Chapter 6

Making Government Mobile

Siddhartha Raja and Samia Melhem with Matthew Cruse, Joshua Goldstein, Katherine Maher, Michael Minges, and Priya Surya

Governments around the world, in varying stages of economic development and with diverse technological and institutional capacities, are adopting or investigating mobile government (mGovernment). Several examples of how civil society, the private sector, and entrepreneurs are delivering service improvements using mobile tools have been discussed in chapters 2–5. This chapter focuses on how mobile tools are helping governments to deliver public services more widely and to improve processes of governance.

Yet, the mere introduction of mobile tools cannot serve as a panacea for structural deficiencies in governments' capacities or processes. Initial experiences suggest that the benefits of mGovernment will likely accrue to those governments that put in place policies and programs that not only enable technological transformation but also promote needed institutional reforms and process redesign. The increased demand for services and governance stimulated by this technological transformation will require an increased capacity to supply those services and improve governance. Recognizing the rapid evolution of the field, this chapter identifies some emerging best practice policies and programs that could support the technological transformation and needed institutional capacity development to unlock the benefits of mGovernment.

A typology of mGovernment

Mobile government involves using mobile tools to change either the interactions between users and government or the processes of government. In 2012 tools in use include mobile networks (such as broadband, Wi-Fi, and voice-centric), mobile devices (tablets, smartphones, featurephones), their associated technologies (voice calling, SMS text messaging, location detection, internet access), and software in the form of network services and applications.

Mobile government matters because it has the potential to liberate users from the physical or location-related constraints inherent in conventional service delivery and traditional electronic government (eGovernment) services. With more than 6 billion mobile telephone subscriptions worldwide in early 2012, and more than four-fifths of the world's population covered by mobile telephone networks, mGovernment can make public services and processes available and accessible just about anywhere, at anytime, to almost anyone.

Table 6.1 summarizes three forms of mGovernment. Typically, governments adopt a combination of these three types to achieve their service delivery and governance objectives, and in so doing, provide accountability, transparency, and responsiveness to their citizens. First, mobile tools can be used to *supplement* existing eGovernment applications

Table 6.1 Three types of mGovernment

mGovernment	Supplement	Expand	Innovate
Definition	Mobile tools add a channel to existing eGovernment services and processes.	Mobile tools allow conventional services to reach previously un- or underserved constituents.	Mobile tools are used to develop new services for service delivery and governance.
Example	The Republic of Korea with widespread e-Government, has added wireless portals and interfaces to e-services (such as transport tickets, renewals, confirmations).[a]	Bangladesh's Health Line provides citizens with medical advice through a telephone hotline, cutting travel time and waiting at health centers.[b]	In the Democratic Republic of Congo, mobile tools allow citizens to participate in budgeting, by voting on how to spend local budgets.[c]
Opportunities	Mobile devices, which are more widespread than traditional computers, connect more citizens to existing e-services.	Widespread mobile tools allow conventional services to reach previously excluded citizens including the poor, rural populations, and people with disabilities.	Combined innovation in technology and government processes creates new opportunities for citizens to engage with and hold government accountable.
Limitations	Full advantage is not taken of unique capabilities of mobile tools (such as location determination, built-in cameras); limited to existing eGovernment services.	Benefits are limited by the design and nature of the conventional service and institution; do not necessarily improve the government-citizen relationship.	Extent of innovation depends on local political, economic, and capacity constraints; might need more time to deploy.
Implications for government	Marginal: related to being able to provide any related "physical" service at the needed location and time.	Moderate to significant: government capacity needs to grow to serve more citizens; may need process re-engineer-	Significant: needs changes to government processes, creating response capacity.

a. http://www.futuregov.asia/articles/2011/mar/21/korean-city-opens-mobile-app-centre/.

b. http://healthmarketinnovations.org/program/healthline-bangladesh.

c. http://wbi.worldbank.org/wbi/news/2012/02/17/mobile-enhanced-participatory-budgeting-drc.

based on traditional personal computers (PCs), adding a new channel to reach citizens or manage processes of governance. Supplementary mGovernment adds the dimension of mobility to existing electronic services.

Second, mobile tools can *expand* the reach of conventional public services or government processes to citizens who are unserved or underserved, often because of their remote location or the nonavailability of PCs and internet access. Broad mobile coverage and widespread access to and familiarity with mobile telephones, give governments the opportunity to reach people who might not otherwise have easy access to these public services and processes. These two types—supplementary and expansionary—are also instrumental, focusing more on the "mobile" in mGovernment.

Third, mGovernment can use the introduction of mobile tools to *innovate* new ways for governments to interact with and involve constituents, creating new types of services and governance processes. Innovative mGovernment programs intend to change not only the technology of interaction but also the nature of service delivery or the process. For example,

they allow participatory budgeting[1] and community mapping of infrastructure and services.[2] Experiments in mobile-enabled mapping by urban slum dwellers, for example, suggest that innovative mGovernment could actually transform governments' design process for urban development programs by directly involving beneficiaries.[3] Possibilities like these have profound implications for innovative mGovernment.

Although the specific form of a service will vary depending on the availability or advancement of technology, governments could use these different types of mobile services regardless of the technical base or socioeconomic status. In the case of transformative mGovernment, for example, applications using smartphones or basic devices can allow citizens to report nonemergency municipal problems, track responsiveness, and participate in virtual social spaces to put pressure on municipalities to address community issues.[4]

There are some limits on what might be possible to accomplish on a mobile device with a smaller screen or less powerful computing capability than a traditional personal computer has; more traditional eGovernment services will

thus continue to have an important role. Both the design of mobile devices as well as their (and networks') capabilities are constantly evolving, however, and the future might see more powerful mGovernment services working alongside, or as replacements for, traditional eGovernment services. Governments will thus need to consider carefully which services can make the transition to mobile, weighing the capabilities of both users and technologies in the process.

Drivers for mGovernment

Why have local, provincial, and national governments and public agencies around the world become interested in mGovernment? Experience thus far suggests that two sets of factors are driving governments to look at mGovernment: global developments that create the environment for governments to consider mobile tools, and the opportunity mGovernment offers to governments seeking to improve service delivery and promote good governance.

Global developments

Three sets of global developments are creating an environment in which mGovernment has become relevant. These are the creation of the underlying technology base in the form of mobile networks and devices, deepening innovation in mobile applications and services, and shifts in the ability of citizens to voice their demands using these technologies combined with increasing pressure on governments to respond to those demands.

First, as chapter 1 shows, mobile networks are spreading even as devices become ever more capable. Mobile networks now have the capacity to deliver a mix of voice, audio-visual, and data services, creating an opportunity for governments to reach more citizens and offer new services through other than conventional means. And while the vast majority of the world's population now uses basic mobile telephones, more powerful mobile devices such as smartphones and tablets are being increasingly adopted (Hellstrom 2008).

Second, as illustrated in chapters 2–5, there is tremendous growth in innovation in the development of applications and services that use mobile technologies. While initial innovation focused on commercial and entertainment applications, more recently there has been a rapid increase in innovative mobile applications and services for social or economic development (Qiang et al. 2012a, b). A growing list of individuals, cooperatives, not-for-profit and nongovernmental organizations, private firms, and public agencies are experimenting with and using mobile applications and services in interesting ways (OECD and ITU 2011; UNDP 2012). As the frontier of innovation begins to touch many public services, it often compels or encourages governments to experiment with these technologies.

Third, individuals have begun to harness these technologies and applications to voice their demands, mobilize communities, and engage with various levels of governments (box 6.1). Even if the results of such efforts vary,[5] combined with ongoing global political and economic transformations in recent years, this voiced demand for responsive services and good governance by citizens through alternative means has increased pressure on some governments to respond.

Because these developments affect different governments in different ways, the speed with which governments adopt mobile tools is certain to vary. Yet, as the subsequent examples illustrate, few governments at any level anywhere in the world are not interested in going mobile (OECD and ITU 2011, 119–50).

The opportunity of mGovernment

In comparison with the growing volume of evidence on the benefits of eGovernment (*info*Dev 2009; Hanna 2010), the impact of many mGovernment services is still unknown. Even without clear evidence of the benefits, many governments nonetheless have begun to explore the possibility of mGovernment if only in low-risk or limited ways. A small number of governments are undertaking major efforts to mainstream mobile tools in service delivery and governance. This section describes some of the more sector- or function-specific examples first, beginning with a discussion of citizen-facing examples and following with examples of internal process-oriented tools. It then discusses broader and, in some cases, government-wide initiatives.

Sector- or function-specific programs. There are many examples of sector- or function-specific mGovernment programs. The simplest ones use mobile tools as a means for government to reach citizens to provide information or simple services or to coordinate internal processes.

Common examples are emergency notifications for adverse weather events or for changes to water or energy supplies. Moldova's Ministry of Agriculture and Food Industries is working with a local agriculture cooperative to pilot

Mobile devices, especially mobile telephones, have become important tools for citizens to express their opinions, mobilize groups, and report on events as they unfold (UNDP 2012). Although mobile telephones and associated applications cannot substitute for community mobilization and democratic processes, they can and have played a role in organizing citizens, especially through social media such as Facebook and Twitter (Brisson and Krontiris 2012).

Perhaps the best-known example is the Ushahidi platform, which emerged in Kenya in response to the violence that erupted after the 2007 election. Ushahidi has now become an open source platform that anyone may use to create an incident-reporting system, by crowdsourcing information using multiple channels such as SMS, email, Twitter, and the web. The information is used to create a map of events to give users a visual image of event hotspots. It has been applied in circumstances as diverse as election monitoring, disaster recovery, and crime reporting.

More recently, feature- and smartphones have been used widely in the ongoing political changes in the Middle East. Citizens have collected and disseminated information during recent events in Egypt, for example, through mobile-based tools including SMS, and for users with more sophisticated devices, through Twitter and YouTube (see chapter 1).

Box figure 6.1.1 Screenshot of the original Ushahidi mash-up
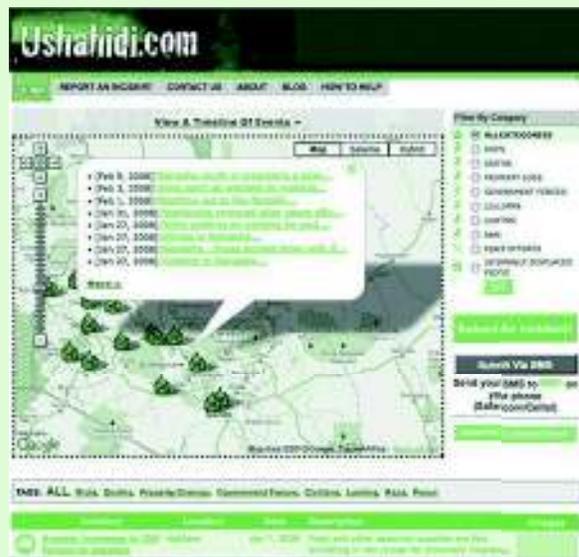
Sources: Stauffacher, Hattotuwa, and Weekes 2012; http://ushahidi.com/about-us; UNDP 2012.

an adverse weather alert service for farmers.[6] Similar examples come from Malaysia and the United States, where SMS is used to alert citizens about limited drinking water supplies or energy blackouts (OECD and ITU 2011). A number of educational systems use SMS to provide students with examination results. The state of Kerala in India has used SMS to send students examination results on request since 2010, reducing the need to wait in queues.[7]

Mobile tools have also shown potential in cutting out intermediaries while improving broader economic outcomes. In Bangladesh, sugarcane farmers now receive an SMS telling them when they should bring their product to sugar mills. In the conventional system, a paper notification might either be misplaced or misdirected by rent-seeking intermediaries. After a successful trial, this system, e-Purjee, was extended to about 200,000 farmers and all 15 of the country's state-owned sugarcane mills, and a feature was added alerting farmers when their payment was ready. Sugar production rose 62 percent following the introduction of e-Purjee, and farmers are benefiting from a more transparent system.[8]

Integration with mobile-based payment systems offers consumers of public resources the opportunity to pay for services anytime and any where and also simplifies revenue collection for governments. Many cities in Europe and the

United States have integrated payment for parking or transport services into mobile applications. In Bangladesh students can also apply for their university entrance examinations through SMS, reducing the need for them to travel to the university to submit an application. Fees are deducted from the applicant's mobile phone account. Following a successful pilot, 28 postsecondary educational institutions implemented the system in 2010.[9] Qatar's Hukoomi service allows citizens to access and pay for a range of services through their smartphone or computer, including utility bills and parking or traffic fines.[10] Complaint reporting through mobile-based SMS has also been expanding throughout the world.

Mobile government efforts have made use of mobile's potential for wider citizen engagement and participation to strengthen accountability and transparency in public services and processes. These efforts are typically innovative, because they often change the delivery or management of a conventional service or process. For instance, the Department of Education in the Philippines worked with the Affiliated Network for Social Accountability in East Asia and the Pacific to set up a website called checkmyschool.org. This is a government-to-citizen online and mobile-based interactive tool that allows citizens to view pertinent statistics on local schools. The site includes budget allocations, teacher and textbook information, and test scores for about one-fifth of the 44,000 schools in the country. It also gives local teachers and parents a public place to post areas of concern that they feel need to be addressed. All users are able to view the government's responses to these posts. Seeking to improve education service delivery through transparent and accountable behavior by school staff, checkmyschool.org has increased community participation and vigilance and improved teacher behavior.[11]

Municipalities and local police departments have begun to use mobile tools to innovate and encourage citizen participation in incident and issue reporting and tracking. Guerrero, Mexico, was able to cut response times to citizen complaints from 72 hours to 24 hours using Citivox.[12] This service provides real-time report management, crowdsourcing reports from people using mobile telephones to register complaints or opinions on everything from simple municipal issues to violent crimes. Follow-up by public agencies has led to wider citizen participation in the service.[13] Similarly, cities across the United States are saving time and money with SeeClickFix, a citizen-reporting tool that allows people to geo-tag nonemergency municipal issues, such as potholes or graffiti, with their mobile phones.[14] With more than 57,000 incidents reported and a 45 percent fix rate between January and October 2010 across multiple cities, this application shows promise for efficient and streamlined citizen-government interactions.

Public agencies are also using mobile tools to support internal functions and to improve resource and program management. For example, electricity companies are beginning to use mobile networks to get real-time consumption data from wireless-equipped smart meters.[15] This will allow electricity networks and consumers to be better informed about consumption patterns, enabling new tariff models.

Governments are beginning to use mobile tools to manage resources more efficiently. Liberia's water resource management plan seeks to improve access to the half of the rural population that does not have access to potable water. The public works ministry deployed 150 data collectors to map all of its roughly 7,500 publicly accessible water points with a mobile geo-tagging and monitoring tool called FLOW (Field Level Operations Watch). The process gave the ministry a visualization of the status of water points, allowing an updated needs assessment and leading to more effective resource allocation.[16]

The possibility of using location sensing, either through global positioning systems (GPS) embedded in devices or by using mobile networks, has also created new service possibilities. In the city of Cebu, in the Philippines, taxi drivers are using GPS-enabled mobile phones to receive traffic data and dispatch information. The data is used to generate maps in real-time that identify areas with traffic congestion and to generate traffic volume estimates.[17]

Cities are also using mobile devices to monitor the status of ongoing programs. Auckland, New Zealand, piloted a project with Municipal Reporter, a GPS-based handheld system that allows the city to monitor its employees and resources. The handheld monitors are saving the city more than over 30 person-hours a week on highway maintenance work. Auckland is currently in the process of shifting all maintenance management to a GPS-based system. Such tools also can help monitor programs in difficult security or climatic conditions. For example, similar technologies, using GPS-enabled smartphones, have been used in Afghanistan to monitor the quality and progress of road construction.[18]

It is also possible to embed unique identifiers in physical objects that mobile phones can recognize (Gartner 2011). Such tools can allow citizens, for instance, to report a broken streetlamp or park bench; officials can then use the same technology to monitor repairs.

Civil society or international agencies have also used platforms to support government service delivery by improving efficiency and reducing waste. For example, UNICEF created a mobile-based data collection tool called Rapid SMS (see box 3.2 in chapter 3).[19] In Hong Kong SAR, China, the Mobile Field Inspection System enables inspectors to use touch-screen PDAs (personal digital assistants) to enter inspection information at the scene, as well as to review the results of past inspections. Inspectors can send their reports through their mobile phones without going to the office. The PDAs were designed for easy use to shorten the training time. Some of the benefits include an approximate 10 percent increase in productivity, a 1.5-hour daily timesaving per inspection team, and elimination of duplicate work.[20]

The wide range of countries and sectors covered in this short list of examples is evidence of the growing interest in and use of mobile tools by governments at different levels and in varying stages of economic development. These examples also display a range of implementation arrangements. In some cases, such as with FLOW in Liberia, projects have been initiated by single agencies. In other cases, multiple partners come together to deploy the tool and respond to citizens' demands. An example is SeeClickFix, where the responsibility of complaint registration, traditionally a government function, is shared between a private organization and the city municipality. Governments adopt these services because they involve and engage citizens in incident and problem reporting through a third party, building trust and credibility. At the same time, such services also build pressure on governments to perform, opening government processes to public scrutiny.

Government-wide initiatives. Apart from the many initiatives coming through bottom-up efforts, a few governments have also begun mainstreaming mGovernment in a larger and more coordinated way, taking a top-down approach in some cases. Some governments, such as that of the state of Kerala in India (box 6.2), have started on such coordination relatively early; others such as the Republic of Korea have evolved to realize the need for such coordination (box 6.3).

Such government-wide initiatives span the range from having an overall mGovernment strategy for mobile services to creating facilities for multiple government agencies to use to deploy services. Countries as diverse as Afghanistan, India,[21] and the United States[22] have been developing mobile-specific strategies that address issues such as how to align activities across agencies, encourage innovation within an overall technical or process framework, and support the development and delivery of services. Other countries have incorporated mobility in their overall ICT strategies. For example, Singapore's government has already deployed more than 300 mGovernment services and has plans, as part of the Singapore eGovernment master plan to create "more feature-rich and innovative mobile services" between 2011 and 2015.[23] Similarly, the U.K. government has identified mobile technologies as an area for attention in its Government ICT Strategy of 2011.[24]

Some governments have also begun to create shared facilities that may be used by multiple agencies. These facilities are similar to those run by private firms that offer news, entertainment, or information services. A number of governments have developed shared services platforms that give citizens access through a common entry point to a range of services. Such platforms allow costs to be shared across multiple agencies, consolidate demand for telecommunications services, and focus human capacity. The governments of Jordan[25] and of the state of Kerala in India (see box 6.2), for example, have implemented shared services platforms that deliver a wide range of SMS, interactive voice response (IVR), or simple text-data services that citizens access using a short code. Among the less developed countries, the government of Afghanistan is also planning to set up a government-wide mobile services delivery platform, which will allow government services to reach the half of all Afghan households that have mobile phones; for many the phone would become the first medium for regular interaction with the government.[26]

In countries where smartphones are common, governments have begun to create points of entry such as mobile sites (the United Kingdom's direct.gov, for example[27]) or even government "app stores." Such facilities allow citizens easy discovery, access, and use of mGovernment applications. In 2010 the U.S. government created such an app store with the intention of making it easy for citizens to access information and services using their smartphones.[28]

Box 6.2 Kerala's mobile government program

The southern Indian state of Kerala has a population of 33 million. Leveraging the wide use of mobile telephones, the Kerala State IT Mission (KSITM) leads a province-level mGovernment program. The objective was to allow equitable access and enable social impact by reaching people with mobile devices, rather than only those who are able to afford and access computer-based internet services.

The centerpiece in Kerala's m-Government architecture is a common service delivery platform (SDP) that integrates various channels such as voice, data, and SMS. The KSITM manages the SDP, supervising a private firm, MobMe, which set up the SDP. All government departments can access the SDP to enable the cost-effective design, development, and deployment of various mGovernment applications. This arrangement avoids duplication of effort and cuts capital spending on stand-alone systems. By integrating with all telecommunication companies, the SDP eliminates the need for individual coordination by government agencies. The KSITM also provides technical assistance to public departments to design and launch mobile applications.

Services include a common "short code" for the government (citizens dial KERALA or 537252 to access services). The service has created an additional incentive for the government to offer services relevant to consumers, including citizen voting on a social reality show where village governments present their successes, posting scores for major exams, and processing movie and bus ticket reservations. The KSITM has also set up an electronic SMS (eSMS) gateway for various government departments to communicate throughout their own units and departments and across institutions. An interactive voice response system supports government customer service call centers and was used to conduct an energy availability survey. A Mobile Crime and Accident Reporting Platform has been used by Keralan police to enhance public safety and law and order. Now, the state is looking to adopt a mobile payments platform, so citizens can pay government fees from their handsets. The state continues to improve and scale up initial mobile applications, such as multimedia messaging service-based accident and crime reporting.

Since its launch in December 2010, the program has involved more than 60 government agencies, facilitated more than 3 million interactions between the government and citizens, deployed at least 20 mGovernment applications, and captured some 200,000 photos for crime and accident reporting purposes. As the KSITM sees it, this is a start to shifting government-citizen interactions from "red tape" to a "red carpet."

Yet, the state faces various challenges in using mobile technology to create transformative change. Successful applications for citizen participatory monitoring and reporting remain elusive. Other key challenges are the low resource and process capacity of public agencies, which limit the ability of the state to respond or improve its accountability.

Having such coordinated and broader approaches to mGovernment does not mean that governments should or will need to stop bottom-up or innovative application development. Governments will need to encourage quick deployment of innovative applications when the demand arises. Moreover, as the U.S. government's draft federal mobile strategy indicates, one size does not fit all, and there will be a need to accommodate agency-specific programs. Such coordination should enable innovation by guiding the choice of technical standards and providing facilities where needed.

Challenges for governments

Two key challenges for governments seeking to implement mGovernment are to enable the technology transformation and to respond increased demand for services and good governance.

Enabling the technology transformation

Governments that are interested in mGovernment will need to ensure that mobile tools are widely available to citizens, that public agencies are ready and able to adopt these technologies, and that the ecosystem of applications and services developers is in place to deliver needed services.

Simple mobile telephones are now commonplace across the world, and mobile networks are widespread. However, governments will need to ensure that the populations or geographies they wish to target are adequately covered. This issue is especially important if technology choices are more sophisticated—using feature- or smartphones, for example—because mismatches could keep citizens from accessing public services.

Public agencies will also need to have the ability to adopt these technologies. In many countries, that is likely to involve closing gaps in technological or human capacity, ensuring financial sustainability, and overcoming political or bureaucratic resistance. These considerations are similar to those seen for eGovernment services in the past, and indeed, such factors limited the adoption of many of those programs and reduced their long-term impact.

Many developing country governments are not in a position to carry out mobile applications development on their own, so it will be critical for them to work with partners in the private or nonprofit sector. In some cases, countries have local technology companies that could develop and even manage mGovernment applications. Many governments might face a shortage of talent in applications development, however, or might not easily find willing partners. Such constraints might slow down mGovernment efforts or increase costs if nonlocal resources have to be called upon.

Creating institutional capacity

Even if mGovernment gains widespread acceptance, concerns remain about the increased demand for responsive services and good governance. It is thus important to match technological progress with increases in institutional capacity and, depending on the scale of change, possibly to restructure government. Institutional capacity is a greater issue with mGovernment than eGovernment because of the wider reach of mobile tools and consequently the larger number of citizens that likely would use such tools.

True transformation needs governments to pay close attention to re-engineering processes, reforming institutions, and creating an environment for greater accountability and transparency. Such major shifts often need significant political leadership and capital to implement, and they inevitably take time. At the very least, governments should have the institutional capacity in place to respond to citizen demands because the move to mobile exponentially increases the capacity for citizens to demand services and good governance.

As Ben Berkowitz, the co-founder of SeeClickFix, explains, "The most important part of the process is the 'fix.' Without that, the incentive for participation disappears."[29] Echoing a similar sentiment, Lishoy Bhaskar, vice president at MobMe—the implementer of the Kerala shared service delivery platform—finds that many government officials in the developing world understand the benefits of mGovernment but often hesitate to implement it because "there is no one to fix the potholes even if they are reported."[30]

The risk in not responding is that citizens will quickly lose trust and interest in participating in mGovernment programs. This risk extends not only to those programs that propose to make governance transparent and accountable but also to those where technologies are supposed to improve service quality by reducing wait times or simplifying processes. If a government is unable to follow up on the expansion of service—for example, by being unable to serve the increased number of patients that show up at health clinics because of better information on medical conditions—it risks losing credibility.

Emerging best practices for going mobile

How might governments respond to the challenges inherent in going mobile? Emerging best practices—summarized in this section and in table 6.2—suggest a range of actions governments could take to boost technological take-up and improve institutional capacity.

Enabling a sustainable technological transformation

Create a strategy for mGovernment. A holistic mGovernment strategy or strategic framework can help governments identify gaps in technology and human capacity, in financial sustainability, and in the applications development ecosystem. It can also help raise the profile of mGovernment, potentially leading to high-level political support. And mGovernment programs should be aligned with broader national development programs and strategies.[31] Such a strategy could also define needed technology, service, and data standards; identify common facilities and resources to be developed within the government; and look for opportunities for partnering with civil society, the private sector, and entrepreneurs. The strategy could also define ways to make these programs financially sustainable. It will be important, however, to avoid restricting innovation and flexibility. Furthermore, coordination should not imply that some types of sector- or function-specific systems should never exist independently; some services (such as in health or education) will have specific needs and might be justifiably separate in their implementation.

Enable innovation. Much of the development in mobile applications and services worldwide has come from innovation by nongovernment agencies. Governments are often late adopters of this technology. Hence, there is much to gain from allowing such innovation to continue, with governments encouraging innovation and working with partners such as mobile networks, applications

Table 6.2 Policies and programs to promote mGovernment		
	Enabling a sustainable technological transformation	Strengthening institutional capacity to respond
Policies	• Create a strategy for mGovernment • Enable innovation • Make mobile technology accessible and affordable • Enable mobile payments • Define standards for technologies and content	• Enable shared responsibility in service delivery • Promote efficiencies in resource allocation and management and in processes • Build trust
Programs	• Create shared facilities • Support content creation and use in local languages • Mobilize and train users • Support public-private partnerships	• Train government officials on strategic uses of mGovernment • Incentivize testing through iterative processes, user-centric design, and risk-reduced innovation programs

developers, and civil society organizations to design and pilot applications. At the least, interested agencies within government should be encouraged to move swiftly toward implementing "quick wins" that demonstrate the validity of the approach and hence secure greater support among other participants. Definition of technology standards and opening of government facilities (such as data centers or data sets) will help direct such innovation and avoid undesirable fragmentation of systems. Governments could also partner with universities and mobile networks to develop skills among potential mobile application developers.

Make mobile technology accessible and affordable. Governments will need to promote universal access and service for specific user groups where mobile networks have yet to reach, especially because these groups also tend to be the unserved for regular government services. Efforts should also focus on improving the affordability of devices and services. Some countries may be able to reduce the price of devices by cutting excessive taxes, duties, or levies. Service prices might be reduced by consolidating demand across government, for example, through purchases of bulk SMS or IVR minutes. The reader is directed to chapter 7 on this topic (see also Kelly and Rossotto 2012; Muente-Kunigami and Navas-Sabater 2010).

Enable mobile payments. Many government transactions involve the transfer of money to citizens or payment of fees by citizens. Enabling mobile payments will allow citizens to make and receive payments securely, even if they do not have bank accounts or cannot securely carry cash, and will encourage them to use mobile-based services. The reader is directed to chapter 5 for further discussion.

Adopt standards for technologies and content. Governments can help to enable innovation by adopting standards for technologies and content. For example, the Open 311 framework is a protocol developed by a combination of government and civil society organizations and adopted by municipalities for location-based collaborative issue tracking.[32] Adopting Open 311 could help standardize complaint or issue management applications across government, making them interoperable. Such standards could also extend to how government agencies open and share the

information and data they produce. Such information, when digitized and openly available, could facilitate the creation of mGovernment services (box 6.4).

Create shared facilities. Some governments, such as those in Kerala state and Jordan, are creating shared facilities to develop, deploy, operate, and manage mGovernment services. For citizens, such common facilities would make access simpler and more organized by enabling "single windows" (Hellstrom 2008). For the government, these resources include the hardware and software needed to run applications as well as the communication services to connect with users through mobile telecommunications networks (such as text messages, voice minutes, data services). These facilities could also include commonly used tools to simplify development and deployment of mGovernment services (such as survey tools, peer-to-peer communication tools, short codes). Such shared facilities for mGovernment could also link with efforts to create government cloud-computing facilities.[33]

Support content creation and use in local languages. As with any technology, cultural context, user capability, and local relevance will drive adoption and success. Ensuring that mGovernment services remain focused on beneficiaries is important, especially in the case of service delivery or information provision. Governments will need to engage with a wide range of stakeholders—technologists, communities, users, intermediaries, and public service providers— to design and develop demand driven and user-centric applications and services. Updated content will have to be created or kept in local languages, and the content and the application will need to fit the needs and ICT literacy levels of users.

Mobilize and train users. Users beyond early adopters need to understand the benefits of using mGovernment services. Community-level intermediaries can play a vital role in educating users and driving adoption of applications. Critically, however, evidence of government responsiveness and improved service delivery and governance will be the most effective means to attract citizens to this platform.

Encourage public-private partnerships to support mGovernment. Both private and public sector efforts will

Governments are beginning to open public data sets and make them accessible to the public and civil society. With mobile telephones being more widespread than PCs, it is not surprising to see more open data being made available on mobile platforms with interesting consequences.

In July 2011 Kenya became one of the first African countries to launch an open data initiative, making some 160 government datasets open to the public, with more on the way (www.opendata.go.ke). The aim was to lead to a more responsive and citizen focused-government. Among the initial data sets that were uploaded are poverty surveys by district, budget by government department, and plans for future changes in electoral districts and health facilities. A beta site was launched in June 2009 and the public site a year later.

But in Kenya, as in many other developing nations, mobile ownership far exceeds PC ownership, so to increase transparency and widen access, facilitating mobile access to the data is an important goal. Kenya's experience with Ushahidi (see box 6.1) created a local precedent for this. To support the development of mobile applications that would open up the government data, the Kenya ICT Board launched the Tandaa Digital Content Grant, offering up to 30 awards totaling $1.5 million. An early success came when exam results were made available on mobile phones.

Providing data to citizens, civil society, and entrepreneurs will support their ability to engage with the government and help develop new ideas and services. As such, open data is part of making the government a platform on which stakeholders and constituents can engage, interact, and create.

Box figure 6.4.1 Screenshot from Open Data Kenya website, showing poverty and pupils per teacher
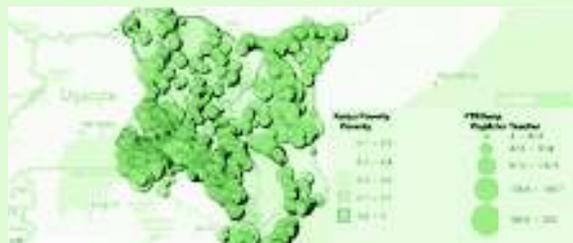
Source: Adapted from Rahemtulla et al. 2011.

complement and strengthen each other. Initially, the private sector will focus on commercially viable applications including media and infotainment, mCommerce, and advertising- or subscription-based information services. With the right incentives and given the opportunity, private entities can supplement state technological capacity and create and deploy applications that serve public needs or support program management. The examples of Kerala (see box 6.2), where the IT Mission has contracted with a private company, and of SeeClickFix, a private group working with municipalities, suggest such new possibilities. Such partnerships could also help close technological or human capacity gaps, with private firms taking on the

responsibility of managing the technology and sharing some of the financial or political risks.

Strengthening the institutional capacity to respond
Enable shared responsibility in service delivery. A key consideration is how the nature of service delivery will change as technology and its use evolves. It is difficult to predict the extent of transformation in services. However, governments can begin to prepare by looking for ways to share responsibility, which can also create the possibility of increasing capacity. Three options exist: governments could transfer responsibility for service delivery to the private sector or civil society, share responsibility for serving citizen

demands with other actors, or continue to supply improved or enhanced services but with the help of private and civil society actors. These models can exist side by side. For example, many countries have transferred responsibility for infrastructure construction and operation (roads, power, telecommunications) to the private sector while retaining or sharing responsibility in others areas such as education or health services. In any case, governments will need to consider how the re-engineering of processes could open new models for service delivery and remove any unneeded legal or regulatory impediments to transferring or sharing responsibility where such models are valuable.

Promote efficiencies in processes and in resource allocation and management. Governments can encourage the use of mGovernment tools by creating opportunities for greater efficiencies within existing workflows and processes. In an analogous example, the government of Bhutan encouraged civil servants to use electronic communications technology while cutting office stationery budgets.[34] As was the case in Bhutan, adequate training and capacity building will be needed to support the transition to the use of mobile tools.

Build trust. One of the most critical, yet often ignored, aspects in mGovernment is to balance the increased interaction between governments and citizens with the need to ensure privacy and security. There are three aspects to this—the security of private information, avoiding the perception of surveillance, and managing anonymity—which are discussed in box 6.5. Legal and ethical views on privacy vary from government to government and also depend on social context. Yet, in every case, governments must maintain the expected level of trust through a combination of legal and technical actions. Infringements must be dealt with quickly. A related area for consideration is the development of electronic or mobile identification services to protect citizens' identities in their interactions with governments and to prevent data leakage and fraud. The government of Moldova is now developing a system to create a unified way to solve, for any electronic or mobile application, security-related tasks such as identity management, authentication, and transaction authorization.[35]

Train government officials on strategic uses of mGovernment. Governments will need to undertake some capacity-

building programs to develop skills of government officials to understand and use mGovernment tools. In Afghanistan, the Ministry of Communications and IT coordinates government training of chief information officers (CIOs) with targeted mGovernment-related training. It is also creating a team of mGovernment advisors—international experts who could advise on strategic interventions—to support the cadre of CIOs and officials keen to deploy mGovernment tools.

Incentivize testing, user-centric design, and innovation. Governments could consider promoting innovative approaches to applications development and operation through innovation challenges or competitions;[36] set up incubators that provide entrepreneurs within and outside government a physical, social, and intellectual space to develop innovative services; or support national innovation policy programs. A forthcoming Innovation Support Program in Afghanistan explicitly targets the development of products for improved public service delivery and adoption. Governments should also borrow from techniques employed in the private sector for the development and adoption of new technology platforms and services, such as iterative, pilot-based service rollout, and user-centric design to ensure relevance and usability.

Conclusions

The ubiquity of the mobile telephone has created an opportunity for governments around the world to improve service delivery and enhance governance. Mobile tools also create the opportunity for citizens to participate directly and engage with governments like never before. Already, examples from a wide range of countries, provinces, and cities are showing that mGovernment is taking hold and helping supplement, expand, and innovate services and governance.

Mobile government is relatively nascent and the potential of mobile devices continues to evolve, so new ideas are certain to emerge to help make governments mobile. Based on experience thus far, however, governments seeking to go mobile will need to create an enabling environment for technology transformation as well as the institutional capacity to respond to citizen requests for service.

In closing, any government seeking to adopt mobile tools should keep in mind that this process will successfully

As governments find more ways to deliver services using mobile and geo-location technologies, concerns over security and privacy are mounting. If used properly, mGovernment can promote transparency and accountability of service delivery. However, citizens often express concern about the security of their private and confidential information, possible surveillance, and anonymity, among other issues.

It is vital that governments create a legal and technical framework to protect data from corruption or leakage. Without strong protection or the quick resolution of any breach, citizens will be wary of sharing their information with the government, and efforts to connect and interact would quickly be undermined. Internet users already face security problems—for example, so-called "Trojans" or "malware" can compromise personal computers and gather private data from users illegally.

While location- and context-based services offer powerful opportunities, illegal or unwarranted surveillance must also be avoided. Again, citizens need to be assured that installing applications or using services will not compromise their privacy. Governments will need to exercise care in securing their systems and software to avoid any perception of surveillance. For example, the Data Protection Working Party, an independent European Union advisory body on data protection and privacy, has suggested that users of smartphones and other mobile devices give clear and explicit consent and have a clear understanding of how the data will be used, before location data is collected.

Finally, citizens might seek anonymity (or pseudonymity) as they become more vocal to avoid the risk of reprisals due to their views. Governments may need to consider which services require identification and which services (anticorruption hotlines, for example) might be more popular if citizens can remain anonymous when they make a report.

Balancing privacy concerns against the government's need to ensure that it is dealing with legitimate users of the service should not be a barrier to exploring mGovernment. Rather, it should be the catalyst for ongoing conversations regarding the strength of privacy laws and proper auditing alongside the ability to share information.

Source: http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion-recommendation/files/2011/wp185_en.pdf.

transform the government-citizen relationship only when governments enable the transformation of both elements—"mobile" and "government."

Notes

1. "Participatory budgeting" implies citizen involvement in the budgeting and allocation of public resources through direct democracy; see, for instance, http://www.youtube.com/watch?v=hZYm0kEvkAo; http://www.tnpp.org/2011/12/mobile-participatory-budgeting-dr-congo.html.

2. www.mapkibera.org.

3. Initial efforts toward this aim are under way in Dar es Salaam, for example, where citizens are involved in mapping community resources as a first step toward improving resource allocation for urban services. See http://blogs.worldbank.org/ic4d/node/535.

4. See, for example, http://seeclickfix.com/, http://www.fixmystreet.com/, and http://plus1lab.com/about-cityreporter/.

5. See varying opinions and views on the role of social media and ICT in recent political events: http://pitpi.org/index.php/2011/09/11/opening-closed-regimes-what-was-the-role-of-social-media-during-the-arab-spring/; http://www.twq.com/ 11autumn/docs/11autumn_Alterman.pdf; and http://www .time.com/time/world/article/0,8599,2104446,00.html.

6. http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/07/19/000334955_20100719024447/Rendered/PDF/530500PAD0IDA11B01OFFICIAL0USE01091.pdf.

7. http://www.hindu.com/2010/05/02/stories/2010050255260400.htm.

8. http://www.epurjee.info/Implementation.php.

9. http://www.ictdata.org/2011/10/going-digital-in-bangladesh.html.

10. http://www.ictqatar.qa/en/department/national-programs/e-government/hukoomi.

11. www.checkmyschool.org.

12. http://citivox.com/.

13. http://thanassiscambanis.com/sipa/?p=276; http://www.informationactivism.org/en/citivox.

14. http://seeclickfix.com/.

15. http://www.telenor.com/en/news-and-media/press-releases/2011/telenor-to-measure-your-electricity-consumption.

16. http://www.wsp.org/wsp/sites/wsp.org/files/publications/WSP-FLOW-Liberia-QandA.pdf.

17. http://www.citynet-ap.org/images/uploads/resources/Dhaka Nov27.pdf (p. 36).

18. http://aidc.af/aidc/.

19. http://www.rapidsms.org/case-studies/malawi-nutritional-surviellence/.

20. http://www.itu.int/ITU-D/asp/CMS/Events/2011/ict-apps/s1_ITU_souheil.pdf.

21. http://www.mit.gov.in/content/framework-mobile-governance.

22. http://mobility-strategy.ideascale.com/a/pages/draft-outline.

23. http://www.egov.gov.sg/c/document_library/get_file?uuid=4f 9e71be-fe35-432a-9901-ab3279b92342&groupId=10157 (p. 7).

24. http://www.cabinetoffice.gov.uk/content/government-ict-strategy.

25. http://www.jordan.gov.jo/wps/portal/?New_WCM_Context= /wps/wcm/connect/gov/eGov/Home/e-Government+Program /E-Services/Shared+Services/SMS+Gateway.

26. http://documents.worldbank.org/curated/en/2011/03/ 13995882/afghanistan-ict-sector-development-project (pp. 24-25).

27. http://www.direct.gov.uk/en/Hl1/Help/YourQuestions/ DG_069492.

28. http://apps.usa.gov/.

29. Interview with Mr. Berkowitz, June 2011.

30. Interview with Mr. Bhaskar, December 2011.

31. This is also noted in the draft mGovernment strategy outline for the U.S. federal government; see http://mobility-strategy.idea scale.com/a/pages/draft-outline.

32. http://open311.org/learn/.

33. http://www.cloudbook.net/directories/gov-clouds/government-cloud-computing.php.

34. http://www.bhutanobserver.bt/ministries-try-frugal-stationery-use/.

35. http://egov.md/upload/CN-mobile-eID-eGC-June-2011.pdf.

36. http://whatmatters.mckinseydigital.com/innovation/prizes-a-winning-strategy-for-innovation.

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