronic signature) that allow service delivery. In this configuration, local actors are directly responsible for service provision and have to coordinate their actions (technical and organizational interoperability).¹¹ Both have been successfully employed separately and in combination by different countries.

The experience of the United Arab Emirates in managing its e-government initiative is instructive in this respect. While the Emirate of Dubai centrally controlled and monitored the e-services development overall, government departments were given the freedom to creatively build their own e-services in an early phase of the project. This not only accelerated development, but also helped the government departments to meet the initial target of 70 per cent of government services to be online by 2005.¹²

Similarly, Dubai adopted a hybrid approach to implementing its e-government initiative whereby government departments focused on e-service enablement while the central authority focused on building common parts (e.g., payment, customer support, etc.) needed by all offices. This balance

between centralization of common aspects of e-services implementation and decentralization of e-services enablement was one of the key pillars of success in the Dubai e-government initiative, which resulted in standardization, best practices sharing, cost savings, and reduced time to market.

Implementation can be augmented by adding identity management and single-sign-on functionality. The former allows the government to verify the citizen's identity, which in turn permits a broader range of online service offerings. However, it also permits government to more easily tie together information about individual citizens from multiple data repositories. This enables the government to increase efficiency by reducing data duplication and administrative overhead while providing more personalized services to citizens. Single-sign-on functionality adds the ability for citizens to only log on once regardless of with how many disparate government ICT systems they interact. The whole-of-government model of information and service delivery benefits citizens by simplifying their interaction with government. As a result, it can be expected to drive user take-up of government information and services.

3.2.4 Privacy and security matters

There must also be a strong emphasis on a legal framework that embodies elements of trustworthiness, traceability, security and privacy of citizens' data. One-stop government often requires the adaptation of laws to make e-government solutions legally binding. Among the legal issues to be investigated for a successful one-stop government are: data protection, access to sensitive data, networking of authorities and databases, equal opportunities, electronic signature, etc.¹³

A central challenge of one-stop government is how the new technology can be used not only to increase efficiency for public administration, but also to strengthen confidence in privacy measures by creating mutual transparency between public administration and citizens.¹⁴ For example, while secure systems are needed to impede unauthorized access to data, such personal data must be made accessible to a citizen who wishes to verify the use, authenticity and accuracy of his or her own personal data.

Protection of personal data calls for a number of organizational and technical measures to prevent unauthorized access and processing, for example by:¹⁵

- Protecting premises, equipment and systems software, including input-output units;
- Protecting software applications used to process personal data;
- Preventing unauthorized access to personal data during transmission thereof, including transmission via telecommunication means and networks;
- Ensuring effective methods of blocking, destruction, erasure, or anonymization of personal data;
- Enabling subsequent determination of when individual personal data were entered into a filing system, used or otherwise processed, and the person responsible, for the period covered by statutory protection of the rights of an individual with regard to unauthorized supply or processing of personal data.

Creating a trusted framework for digital authentication is also a crucial factor in assuring the integrity of online and mobile financial transactions. Digital signature is only a beginning. Concrete applications have to be developed, and they require a lot more legal changes. Individual laws, governing both the operation of public administrations and policy-specific issues, have to institute digital signatures as an accepted way of identification and authentication.¹⁶ A key concept with security issues is scalability. At the same time, the security framework should take into consideration the fact that a majority of administrative transactions do not need high levels of protection and that secure procedures are expensive, difficult to implement and not always well accepted by the end user.¹⁷

Given the complexities, implementation of trusted security and privacy measures constitutes a major challenge to one-stop-shops, which many governments have yet to tackle. Only about one fifth of national portals clearly indicate the presence of security features with significant regional variation. According to the 2012 Survey, almost half of the countries in Europe display secure links on their national websites, while only one in Africa appears to do so, underscoring the continuing difficulty that African governments face in moving to the transactional and connected stages of e-government development.

A central challenge of one-stop government is the need to strengthen confidence in data privacy and security measures, for example by allowing citizens to verify the accuracy of personal records.

Box 3.5 Cloud computing

Cloud computing has been a big beneficiary of virtualization, enabling organizations to share computing resources and, depending on service level agreements, pay only for what they use. In the United States, as part of the new Cloud First Initiative, government agencies are required to consider cloud options before making new IT investments. With virtualization, data can reside across a shared pool of storage devices, but the devices themselves do not have to be equal. Critical information that needs to be accessed frequently can be sent to high performance storage – the

equipment with the fastest response times – while less important data can go to lower cost devices with slower response times. Data that is rarely accessed or needed only in emergencies can be sent in devices that are less advanced and less costly. Virtualization enables organizations to use their most expensive storage devices for their most important data and to buy fewer of them.¹⁸

Another possible advantage of virtualization is that it can contribute to green IT when data centres are established in areas with access to renewable energy sources. One of the

major vendors of cloud computing equipment reports that virtualization has enabled the Municipality of Copenhagen, Denmark to cut the number of servers it uses from 638 to just 32. That meant not only less infrastructure to maintain but also lower power consumption, reducing carbon emissions by 77 per cent.¹⁹

A major caveat, however, is that data about citizen-government transactions and the content of those transactions is better off kept under governmental control to protect privacy and ensure that use of data complies with applicable regulations. ♦

3.2.5 Issues in infrastructure development

Relevant infrastructure issues to be considered here include the country’s existing infrastructure, current level of Internet penetration, telephone density, existing speed of technology change, allowances for convergence, and investment in broadband.

Table 3.5 National portals clearly indicating a security feature

	Portals with a security feature indicated	Number of countries in region	Percentage
Africa	1	54	2%
Americas	4	35	11%
Asia	12	47	26%
Europe	19	43	44%
Oceania	3	14	21%
World	38	193	20%

The advantage of having one’s own backbone is that government communications are open and secure and operating 24-7. However, this may imply regular funding for upgrades and maintenance of the network, and for hiring a team to support the network full-time.

Given the cost and time implications of building a backbone, governments may opt for an existing private telecommunications backbone, usually one

run by a large telecommunications carrier. With this alternative, the government entrusts the security of the network to the operator, who will also be assuming the costs of regular network maintenance and technical support and the risks of possible network sabotage.

In order to minimize the threat of security risks, governments that choose to ride on a private backbone will have to set up specific security measures, including: firewalls, intrusion detection software, encryption, and secure networks (such as Virtual Private Networks, Wide Area Networks or Local Area Networks) for government agencies that require high levels of security.

One-stop e-government requires IT support. It is therefore necessary to develop the appropriate technical infrastructures, such as a full-fledged electronic network among agencies, including applications for communication and electronic filing.

Standardization and intelligent functionality has to be provided for the portal, front-office (intake and communication) as well as the back office.²⁰ Specific attention has to be paid to small units of government in rural regions, which otherwise would never get a chance to use the required government infrastructure. In this respect, the need for cooperative, shared architectures and infrastructures to avoid lack of skilled resources and to lower investment and maintenance costs becomes important too.

With the silos being phased out, IT resources become much more tightly linked and collaboration becomes crucial. Increasing flexibility and efficiency in e-government operations can now be achieved via virtualization, which enables organizations to pool computing resources and use the same servers and storage devices for many different users and applications. On-demand computing is the new model for organizations looking to get the best returns from their technology investments.

3.3 Conclusions

Employing e-government to improve efficiency and effectiveness of public service delivery, and to promote development for the people helps governments use available resources to their best advantage, thus contributing to economic sustainability. In the past, e-government development efforts tended to focus on the short term, in particular on getting isolated services online, publishing information without providing for regular updates and adding new features to websites in response to changes in technology. This approach has helped meet the immediate needs of specific agencies while bypassing reform of institutional frameworks, enabled by technology, in response to the long-term financial and operational challenges of the public sector.

The 2012 Survey finds that many Member States are moving from a decentralized single-purpose organization model, to an integrated unified whole-of-government model, contributing to efficiency and effectiveness. The model aims at centralizing the entry point of service delivery to a single portal where citizens can access all government-supplied services, regardless of which government authority provides that service. In some countries, the whole-of-government approach helps build a transparent government system with interconnected departments and divisions.

Although there is widespread support for the principles of whole-of-government, there remain major problems in implementing the concept related to issues of ensuring accountability for publicly funded activities and overcoming the 'silos' created by departmentalism or vertical styles of

management while avoiding fragmentation and lack of coordination. Knowledge and attitudes of public servants to the whole-of-government vision are also seen as critical elements to its success.

Why is integrated service delivery so hard, and what are the key lessons that can be extracted from reviewing the literature? The problem lies not with the technology but in the political challenge of re-wiring a range of public sector programmes delivered by different levels of government – often with different qualification requirements – for the people. Adding to the complexity is the fact that an increasing number of these services are delivered on behalf of a government by a network of private and non-profit organizations with a common mission such as reducing poverty, improving education or helping teens find jobs.

The network model for service delivery has evolved because traditional hierarchical government has failed to figure out how individual agencies can interconnect and deliver services that successfully deal with the complex and tough social and economic challenges facing societies. For some, networked service delivery avoids the inefficiencies inherent in earlier efforts to reorganize government agencies into single large units. Instead, it focuses on engaging existing agencies in joint problem solving without realignment of formal authorities.²¹

The key lessons that can be drawn from the preceding analysis are:

- *On strategy:* It is essential to begin with a strategic framework. That involves defining the framework for the whole-of-government, basic roles of the public as well as the private sector, and strategic decisions to be taken, as well as identifying constraints to be considered for realizing and implementing a one-stop government.
- *On leadership, commitment and vision:* If effective one-stop government is to materialize in any shape or form, public officials must have a long-term coherent vision that identifies, articulates and advocates the benefits of a one-stop government programme. They must also be aware of potential resistance to change, which is always inherent in projects like one-stop government. Since tradition is deeply rooted in public administration, leaders must address

Despite widespread support for whole-of-government, there remain major problems in overcoming departmental silos, reducing fragmentation and enhancing coordination.

and explain what the one-stop government portal is, inviting the opinion of personnel in the process and emphasizing the importance of continuous communication while developing and implementing the project. Leaders must also provide all necessary resources to personnel to carry out their work effectively, while training them in an adequate and continuous way during the whole process.

There are many examples illustrating that in the search for appropriate institutional arrangements for implementing whole-of-government for sustainable development, whether supported by ICT or not, there is a need to emphasize collaboration, partnerships, mainstreaming, and inter-agency or inter-departmental coordination across the whole spectrum of governance. This includes collaboration and partnership with private sector and civil society organizations.

- *On funding:* Governments fund their e-government programmes in a variety of ways: financing through a general fund, user fees, and public-private partnerships. When good economic conditions prevail, tax revenues can be an effective way to pay for a one-stop government portal. When economic hardship prevails however, spending on e-government and one-stop portals becomes more difficult as it must compete with spending for education, health care, and other social welfare concerns. Therefore, it may make sense to embark on ambitious one-stop portals during economic boom times.
- *On systems transformation:* The objective of one-stop government should be to focus on the depth of services, integrating them as deeply as possible, especially those frequently in high demand. The breadth of services should be the next focus. Such an undertaking implies developing seamless links from the front to the back office.

An e-government system may have both centralized and decentralized processes for implementing and executing e-government goals for the people. Neither system guarantees the success of these goals while each has its advantages and disadvantages. Centralized administrative systems allow IT requests to

be filtered through one agency, reducing the variation and duplication of e-government systems. Decentralized e-government systems allow individual agencies more control over e-government administration and content. Agencies can choose which firms to use when they outsource e-services.

The argument can also be made that decentralized information provision is more accurate because it is as close to the source as possible. Decentralized systems can provide agencies with a sense of ownership that can encourage better site management and design.²² The decision to develop a centralized or decentralized e-government system depends on the economic and political circumstances within a government and the objectives stated in its e-government strategy. In either case, there needs to be smooth cooperation among government authorities (central government, local government and other administration bodies).

- *On sustainability and efficiency:* A study on the strategies of the European Union plus 21 other countries showed that the most prominent strategic objectives that appear among e-government strategies are: enhancement of public sector capacity for better services; networked government; efficiency; simpler procedures to boost business participation; business facilitation; simplification of life; increasing public value; and human capacity building, respectively.²³ One of the study's most striking findings is that the most frequent guiding principle is to always consider efficiency while devising solutions. The second most prevalent guiding principle is to design e-government in such a way as to allow greater participation from the constituents. Clearly, this is a social requirement that also calls for government to become more responsive and considerate vis-à-vis users of its services. A responsive government aims at offering better services. To achieve this, internal efficiency also needs to be attained. The third most important guiding principle for e-government is to achieve universal access, while the fourth was found to be user-centricity. All of these four goals, in turn, feed directly into making sustainable development citizen-centric and participatory.

It is important to note that creating a one-stop portal is a great step forward towards establishment of a one-stop-shop. However, the portal per se does not guarantee such an outcome. That requires connecting all the e-government systems so that no matter where the user starts his/her quest, he/she will always be pointed to the desired service.²⁴ This clearly needs collaboration among all government units. Internal efficiencies and government networking are therefore needed to make systems sustainable.

Herein lies perhaps the biggest conundrum facing whole-of-government approaches. While whole-of-government approaches and the technological benefits to be derived thereof require cooperation across the boundaries that separate one agency from another, and the government from the private sector, sustaining cooperation among diverse entities is almost always difficult if not a Herculean task. However, given the substantial benefits for both governments and citizens that can result, many governments are finding it well worth the effort. 