

Enabling Private Sector Feedback on Public Services through Mobile Devices

Lessons from Recent International Experience



The rapid diffusion of increasingly sophisticated mobile devices, particularly in the developing world, has created many new opportunities for online interactions between government, businesses, and civil society. Many examples already exist of mobile applications that allow citizens and businesses to request services, report problems with public infrastructure, and even declare and pay tax liabilities. While for many years governments have utilized their websites to collect general feedback on service delivery or proposed laws and regulations, moving these capabilities to mobile devices can enable immediate feedback on customer experiences after the delivery of a particular service. This provides management of public agencies greater ability to quickly identify performance issues, obtain constructive suggestions for reform, and communicate progress back to the customers who provided the feedback. Mobiles also offer the opportunity for public agencies to disseminate information about reforms faster and more reliably since mobile network coverage, particularly in developing countries, is much more widespread than terrestrial Internet access.

Based on research of several organizations that have implemented mobile feedback capabilities as well as recent experience implementing a mobile feedback project in Jordan, the World Bank Group has identified a number of emerging best practices and open-source software tools for data collection, summarization, and visualization which can be leveraged to support future investment climate

reform programs. Many of these mobile data collection (MDC) tools were pioneered in the health sector within developing countries to support disease reporting and patient monitoring in remote areas. They are now increasingly being leveraged to gather feedback and crowdsource¹ data from citizens and businesses to support improved public service delivery in a range of areas.

What is mobile data collection?

Mobile data collection is the targeted gathering of information using devices such as mobile phones or tablets. MDC makes it possible for citizens or businesses to provide feedback quickly, cheaply, and at their convenience, as long as they have access to a mobile device and the necessary software, either on their devices or a central web server. MDC provides a structured framework and tools for collecting information from target audiences, compiling it in a central database as well as assessing and presenting the data using a variety of analytical and visualization tools.

How can MDC tools support investment climate reform?

MDC tools can provide the means to elicit several types of information, which can monitor public service delivery and support regulators in their regulatory reform or oversight efforts. Examples include:

- 1. Feedback on the delivery of specific government services, such as business inspections and issuance of licenses**—This involves the deployment of software through which businesses can respond to brief online surveys that collect quantitative and anecdotal feedback summarizing key aspects of service delivery such as the

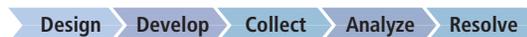
quality of the customer experience, the knowledge and professionalism of government staff, and the compliance burden (for example, queue times and costs incurred). The software tools, which are easily downloaded from application stores or other sources, can be designed to collect data using a wide range of mobile devices from low-end feature phones to smartphones running Android and iOS operating systems. They can also be structured so the aggregated data is displayed on an online “management dashboard” summarizing the performance of specific operating units over time. The Bank Group is currently piloting a mobile-based feedback tool in Jordan focusing on the business inspection services delivered by three government agencies.

2. **Facilitating the collection and analysis of business environment survey data**—Many business intermediary organizations, think tanks, and government agencies conduct periodic surveys to monitor different aspects of the investment climate or evaluate the overall quality of service delivery provided by specific government agencies. The data collection process can be greatly facilitated using mobile technology. Survey data input by enumerators in the field is transmitted to a central database, which supports the summary reporting and analysis of the information collected. For example, the King Abdullah II Center for Excellence in Jordan has developed a tablet-based application to support its periodic performance survey of Jordanian government agencies.
3. **Crowdsourcing data to support regulatory and budgetary monitoring**—Several governments have developed web-based tools to enable citizens to report on the implementation of local infrastructure projects² or environmental violations encountered. Given that even many low-end mobile phones have cameras and software to take advantage of geospatial data, they can provide a low-cost means to collect such information. Also, the use of mobile phones broadens the reach of data collection efforts to citizens and businesses that do not have direct Internet connectivity or even access to a computer.

The balance of this note focuses on practical advice for practitioners who wish to use MDCs to gather feedback on the delivery of specific government agencies (1, above); however, much of the discussion is also applicable to the other two types of data gathering (2 and 3, above).

Implementing a feedback application to monitor government service delivery

Mobile feedback projects should be implemented in five phases: design, develop, collect, analyze, and resolve.



Design In the **design phase** of an MDC project, there are several strategic, institutional, and financial issues to consider:

What are the objectives?

Does management of the public agency wish to monitor its overall performance, the quality of individual services, or even individual service delivery locations? Or, is the objective to collect feedback on proposed reforms or new regulations, as may be the case when the government is undertaking an investment climate reform program? Answers to these questions will help determine the features and functionality of the tools required to collect and analyze the feedback.

What is the nature of the information or feedback?

Is the information to be collected subject to privacy laws in the country? Some information that may be collected in social sectors is considered confidential, for example, personal health information. It is important to understand legal and regulatory requirements regarding the collection and storage of different types of information in the country where the MDC system is being deployed.

What ability exists at the public agency or elsewhere within the government to collect and respond to feedback as well as manage technology?

How does the agency presently collect and respond to feedback? Some public agencies already have established complaint hotlines or other mechanisms to collect feedback from constituents; others require a culture change to enable the effective use of such feedback channels. Does the public agency have skilled information technology (IT) staff to support and maintain the MDC system, or will the agency need external support? Is there a data center where the application can be hosted?

How will the ongoing administration of the service be funded?

Many mobile initiatives of this nature have been criticized for lack of sustainability. Most projects start with a pilot that is then evaluated for scale-up; however, how this scale-up will occur should be addressed in the initial design. Even if donors fund the design, development, and deployment of the system (the costs of which are not substantial when compared to other financial and management systems), an ongoing investment in staff and technology resources will be required to administer the software as well as analyze and respond to the feedback. Also, will the feedback providers be required to pay for the airtime required to

transmit feedback, or will there be some arrangement to furnish no-cost airtime or provide some reimbursement?

Develop In the **develop phase** of an MDC project, there are technology and device selection issues to consider.

What type of technology should be employed?

The choice among three technology approaches that can be employed in MDC depends on the amount and complexity of the data being collected and the sophistication of the mobile device used to collect and transmit the data. Alternatives include:

- 1. USSD sessions**—Unstructured Supplementary Service Data (USSD) is a mobile telecommunications protocol through which a respondent using even a simple mobile phone can establish a “session” with the database server and be prompted to input data or make choices from an onscreen menu (for instance, select “good,” “fair,” or “poor”). This approach can be utilized for providing feedback in a very simple form, but it can be difficult for untrained individuals to master without instruction.
- 2. SMS messages**—In this case, a short code is established to route Short Messaging Service (SMS) messages sent to it to a server where it will be read and stored in the database. Limited amounts of data also can be collected offline and transmitted later when the user has a phone signal. This is most often used for collecting simple feedback and has been successfully employed in many citizen feedback services, such as LAPOR³ in Indonesia.
- 3. Mobile applications**—If more sophisticated smartphones and tablets can be utilized to submit data, this approach employs a mobile application that can be downloaded by the user for free from an application store. Data can be collected through forms with data fields or drop-down boxes for structured responses; images, recordings, or video can also be collected. This is a more user-friendly interface, and it permits larger amounts of data to be collected offline when the user is out of range of the telecommunications network. Figure 1 illustrates an example of a mobile interface for collecting feedback.

What devices and operating systems will be supported?

The software must run on the devices available in the local market, particularly if the program targets citizens and businesspeople using their own devices to provide feedback. This will involve considering the different devices (and their operating systems) prevalent locally and the other functionalities required such as global positioning system (GPS), camera, video, audio, and barcode readers. The main operating systems utilized worldwide include: Android, iOS,

FIGURE 1: MOBILE INTERFACE FROM JORDAN BUSINESS INSPECTIONS SURVEY

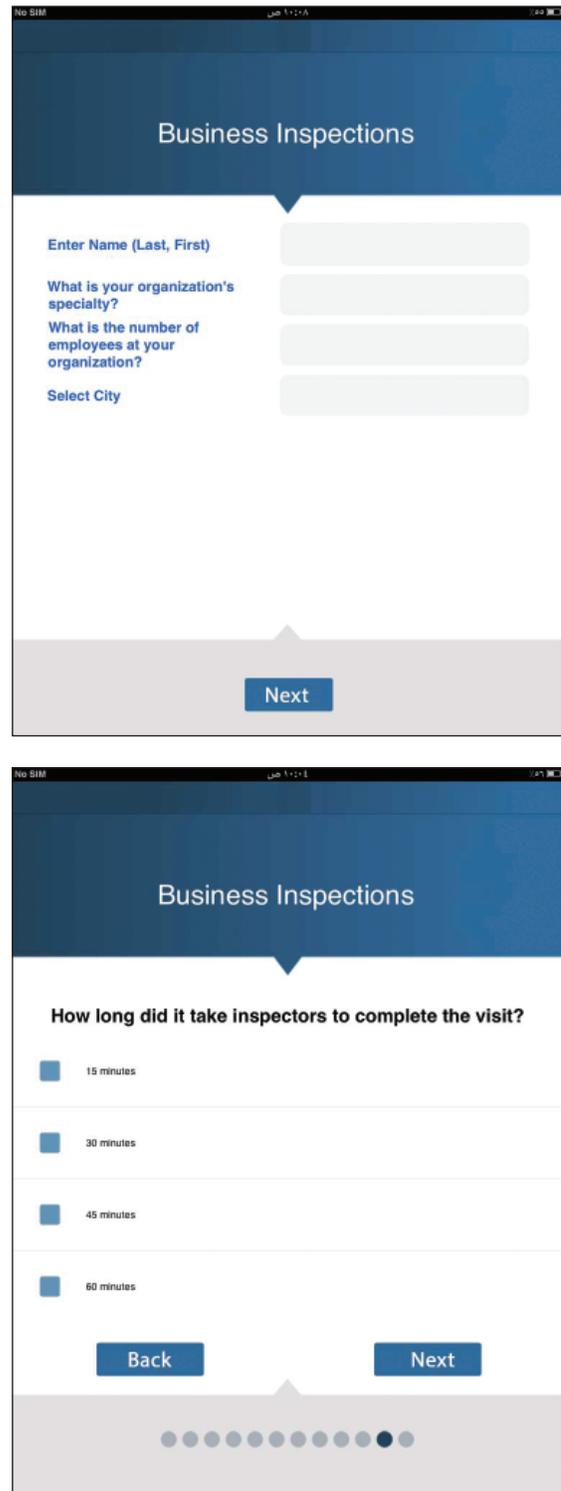


Figure 1 shows the user interface of the mobile-based feedback tool the World Bank Group is piloting in Jordan focusing on the business inspection services delivered by three government agencies.

Windows Mobile, Samsung Bada, Blackberry, Nokia Asha, Linux, and Symbian OS. The product distribution in the local market may require the mobile application be developed on two to three operating systems to ensure the broadest reach. Alternatively, the application could be based on USSD or SMS, which supports data input regardless of the operating system.

What type of software should be used?

Recent technology trends support using open-source tools to develop software that runs on open-source platforms; doing so allows other developers to see how the system is set up and use the development as a basis for further customization. Among the positives of developing software using open-source tools is the opportunity to exchange ideas with others working to solve similar problems, since programmers who use open-source tools often share their work within a community of developers. Another positive is avoiding the recurring license expense.

However, several robust proprietary packages, developed in response to growing market demand, may be worth the licensing or subscription costs; these packages may be especially appropriate when the implementing organization lacks the capacity to manage software applications in-house. Whether a system is open source or proprietary, usability is important. Software should be easy to use and take into consideration the level of literacy and technological sophistication within the target audience.

A number of companies that have developed MDC systems use a software-as-a-service (SaaS) model through which they provide a minimum level of service for free and then charge per user or per month to store information collected on a cloud-based server. Alternatively, public agencies that have access to IT hardware and support can manage the storage, maintenance, and support processes, thus avoiding subscription fees.

For more information on selected MDC tools, see Table 1.

How should the software selected be customized and supported?

More important than the particular software selected is the need to customize the software to meet stakeholders' needs. Ideally, software customization requirements should be designed in partnership with the stakeholders that plan to use the tools, including the citizens and business representatives who will be asked to provide feedback. Planning for periodic new releases of the software is also good practice, as new features and functionality requirements will inevitably be identified once the software application is in daily use.

If public agencies lack the technical resources to work with stakeholders to develop or customize the software, there are several options for procuring those resources from third parties. They can:

- Tender for a firm that has a proprietary MDC system which can be configured and deployed to meet the project's needs; this may be preferable if hosting by the vendor is also required;
- Tender for a software developer using open-source tools to provide the customization and support required to meet the project's needs. This may be preferable if local support and language capabilities are required;
- Utilize the "hackathon"⁴ or prize approach. This involves issuing a problem statement and convening or attracting computer programmers and other experts in software development to produce a solution within a specified period of time. Working with existing innovation hubs⁵ and solver communities⁶ to organize and host the hackathon or issue the prize will expand participation. The most promising solution developed during this competition can then be supported with further resources to complete and maintain a production version of the application.

Collect In the **collect phase**, there are communication, environment, and technology issues to consider.

What questions should be employed in the survey?

Project leaders must think of the data to be collected and also must consider the questionnaire's length and language, which may impact the rate of response. Three indicative types of feedback that can be collected include:

- Overall rating—similar to that provided by restaurant and hotel rating services, either rating the overall experience or specific aspects (for example, timeliness, knowledge of government official).
- Time or costs involved in the delivery of the service—particularly useful if there is a service standard established by the government agency (such as a business license issued within X days).
- Commentary on service delivery—providing free text information or answering questions about issues such as: (i) knowledge and attitude of the individual providing the service; (ii) consistency of service delivery with the relevant guidelines and regulations; (iii) resolution of problems encountered (for example, inspection violations); (iv) indications of rent-seeking behaviors; and (v) suggestions for reform.

Public agency management should consider whether it is more appropriate to monitor (i) quantitative indicators (such as

TABLE 1: OVERVIEW OF SELECTED MDC TOOLS

Tool	Description	Can data be collected and stored in the cloud?
CommCare HQ www.dimagi.com	Proprietary software to collect and aggregate field data quickly, accurately, and securely on Android devices. Demo is at http://www.youtube.com/watch?v=EHhi5t3w3YM	Yes; Dimagi offers software-as-a-service hosting with full support. Pricing is at http://www.commcarehq.org/service-packages/
EpiCollect www.epicollect.net	Free, open-source software developed at Imperial College London that runs on Android and iOS. For an independent evaluation of EpiCollect, go to http://www.phiresearchlab.org/downloads/epicollect-structured-evaluation.pdf	Yes; Imperial College London allows organizations to set up project websites for free, but approach requires technical skills. http://www.epicollect.net/instructions/website/NetWebsite.html
FormHub formhub.org	Free, open-source tool, which was developed by Modi Research Group, Earth Institute, Columbia University. Allows users to create surveys in Microsoft Excel and which are then uploaded to a FormHub Account online. Runs on Android and utilizes Open Data Kit. Demo is at http://www.youtube.com/watch?v=jqpmMpkIXSQ	Yes, designed to be used with Open Data Kit Aggregator; organizations can store data in the cloud using Google's AppEngine.
FrontlineSMS and FrontlineCloud www.frontlinesms.com	FrontlineSMS is desktop software enabling two-way communication to any mobile handset. FrontlineCloud, which is offered through the software-as-a-service model, enables users to send, receive, and manage SMS messages through an Android device.	Yes, through FrontlineCloud at \$10 per month.
Magpi www.datadyne.com	Proprietary software, formerly called EpiSurveyor, is in use by more than 9,000 people in more than 170 countries. Runs on iOS, BlackBerry, and Symbian. Demo is at http://www.youtube.com/watch?v=KGAiCe5RORs&feature=youtu.be	Yes; Datadyne offers software-as-a-service hosting with full support. Pricing is at https://datadyne.zendesk.com/entries/21093588-Cost-of-Magpi-formerly-EpiSurveyor-
Open Data Kit opendatakit.org	Free, open-source set of tools which help organizations author, deploy, and manage mobile data collection solutions on Android devices.	Yes; Open Data Kit Aggregator is the component that enables organizations to store data in the cloud using Google's App Engine.
RapidSMS www.rapidsms.org	Free, open-source framework for dynamic data collection, logistics coordination, and communication, leveraging SMS technology.	No.
uReport ureport.ug	Free SMS-based communications technology developed by UNICEF Uganda to support social mobilization, monitoring, and response efforts. By sending the text message, "join," to a toll-free number and submitting a few personal details, anyone with a mobile phone can become a volunteer "U-reporter," sharing his or her observations and ideas on a wide range of development issues.	No; It should also be noted that implementation would require a formal partnership with UNICEF.

rating, cost) which can be summarized and presented visually through a management dashboard; (ii) qualitative information (for instance, commentaries on the service delivery experience), which requires individual analysis of each response; (iii) or a combination of the two. This choice will have a significant impact on the analytical resources required to administer the service and respond to feedback.

How will feedback or other required information be collected?

Will the public agency collect information directly from consumers or business representatives or will enumerators or agents be employed to collect the feedback? When using agents, identified persons go to the field to collect data and are usually educated and literate in mobile phone use. They are familiar with the population and topic, and they may receive payment for the task or it may be part of their jobs. They either use agency-provided devices and airtime or are reimbursed or incentivized to use their own devices and airtime.

The limitations of using agents are that they are expensive and affect sustainability for continuous data collection processes. In cases where no agents are used, costs are lower, but lower data quality may result from limitations on user technology or basic literacy. If the public agency does not use agents, consideration should be given of whether the telecommunication costs should be borne by the end user who is providing the feedback. In both cases, the project should ensure that training of administrators and end users occurs and that training materials are available in different formats (one page user guides, YouTube videos, manuals).

What communications channels and incentives will be used to elicit feedback?

Once an improved feedback mechanism is operational, there is a need to ensure that this new channel is marketed to potential users. A marketing campaign, which uses both targeted and public advertising, coordinates with press outlets, distributes flyers or leave-behind cards, and works

through business intermediaries, should be employed to raise awareness of the new feedback mechanism. Also, if feedback is being solicited directly from users, promotional incentives such as free airtime to compensate respondents also should be considered, particularly in the pilot phase. Preliminary research has shown that incentives are less important over the long term than responsiveness and accountability of the public agency to the feedback provided; however, if resources allow, incentives may be effective at building awareness and jumpstarting use of the feedback tool.

Analyze In the **analyze phase**, there are policy and technology issues to consider. These include:

How should the information be displayed?

Virtually all MDC tools employ a server to host a data collection and analysis application, with an administrator interface that allows the public agency to create and update forms and menus, import and export data, and set up management dashboards and other tools for analyzing and visualizing the quantitative feedback in summary form. Figure 2 provides

an example of a management dashboard for displaying quantitative feedback on business inspection activities.

To utilize visualization and analysis features, the system requirements should be defined in the design stage to ensure that data formats can be easily imported and exported and provide support for basic graphs, mapping functionality, and flexible queries.

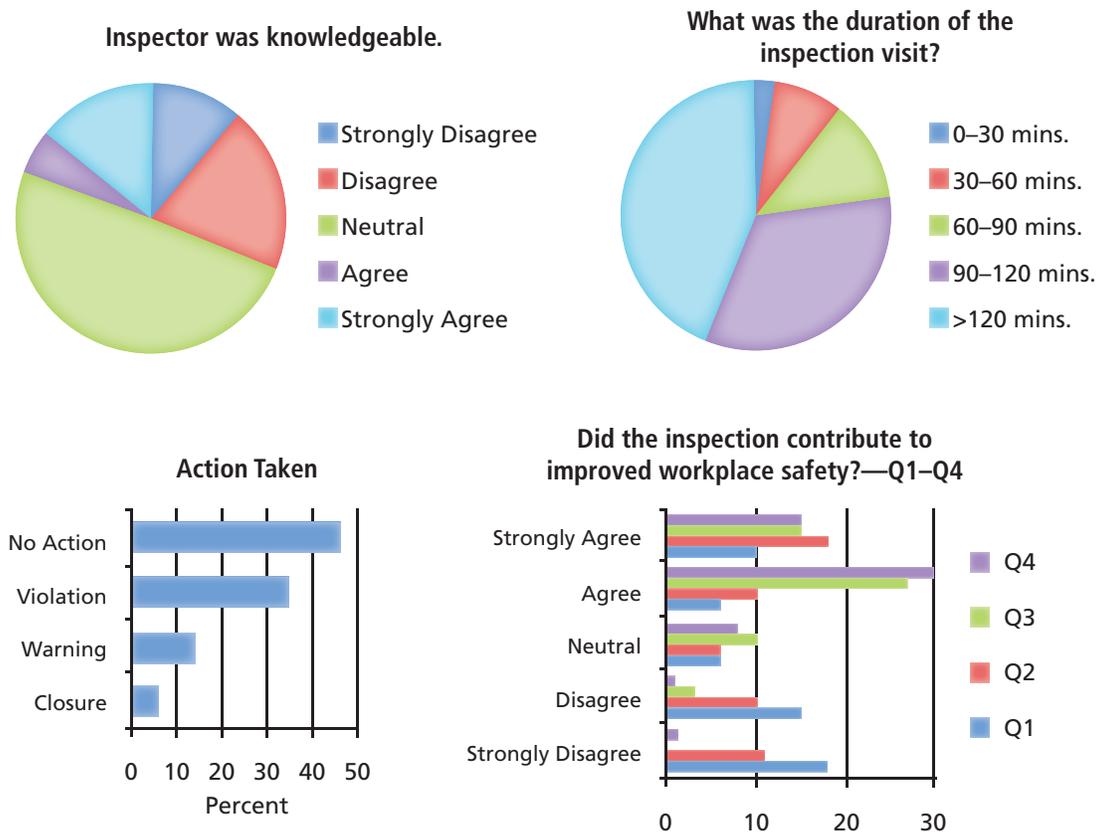
Collating and analyzing user comments and other non-quantitative feedback is a more labor-intensive task requiring ongoing staff resources.

Donors sponsoring reform programs under which these MDC solutions are implemented can also utilize this data to monitor the outcomes of their regulatory reform interventions, for example, tracking reductions in compliance costs for businesses regulated by the public agency.

Resolve In the **resolve phase** of an MDC project, there are institutional and communications issues to consider. These include:

FIGURE 2: EXAMPLE OF MANAGEMENT DASHBOARD

Feedback on Business Inspection Activities



How should the agency process and respond to feedback?

Once feedback systems have been IT-enabled and information coming in from consumers and business representatives is automatically organized in management dashboards, resources should be devoted to analyzing the feedback collected, identifying key issues that emerge, and developing action plans to address these issues. Examples of such issues may include variation in service quality provided by type of service or location, or indications of weaknesses in the training of client-facing staff.

How should the agency share trends in feedback with consumers and business representatives?

It is essential for long-term success of the project that—once the feedback system has been established and businesses are using it—the public agency report back to feedback providers on the issue identified and the organizational response. Information on aggregated responses to the feedback surveys should be made available through public channels such as agency websites, so that business people can see their feedback acknowledged by the agency. In addition, any policy change or service improvement resulting from feedback also should be communicated directly to feedback providers to demonstrate the agency's responsiveness and accountability.

Challenges on MDC projects

Various challenges can hamper mobile data collection projects. The best way to combat these challenges is to be aware of them at the outset and plan accordingly. Below are some of the most common challenges and recommendations for addressing them.

Challenge 1: Poor telecommunications network connectivity

Many countries have unreliable telecommunications networks which make transmission of data problematic.

Solution: Conduct network assessments before system design and ensure the technology solution selected is appropriate for the environment. For example, support for offline data entry with subsequent synchronization with the server can help address problems with mobile phone service interruption or jammed networks.

Challenge 2: Varying end-user capabilities

In collecting feedback from end users, their capacity to utilize such applications can often vary widely.

Solution: It is important to understand the baseline characteristics of the people providing feedback, design the system, and modify training and marketing materials to ensure efficient mobile data collection. If enumerators or agents are

being used, assessing their performance and advising them on how to improve can increase ownership and effectiveness of the data collection activity. If end users are providing the feedback directly, demonstrations can be provided by business intermediaries or other partner organizations.

Challenge 3: Data fabrication

Fabrication of data is possible. Particularly when enumerators are used, cheating may be perceived as an easy way to reach the target number of surveys completed.

Solution: Supervision through web and GPS tracking and device management help identify such cases early on in the process of the data collection. Another solution is to require authentication by end users; however, this may drastically reduce the number of respondents.

Challenge 4: Lack of willingness to use the feedback mechanism

Consumers or business representatives may be unwilling to take the time out of their business day or pay for the airtime required to complete a survey.

Solution: Giving respondents free airtime, holding promotional events, or offering the chance of a prize may convince people to use the service, particularly during the pilot period.

Challenge 5: Lack of trust among consumers and business representatives in providing feedback

If the government has a poor record of demonstrating accountability to citizens and the private sector, potential users may be reluctant to provide feedback for fear of unfair treatment by the public agency in the future.

Solution: Ensuring users that their individual feedback will be protected and made available only in aggregate form within the agency may help address this concern. Co-branding or offering the service through an independent partner or branch of government also may help allay such fears.

Challenge 6: Need to secure funding for the ongoing administration of the MDC project

Especially in public agencies in which there was previously no way to collect and respond to feedback, ensuring the viability of an MDC project to collect feedback on the nature of government-to-business service delivery may be difficult.

Solution: Raising funds to support a long-term project in any context that employs annual budgeting can be challenging even when securing support for the most popular initiatives; feedback projects also risk losing support over time from staff of the implementing agency, especially if feedback provided through the system reveals weaknesses in the public agency's

processes or staff. Therefore, public agency management support must be secured before undertaking such a project, and an internal champion and long-term budget should be identified prior to project kick-off.

Challenge 7: Lack of government capacity to develop, manage, and operate a feedback system

Implementation of a feedback system requires some essential capabilities of public agencies including a culture of openness and responsiveness and a baseline of skills among public servants to provide competent customer service. In many countries where the Bank Group is active in supporting improved public service delivery, it is necessary to work over a long period of time with governments to develop the requisite institutional culture and staff skills.

Conclusion

Mobile data collection tools offer governments a cost-effective means to monitor their performance, support public-private dialogue on regulatory issues, and collect data required to fulfill their regulatory oversight responsibilities.

Donor agencies can also leverage these tools to improve their monitoring and evaluation of regulatory reform interventions, particularly those focusing on improving quality of public service delivery and reducing compliance costs for businesses.

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represent official policy of the World Bank Group or of its Executive Directors or the countries they represent.

The Investment Climate Department of the World Bank Group helps governments implement reforms to improve their business environments and encourage and retain investment, thus fostering competitive markets, growth, and job creation. Funding is provided by the World Bank Group and over 15 donor partners working through the multidonor FIAS platform.

Notes

- ¹ “Crowdsourcing” describes the act of reaching out to the public through the internet or other media to collect information, identify ideas for solving problems, solicit funds for a particular cause, and so on.
- ² As part of an economic stimulus program in Kenya, Google assisted the Ministry of Finance in deploying a mapping application which displays information and photos uploaded by citizens reporting on the progress of local investment projects, such as schools, health centers, and roads. This program has since ended.
- ³ Layanan Aspirasi Dan Pengaduan Online Rakyat (LAPOR) is a web- and mobile-based system designed to enable citizens to report on the delivery of public services, flag public infrastructure problems, and comment on policy issues.
- ⁴ A hackathon is a gathering of programmers and others with IT project skills, such as designers and usability experts, to work collaboratively to create (over a short and specified period of time) software designed to provide a solution to a problem.
- ⁵ A non-exhaustive list of examples in Africa includes AfriLabs, BongoHive (Zambia), Botswana Innovation Hub, Co-Creation Hub (Nigeria), Ice Addis (Ethiopia), iHub (Nairobi), iLab (Liberia), mFriday Lab (Ghana), Plug and Play Egypt.
- ⁶ A non-exhaustive list of examples includes Charodix, InnoCentive, OpenIdeo, PitchBurner, Skild, TopCoder, We ThinQ.

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