

Chapter 2

Benefits and outcomes of m-government

Mobile technology is significantly expanding governments' capacity to produce benefits and deliver outcomes for governments, citizens, businesses, and to impact positively national overall economic growth. The most notable progress will be in developing countries which have been historically limited by poor or non-existent communications infrastructure that, in turn, have constrained economic development and social improvements. However, m-government development will also provide countries with more developed e-government and the opportunity to tackle a number of issues - such as those related to the digital-divide - which remain a critical factor in the levels of e-government services take-up which are lower-than-expected in many countries. By enabling the development of a whole new set of G2C, G2G, G2B and G2E applications and services, m-government affords, for instance, a powerful and transformational capacity to extend access to existing services, to expand the delivery of new services, to increase active citizen participation in government operations and to change the way of working within the public sector.

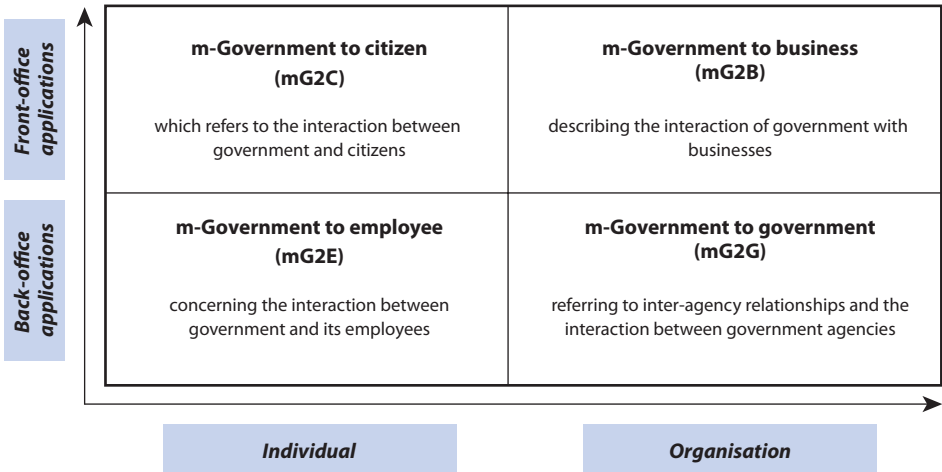
Expanding governments’ capacity

Mobile technology is significantly expanding the capacity of government to deliver citizen- and business-centric services. The most notable progress will be in developing countries, which historically have been limited by poor or non-existent communications infrastructure that, in turn, constrains economic development and social improvements.

However, these developments will also provide countries with more developed e-government and the opportunity to tackle digital-divide-related issues, which remain a critical factor in lower-than-expected levels of m-government services take-up.¹

M-Government affords a powerful and transformational capacity to both extend access to existing services, and expand the delivery of new services – and to increase active citizen participation in government operations, moving beyond the initial concentration of e-government on commerce and e-taxation, and improving internal operations. This will foster civic engagement and transparent democracy, as well as educational advancement and innovative health services. The amalgamation of mobile devices and new media applications – which support quick access to integrated data, location-based services, and empowered citizens from any place at any time – is the cornerstone of the emerging impact of mobile governance. Mobile technologies are enhancing the value of government services: from an electronic wallet

Figure 2.1. Primary delivery models of m-government



Source: Oui-Suk, Uhm (2010), *Introduction of m.Government & IT Convergence Technology*, KAIST Institute for IT Convergence.

card linked to a mobile phone in Bahrain, the United Arab Emirates or the Philippines; to voting, registration or election monitoring in Morocco, Kenya, Estonia and Ukraine; to support of farmers with weather and market price alerts in Malaysia, Uganda, India and China; to co-ordination of real-time location data for emergency response in Turkey, the United States and France.

In general, there are four primary delivery models of m-government:

- government-to-citizens (G2C)
- government-to-government (G2G)
- government-to-business (G2B)
- government-to-employees (G2E)

Mobile applications and services are to a large extent Government-to-Citizens (G2C) services. However, G2G, G2B and G2E m-government services also exist.

Transformational stages of e-government

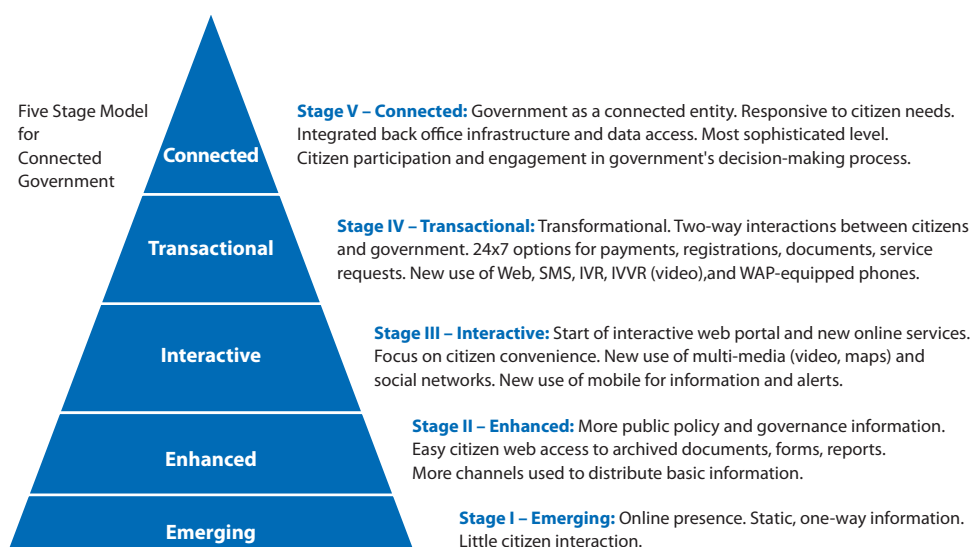
By conducting periodic global e-government surveys and examining the Knowledge Base of E-Government Practices, the United Nations Department of Economic and Social Affairs (DESA) studies the idea of connected governance as the means to achieve maximum cost savings and improve service delivery. The concept of connected government looks towards technology as a strategic tool and an enabler for public service transformation, innovation and productivity growth.

DESA identifies five stages for connected government: (1) emerging, (2) enhanced, (3) interactive, (4) transactional, and (5) connected.² According to DESA definitions, the “emerging” stage includes a basic web presence. The ability to present documents or forms would be more advanced and, therefore, be part of the “enhanced” stage. During this second stage, users are not yet able to interact electronically with the administration. The establishment of interactive portals, websites or mobile applications would be representative of the third, “interactive” stage, while “transactional” relations would be part of DESA’s fourth stage. The final stage of e-government combines vertical and horizontal integration with other capabilities, such as interoperability and the establishment of connections among several stakeholders (government, businesses, academic institutions, NGOs and civil society). E-participation – that is, the involvement of different individuals and groups in forming opinions and the decision-making processes through electronic means – is representative of the final “connected” stage.

As organisations move towards the stage of connected government, they pass through many thresholds in terms of infrastructure development, content delivery, business re-engineering, data management, security and customer management. Each stage, as indicated in Figure 2.2, presents a number of similar challenges; how a government meets those challenges will determine the pace at which it migrates upwards on the pyramid.

The following m-government applications and services show to what extent mobile technologies are a catalyst in assisting governments to transform themselves and move across the transformational stages towards the ultimate goal of connected governance.

Figure 2.2. Stages of connected government



Source: DESA (2010), *E.Government Survey 2010*, United Nations, New York.

G2C applications and services

Government-to-Citizens services enable citizens to interact with government in a way that is responsive to citizen needs and communication preferences. G2C services allow citizens to stay current on government information, ask questions, request services, complete transactions, submit comments, report problems, request emergency assistance and access data.

Once an agency has “emerged” and is at the “enhanced” level of governance, more channels – such as SMS (Short Message Service), IVR (interactive voice response), IVVR (Interactive Voice and Video Response), and WAP-equipped phones – are used to send to and receive from citizens information about topics important to them, ranging from overdue library books and exam results to job vacancies and emergency updates. Included in these new tools for G2C communications is the active use of popular social media, such as Facebook, Twitter, and YouTube.

M-Government G2C services fall into four categories:

- informational and educational services
- interactive services
- transactional services
- governance and citizen engagement

Informational and educational services (Push services)

This type of G2C service involves distributing information to citizens (e.g. related to services, schedules, education, emergencies, regulations and other flat content). The government service is mainly comprised of pushing information through SMS, for example, or making it available on a Web or WAP site. Much of the information is static and there is little interaction with citizens. Most inquiries to government from citizens are for basic service information, and providing push services both enables real-time communications to citizens, and creates cost savings for government.

Services can be related to:

- *general information for citizens (e.g. weather, tourism, recreation, health, public safety, contact information, services, regulations);*
- *specific information (e.g. exchange rates, market rates, exam results, events and programmes, news, road closures, holiday schedules, public hearing/meeting schedules, service or fee changes);*
- *emergency alerts (e.g. severe weather, terrorism, fires, accidents, health risks);*
- *health and safety education (prevention and preparedness);*
- *educational programmes;*
- *notifications (e.g. library book deadlines, security notifications, social media posts, RSS feeds for news and updates).*

Examples:

- An SMS broadcasting system used in Mexico City, Mexico, sends alert messages to citizens in the district regarding meteorological and high-rain risks, low temperatures, potential disasters, and emergency locations, as well as contact numbers.
- Singapore's citizen alert system sends notification for library book deadlines and passport renewals, as well as flight information.
- Australia's broad range of SMS-based services includes alerts of delays in public transport, notification of examination results, availability of parking spaces and alerts on the location of drug-sniffing dogs.
- The bulk of SMS news in Galewela, Sri Lanka, to rural farmers and youth sends timely information about market prices and new seeds and fertilizers, as well as information on vocational education courses, health education and nutrition.
- Denmark's Mobile Alert System provides instructions to citizens via their mobile devices in case of natural disasters, accidents and other emergencies.
- G2C emergency notifications via SMS are utilised in Malaysia for limited drinking water supplies; in England and the United States for flood dangers; in China for typhoon dangers; in the United States for energy black-outs; and in England for terrorist threats.
- The "M4Girls" innovative project – a partnership of the South African Government's Department of Education, Nokia and the non-profit Mindset Network – provides mobile phones loaded with educational material to help students from historically disadvantaged backgrounds improve their proficiency in key subjects like mathematics. The project recognises the active use of mobile phones by young people to access the Internet and network with peers, and is using their preferred channel to expand education.³
- Bridgeit is a pioneering educational programme in Tanzania implemented by the International Youth Foundation and a number of partner agencies, with a USD 2-million grant from the United States Agency for International Development in 2008. The programme is significantly increasing educational quality and student achievement in math, science and life skills through the innovative use of cell phones and digital technology.⁴ Mobile technologies are enabling in-context learning, such as geographically- mapped Wikipedia entries and mobile astronomy to point and identify stars, creating breakthrough learning in a digital age.⁵

- The Republic of Korea provides a disaster information messaging service, via a cell broadcast system (CBS), to mobile phone subscribers located within base stations who receive disaster information messages on impending natural disasters such as typhoons, heavy rain or snow.
- The Republic of Korea provides a national mobile portal service (*m.korea.go.kr*) through which citizens can use the m-government services of each government organisation and receive customised national policy information at once.
- The National Library of the Republic of Korea offers SMS services to users regarding confirmation of overnight book reservations, return requests, confirmation of new book requests, answers to service requests, confirmation of copy and mail requests, confirmation of library field trip applications.

Interactive services

Through interactive G2C services, citizens can engage in dialogue with governments and send inquiries, problems, comments, or service requests to specific agencies. Citizens also can access forms, applications, and databases. In this stage, the interaction becomes more personalised, detailed and targeted to specific citizen interests and service needs, and specific agency divisions and service areas. The communication becomes one-to-one, rather than one-to-many. The focus is on citizen convenience and increased participation, with citizens choosing to receive specific notifications, such as neighbourhood crime reports, exam results or the availability of a special library book. Mapping, location-based services and photo/video capabilities enhance the functionality of SMS and mobile applications. Social media tools build communication networks for breaking news, events and emergencies, with real-time citizen feedback and information sharing.

Services can be related to:

- *health services* (e.g. screening and tests, monitoring, health forms);
- *education services* (e.g. grades, admissions, exam results);
- *security services* (e.g. crime reporting, service requests, law enforcement, emergency assistance requests);
- *filing claims and reporting problems* (e.g. service interruptions, suspicious activity, voting issues, complaints about government officials);
- *information inquiry services* (e.g. account information, traffic and transportation availability, service request status); and
- *schedules* (airline flights, field crew locations, etc.).

Examples:

- Rwanda's eNota Project, a mobile-based system that allows students to access their national examination results via their mobile phones.
- Uganda's PurcAI Mobile enables teachers to enter student grades into a system that can be accessed by students, teachers and parents using SMS.
- Ireland's Multimedia (MMS) enables citizens to send photos of criminal suspects to law enforcement agencies and fight against terrorism (criminals have been caught using both of these services).
- India's SMS services to empower citizens to help enforce anti-pollution laws by reporting smoke-belching public buses and other vehicles, and to get citizens involved in the fight against crime and illegal drugs.
- Bahrain's mobile portal, a mobile version of the national portal via WAP-equipped phones, enables anyone with a mobile phone to communicate with all government entities and access their services, in addition to other services, via text message. The initial phase of the mobile portal started with 11 basic government services, expanding with 39 more. The key services include inquiries regarding electricity bills and traffic contraventions, daily price indices, flight information, school examination results and registration of complaints to government bodies.
- In Singapore, more than 150 government services are now accessible via mobile phones using a common SMS number, SGOVT (74688).⁶ Also, the Integrated Clinic Management System enables seamless update and retrieval of patients' records, providing real-time access to accurate patient information, using Radio Frequency IDentification (RFID) technology to match appropriate drugs to patients, and providing an alert system that enables doctors to get critical lab results via SMS.⁷
- India's DakNet, a store and forward wireless broadband network, uses a Mobile Access Point (MAP) mounted on a regular passenger bus to transmit information between village and district headquarters. Villagers can request information about their land records or other services through a PC in a WiFi-enabled village kiosk. The request will be stored in the computer until a bus with a MAP passes and collects the information wirelessly. The information then will be transferred to the district headquarters when the bus is within range of the WiFi-enabled systems based at headquarters. The villager gets the response when the bus "delivers" the information back to the PC in the village kiosk.
- The Republic of Korea provides public transportation maps (subway and buses) with real-time operation information and traffic information of main roads via mobile devices. Train passes can be also

purchased and reservation information or ticket confirmation can be checked on a mobile device. Specifically, with relevant public information such as public transportation and road traffic information provided to the public sector, many applications are being developed.

- The Republic of Korea allows search on missing children's information via website, mobile web and twitter. This service also allows reporting of missing or found children. An amber alert is issued through mobile phone SMS to induce active participation of citizens in finding missing children.

Transactional services

With G2C Transactional Services, governments begin to transform themselves by expanding two-way interactions between citizens and government to new levels. In this stage, citizens can complete their transactions with government electronically and at their convenience. This includes self-service options for paying taxes, making payments, lodging tax returns, applying for services and grants, as well as other similar G2C interactions, allowing the citizen to access these services 24/7.

Services can be related to:

- employment (*e.g.* job postings, applications, matching services, interviews);
- government transfer programmes (*e.g.* food coupons, relief compensation, basic income grants, social benefits);
- paying taxes (*e.g.* income, real estate, etc.);
- booking appointments (*e.g.* officials, inspections);
- transportation services (*e.g.* buying train tickets, parking, bus tickets, airline flights);
- signing a transaction with mobile signature.

Examples:

- Citizen bus/train ticket system in Amsterdam, the Netherlands, enables passengers to use an IVR or the Internet to request a specific route at a specific time and receive a ticket via SMS sent to their mobile phones; they can then show the SMS (M-Ticket) to the conductor.
- In Turkey mobile signature is valid for signing commercial and public services and banking transactions. Two of three mobile phone operators offer m-signature services, namely Turkcell and Avea.

- Uganda's SMS service for employers allows companies to access the labour force and recruit instantly through a SMS service.
- The Philippines' Job Hunt notification system sends a message to a job seeker whenever a matching job is available.
- Kenya's job information service allows employers to post job listings and job seekers to get personalised text messages based on the kind of work they are seeking.
- Brazil's SMS registration service for job seekers and employers provides notification of a job match and 24-hour notice to show up for an interview.
- Istanbul's SMS tax service enables citizens to query and pay their taxes via SMS, along with a reminder module for their tax payment deadlines and tax amounts upon registration.
- mPARK mobile parking fee payment services in Edinburgh, Scotland (UK); Cologne, Germany; Oklahoma City, United States; and Tartu, Estonia; and SMS toll payment service in London, UK, provide transportation-related payments.
- Malta's lifelong learning "cradle to grave" certificate service provides the public with the ability to order official documents from a central registry and pay for copies by cell phone and have them delivered to their homes.
- Norway's SMS tax returns enable taxpayers who have no changes to make to the form they receive in the post to simply send a text message with a code word, their identity number and a pin code, instead of returning the form by mail, benefiting an estimated 1.5 million Norwegian taxpayers.
- The Republic of Korea provides frequently used civil application services through smart phones and citizens can now view the process of their application regardless of time, and place and in a more convenient way via smart phones rather than visiting public offices in person or accessing the Internet. Particularly, mobile security features encrypting communication sections and personal information as well as prohibiting storage of process information leads to stability of mobile services.
- Through the Home Tax Service, tax payers in the Republic of Korea can check through mobile phones to see what has been filed electronically by their agents on a real-time basis. Home Tax Service users subscribing to an electronic billing service can retrieve billing information such as tax items and the amount from the day of billing to the due date of payment. The amount of tax return, left uncollected by tax payers

for the last five years, can be retrieved and by entering the business registration number on mobile phones, citizens can retrieve the business type and operation status.

Box 2.1. Mobile payment

Mobile payment is a growing alternative payment method, especially in Asia and Europe. The four primary models for mobile payments are Premium SMS-based Transactional Payments, Direct Mobile Billing, Mobile Web Payments (WAP) and Contactless NFC (Near Field Communication). The combined market for all types of mobile payments is expected to reach more than USD 600 billion globally by 2013.

Source: http://en.wikipedia.org/wiki/Mobile_payment.

Governance and citizen engagement

A key result area for connected governance is citizen engagement. Mobile technologies facilitate achievement of that goal by increasing ease of access and participation. One mobile tool, SMS, or “texting,” has become a powerful and prevalent communication channel for government and citizens, and a fundamental foundation of effective m-government strategies, positively impacting the democratic process.

Services can be related to:

- citizen engagement (to strengthen a citizen-centred approach to government and to involve citizens in policy development and decision making)
- elections and voting

Examples:

- Citizens in China and the Philippines can actively text message members of their legislatures.
- Increased voter registration and turn-out in the United States as a result of the 2004 Rock the Vote campaign,⁸ the 2005 San Francisco initiative and the 2008 presidential election.
- Increased participation of women voting in Macedonia in the 2006 national elections, with a 29% increase of women in Parliament.

- Casting of ballots via mobile phone by over 70% of 300 000 voters in the Republic of Korea in the October 2007 poll for the presidential candidate for the United New Democratic Party.
- Use of SMS by nearly 8 million voters in Venezuela during the 2006 Presidential Election to find their polling station.
- Direct political action by the Nairobi People's Settlement Network using mobile phones and the Internet to organise and rally against evictions; by Pakistani NGOs and activists using an SMS-based system to co-ordinate peace rallies and candlelight vigils against martial law;⁹ and by the Women of Uganda Network's use of social networking tools such as websites, email, SMS and mobile phones to reduce violence against women.¹⁰
- By allowing real-time reception of civil complaints and policy suggestions on mobile websites and smartphone applications, the Republic of Korea is facilitating citizen participation in policy-making.

G2G applications and services

With G2G services, governments transform themselves into a connected entity that more effectively and efficiently responds to the needs of its citizens by developing an integrated back-office infrastructure. Connections can be:

- horizontal connections (among government agencies)
- vertical connections (between central and local government agencies)

Services can be related to:

- *co-ordination of government activities for inspections, controls and supervisions*
- *security services (law enforcement, citizens' security)*
- *emergency management*
- *access to knowledge bases and records (public safety, health, education, etc.).*

Examples:

Public safety and emergency management personnel have been making transformational progress in their notification, response and disaster management capabilities through the use of mobile technologies. Real-time data is being accessed and co-ordinated among agencies through state-of-the-art mapping and planning technology and traffic information systems.

- G2G services in the United States use mobile technology to link field reporting, ambulance tracking, and other communication systems among emergency professionals, police officers, firefighters, and public works departments; mobile technologies play a critical role in administering and co-ordinating complex emergency management and law enforcement efforts, in which mobile actors must rely on fast, precise, and safe communication channels.
- Use of mobile phones for shared and co-ordinated communications among emergency personnel and agency officials in California's National Park Service, the US Forest Service, the Bureau of Land Management, and the California Department of Forestry in their battle against a 10 000-acre blaze in the Cleveland National Forest.
- Texas's emergency system in the United States estimates flooding by using light detection and ranging, or LIDAR, which is similar to the radar used in airplanes and can transmit data over mobile telecommunications devices to emergency personnel in the event of flooding.
- Turkey's Trafik Bilgi Sistemi or Traffic Information System equips mobile traffic units with tablet PCs to quickly conduct queries on the licenses and vehicle information of offending drivers. This increases the efficiency of the mobile traffic units. In addition, each mobile traffic unit can be located and dispatched to a particular location, such as a traffic incident. Vehicle information is cross-checked with several government agencies for road tax expiration, criminal suspicion and owner's validation.
- In the Republic of Korea, the National Computing and Information Agency carries out integrated operation and management of information systems of each government organisation. It provides information on failure alerts, maintenance status and results to each officer through SMS. In addition, the Republic of Korea provides government organizations with SMS/MMS, mobile civil complaint service, and an environment for MSG and WAP services to achieve m-government.

G2B applications and services

Government to Business (G2B) services include providing information regarding policies, regulations, forms, and applications related to procurement, licensing, permitting and payment of taxes, as well as support of small and medium enterprises and business development. With considerable value for rural businesses, government agencies are providing support including accessible kiosks and low-cost handsets, digital signature services, SMS weather and market updates, mobile wallets and maps for transport and tourist sites.

Examples:

- India's unique mobile weather forecast service helps farmers and fishermen decide when to plant, water and harvest their crops, and when to fish, boosting the profits of many fishermen in south India.
- Farmer's Friend, an agricultural information service based on text messages, is used in Uganda and other countries. The system accepts queries such as "rice aphids", "tomato blight" or "how to plant bananas" and retrieves advice from a database. More complicated questions are forwarded to human experts. The query "pineapple disease" elicits the answer "Copper deficiency in pineapples leads to fruit rot. Cut affected fruit as soon as noticed and dispose of where they will not contaminate other fruits or burn".
- Oman Mobile's new bi-lingual iBulk SMS service utilises an innovative web-based engine that allows businesses to communicate easily with their targeted opt-in customers via the mobile medium and gives businesses the ability to send short messages to their targeted clientele effortlessly, with the click of a button.
- US mobile data entry and inspection reporting provides building contractors, restaurant owners, and other business managers with onsite, real time inspection and permitting results, improving timeliness and accuracy.
- TradeNet in Ghana utilises web pages and text messages to allow rural farmers to advertise their merchandise to an international market and find the fairest price for their crops.
- Bangladesh's SMS classified-ads service provides a marketplace to buy and sell goods and services.
- The Republic of Korea has introduced various information services required for business activities such as industry information, business news and government aid programmes on a single mobile web-site (*m.g4b.go.kr*). Moreover, it provides information on the progress of test inspection and certification applications registered online by businesses and offers services issuing and retrieving performance reports and certificates.

G2E applications and services

With Government to Employees (G2E) services, governments provide tools, training, and data access to their employees that not only assist those employees in their daily operations, but also improve organisational efficiencies and accountability, maximise limited resources and enhance the quality of service to citizens. Mobile technologies have substantial impact on improving

G2E services, especially for field crews and staff who work in secondary or remote locations, enabling real-time access to enter, retrieve and share data.

Examples:

- The North London Strategic Alliance Street Wardens Pilot Project is a mobile government application aimed at streamlining the operations of street wardens, who fill in information regarding incidents “at the scene” using a mobile device like a smartphone or Pocket PC, which have GPRS and Bluetooth connectivity as well as mapping capabilities.
- In Hong Kong, China’s Mobile Field Inspection System enables inspectors to use touch-screen PDAs to enter inspection information at the scene, as well as 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, so the training time was short. Some of the savings include an approximate 10% increase in productivity, a 1.5-hour time savings per inspection team on a daily basis, and elimination of duplicate work.
- Florida Keys Mosquito Control District Digital Mapping in the United States helps to maximise the use of the 61 vehicles engaged in insecticide control to prevent the spread of West Nile Virus and other mosquito-borne diseases in over 1 million acres of coastal marshland. A wireless fleet management solution is used to monitor the locations, heading, speed and insecticide applications of all vehicles in real time. The information provided wirelessly by the vehicles is displayed on a digital map screen at district headquarters in Key West. The digital map monitors what each vehicle is doing, where it is spraying (or dropping) chemicals, and the vehicle’s rate of speed. This allows supervisory staff at headquarters to monitor vehicle progress and instruct personnel as necessary. The system also allows them to generate reports both in real time and on a historical basis.
- The City of Corpus Christi, US, has a comprehensive mobile application for its work and asset management system. Officials use a standardised enterprise system with embedded GIS (Geographic Information System) for operating departments, and developed a customised CRM (Customer Resource Management) in the same system for their centralised Customer Service Center, through which agents issue work orders to mobile crews. As part of an Intel Digital Cities Initiative, pilot projects were deployed and field workers were provided with different mobile devices, along with training, to determine what worked best. As a result, mobile workers are using laptops and smartphones to access information, displayed for smaller screens, and

enter data. The City's WiFi network was extended to enable consistent onsite access. CCMobile, promoted through Facebook and Twitter, is a complementary, interfaced application that enables citizens to download a free application on smartphones, take photos of problems and send service requests, with global positioning systems (GPS) location, date and time stamp. Mobile workers participate in regular user group meetings to identify improvement opportunities. Work crews respond in the field to service requests, enabling real-time status, joint data access, information consistency, instant emergency communications and reduced calls. To exemplify the benefit, in one service department, the mobile system has enabled mobile crews to increase unit availability and achieve personnel savings of approximately USD 50 000 per year, as well as a reduction in fuel costs.¹¹

- Ministries in the Republic of Korea provide various mobile intra-governmental administrative services, including emails, notices, personal appointments, press releases, and contact information.

M-Government – Benefits for governments

Mobile technologies provide government with significant opportunities for achieving greater cost optimisation, improved communications and data co-ordination, expanded service delivery and much progress towards digital equality.

Wider reach – Mobile phone penetration extends outreach and access to often difficult-to-reach groups, such as seniors, people with disabilities and citizens living in rural areas. Government has tremendous opportunities for community messaging and to capitalise on networks through which people forward information to friends, families and co-workers. Communication impact can be appreciably compounded. Mobile phone communications offer flexible communication options, such as voice communications or IVR for visually impaired people and SMS for those who are hearing impaired.¹² In Amsterdam and London, it was possible to provide emergency alerts to hearing-impaired people through Vibro-SMS Emergency Alerts.

Mobility and ubiquity – Citizens have access to government information and services anytime and anywhere using wireless networks through their mobile and wireless devices. Government employees can work using the exact same type of devices regardless of distance, time, place and diverse natural conditions, especially relevant for public safety and emergency management.

More personalisation of services – Provision of location-based government services: As mobile phones are typically personal, the possibility of locating an individual's exact physical location ensures that governments can directly

Box 2.2. Turkey – SMS judicial information system

Overview – The SMS judicial information system, officially called National Judiciary Informatics System, enables citizens and lawyers to receive SMS messages containing legal information, such as ongoing cases, dates of court hearings, the latest actions on cases, and suits or claims against them. Although sending an SMS does not replace official notification, it provides information to the parties so that they can take necessary measures in time, without delay, in order to prevent deprivation of legal rights. The IT Department of the Ministry of Justice of Turkey was responsible for implementation; it signed a co-operation agreement with the Turkish GSM operators in order to establish the SMS system. The UYAP system was awarded a 2009 e-government award by the European Commission in the framework of the 5th Ministerial e-government Conference in Malmö, Sweden.

Pressures and drivers – The Turkish Constitution states that judicial tasks should be maintained in a swift and economic manner. Additionally, access to justice is included as a fundamental priority in the Accession Partnership of the EU. Before implementing the SMS system, there was a huge workload for staff in answering inquiries of citizens in courts. Previously, notifications were sent via post, and lawyers and citizens often went directly to the court to obtain information. Turkey's unique citizen ID numbers, used for every process, greatly facilitate implementation of this system.

Impact – This system increases the quality of legal services by reducing costs, preventing red tape and ensuring utmost availability of information. For citizens and lawyers, it is not necessary to go to courthouses to get information about cases or find hearing dates or pay travel costs to go to remote courts. The system will be integrated with other state department e-government programmes so that citizens can be informed instantly about all other public services. For example, plans are in place to integrate it with the security forces' electronic system. When a wanted person makes any transaction with the systems in hospitals, pharmacies, airports and railway ports, the nearest police station will be notified by SMS which will show the location of the person.

Response – This m-government application has transformed the vision of judicial organs from a conservative state demanding information from individuals to a modern state swiftly providing information to them, so as to prevent unjust treatments and irregularities. Use of this system makes the justice system more efficient and transparent, engendering greater public trust and confidence in the judiciary and respect for the rule of law. SMS information system applications have become a key method for reaching citizens living in remote areas and promoting exchange of communications. An important feature of the system for Turkey is the ability to reach people living in rural areas.

Source: UYAP www.e-justice.gov.tr/.

provide services to each person. This could accelerate reforming government organisational structures to become more horizontal and more simplified.

Cost-effectiveness – Cost-saving results include m-government streamlined processes, shared and co-ordinated data access, embedded mapping, and electronic processes, communications and transactions. Empowerment of field workers and cross-agency interactions can reduce requirements and costs for time, travel and staffing, as well as eliminate redundant data entry. Mobile crews with mobile devices can increase unit availability.

Faster information flow – Real-time and location-based processes result in quick and easily accessible data and communications, information consistency, responsive case management and seamless information exchanges. Information and actions can be co-ordinated in any location and with other agencies, improving collaboration among government authorities. Mobile technologies can be valuable assets in emergency response through instant information access and release, and shared access to mapping data.

Better management – Mobile technology has the potential to help government officials to better manage allocated financial and human resources. Satellite or rural offices and operations can communicate needs and situations as they occur. Current and accurate data improves knowledge-based decision making and responsiveness.

Increased democracy – Public officials can stay current on public opinion and priorities from a larger group of citizens. Extended outreach also expands government accountability and transparency to more citizens and empowers greater citizen participation in policy development and democratic decision making. For example, a free mobile application, Visible Vote,¹³ enables citizens in the United States to connect with elected officials on legislation, express opinions on issues, and track voting records.

Enabled green government – This is the result of the environmental-friendliness and paper-use reduction achieved thanks to the increased use of the mobile services. Mobile phones batteries are not very green – so the proliferation of cell phones and their batteries will have an environmental cost. It would therefore be good to start working a greener solution to this, at least to ensure proper disposal.

M-Government – Benefits for citizens

Mobile technologies are empowering citizens in all aspects of their daily lives, improving the quality of life for many. More people can afford a mobile phone than a personal computer and are comfortable learning to use mobile devices in their daily lives. The popularity of social media and use of Web 2.0 tools is also transferring easily to mobile applications. M-Government

can affect the activities of any public sector agency, ranging from tax and customs administration to health, social security and personal identification. The prevailing use of mobile phones by citizens across the world provides a communication channel that vastly improves the timeliness and ease with which citizens can access and interact with government.

More importantly, mobile technologies present government with opportunities to increase citizens' take-up and adoption of connected government processes. At the same time, governments should address the challenges of ensuring privacy and extending digital inclusion. Further personalisation and location-based services are additional strategies that can enhance benefits for citizens, resulting in greater citizen engagement and satisfaction. Evaluating the ongoing effectiveness of public officials or public bodies through m-government applications ensures that the officials and institutions are performing to their full potential, providing value for money in the provision of public services, instilling confidence in the government and being responsive to the community they are meant to be serving.

Convenience and access – Mobile technologies enable convenient access to government information, forms and business processes. Mobile devices are a common part of most citizens' daily life. Since 2005, mobile phone penetration in some developed countries has exceeded 100%. Although global positioning systems (GPS) and smartphones are less widespread, they are becoming increasingly popular worldwide.

In a number of US cities, citizens can request services and report problems (with photos, automatic locations and date stamps) through free downloadable smartphone applications.¹⁴ In cities across the world, citizens can make payments, sign up for specific notifications, and interact with service providers and government leaders. They can hold elected officials accountable through access to performance and financial data. Citizens can reserve and pay for parking spots or travel tickets. These actions can be completed where and when they choose. Mobile communications can be a substitute for transportation. Inexpensive handsets, micro prepayments, and top-up cards have increased affordability and are just some of the reasons that mobile telephony has become the most easily accessible and ubiquitous communications device in rural areas.¹⁵

Health and public safety – Citizens in previously unreachable areas can receive m-health assistance, monitoring, notifications and emergency medical alerts.¹⁶ For example, handheld devices were distributed to public health and other health workers in developing countries, providing real-time information on infectious diseases.¹⁷ Through mobile technologies, citizens can also report suspicious or criminal activity, as well as improper actions of officials; therefore, contributing to increased transparency and accountability. Citizens can request emergency assistance, with the mobile application providing GPS data. Residents can participate in emergency management, identifying specific locations and conditions with mapping, photos and video.

Financial management – M-Government mobile payment applications are widespread in both developed and developing countries. Multiple applications are available for banking and financial services, money transfers, remittances, emergency aid, grants, loans and social cash transfers.

In addition to those with easy access to smartphones, mobile technologies are empowering citizens who previously had difficulty to securely process cash transfers, deposits and withdrawals, payroll credits, international remittances and other banking activities.

While person-to-person remittances and e-bill payment through mobile phones have been widely adopted and have had great impact, especially among rural and underserved populations as in Kenya (M-PESA¹⁸) and Bangladesh (Grameen phone's BillPay service), it is important to move to other value-added services such as receipt and payments of loans, interest bearing accounts, payroll and any other Government-to-Person (G2P) payments. Governments can reach the critical mass, providing them with value-added services, such as paying out salaries and other government disbursements and social benefit payments via secured mobile payments platforms.

Education – Teachers are now delivering content to students in primary schools and entering student grades through mobile technologies. Students are able to access exam scores and scholarship decisions, and parents can receive notifications if a child is absent from school.¹⁹ Mobile projects, like India's e-learning initiatives for seamless transfer of educational content,²⁰ are being implemented in multiple countries to expand educational access and promote academic achievement.

Box 2.3. mGive platform

Responding to the earthquake in Haiti is an excellent example of partnerships and the power of mobile payments. As of June 2010, over USD 41 million was raised in text message donations by the Red Cross to help victims of the earthquake. Mobile Accord's mGive platform enabled the public to send one-time gifts of USD 10, which was charged to the sender's mobile account. 95% of the donations received were from first-time donors.

Source: www.nten.org/blog/2010/09/13/7-ways-nonprofits-use-mobile-phones-rake-cash-monies.

Box 2.4. Estonia – Mobile ID

Overview – The Mobile-ID service is a collection of organisational and technical measures to create a strong, seamless digital identity for Internet users. To use Mobile-ID, users must acquire a special SIM card (available from mobile operators) and, for extra security, activate the service on a website with an Estonian ID card. After that, the Mobile-ID is ready to be used on any compatible website for authentication and digital signature. The Mobile-ID certificates are valid for five years, after which the SIM should be replaced. The service is implemented according to Public Key Infrastructure (PKI) and launched by mobile operator EMT in co-operation with CA AS Sertifitseerimiskeskus. The initiative is being led by the Ministry of Economic Affairs and Communications.

Pressures and drivers – Estonia's mobile market is one of the most penetrated, exceeding 100%. Mobile broadband access services, as well as mobile content and applications, are readily available, underpinning future revenue growth. Implementing the Mobile-ID ensures compliance with Directive 1999/93/EC and subsequent Estonian Digital Signature Law. The biggest concern is ensuring that the user registration process is secure enough to be used by service providers and government. There were no standards and no best practices available in this area.

Impact (change) – The main impact is for users, who benefit from a more convenient login (authentication) process, which is compatible among websites. This service has shown real value in furthering secure usage of m- and e-services. Most people have both ID-cards and mobile phones with them at all times, so these devices greatly minimise the risks of using e-services. There is no more queuing, no bribes, no forms in triplicate, and no need to plead a case to several administrators. The benefit for service providers is that the authentication process is highly secure and low cost.

Impact (innovation) – The e-Governance Academy (eGA) was founded to create and transfer knowledge concerning e-governance, e-democracy and the development of civil society. eGA implements its mission through research, training, consultancy and networking. Estonia is exporting its digital-democracy technology through its e-Governance Academy, which has trained bureaucrats from 36 countries.

Response – Because Mobile-ID is based on the same technologies as the Estonian ID card, it can be applied for m-voting. E-voting was first used in Estonia in local government elections in 2005, and then again in the parliamentary election in 2007. Estonia broke new ground in this area, showing that e-voting is possible and thoroughly secure when citizens are identified by personal keys and when votes are confirmed with digital signatures. The m-voting solution might increase voter turnout, thus ensuring more effective actualisation of the will of the people. A security study has been initiated, and the law would have to be amended to make it possible to use Mobile-ID for voting.

Source: www.id.ee/10995.

M-Government – Benefits for businesses and economic growth

Several factors are contributing to the expansion of business use of mobile technologies. Business managers are focused on reducing costs and physical infrastructure, and recognise the capabilities created by key advances in wireless technology: faster and wider wireless networks; larger device displays; and better technical platforms for applications (capacity and operating systems).

Box 2.5. The Republic of Korea – Mobile Public Procurement Service

Overview – The mobile public procurement system increases efficiency of public procurement by handling all procurement procedures through an online single window. In particular, it has provided ‘smart electronic procurement service’ through mobile phones, allowing users to search for bidding information and participate in bidding since 2005 (PDA), 2008 (3G phones), 2010 (smart phones). The mobile procurement service features upgraded security functions by supporting dual authentication procedures that consist of PIN authentication of smart security token and fingerprint identification for mobile bidding participation. The mobile procurement service (wireless) is based on the Republic of Korea’s fixed electronic procurement service which won the UN Public Service Award in 2003 and the AFACT e-Asia Award in 2007.

Pressures and drivers – All registered companies are enabled to participate in biddings of all public organisations, including national organisations, local government bodies, and public corporations by a single registration in the system. The mobile procurement system improves efficiency and transparency and helps corporations which need bid-information and fast decision-making.

Impact – The wired and wireless procurement volume through G2B reaches approximately 555 000 contracts, USD 75 billion per year and the rate of the electronic contracts is 97% in 2010. Many stages of procurement ranging from notices, bidding information, opening of the bids, participation to the result of the bids are handled and procurement progress can be monitored on a real-time basis using mobile phones.

Response – Government will rebuild the public procurement system through 2012 in order to enhance user oriented online bidding service. In particular, the mobile service area will be expanded by using smart phones.

Source: Government of the Republic of Korea.

Box 2.6. Mobile Technology

According to a 2009 World Bank study, every 10 percentage-point increase in mobile-phone penetration in a developing country yields an extra 0.81 percentage points of annual economic growth. Mobile Internet can have an even greater impact.

Source: www.economist.com/node/16944020?story_id=16944020.

Economic opportunity and improvement – Mobile applications are being used to assist job seekers and support more efficient business processes through real-time communications, quick data access, notifications, and product orders from the field. People can connect rather than travel. Farmers and fishermen have increased productivity and profits through on-the-spot weather and market price alerts.²¹ By calling first, buyers can locate best price options, which supports price stabilisation and reduces product waste. Through SMS services, farmers can text their questions and instantly get advice from a database or agricultural experts. The database is expanded as new inquiries are received. With a focus on small and medium-sized businesses (SMEs), governments and service providers are joining forces to expand mobile access through low-cost handsets, recycled mobile phones and even travelling “telephone teams” which function as a mobile phone booth. Mobile phones are streamlining business activities, enabling remote, real-time business management and matching buyers and sellers from across the world.

Productivity – The productivity benefits of mobile phones include business expansion through more accurate product or service demand projections and customer outreach; streamlined and more accessible employment searches; lower start-up and operating costs for entrepreneurs; accessible and cost-efficient mobile banking; and real-time, flexible communications and transactions between buyers and sellers.²²

Mobile workers – The research firm IDC reports that the number of mobile workers accessing enterprise systems worldwide will reach 1 billion in 2010 and 1.2 billion by 2013, or more than one-third of the world’s workforce.²³ Empowered mobile workers increase efficiencies, co-ordination, real-time communications and performance management.

Customer service – Mobile computing enables access to customer relationship management systems from multiple locations to maintain current and accurate customer information. Customers can use self-service options to establish new accounts, obtain account information, or make payments, improving both customer satisfaction levels and cost efficiency for companies. Customers can also access inventory availability and pricing, and place orders, thus streamlining business processes, responsiveness and resource requirements.²⁴

Green economy – ICT has an active role in efforts towards a “Green Economy.” Current network optimisation packages for mobile infrastructure can reduce energy consumption by 44%, while solar-based base stations have the potential to reduce carbon emission by 80%. Mobile devices can reduce energy consumption through energy saving configuration and empowered field staff, sales teams and telepresence conferencing.²⁵ The theme of a green economy in the context of sustainable development, and the impact of mobile technologies, will be a focus at the 2012 Rio+20, the United Nations Conference on Sustainable Development.²⁶

Box 2.7. Singapore – Mobile Government Programme

Overview – The Mobile Government Programme makes government e-services more accessible to a wider customer base and more convenient for those who need to transact on the move. In 2009, more than 3.3 million government mobile transactions were conducted. Today, more than 300 mobile government information and services are available. “M-Gov” also established a whole-of-government (WOG) central short-messaging-service (SMS) platform, known as OneSMS, to facilitate the development of m-services by government agencies through demand aggregation. The programme was co-developed by the Ministry of Finance (MOF) and the Infocomm Development Authority of Singapore (IDA) as part of the Integrated Government 2010 (“iGov2010”) e-government master plan for the years 2005-10. The achievements are specially mentioned in the 2010 UN E-government Survey.

Pressures and drivers – Mobile channels are of special interest due to the high mobility of mobile phone devices, with a higher penetration rate in Singapore (140.7%) compared to the household Internet penetration rate (81% in 2009). This presents the opportunity for higher adoption of e-services delivered through the mobile channel. In addition, mobile technologies open up a vista of possibilities for new services that are not possible or relevant through the Internet or counters (e.g. location-aware capability), offering a unique opportunity to deliver new and personalised services to customers.

Impact – The following objectives have largely been met: (1) deliver innovative services via the mobile channel that were not feasible with the Internet or counters; and (2) make government e-services more accessible to a wider customer base and increase convenience for those who need to transact on the move. Demand aggregation enabled government agencies to enjoy bulk discounts on SMS delivery rates, which resulted in significant cost savings of about SGD 1 million per year. Citizens also benefited from the integrated WOG approach, as any m-service subscription could be easily accessed on the one-stop portal “My citizen” (www.mycitizen.sg). They also enjoyed the convenience of only remembering one short code and a more consistent user experience on the mobile channel. The Singapore Police Force and five voluntary welfare organisations collaborated to develop SMS70999. This gave registered members of the deaf, hard of hearing and speech impaired community in Singapore an emergency SMS helpline to contact the police and emergency services via SMS. Prior to this, the community with special needs was unable to access the emergency voice helpline.

Response – In line with technology trends, the M-Gov programme is also shifting gears to facilitate the delivery of government m-services over more varied mobile devices and platforms. To further tap into the emerging mobile technologies, such as location-based capabilities and augmented reality, the M-Gov programme is supporting agencies in their pilot development of m-services.

Source: www.sgdi.gov.sg/mobile.

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