CREATING AND IMPLEMENTING A HOLISTIC MOBILITY STRATEGY

A Policy Guide for State and Local Government Leaders

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CREATING AND IMPLEMENTING A HOLISTIC MOBILITY STRATEGY

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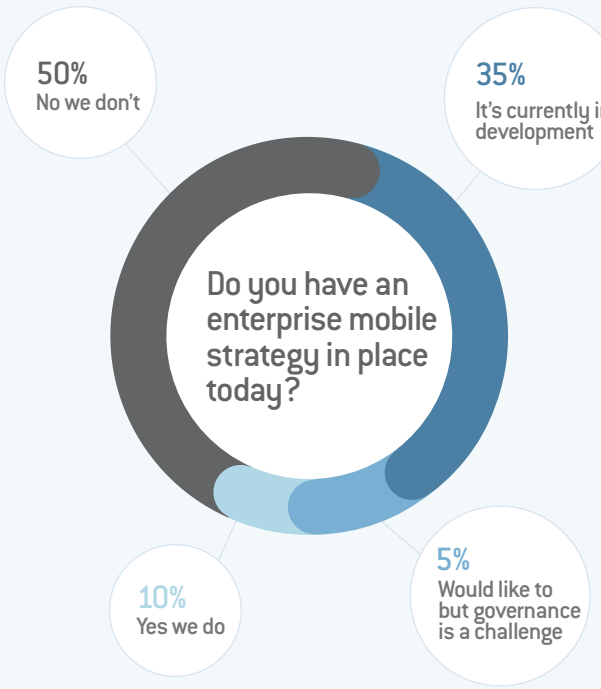
Background

Smartphones, tablets and other mobile devices are relentless in their efforts to conquer the world. Global smartphone shipments already exceed personal computer shipments, and by 2015, more Americans will access the Internet using mobile devices than desktop PCs.[1] By January 2012, less than two years after Apple introduced the first iPad, one in five U.S. adults owned a tablet.[2]

The flood of statistics about the ubiquity of mobile devices, consumer mobile device adoption and the consumerization of IT has not gone unnoticed by government leaders, who are attracted by the promise of improved employee productivity and retention, better citizen outreach and service delivery, and lower costs. In addition, a number of legislative actions that integrate mobility into agency plans have been passed, and citizen and employee preferences and demands are clear.



**The Governing magazine survey queried 135 state and local government leaders about their mobility strategies and plans.*

Governments are adding mobility to their mix of constituent communication channels, and mobile devices are making their way from coat pockets, handbags, briefcases and backpacks into federal and state agencies, mayors' and governors' offices, city halls and county buildings across the country.

Federal agencies, for example, are working to meet the requirements of the Obama Administration's May 2012 Digital Government Strategy, which mandates that every major federal agency make two key services available on mobile phones within a year. And the 2010 Telework Enhancement Act aims to increase the number of federal employees that telecommute. The Act requires agencies to support teleworkers by establishing a telework policy and providing a telework training program, among other measures.

Many state, county and city technology leaders are also heeding mobility's siren call, but at a slower pace. Research from the National Association of State CIOs (NASCIO) has found that mobility, mobile services and mobile workforce technologies are high priorities for state and local agencies.[3,4] However, a recent survey of 135 state and local leaders by *Governing* magazine indicates that only 10 percent of them actually have an enterprise mobility strategy in place — although 35 percent are in the process of developing such a strategy.[5]

This policy paper will review the results of *Governing* magazine's public sector survey on mobility, including primary drivers and challenges, as well as application development strategies and priorities.

To help agencies jumpstart their mobility initiatives, we'll illustrate the promise of mobility using public sector case studies and review the most common challenges to developing mobile initiatives. We'll suggest strategies and approaches for overcoming these challenges. And finally, we'll provide a how-to guide to help government organizations assess their current situation and develop a preliminary strategy for adopting mobility, using best practices gleaned from government executives.

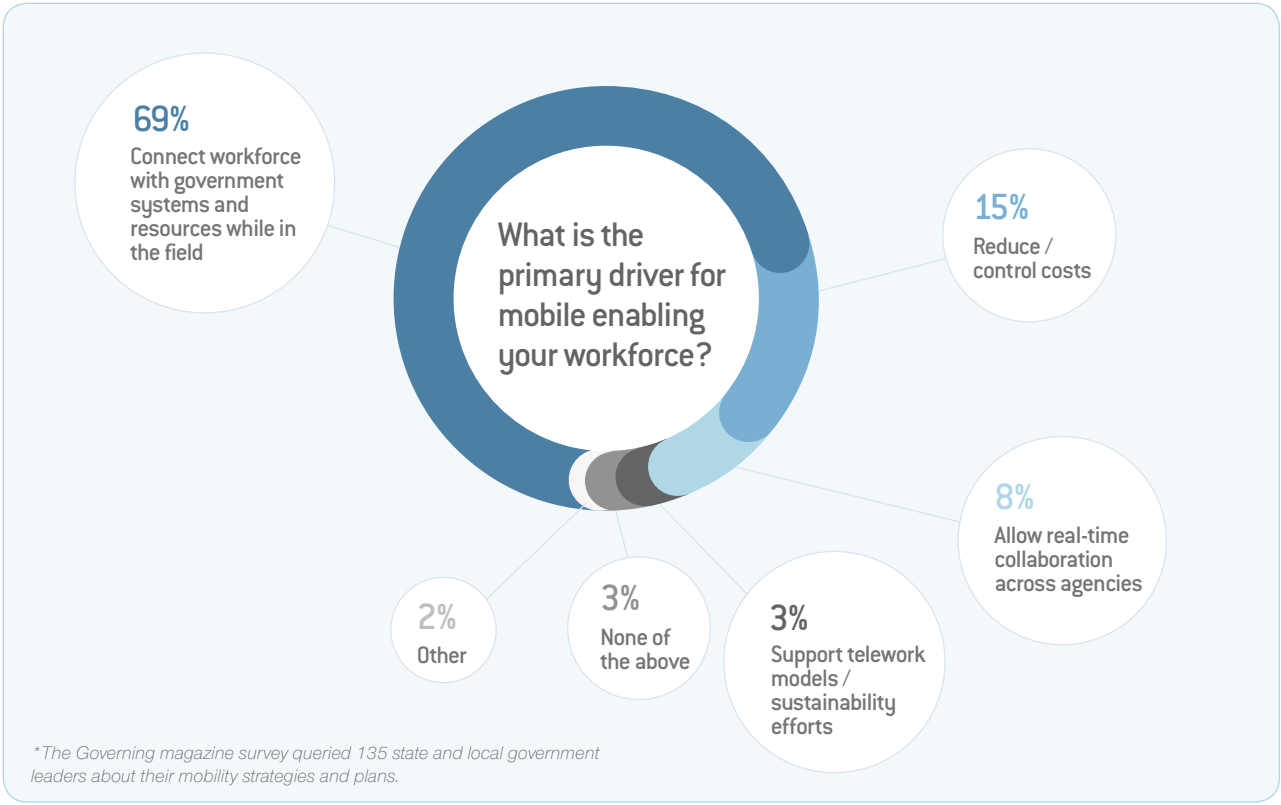
Case Studies: The Benefits of Enterprise-Wide Mobility

The speed at which mobile devices have moved from "luxury" to "necessity" is pushing the public sector to take measures to accommodate the use of mobile devices by citizens and government workers. Government leaders understand the necessity of accommodating citizen and employee preferences, and they know mobility can reap considerable gains in productivity and efficiency, produce better program outcomes, and improve citizen engagement and service delivery. They're caught between a proverbial rock (ignoring mobility) and a hard place (moving forward too quickly).

Too often, mobility initiatives are initiated and implemented haphazardly, without the benefit of a holistic mobility plan. Without proper planning, mobility efforts can be stymied by budget and staffing challenges, as well as deployment and security issues.

More than two-thirds (69 percent) of the state and local government leaders we surveyed say that they are mobile enabling their field-based workforce to provide better access to technology and resources.[6]

True, many of the benefits of mobility can be achieved by developing department- or agency-specific point solutions and accommodating multiple



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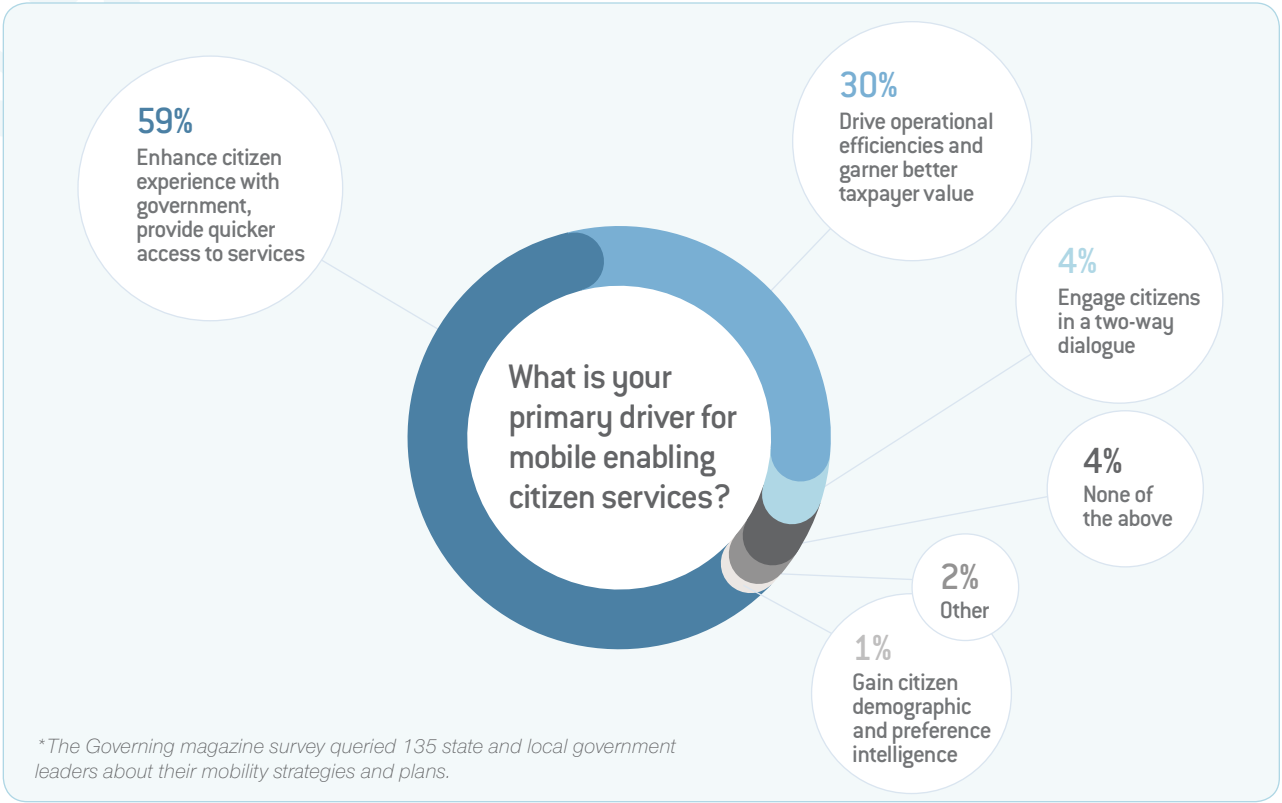

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types of mobile devices. These solutions may work out just fine for a small agency, but they usually aren't scalable. Mobility is more than apps and devices — it includes architectures, software platforms, and back-end applications and databases. An enterprise-wide mobile strategy reduces costs by eliminating redundant infrastructures and platforms, which then spreads costs across the enterprise and makes it easier to manage and maintain technology.

Let's take a brief look at how the state of Michigan and San Diego County leverage their mobility strategies to achieve benefits across the government enterprise.

Win-Win for the State of Michigan's Citizens and Employees

Michigan was an early adopter of centralized IT, so its technology plan, including proposed mobile solutions, are directly related to the needs of its 17 partner agencies. The state's IT plan contains six major goals that are all supported by mobility, including anytime, anywhere access to business and citizen services; providing efficient and effective technology; creating a great workplace; and transforming government through innovation.[7]

"We developed our ICT (information and communications technology) in 2011, and mobility was a big part of that," says David Behen, CIO of Michigan. "We asked for — and got — a significant amount of funding from the legislature in 2012 and started multiple major projects, including mobility. Now, in 2013, it's the year for us to hit our stride and become more effective and efficient using the technology they put in our hands."[8]

That allows the Michigan Department of Technology, Management and Budget (DTMB) to deliver its agency partners customized mobility solutions that are aligned with their enterprise-wide mobility goals.

An example is the Michigan State Police (MSP). Facing a $17.7 million general fund reduction for 2012, MSP wanted to reduce the number of brick-and-mortar posts without impacting its commitment to public

safety. DTMB helped MSP achieve its goals for a regional policing model by rolling out laptops and in-vehicle mounted workstations to all of the state's 700 police cruisers.

The program is a win for both citizens and state employees. It helps troopers be more productive and spend more time on the streets — they're able to create crash reports and file traffic citations five times as fast as when they were done manually and their reports are more accurate. They also have greater mobile access to information in critical law enforcement databases.

Public safety was uncompromised because none of MSP's approximately 1,200 troopers lost their jobs. The officers are safer, too — global positioning system (GPS) technology and automated data collection ensures that a trooper's location is always known. And by reducing the number of brick-and-mortar posts from 62 to 29, MSP saved $21 million.[9,10]

Michigan's Department of Human Services (DHS) is another agency that has taken the lead in using mobility to meet its goals. DHS's aggressive mobility program is built around lightweight laptops with cameras for videoconferences and smartphones deployed to all of its 2,200 caseworkers.[11]

"Our caseworkers are no longer in brick-and-mortar offices, so we've been able to take that savings and move it into mobile technology," says Behen. "Employees don't have to drive back to the office to look for paperwork, file reports, search databases or return phone calls. So we can provide better service to the families of our state."[12]

The state has also created both online and mobile apps known as MiPage, to complement its extensive Michigan.gov website. "Our vision is to have our citizens be able to access all government services from a single application," Behen says.[13]

DTMB develops solutions to meet both citizen and employee needs, but not in a vacuum. "I don't see a lot of difference between citizens and employees. I want all of our employees and citizens to be able to experience the same ability to be more efficient and more effective by using mobile devices," Behen says. "We might approach them separately, but they're equally important, and our vision is the same for both of them."[14]

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>
> — David Behen, CIO, Michigan

His colleague Eric Swanson agrees. "Everything we do in government ends up impacting citizens," says Swanson, who's the director of Michigan's Center for Shared Solutions and Technology Partnerships. "So when we save money or make it easier for state employees to do their jobs, we're ultimately making it easier for citizens to do business with us, and also saving their tax dollars."[15]

San Diego County Tears Down the Walls

The county of San Diego is well known for its forward-looking technology initiatives. It won first place in the Center for Digital Government's Digital Counties Survey in 2004 and 2008, and was the finalist in the Center's Best of the Web award program in 2009. In 2010 it received the California County Information Services Directors Association's Innovation Award.

Mobility is one of the county's strategic IT initiatives, along with end-user computing, identity and access management, enterprise information management and others. An aggressive mobility program was initiated and integrated into its strategic IT plan in 2011 and is in the process of being implemented across all county agencies and departments.

The county's roadmap enables anytime, anywhere access for citizens and employees. Features include:[16]

- Employee access to the county network using

A 90-day pilot mobility program involving seven inspectors in San Diego County's Land Use and Environment Group resulted in more than $130,000 in savings due to reduced fuel, office occupancy, traveling time and landline costs.

any mobile device and almost any wireless carrier via applications developed by the departments in accordance with enterprise security, management, application architecture and database synchronization policies

- An enterprise mobility platform with a common enterprise infrastructure for servers and gateways that eliminates duplicative departmental investments
- An application development architecture that helps departments launch mobile apps
- An enterprise-wide mobile device management platform that manages mobile devices, applications, application security and data on devices
- Government Without Walls, or GWOW, a mobile workforce initiative that encourages flexible work options
- An ongoing commitment to mobile-enabled government services, leveraging mobile features such as location-based services, texting and mobile browsers

The treatment of mobility as a critical part of a holistic IT plan gives individual agencies and departments the flexibility to choose devices and develop applications that meet their unique needs while adhering to enterprise standards. These policies, technologies and platforms allow the county to explore the possibility of a BYOD program that will also give individual entities the ability to participate as needed.

How are individual departments leveraging the county's mobility policy? As part of its GWOW initiative, the county's Land Use and Environment Group (LUEG) sends staff to agricultural and other remote areas for inspections and permitting. LUEG is providing its field workers with mobility tools and platforms that will reduce travel time and increase the amount of productive field work with citizens.[17]

A 90-day pilot mobility program involving seven inspectors resulted in more than $130,000 in savings due to reduced fuel, office occupancy, traveling time and landline costs. And because field staff reduced their travel time, they were 31 percent more productive — the equivalent of approximately 2,500 additional inspections per year. And this was for just seven inspectors![18]

The program is being adopted on a widespread basis by LUEG, as well as the county's Health and Human Services Agency (HHSA). About 600 HHSA child welfare workers and public health nurses are using the mobile solution in the field. They're experiencing the same positive results, including more time with clients and less time doing office-based paperwork.[19]

Another mobile initiative, SD Emergency, was introduced by the Public Safety Group's Office of Emergency Services, which coordinates the overall county response to disasters. SD Emergency is an app for Android and Apple devices that improves public safety. It provides the public with real-time map-based information about emergency incidents such as fires, floods and earthquakes. Users can configure the app to send themselves push notifications and emergency updates, such as road closures, evacuations and emergency shelters.[20]

SD Emergency, which was released during the destructive 2012 Shockey Fire, was downloaded and used immediately by citizens to receive current information about the fire.[21] Citizen reviews in the iTunes App Store and Google Play Store are overwhelmingly positive. The comments show that, besides improving public safety and even saving lives, the county is improving public engagement and increasing citizen trust. Says one reviewer, "...this will be a true lifesaver for a lot of us. Please give family and friends the info. Everyone needs this app!"[22]

Overcoming Mobility's Challenges with Technology

Our research shows that the primary challenges or objections to developing and implementing a holistic enterprise-wide mobility strategy are:

- Developing a strategy
- Budget and staffing inadequacies
- Security
- Mobile enablement of legacy applications
- Managing workforce devices for employees
- Managing enterprise and citizen applications and data
- Addressing lifecycle management
- e-Discovery and the Freedom of Information Act (FOIA) issues
- Managing mobility-driven big data

Let's take a look at some of these challenges and how they hinder the public sector adoption of enterprise mobile strategy. In the next section, we'll discuss how to overcome them.

Developing a Strategy

Developing a holistic mobility strategy can seem overwhelming. The speed of technology changes can be paralyzing, and a host of challenges, which we're getting ready to discuss, may need to be addressed before mobility is integrated into the enterprise.

But seasoned IT pros know that enabling mobility is more complex than deploying mobile devices and implementing network connectivity for the workforce, or developing a mobile website and some external-facing apps for citizens. A well-thought-out strategy and implementation plan that address the enterprise challenges, as well as the needs of employees and constituents, can prevent serious management, financial and security problems further down the road.

Many government enterprises spend duplicate financial and staffing resources implementing siloed point solutions for specific departments or agencies. It's important for them to develop a mobility strategy that includes a common enterprise-wide goal and end state. This ensures that all agencies are on the same page, saves tax dollars and helps future-proof the mobility strategy.

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Budget and Staffing Inadequacies

Jack Doane, director of Alabama's Information Services Division, says that the state is analyzing plans for a holistic mobile enablement strategy. However, he's circumspect about enterprise-wide mobility. "Making mobile device strategy an enterprise-wide strategy, while convenient for many citizens, may not be the most economical way to provide citizens services," he says. "Funding is not adequate to rush the implementation of a holistic mobile enablement strategy. Training and outfitting staff for mobile applications is underfunded."[23]

The majority of our survey participants agree with Doane. When asked about the challenges of enterprise-wide mobility, 62 percent say that budget and staffing challenges were the biggest impediment.[24]

Security

The National Security Agency's (NSA) mobility initiative, launched at the end of 2012, allows its employees to access classified data from their personal smartphones and tablets. In remarks before the Armed Forces Communications and Electronics Association, Debora Plunkett, the director of NSA's Information Assurance Directorate, acknowledged that security had been a roadblock to meeting employee demands for

up-to-date devices. "We very strongly believe that in the absence of our ability to be able to leverage the capacity of industry to deliver security and components that we need, we will not be able to meet the demand signals from our customers," she said.[25]

The agency had to develop and implement an approach that met its strict security requirements, while at the same time didn't deliver obsolete technology. Before the NSA could launch its mobile device initiative, it had to overcome security hurdles, including mobile operating systems and devices that don't meet government security requirements. The agency worked with industry vendors to beef up OS security and develop better software for protecting handhelds.[26]

Mobility requires governments to make a cultural shift. "We've got to be able to operate in that same cycle [as commercial technology] as we're looking at putting smart devices in the hands of government users," Plunkett said. "We've got to be able to move quickly enough such that we can also evaluate those new devices and put them in the hands of users in enough time while those devices are not obsolete."[27]

Legacy Applications

In the public sector, many mission-critical applications are those that are 10 to 20 years old, or even older. By mobilizing legacy applications, governments expand access to the segment of their constituents that don't have Internet or computer access at home, but do have mobile devices. In areas such as health and human services, this expands citizen access to services, reducing their need to come into the office for certain routine tasks. In addition to saving time for citizens, it streamlines operations by freeing employees to work on other tasks.

Mobilizing these legacy applications can be challenging. Some organizations, like the states of Mississippi and Michigan, are fortunate to have funding for modernization efforts. "We have an aggressive modernization effort across the state, with five systems in the process of being modernized and migrated," says Dr. Craig Orgeron, CIO and executive director at the Mississippi Department of IT Services. "The more current the systems are, the more you can access real-time data, improve Web services and increase mobility."[28]

But many organizations don't have funding to modernize legacy systems. They may simply ignore legacy applications in planning their mobility strategy.

Managing Devices, Applications and Data

With shrinking budgets and fewer staff, government IT departments don't have the resources to provision, manage and support devices and applications, and protect data. They require easy-to-use tools that help them remotely and efficiently manage the different components of their mobility initiatives.

Mobility-Driven Big Data

A huge number of today's government transactions are being made via mobile device. And mobile devices, networks and applications will generate more than seven exabytes of data by 2015.[29] This volume of data has the potential to revolutionize citizen services and outcomes. But will governments be able to manage it all?

E-Discovery and the Freedom of Information Act (FOIA)

E-Discovery and FOIA are always challenging, but even more so if the agency is considering mobility, especially BYOD. Says Harold Tuck, former CIO of San Diego County, "If we receive a request under the Freedom of Information Act, and that request involves data that might reside on a user's personal device, that user will have to surrender their device temporarily so we can comply."

Only 27 percent of the government leaders *Governing* magazine surveyed agree that records retention and open records laws create challenges to enabling mobility, and 22 percent of those say that they're still able to move forward. However, 57 percent say that they aren't sure, because their strategy is still in development.[30]

Reading this laundry list of challenges may tempt you to forget mobility altogether. The good news is, these challenges can be overcome by using the right approaches and tools.

The Building Blocks of Enterprise-Wide Mobility

Numerous technology tools and approaches make it easier to overcome mobility's challenges. To enable enterprise-wide mobility, we'll explore the following tools and strategies:

- Mobile devices
- BYOD
- Dual persona software
- Mobile apps and access to government services
- Mobilized government websites
- Mobile device management (MDM)
- Mobile application management (MAM)
- Application development tools and approaches
- Mobile business analytics
- Mobile VPN
- ROI performance measures

Mobile Devices

Laptops, tablets and smartphones all have a place in the government workforce. Michigan's Swanson notes, "I use my cell phone so much that I'm days away from no longer needing a laptop. And our state house just converted entirely to tablets."[31]

He suggests that employee profiles can help determine which employees get which devices. "We have to either cut costs or keep budget level when it comes to new technologies. How can we make sure that everyone has the devices they need, but not more than that?" he adds. "Not every employee needs a tablet."[32]

For agencies issuing devices to their employees, a standardization policy can save money by allowing procurement to take advantage of economies of scale. When the number of devices and configurations are limited, it's easier to develop budgets and manage devices. It also simplifies the procurement process and even enables the possibility for employee self service.[33]

A mobile device standardization policy can save money by allowing procurement to take advantage of economies of scale.

BYOD

And then there's BYOD. Attitudes have evolved quickly over the last year. "BYOD: Resistance is Futile" trumpeted a headline in *Government Technology*. According to the magazine, 2012 was the year that government CIOs — from the federal to the county and city level — stopped resisting BYOD and instead recognized the potential cost savings of replacing some government-owned devices with employee-owned ones. Yet they still continue to wrestle with BYOD challenges, including lost or stolen devices, mobile malware and e-discovery.[34]

BYOD has many benefits. The increased mobility and flexibility that results when governments allow their employees to use their own devices allows them to be more productive in both their personal and work lives, which increases job satisfaction. A BYOD program should be cost-effective, so a cost-benefit analysis must be done. Take into account the cost of mobile devices, government reimbursements for voice and data charges, mobile enterprise infrastructure and management costs, and lifecycle asset management costs.

"We view BYOD as a good thing because it can offset the expenses of providing wireless devices," says Dr. Orgeron. "But security is a large and demanding challenge, and so are provisioning, policy applications and updates."[35]

Dual Persona Software

Some of the bloom may come off the BYOD rose when users are asked to turn over their phones to their employers for e-Discovery or FOIA requests. However, dual persona software can create a wall between enterprise and personal apps and data.

End users can log in and out of personal and work modes, and both modes are secure. Employees can use whatever personal apps they want, and store their personal videos, photos, texts and emails without worrying about privacy concerns.

Mobile Apps and Access to Government Services

In our survey of government leaders, we found that executive support for mobile app development was high, with 41 percent saying that agency leadership was supportive of app development, or in some cases, the driver of app development (7 percent). The majority of respondents (48 percent) have already developed between one and three citizen or employee apps, or are planning to in the next two years — but almost as many (42 percent) have not developed any apps yet and aren't planning to do so in the next two years.[36]

For their mobile workforce and their constituents, governments use a mix of purchasing third-party apps and developing custom apps internally or through outsourcing. Workforce or productivity apps help automate report filing, record and data searches, vacation requests, and just about any other paper-based process. As we saw in Michigan and San Diego County, other apps mobilize lines of business workflow and processes so that field workers can enjoy a more streamlined and productive work experience. For workforce apps, a frequent strategy is to use a third-party app, perhaps with some vendor or internal customization.

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Constituent-facing applications provide mobile access to services, such as registering to vote, checking on neighborhood police activity, finding nearby government offices or reserving a campsite at a state park. Interactive applications allow citizens to report issues such as abandoned cars, potholes and graffiti. Thirty-nine percent of the government leaders we surveyed say that they are considering mobile app development in the areas of basic government services, such as tax payments or driver's license renewal. Twenty-one percent of participants are considering public safety and emergency response apps, such as San Diego County's SD Emergency.[37]

Mississippi is going through a huge push in application development, according to Dr. Orgeron. "We have a mobile app for Mississippi.gov; the Division of Motor Vehicles has a really successful app for a practice driving test; and the Department of Transportation's traffic congestion app is really popular," he says. "Mississippians love the outdoors, so our fishing and hunting and tourism apps have also been a big hit."[38]

What about next door in Alabama? "We're focused right now on mobile employee-facing apps involving healthcare, as well as location awareness applications that can efficiently direct citizens to government services," says Doane.

Mobilized Government Websites

Formatting, size and usability are critical as more citizens arrive at websites via tablets and smartphones. One option for optimizing websites for mobile device users is to use a technique known as responsive Web design, which automatically scales and reformats website content to fit smaller screen sizes.

Or, an agency may choose to develop an HTML5 app (mobile Web app) for its portal. (You'll read more about this tool a little later.) The HTML5 app is automatically initiated whenever a user accesses the site through a mobile device Web browser, and

it's designed specifically for the mobile experience. For example, the buttons are larger and more finger friendly, and they're often placed in the familiar grid format that users experience when navigating downloadable Web apps.

Location awareness is another nod to mobile website users. Location-aware websites can determine user location automatically using GPS data. The website can be configured to display or push relevant information to the user based on location.

Mobile Device Management and Mobile Application Management

One of the reasons that BYOD hit its stride in 2012 is that technologies to protect devices, like mobile device management (MDM) and mobile application management (MAM), have matured considerably and simplified the process of protecting employee devices.

MDM software platforms allow for centralized, remote management, monitoring and security for all types of mobile devices and their data (whether at rest or in transit) across any mobile operator or service provider. Features include device functionality lockdown, user access application control, remote wiping of data from a lost or stolen device, troubleshooting, and the ability to upgrade software and operating systems.

Most solutions include a server that delivers the management commands, along with client software that receives the commands and implements them. The software may be run on premises or in the cloud.

MDM software is critical for addressing government's security issues and ensuring the security of government devices, networks, application and data. It can be used for both government-issued and employee-owned devices, which means that it can take some of the anxiety out of BYOD initiatives. IT staff can empower end users to control some aspects of MDM using self-service options.

MAM helps government enterprises provision and manage both third-party and internally developed apps on mobile devices. Unlike MDM, which manages the device configuration and can include application and data management, MAM is used exclusively to manage applications, including delivery, licensing, configuration, maintenance, usage tracking and policy enforcement.[39]

> **"We are tracking a significant increase in citizens' use of mobile devices to access our state Web portal, and we are developing content accordingly."**
>
> — Calvin Rhodes, CIO, State of Georgia

MAM makes provisioning apps easier because it automatically occurs when a new device accesses the network by comparing user profiles to IT-developed policies. It also provides controls for administrators to wipe apps and associated data from the employee device or to limit network or database access.

Like MDM, MAM software can be used on both government-issued and employee-owned devices, and self-service options are available.

Application Development Tools

There are many options for extending business applications across the mobile platform for both employee and constituent applications. One solution for mobile application development is the mobile enterprise application platform (MEAP), which consists of a platform and a mobile client application, management tools and a development environment.

Platform. The platform handles system integration, security, communications, scalability and cross-platform support. No data is stored in the platform; it manages data from the back-end system to the mobile device and back.

Mobile applications. Mobile application software connects to the platform and drives both the user interface and the business logic on the device.

Management tools. The utilities for managing users, devices, profiles, security, and policies and reports such as the status of the platform, usage statistics, etc.

Development environment. The internal development environment is used to create cross-platform mobile applications. It can include graphical front-ends for code editing, compilation, documentation, source versioning, change management, debugging and profiling, as well as test tools, enablers and a development community.

Mobile enterprise application platforms (MEAPs) provide multiple developers across many organizations with access to the same app development tools, including middleware applications, hosting, management and professional services.

MEAPs provide multiple developers across many organizations with access to the same app development tools. They use drag-and-drop user interfaces, which are easy to use for developers that don't have extensive programming experience, and they make it easy to develop applications for multiple devices and operating systems.

MEAPs can also be a platform for mobilizing legacy applications by using an application programming interface (API), a software protocol that interfaces between different applications and allows them to communicate with each other. API coding allows app developers to seamlessly connect legacy applications to the mobile platform without changing the legacy code.

Gartner, which coined the term MEAP in 2008, recommends that organizations use MEAPs if they plan to support at least three mobile apps, three mobile operating systems and three back-end data sources.

As an alternative to deploying a MEAP, some small organizations may find it completely acceptable and cost effective to develop a point solution — one app for one device form factor or a single operating system. This is a fairly easy approach to execute, as long as the organization doesn't need to extend the app beyond a single type of device or operating system.

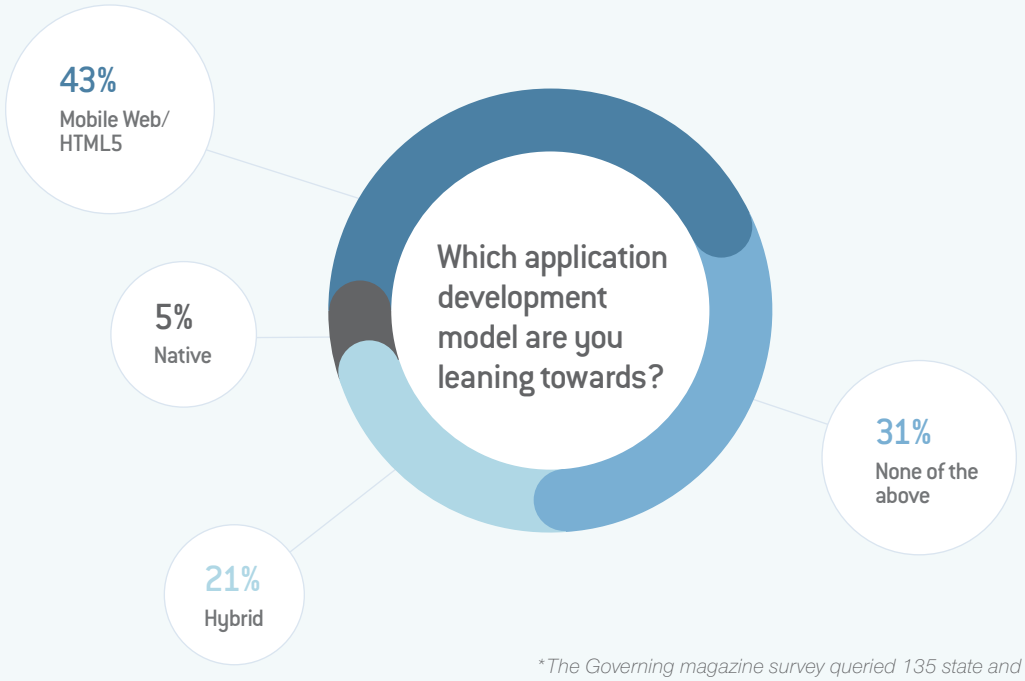
Point solutions are harder to update as operating systems change. And because each standalone app requires its own infrastructure, it's not a scalable solution for organizations that plan to deploy multiple internal and external apps.

Application Development Approaches: Which is Best?

There are two primary coding approaches to developing apps — native and HTML5 — and a third approach that combines the two. Developers across all industries are embroiled in a debate about the merits of each. Here's a quick rundown of the three models:

Native apps. Native apps are developed for particular mobile operating systems (e.g. Android or iOS). Since these are relatively new platforms, they require expertise in new coding skills and tools and the knowledge of multiple programming languages, operating systems and devices. Because a separate app must be developed for each operating system, native apps cost more and use more technical resources. But they take full advantage of the operating system, usually have the best look and performance, and provide the developer with a presence in the app stores.

HTML5 apps. Also called a mobile Web app, HTML5 apps running in a mobile browser are an easy way to provide mobile access to website functions (as we discussed earlier). Mobile Web apps aren't really apps at all — they're websites that are customized to have the appearance and functionality of an app. HTML5 apps rely on more commonly held coding skills and are easier to deploy than native apps. They're meant to deliver "one-size-fits-all" apps for all devices and operating systems. But in practice, developers spend a lot of time adapting the apps to meet the requirements



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of multiple operating systems, and they don't usually work as smoothly as native apps.

Hybrid apps. An app developed in HTML5 and enclosed in a pre-built native "wrapper," or container, is called a hybrid app. Hybrids combine the best of the two approaches: They're easier to develop using common development skills, are compatible with multiple platforms and provide an app store presence.

The majority of state and local government IT leaders surveyed by *Governing* magazine say they intend to develop their apps using the HTML5 mobile Web application development strategy. This makes sense given the limited budgets of many agencies.

Mobile Business Analytics

Alabama's Doane says that big data has the potential to change the current paradigm. "By using big data, governments will be able to recognize trends that require citizen services in real time and distribute that service directly to citizens," he noted. "The time required to accurately respond to a citizen need will be dramatically shortened."[40]

Like Doane, the majority of our survey participants have high expectations of mobility-driven big data. Sixty-five percent say that its role is to capture more information more rapidly, and 82 percent say that it will enable the delivery of intelligence and services to mobile citizens and employees. Sixty-two percent are looking forward to using it to automate laborious, time-intensive processes.[41]

Data analytics and business intelligence software provide actionable insight through analysis of large data sets, using statistical analysis methods, data analysis and reporting, algorithm-based predictive modeling and visualization techniques, such as scorecards and dashboards. When applied to the mountains of data generated by mobile devices, networks and applications, these tools can drive instant, automatic decision-making or be used as input for decisions by humans.

The use of big data in government is in its infancy, so initially this may simply be information about how citizens use their mobile devices to access government services. Over time, however, governments will be able to use mobile data to determine how they respond to

5 Tips for App Development

The following tips for app developers apply to both citizen- and employee-facing apps.

1. **Keep it simple.** An app with too many functions will be too hard to use — you may need to develop multiple apps. The design should be simple and intuitive, and make it easy for users to fill out forms with pre-filled categories and drop-down menus.

2. **Focus on user experience.** The end-user experience is the most important consideration in app development. One recommendation says that the user should not have to make more than three clicks or wait more than three seconds to get to a desired feature.

3. **Integrate with relevant systems.** If your app collects data, it should integrate with existing systems, such as work order or dispatch systems for 3-1-1 apps. If it doesn't, staff will waste time re-inputting data.

4. **Leverage GPS.** A location-aware app is a personalized app. When an app can use GPS information to serve up location-based content, it dramatically increases your ability to connect with constituents.

5. **Support multiple platforms.** Accommodate as many types of devices and operating systems as possible. The most common operating systems, of course, are Android and iOS, but don't count out BlackBerry, Symbian and Windows Phone operating systems, or the myriad other systems that are on the market or will soon be coming to market.[42,43]

emergencies, or how they manage traffic and other applications that rely on or generate heavy citizen mobile device use.

Mobile Virtual Private Network (VPN)

Many field or remote workers need to maintain authentication into applications while they access different networks, cross coverage gaps, or suspend and resume device connectivity. A traditional VPN can frustrate these workers because constant disruptions in the network tunnel cause application failures and device crashes. Mobile VPNs are designed to meet the challenges of mobile environments.

ROI Performance Measures

Given that so many government leaders are struggling to find the budget and staffing resources to devote to mobility initiatives, developing ROI metrics and measuring ROI may be one of the most important strategies for successfully deploying an enterprise-wide mobile strategy. Mobility enables greater productivity and more efficient employees — as demonstrated by the Michigan State Police, Michigan's Department of Human Services and San Diego County's Land Use and Environment Group — which can ultimately lead to increased revenue.

Also, in cases where mobilizing the workforce eliminates office space, those savings can also be included in the ROI calculations. "There are ways to find the money in tight times to make new investments," notes Michigan's Swanson. "We have to be creative and look at how to take the savings from the previous technology or workflow process and move them to the next."[44]

Process and Best Practices for Developing an Enterprise-Wide Mobility Strategy

We recommend a three-phase framework for developing a holistic mobility strategy, beginning with discovery, shifting to analysis and wrapping up with a call to action.[45]

Phase I: Discovery

In the discovery phase, the agency establishes a baseline understanding of its overall strategy, existing business processes and systems, and current experience with mobility. This aligns the mobility strategy with agency/department goals. It can include reviewing and documenting core business, back-end and security processes; identifying opportunities in the individual lines of business; reviewing infrastructure and access requirements; documenting the level of experience that each line of business has with mobile technologies; and educating staff through roundtables, workshops and brainstorming on best practices, technology trends and other mobility topics.

Phase II: Analysis

Analysis involves reviewing the data gathered in the discovery phase to identify the resources, infrastructure and policies needed to support the mobility strategy. This can include conducting a gap analysis based on current and future states; and developing criteria for prioritizing mobility opportunities, user and solution profiles and a mobile solution development strategy based on these profiles, a lifecycle deployment plan for internal mobile device support, a reference architecture for the top solutions, an enterprise mobility governance model and a comprehensive support model for both citizens and employees.

Phase III: Call to Action

In the final phase, recommendations for various components of the mobility strategy are developed. The strategy document lays out the sequence of actions and decisions necessary to move forward. This can include developing the overall mobility strategy, a mobility roadmap that identifies the tactical steps, a high-level cost model for implementing the mobility strategy, and recommendations for mobility policy and governance.

Public sector leaders have their own best practices for successfully deploying enterprise-wide mobility. Here's what the pros suggest.

Tips from the Pros: Best Practices for Developing a Mobility Strategy

Public sector leaders have their own best practices for successfully deploying enterprise-wide mobility. Here's what the pros suggest.

Educate yourself — and everyone else. Jack Doane suggests learning how other agencies and jurisdictions are achieving mobility. "First meet with experts in the mobility field and get their input, see how others implemented their mobility solutions and learn the pitfalls," he advises. "Then you can work toward identifying current and future needs, creating policies and developing an implementation plan."[46]

Talk up your plans with key stakeholders to get their support and feedback. "We're constantly talking with policy makers, members of the legislature and other elected officials to gain support for initiatives such as mobility or modernizing legacy applications to enable mobility," says Dr. Orgeron.[47]

Consider creating a team of a group of IT staff, line of business stakeholders and even critical vendors to help you sort through mobility's many facets. San Diego County's Harold Tuck created an Innovation

Council that brings together county employees and IT industry representatives to discuss potential projects involving innovative technology, including mobility and others. "We're looking for development of applications and ideas for our internal use — for our staff to provide services to constituents — and externally for people who want to do business with us," Tuck notes.[48]

Get started. As constituents and government employees integrate mobility into their daily lives, it's inevitable that the public sector will embrace the technology.

Develop a business case. Make sure to understand what the business requirements are. "One of the benefits of having a centralized IT organization is that we're able to be proactive," says Michigan's Swanson. "We can suggest mobility solutions based on our close relationships with our agency partners, instead of waiting for them to bring problems to our attention."[49]

Whether your IT team is centralized or not, reach out to the lines of business. Work closely with them to understand their mandates and objectives. Make sure to communicate what's possible in the enterprise environment, and keep the lines of communication open throughout the process of developing your strategy and deploying technology.

Prioritize goals and initiatives. Once you understand the enterprise's multiple business cases, prioritize the goals and initiatives. Rank them based on factors such as citizen and employee imperatives, solutions that have the most impact, and solutions that are easiest or most cost effective to implement.

Look at the business processes and back-end systems that are involved. Determine if an application can be bought off the shelf or if it needs to be developed. Understand the device, security and architecture needs of each solution, and make your decisions based on the outcome.

Don't reinvent the wheel. Borrow strategies from other government agencies, and look to your favorite private sector experiences for ideas. "My bank has an incredible Web app," says Dr. Orgeron. "There are plenty of private sector companies with phenomenal mobile experiences that can serve as models for government."[50]

Don't forget the back end. Mobility's ability to streamline business processes is legendary, but there is much efficiency that can be created by streamlining back-end processes. For example, Mississippi standardized its payment engine so that all transactions go through a single solution.[51]

Define success. Mobility holds so many options and opportunities that it's easy to get started without defining the measures for success. Using input from agency leaders, lines of business and other stakeholders, define your agency's success criteria and how you'll measure it. Are you looking for higher revenue, improved productivity or better communication? Knowing your expected outcomes will help you and your implementation and technology partners be more successful.

Pick the right technology partners. Pick a partner that is more interested in your agency's needs than in leading you down a particular technology path. And, notes Doane, "When developing mobility goals, it's important for agencies to glean as much knowledge as possible from their private sector counterparts."[52]

Get started. As constituents and government employees integrate mobility into their daily lives, it's inevitable that the public sector will embrace the technology. Careful planning is key, but once your plan is developed and approved, don't be afraid to jump in.

There's a lot at stake when you put your city, county or state seal on an app. Mobile technology is changing at a breakneck pace, and that makes it important to be adaptable. But resist the urge to wait until the next release of a new operating system, device or application. You can correct mistakes or modify plans as you move forward. Once you've developed your strategy, it's time to press the "launch" button.

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