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Innovations in Public Service Delivery

Issue No. 5

Improving Service Delivery through Information Integration: Building a Single View of the Citizen

Prepared for the Innovation in Citizen Services Division by:

Jane Wiseman

Institutions for Development Sector

Innovation in Citizen Services Division

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For several years, the Inter-American Development Bank (IDB) has been working with governments in the Latin American and Caribbean region to strengthen their management capacities and simplify administrative procedures in order to improve the quality of public services. This support includes technical and financial assistance, as well as the generation and sharing of policy-relevant knowledge to better understand the drivers of institutional change leading to improvements in public service delivery.

As part of these efforts, the IDB has brought together relevant experiences and the lessons learned in a publication series entitled *Innovations in Public Service Delivery.* This paper, *Improving Service Delivery through Information Integration: Building a Single View of the Citizen,* focuses on reform and modernization processes, specifically integrating information that is usually fragmented across government, to achieve a "single view of the citizen."

The author presents an approach that puts citizens' needs at the center of government action. This approach informs government's efforts to overcome institutional fragmentation. This is achieved by highlighting the technological and institutional elements needed for data to flow beyond government silos, and by stressing the importance of rigorous planning in the implementation of these reforms.

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Consider this situation: A couple walks into City Hall to get a marriage license. The City Clerk's office scans the barcode on their driver's licenses and instantly has accurate name and address data for both of them. Then the Clerk issues a marriage license and asks a few more questions. Would the couple like the city to automatically process a last name change for either party? If so, it can be automatically sent to all city, state, and federal agencies, saving the couple time and complication with the name change. Address change? Same simple process. New driver's license with the updated information? Click, click, it's on its way. Change in tax filing status? Also done with one mouse click. The government just made this happy occasion a little better by eliminating the paperwork.

Does government routinely work as described in this example? No. But there are some promising developments. In the past two decades, remarkable progress has been made toward this vision of seamless integration of systems. Government agencies are capable of putting the citizen at the center of their work, creating a user-friendly experience, and organizing all necessary inter-agency handoffs of information in the background. The result is a seamless process that improves customer satisfaction with government, increases transparency, and improves efficiency.

This paper describes the successes and challenges of governments in organizing systems around citizen needs, with the goal of achieving a "single view of the citizen." Government operations centers (e.g., state emergency operations centers, police command centers, and the Rio City command center) have been successful in integrating status information across government agencies and pushing it to a central information portal for real-time display and operational analysis. More difficult, and less widely achieved, is the integration of information about a single citizen as a customer of a government agency. This paper focuses on public-facing systems and those that handle transactions in the service of citizen needs, rather than internal sharing of information for transactional purposes. Implementation recommendations draw on successful case examples. While there is much room for improvement, this paper makes the case that creating citizen-oriented systems in government is a worthwhile and achievable aspiration.

Vision for Government Information Integration

What would it be like if every agency, every process in government, worked like this hypothetical example? Public sector employees could do their work without paging through paper documents or toggling back and forth among different sources of electronic records, such as a mainframe, locally resident data, and data stored in an application at their agency. Error checks could be built in and mistakes could be eliminated, saving time, money, and frustration. Citizens would receive timely, accurate information from government and speedy service, either via self-service tools or with the assistance of government employees. Transactions would be streamlined,

efficient, and simplified. Perhaps most important, public satisfaction with and confidence in government would increase.

While seamless information integration across all of government is still an unrealized goal, there are notable successes within specific domains. Successes have typically been for a narrowly defined purpose or customer segment, often with either a single agency or a handful of government agencies. These cases demonstrate that a "single view of the citizen" can be achieved for at least a component of government or a particular type of citizen transaction or service. Table 1 shows some of the types of information that could be integrated across systems to provide a single view of a client in a human services organization.

Table 1: Data Types in the Single View of the Citizen

Client demographics	Provider information	Service information	Fiscal information
• Name • SSN • Gender • DOB • Address • Race • Marital Status • Education/Employment • Living Arrangement	• Services and Specialized Services Offered • Location of Services	• Service Type • Service Location • Clients Served	• Units of Service • Cost of Services

Success in the private sector demonstrates that a single view can be achieved across the separate components of a corporation, such as, for example, the sales and service departments of a retailer. Yet integration of information across an entire corporation (including, for example, human resources and engineering or internal operations) may not be necessary or beneficial. For government, success may be defined as achieving integration across some number of agencies for a specific citizen purpose.

Table 2 shows a progression of types of information integration in government, from simplified citizen access to streamlined citizen information sharing, to citizen-centric transaction processing, and to the management of citizen information across multiple actors in the service delivery chain. These excellent examples of integrating systems provide a citizen-centric experience, from the convenience of single sign-on in Singapore to the truly life-saving benefit of integrating real-time citizen health information across actors in government and hospitals from ambulances in New York City.

Benefits of Information Integration in Government

With the growth of e-commerce and now the growth of mobile commerce, citizens expect to be able to transact with their bank, shop for clothes, books, and music, or watch a movie online or on their mobile phone. So much of our daily business can be done with a swipe or a mouse click. Citizens have come to expect and to rely on a certain amount of convenience in their daily lives as technology evolves to suit real-time individualized experiences of the marketplace. Those same expectations of

Table 2: Integration of Information in Government

Phase	Access	Share	Transact	Manage
Activity	Constituent-centric point of access	Constituent-defined single point of notification	Constituent-defined single place for processing	Constituent-defined handoff, "follow the customer"
Example	Singapore single sign-on across eGovernment. Singapore created a single sign-on for users of all online government services. With the single sign-on, constituents can use the same username and password to access a wide range of government services, ranging from income tax filing to vehicle registration to passport renewal. The single sign-on simplifies the constituent experience of remembering unique username and password for every government service requiring secure connection. The shared platform across 57 government agencies required significant collaboration.	UK Government, Tell Us Once. Using Tell Us Once, a constituent in the UK can report a birth or death just once to the central government. That one notification will kick off all appropriate and necessary notifications – for example to pension and drivers license agencies. The UK central government created the service and allowed localities to opt in, and 96 have done so. The program streamlines the constituent's interaction with the government. Before Tell us Once, a constituent might have as many as 44 government entities to contact about a death – now there is just one.	State of Utah, One Stop Business Registration. This user-friendly portal creates a single point of entry to register a business with the state. Transparent to the constituent, the transaction spans the Utah State Tax Commission, the Utah Department of Commerce, and the Utah Department of Workforce Services. All registrations are handled in the background, with the appropriate information going to each agency. The user gets transparency to each step in the registration process and a confirmation when completed. For businesses with local registration requirements, there are links to cities to provide downloadable forms and follow up contact information for the cities.	New York City Electronic Patient Care Reporting (ePCR). When a patient gets into an ambulance in New York City, they are beginning a seamless, integrated path to recovery at the hospital – because their medical data is managed all along the path. Data captured at the scene (heart monitor and vital signs) is shared with hospitals over the city wireless network. Telemetry doctors can monitor data and provide advice to the EMTs even before the patient arrives at the hospital. ERs get critical and potentially lifesaving information before ambulances arrive with patients. Sources of data integrated across this system include computer dispatch, automated external defibrillators, ALS cardiac monitors and computerized telemetry.
Key benefits	• Simplifies sign-on for users of government services • Streamlines identity management for government	• Simplifies event notification for citizen • Reduces errors through standardization	• Improves transaction processing speed, reduces errors • Improves customer satisfaction and compliance	• Push notification of critical data speeds transaction handoffs and reduce errors • More informed transactions produce better results, in this case improved health
Requirements	• Single sign-on platform, built into portal for citizen interface • Services to connect to transaction systems • Leadership and willingness to standardize access	• Platform for electronic notification • Portal for citizen transaction • Services to connect back-end operational systems to consume notification data • Leadership to standardize input across agencies	• CRM or other platform for case management and processing • Portal for citizen transaction • Services to connect back end operational systems	• City-wide wifi infrastructure • Cooperation across government and into nonprofit sector • Strong leadership to span boundaries

ease of use and customized experience transfer to the citizen experience of government. Yet, too often the citizen experience of government does not fit the pattern found in the commercial sector.

The expectations of government employees are rising as well, as they take note of technological advances in the private sector. At home, they can access entertainment content anytime, anywhere, on any device. At work, they may have a single desktop computer with an outdated processing system and no ability to leverage the advantages of mobility or cloud computing.

Businesses increasingly use big data analytics to understand customer trends and habits. Companies use social media both to promote their products and to learn more about their customers. Cloud-based computing is saving money and making development more nimble.

In general, government is not moving as quickly as the private sector to embrace technology trends. Yet there are promising examples of digital government where the citizen is at the center of the process. Embracing these emerging technologies helps us move toward a more digital government, forging a new relationship between government and citizen.

The primary benefit of integrated information is increased government transparency and accountability. Another key benefit is increased satisfaction among citizens. There are economic efficiencies as well—most importantly in the reduction of the time it takes to process citizen requests and the corresponding operational efficiency gain. Integration of information allows governments to connect directly with citizens and deliver a seamless experience (See Figure 1). According to the UK Digital Efficiency Report, a 1 percent increase in digitization results in a .5 percent increase in gross domestic output and a .13-point improvement in society and quality of life as measured by the Human Development Index. The average cost of the digital transaction is much lower too—20 times lower than the cost of telephone and 50 times lower than face-to-face interactions.

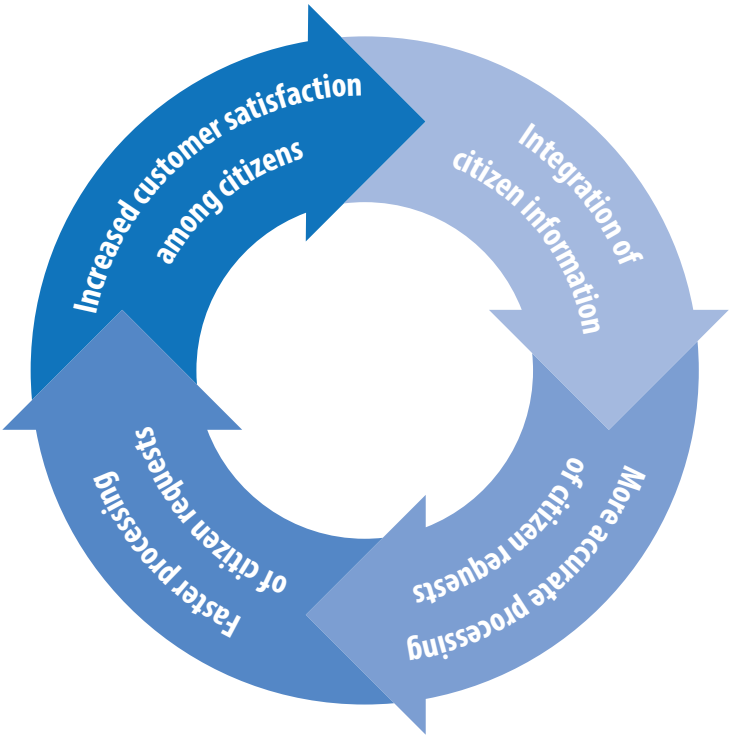
The Challenges of Information Integration in Government

Why is information integration achieved in some places but not yet across all of government? What prevents government from routinely organizing its work around citizen needs, and then aligning its systems in support of an integrated approach?

One big challenge is cost. Integrating databases across even one government agency is costly and time consuming. It could require programming costs to connect existing databases, and possibly new software purchase and implementation costs. For a city with 15 to 30 different agencies, simply standardizing the name and address format across agencies could be a major undertaking. For example, the voter registration record for an individual may say Jane Smith, the census may list Jane M. Smith, the tax records say JM Smith, and a business ownership certification may use another variant. In this example, each agency would have to devote time and money to standardizing name and address, and possibly other related data fields as well, yet there may be no direct benefit to the agency of doing so. If they really needed to use a standard format, wouldn't they already? The agencies do not often directly see the benefits; rather, they accrue to the city as a whole or to the citizen. Thus, the project could be stalled by any one uncooperative participant.

The challenge of getting disparate agencies to collaborate on a project that is not their own initiative and for which they are unlikely to see concrete results in the short term cannot be underestimated. Sharing data from one level of government to another is even more complex. The difficulty

Figure 1: Benefits of Integrated Information in Government



of sharing data across local, state, and federal governments is exacerbated by possibly conflicting agendas and the lack of common funding streams.

Another complicating factor in standardizing citizen data is that for different government agencies, the same individual can have vastly different customer characteristics. Consider a hypothetical woman: to the motor vehicle agency she's a driver, to the revenue department she's a taxpayer, to the small business department she's a business owner, to the school department she's a mother, and to the police department she's a firearms license holder. Each role may have vastly different characteristics and additional attributes in the underlying systems.

One of the most difficult challenges to overcome is resistance to change and the related resistance to collaborate. Any cross-agency collaboration effort will need to address the challenge of inertia—it is human nature to resist change. This may be particularly true for an information-sharing initiative where there may be turf issues. Some agencies value their autonomy and may not see value in sharing data or engaging in discussions about standardization. They may attempt to protect their independence by stalling or withholding data or input, particularly if they perceive a threat to their autonomy in the project. Key strategies to address this challenge are to plan for a robust change-management effort from the start and to build in sufficient time for agencies to develop trust across organizational boundaries.

Another challenge for government is the possibility of privacy concerns among citizens. Some people may simply not want government integrated to the degree that personal information is shared so easily from agency to agency across jurisdictional lines and across levels of government.

Certain challenges may be more acute in Latin American and Caribbean (LAC) countries than in the United States. For example, some LAC governments are characterized by an imbalance of institutional capacity from one locality to another within the same country or region. Another challenge is the

lack of a successful track record in the region for inter-jurisdictional coordination. Another challenge for some LAC countries is a lack of unified governmental focus on a clear strategic vision to achieve common objectives. Brazil, the only LAC country included in the Accenture global digital survey, ranked last among the 10 countries assessed. Among the reasons given was that Brazil lags the other countries in core technology infrastructure and a citizen experience that is customer-centric and widely accessible.

Typology of Information Integration in Government

There are two general types of information integration for service improvement, which can be distinguished by the primary user of the system. One is inward-facing and has as its customer the public, and the other is outward-facing and has as its user the government employee. Table 3 describes a framework for understanding the purpose and benefits of each type of information integration.

Table 3: Typology of Information Integration Approaches

	Internal	External
Primary user	Government employees	Citizens
Primary purposes	Search for information Complete transactions Maintain records	Apply for and manage benefits Transaction processing Service requests
Key benefits	Faster transaction processing Error reduction	Increased speed of processing Fewer errors Higher customer satisfaction

Regarding internal integration of information, information may be passed among agencies in one city, or occasionally it may be shared across levels of government. Passing transactional data from one level of government to another is typically done for specific, narrow purposes and often funded with federal dollars. For example, state and local police can query federal databases for criminal history information using federally funded search tools. State employees can query federal income data sources when determining citizen eligibility for public assistance for health or income support programs. These queries typically provide point-in-time information on a specific data element. Ongoing real-time, two-way communication across the levels of government is rare.

This paper addresses outward-facing integration of information, focused on the citizen experience and on streamlining and improving their interaction with government. Successful examples of providing the citizen with a single source of accurate government information and service are becoming more common, particularly for citizen-initiated service requests (such as a 311 call center). A number of cities have developed initiatives to streamline the process for starting or certifying a new business, leveraging this customer-centric approach to integrating the back-end systems.

The following cases describe how governments can cut costs or improve service delivery and citizen satisfaction through information integration efforts.

Allegheny County Human Services Data Warehouse

Several years ago, the child welfare services of Allegheny County, Pennsylvania, were in crisis. Considered one of the least effective such operations in the country, it had outdated data systems that could not provide accurate basic information, such as the number of children being cared for and the providers serving them. County and nonprofit providers had no standard way to communicate electronically with one another about children, prompting one local advocate to describe the situation as a "morass." A county-wide assessment recommended consolidating all human services into one strongly managed central agency. The Department of Human Services (DHS) now oversees the previously separate departments providing child services, mental health and intellectual disability, and elder care.

DHS planned to create a single, consolidated information system across all the new agencies. But an expert study recommended against doing so, arguing that it wasn't feasible. Instead, the county built a data warehouse to centrally store data from all the various systems. As Figure 2 shows the data warehouse structure allows each operational agency to maintain its existing source systems but provides the capability to connect across all systems for viewing data on each client. By using the data warehouse, a case worker can have a consolidated view of service needs of, for example, a child in protective services with behavioral health needs. The client-matching algorithm in the data warehouse can help county officials identify patterns and recognize gaps in service. Based on this client-matching algorithm, the number of children served by child welfare receiving mental health services doubled because the algorithm could identify their needs.

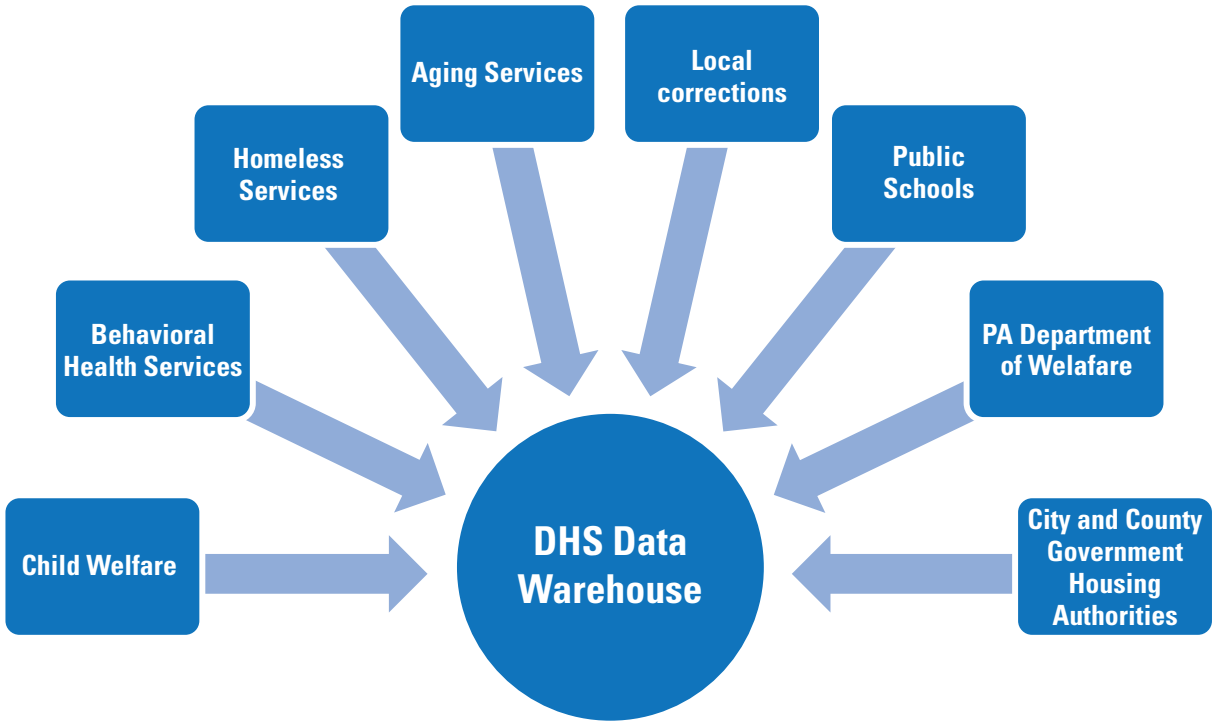
In a remarkable success for information sharing across agencies, the DHS data warehouse now also includes school department data from the Pittsburgh Public Schools. Information shared includes data related to child welfare, mental health, and homelessness status for each child enrolled in school, as well as the schools they attend, attendance, grades, test scores, and behavior-related issues.

The integrated data provide a more comprehensive profile of students who have human services involvement. Integration also provides the analytical capacity to mine the data in ways that offer greater insight into students, service gaps, and the effectiveness of interventions, which allows more informed decisions to be made about how to improve outcomes of children in both systems.

Data sharing between the school and the county has enabled analysts to identify students involved in human services who score well on state standardized tests but do poorly in the classroom. As a result, an inter-agency team met and developed interventions for these children to improve their academic performance.

Data sharing has also helped address school attendance and truancy issues. An unexpected benefit of the data-sharing agreement has been how it has become a catalyst for wider discussion and collaboration among the various departments. It has led to stronger relationships among caseworkers, probation officers, juvenile court judges, school guidance counselors and others who, while they work to improve the well-being of many of the same children, have not always done so in concert.

Figure 2: Internal DHS Data Sources (not inclusive) External Data Sources (not inclusive)



Alameda County Social Services Agency

The Alameda County, California, Social Services Agency saved $11 million after creating a single view of the citizen. This cross-system data integration effort allowed the agency to more actively manage and monitor individuals receiving cash benefits. Savings came from identifying individuals receiving duplicate benefits or receiving benefits when they were not eligible, such as when deceased or incarcerated.

Before implementing the system, staff had to navigate a maze of overlapping social service programs, each with their own system, rules, and regulations. The result was a work process characterized by inefficient toggling among systems. Payments were erroneously made to citizens who had died, moved away, become incarcerated, or become ineligible for other reasons. The county wanted to optimize the accuracy and integrity of benefit amount calculations and the resulting payments to ensure that the right person got the right benefit payment at the right time. The first step was to create a centralized hub to store and analyze all the data related to a particular citizen and the programs and services they received. The new system connects to, rather than replaces, the agency's existing data systems. The system matches program recipient name, household details, service provider, program benefit amount, services received, and support and event data across

all programs and systems. The solution spans the welfare system as well as the county's juvenile probation and adoptions systems.

Data can be analyzed to identify all the services a beneficiary receives and to recognize unusual and suspicious activity, such as beneficiaries who enroll their families under different names or ages. Case workers can also see complex relationships between beneficiaries, households, and programs, helping to determine with greater accuracy which residents qualify for which benefits. The enhanced visibility not only helps staff improve the level and speed of service, but also helps identify recipients abusing the system, thereby greatly preventing waste and fraud. Near-real-time data are analyzed against hundreds of metrics, including Social Security numbers, age, and address, to identify suspicious activity and potential abuse, such as residents who are still receiving benefits after being incarcerated. An embedded repository with more than one billion multicultural names, origins, and variations makes it easier to match names across systems. Reports that used to take weeks or months to create now take only minutes, further helping the agency minimize waste and control fraud by revealing, for instance, if a recipient has moved or is not complying with program rules.

The system makes it possible for case workers to assemble information and create a single view of a program beneficiary from diverse internal and external sources. A data exchange with the Oakland Housing Authority enables the agency to understand housing patterns for citizens such as moving, buying, or renting. Integration of two childcare systems helps case workers know which services are being provided to beneficiaries who need childcare while they're looking for jobs. It is also connected to the county's collections department, giving the agency an opportunity to recover funds from beneficiaries who have been overpaid or have received benefits that should be returned to the agency.

City of Boston, Boston Business Hub

The City of Boston created a single, user-friendly web portal to streamline business interaction with the city. The site offers abundant data with easily searchable tools for prospective business owners to do research on their market. Support for businesses is available in eight languages, and language support can be automatically triggered via self-service contact. Before the Boston Business Hub, interested businesses confronted a dizzying array of requirements to start a business. They had to separately contact the Boston Redevelopment Authority, the Inspection Services Division, the Fire Department, the Office of Neighborhood Development's Office of Business Development, and the Permitting and Licensing offices. There was no common platform—some provided information via the Internet, and others only by phone. Information given by one agency sometimes conflicted with information given by another. This frustrating maze confounded new business owners.

Today, the Boston Business Hub is a single point of entry for entrepreneurs, with a seamless link to every step in the process of opening a business in Boston. The new site creates transparency, streamlines processes, and saves time. The site offers a "connect with an expert" function, which allows users to query staff from throughout city government with the right expertise to solve their problems. Inquiries receive an immediate response email with a case tracking number, along with the name and contact number for the person who will respond. Businesses are guaranteed

a response within 48 hours. Every inquiry is logged so that if a business calls once, and then calls again, their case history is available to the customer service agent. This improves customer service and ensures that the call taker is providing informed advice.

A licensing and permitting wizard walks business owners through a series of questions to determine the business licenses and/or permits necessary for them to operate their business, as well as any zoning issues in the area where they plan to start the business. The system can also automatically create the application and send it for processing. The user gets an alert at each step of the process and when the city has approved the permit or license. The wizard alerts the business owner to issues that could impact the business but might not have been considered, such as business proximity to a wetland or location in a historic building. For new business construction projects, the wizard also provides information on permits, occupancy rules, inspections, and other important requirements, such as for fire safety or business signage. For construction projects, the wizard automatically provides necessary information to meet plumbing, electrical, and welding safety requirements. The wizard creates a personalized punch list for the business to meet all city health and safety regulations before opening. All necessary links, whether to the IRS for obtaining a tax identification number, or to a City of Boston office for permitting or other regulations, are provided via direct website links, saving the business owner time searching for the proper website for next steps.

Creating the licensing and permitting wizard required cross-agency collaboration on a single, accurate decision tree and flow of questions to guide the business through the process of determining the right license or permit. The collaboration uncovered duplication and inaccuracies in a variety of processes—flaws that never would have been uncovered if the agencies had continued working in their silos.

Citizen Service Center, Abu Dhabi, United Arab Emirates

One of the goals of the Abu Dhabi Government is to be among the top e-governments in the world (Abu Dhabi Government, 2010) In the past decade, the region has made great progress in digital government, and Accenture (2014) recently ranked the Emirate as the third-best digital government. The Abu Dhabi Systems and Information Centre (ADSIC) serves as the hub for its citizen service center, a multi-channel system for processing a wide variety of citizen service requests.

Before implementing the citizen service center, the government had inconsistent technology and management systems among its 60 agencies, and there was no ability to have a single view of the citizen. Most customer service was handled at walk-up counters in government buildings. Only 7 percent of government departments had a contact center to answer citizen calls or emails. At the existing call centers, many calls went answered. Few agencies offered citizen services via web portal or mobile or social media. Customer care standards at the agencies were all independently established and ranged from excellent to fair to extremely poor. Typically, citizens would walk into a government office, wait in line, and when it was their turn, present their credentials and all relevant information for their request. If the transaction was not completed, they would be asked to return, again standing in line to wait their turn for service. When their turn came again, they would once

again have to present their credentials and information and wait in line because the transaction history was not saved. There was no interoperability from one system to the next.

Abu Dhabi created a shared government customer relationship management (CRM) system to modernize and streamline the customer service process and serve as a single point of contact for the citizen with government. The goal was to reduce transaction processing delays, improve service delivery and the data available to track service delivery, and enhance the citizen experience by providing a single face of the organization. One of the first steps was to study international best practices in government CRM implementation, including the 311 call center in New York City (NYC311).

The Abu Dhabi Shared Government CRM can be accessed via phone, the primary channel, and via email, SMS/text, live chat, and a new location-based mobile app (the kingdom has one of the highest penetration rates of mobile phones in the world). The solution allows citizens to request information, log complaints, report incidents, and give feedback in the form of suggestions or compliments. Sixty government entities are using the CRM platform, which handles 8,000 cases per month, and customers can reach the contact centers 24 hours a day, seven days a week.

The solution unifies the citizen experience across channels and across the 60 participating government departments. It also enables the government to proactively reach out to citizens via awareness campaigns and to deliver services based on demographic profiles. Benefits achieved since implementation include:

- A single source of accurate and timely information on citizen service requests
- Improved management reporting for tracking of time to complete service requests across agencies
- Increased citizen satisfaction as wait times decrease and service channel options increase
- Lower cost of IT maintenance due to maintenance of a single system rather than individualized siloed systems

These examples demonstrate the wide range of possible ways to integrate information about citizens to serve them better. All require some level of standardization of data elements and a degree of interoperability among systems. Each provides a benefit to the citizen through either a narrow or a wide range of services depending on the scope and intent of the project.

The Allegheny County and Alameda County examples required the creation of a seamless web of connection among the counties' various back-end databases and systems. The Boston and Abu Dhabi examples relied on a new implementation of a comprehensive set of technologies used in the private sector for managing customer interaction and creating a single view of the customer. This solution is called a customer relationship management system, or CRM.

CRM Defined

In the private sector, CRM stands for customer relationship management. In the public sector, it stands for constituent relationship management or citizen relationship management. Regardless of the name, the purpose of a CRM is to standardize and organize all the information about every individual across a series of functions in various operating systems. By combining the data into a single, centralized source, analysis across subsystems is possible. This enables more effective service delivery. A number of government functions may be supported via CRM systems, as described in Table 4.

Table 4: Government Functions Supported by CRM Systems

Government function	Key tasks/uses of a CRM
Human services program	• Eligibility and assignment of benefits • Service planning • Self-service • Case tracking • Audit trail, reporting, analytics
Citizen call center (311)	• Knowledge base for self-service and call taker reference • Case creation with tracking number • Workflow for assigning case to responsible agency/dept. • Ongoing case tracking • Reporting, analytics
Licensing, permitting	• Apply for a license/permit • Personalized experience • Wizards to guide process • Workflow for approvals • Automate renewals
Inspections	• Management of inspector work assignments and workload • Case information for inspectors, mobile capability for field inspections • Tracking of ongoing issues • Documentation of case history

A common theme among successful examples of "single view of the citizen" projects is the need to reach across silos and standardize data dictionaries and nomenclature, while focusing on customer needs rather than historical agency practices. As in

a private sector CRM, customer need is key. A government CRM must be designed around citizen tasks (registering a business, applying for benefits, registering a child for school, etc.) or government regulation of public actions (inspecting a restaurant, investigating a crime, etc.) rather than being defined by the agency. This turns government inside out in a positive way, focusing on the citizen rather than status quo operations.

Lessons from the Private Sector CRM Experience

The private sector has a longer history of using CRM than government, and it has some valuable insights to offer. CRM represents decades of evolution of businesses attempting to understand customer wants and needs and to segment and individualize the customer base. The goal is to monetize those wants and needs, offering the right customer the right deal at the right time.

In the 1980s, companies began to gather customer data and store it in a single, centralized system of record called a data warehouse. Data warehouses have the capability to store data from disparate systems in a centralized location and to dramatically increase the volume of data to be stored. Customer purchase history can be stored in the same place as service request data and other important customer insights.

Massive amounts of data did not automatically lead to customer insight. Applying analytics and business intelligence tools in the 1990s helped businesses gain finer granularity on the attributes of customer behavior, providing trend data in a more accessible format for analysis. New tools allowed easier manipulation of massive amounts of disparate data and an understanding of trends in the data. Analyzing the data is what provides customer insight.

CRM applications are the next step in this process of developing customer insight. A CRM can integrate the various pieces of customer data and can orchestrate for call center or marketing staff the conversations and sales offers to a customer based on the data already available about the customer. For example, an auto company may have separate databases to store customer purchase information, warranty information, service history, product recall information, web site inquiries and in-person or phone inquiries to the dealer. Integration of each part of this data puzzle allows the auto company to know when to offer a warranty extension, when to offer a discount on a new car, and so on. The challenge for businesses now is to operationalize customer insight in a way that truly deepens customer loyalty and trust and results in greater sales revenue. The ideal end result of a CRM implementation is a more personalized and profitable interaction between the business and the customer based on insights from the data.

Some of the great advances in the past decade in private sector information management have come from retail and other industry attempts to have a "single view of the customer" to deepen knowledge of customer needs and wants. The goal of CRM systems is to increase sales, either by improving customer satisfaction and retention or by ensuring a customer-focused experience that brings in new customers and new revenue. Most customer care call centers use a CRM tool to automate the process of steering the customer service conversation and providing support to address customer needs.

Industries that lead CRM spending include communications, media, and IT services, where the need for customer service is intense, followed by the manufacturing sector, which uses CRM

for customer support on products. The third-ranked industry type for CRM spending is banking and securities, where CRM tools are used to both keep customers and sell more products.

For private sector CRM implementations, calculating return on investment is simple. If successful, a new CRM will result in better targeting of offers to customers, which will result in higher response rates to those offers, which will result in increased sales. Comparing implementation costs and increased sales revenue helps companies determine if the project has a positive return on investment (ROI). This is far more complicated in government, because government is not selling products to customers but is instead delivering services. Typically, ROI in government is measured in terms of avoided cost achieved via self-service. A non-quantitative ROI can be found in increased quality of service to citizens and greater citizen satisfaction with service delivery.

One of the most useful lessons from private sector experience is that implementing CRM is a major undertaking, and it is by no means a silver bullet. By some estimates, half of all CRM implementations fail to deliver the anticipated ROI. IT systems are at best enablers of sound business processes. Optimizing IT is not successful in a vacuum: to reorient around the customer, true business process change is needed. Strong leadership is needed to build a common platform among existing silos of information in what can be conflicting formats. In some cases, the parts of the business involved in CRM (sales and service) may have different incentive structures and may not want to share data.

When comparing the government to the private sector, it is important to note that a business implementing a CRM solution is more equivalent to a government agency rather than the entire government. Considering our examples of complete integration across agencies of government, the private sector equivalent would be integration across all businesses. Thus, a more realistic goal for government is to view integration of systems and databases in support of a citizen-oriented approach in a specific agency or for specific citizen needs.

Increasingly in recent years, private sector CRM implementations take the form of software as a service (SaaS), where the application is hosted in the cloud rather than residing on the servers or laptops of the users. Businesses are turning to SaaS and cloud-based services to reduce their IT infrastructure costs and minimize software upgrade time and cost. Not only are new implementations moving to the cloud, but some existing systems are being migrated. Gartner1 estimates that 41 percent of all CRM implementations in 2013 used a SaaS model.

CRM systems are not stand-alone systems They are typically the center of a web of interconnected systems that enables a single view of the customer, and for the customer a seamless view of the company. The core strength of a CRM system is to hold and store case data and the attendant workflows. Most major CRM solutions have at least limited built-in capabilities for other activities, such as customer self-service and data analytics, but more often, specialized tools are added for these and other purposes. For example, customer self-service is often optimized by a custom web portal experience that is connected to the CRM. And while basic analytics can be run from most CRM systems, businesses typically purchase specialized add-on business intelligence

[1] See Gartner, http://www.gartner.com/newsroom/id/2730317

software. For a description of each of the components of a CRM system, see the Analytical Framework section of this paper.

The Use of CRM in Government

For the public sector, the purpose of a CRM system is not to increase sales and revenue. Rather, its value lies in the integration of disparate databases and applications into a single source. Often, governments use it for case management. This can range from a crime incident to a field inspection to human services and permitting—nearly any type of public sector service delivery can be managed this way. Successfully deployed, a CRM can improve service to citizens and increase job satisfaction for public sector employees, as they are equipped with accurate and timely information and have a lighter paperwork burden and fewer data errors to deal with.

Government CRM tools can be deployed on workstations in the office, or via mobile devices in the field. Leveraging mobile CRM applications in the field allows workers to have case history data handy while doing their jobs. For example, a food safety inspector can view a restaurant's inspection history while on-site and, if any violations are found, can upload photos of code violations directly into the system. Case updates and inspection results from the field can be directly uploaded into the system without the worker having to return to the office. Mobile devices for government workers allow them to use the same technologies on the job that they use at home for communication, recreation, and personal finance. CRM systems enable government to streamline work and create efficiencies across service delivery channels and functional areas.

The following sections describe how governments can align their processes, and the back-end systems and databases that support those processes, to make them citizen-focused and to provide a single point of entry for citizens seeking government services. For the government employee, these processes offer a "single view of the citizen." In each case, achieving a single view of the citizen crosses organizational boundaries, often referred to as silos, and integrates data on the citizen among several back-end systems, in the service of greater efficiency and higher citizen satisfaction.

Benefits to Government of Using CRM

CRM tools can help workers become more efficient and can simultaneously improve satisfaction for citizens as they experience seamless transactions. Some specific benefits of CRM include:

- Automated routine tasks, reducing errors and speeding processing
- Streamlined and simplified business processes via business process re-engineering
- Reduced reliance on paper and reduce the need for physical file space
- Automatic edit checks for possible errors (for example by setting ranges of expected values and generating a message when the result falls outside the expected range)
- Automated workflows to reduce errors and delays in routing of approvals
- Improved user experience with a "one-stop shop" where the citizen does not see the hand-offs within government
- Citizen self-service for basic information requests

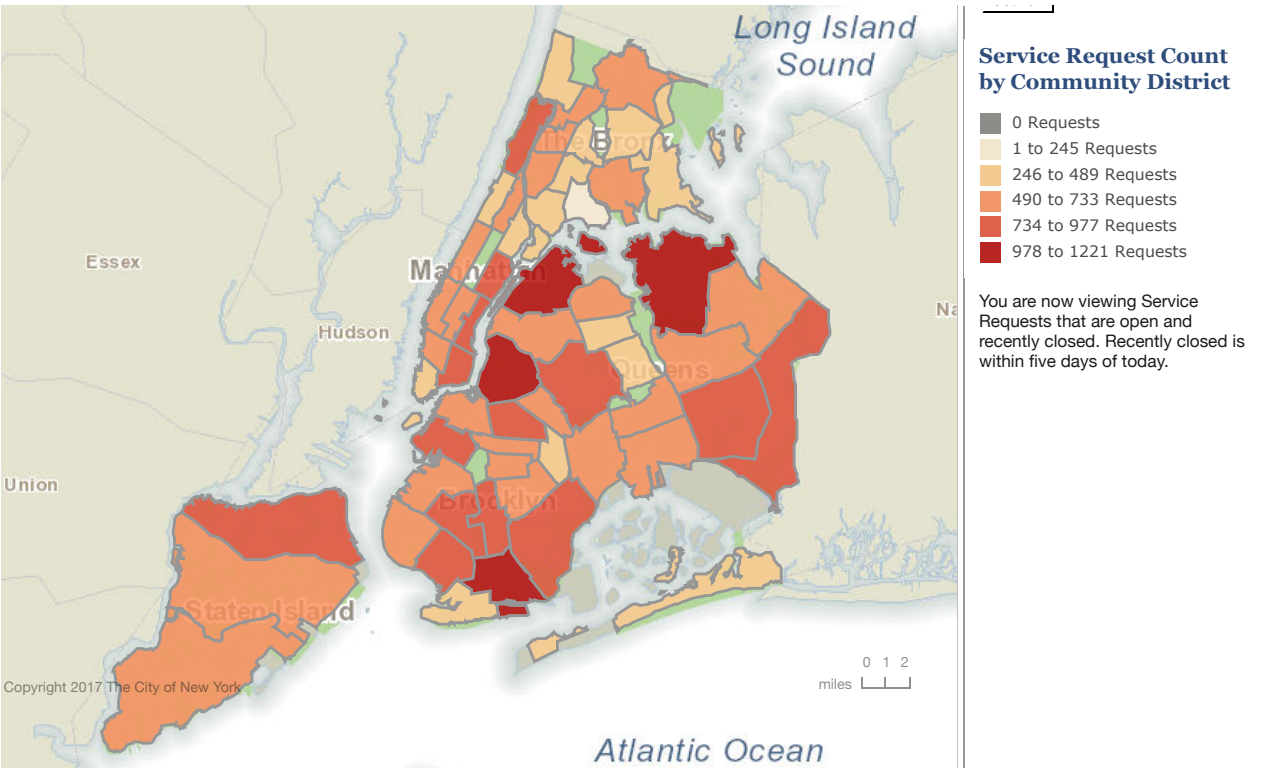
- Single version of the truth, whether the citizen request is made by phone, email, text or in person
- Easy workflow routing of requests to the right department for 311 requests
- Transparency to the citizen of where the transaction is in the workflow process

Sample Case Flow for 311 CRM

The best-known application of CRM for government is its use for managing the work of citizen call centers, often called 311 centers. A 311 center standardizes and simplifies the process for a citizen who contacts the government by streamlining all information and service request processing into a single, central source that is focused exclusively on citizen service delivery. This application of CRM directly mirrors the use in the private sector for customer support via customer care call centers. The CRM offers support to nearly all key functions of 311 center operations, as described below.

- **Citizen self-service.** Whether via telephone using interactive voice response (IVR), web portal, or mobile channel, a citizen can access the 311 information knowledge base and answer their own questions or transact their own business 24 hours a day, 7 days a week, at their convenience. CRM offerings typically support most channels.
- **Information.** When a caller contacts the 311 center, the call taker uses the knowledge base to access information via a searchable, user-friendly interface, to answer citizens' questions, from details about upcoming parades or festivals to the location of the nearest library branch and the time that library closes. In some cities, information requests account for as much as 80 percent of the call volume at the 311 citizen care center.
- **Service request.** When a citizen needs a specific service performed, the call taker will follow a script to make sure that all necessary information is collected to properly process the service request. The call taker can document a service request from a citizen in the CRM. This creates a work order, either directly in the CRM or by connecting to a work order system at the agency. Every service request is assigned to a department based on rules in the system (e.g., calls on rodent control are routed to inspectional services, garbage pickup calls, are routed to sanitation, etc.). Most CRM products will enable the work order to be escalated if a service request is not closed in a specified amount of time. Citizens using the 311 center are provided with a service request number that allows them to track the status of the request until it is completed.
- **GIS.** Every service request has a geographic location attributed to it (e.g., the address for a missed garbage pickup or a broken street light), and as shown in Map 1, these can all be mapped for ease of visualization of patterns of need for city services. For mobile service requests, the mobile app will assign an address based on geo-location services provided in the app. When a caller contacts the citizen service center, the call taker will ask for the location of the service request. These data are important for follow-up by the city as well as for analysis of trends by neighborhood or city council district. Providing the maps of 311 service requests to the public plays a strong role in creating transparency and building trust.

Map 1: New York City 311 Service Request Map



In New York City, when 311 data were made public via a mapping tool, community organizations used those maps to proactively manage and monitor activity and government service delivery in their neighborhood, increasing the degree of partnership with the city.

- **Reporting and status tracking.** Using dashboards and reporting tools, managers can track the status of all outstanding service requests by department and or by area of the city (neighborhood, city council district, etc.). Most CRM systems allow routine reporting based on key performance indicators, and some offer mapping capabilities. The reporting can easily be used for city-wide performance management, as occurs in Kansas City in their KCStat routine city management meetings.

Sample Case Flow for Human Services CRM

Another common application of CRM in the public sector is management of human services delivery to citizens. Human services delivery spans welfare, health, and employment support programs, typically spread across multiple departments. A key benefit of having a single view of the citizen for human services program is to avoid duplication of services and to ensure that the programs delivered best meet the needs of citizens. Using a CRM system allows a human services worker to manage all citizen services and programs across the agency or agencies where it is deployed. It can be used for case management purposes—intake and eligibility determination, benefit calculation, service planning and coordination, data collection and investigation, and ongoing tracking of service delivery. Each step is described below.

- **Intake and eligibility determination.** Using the CRM, a human services case worker has access to the rules and requirements of each applicable benefit program and during the intake process can screen a client for eligibility in each participating program. For example, a mother may need income support as well as child care, education, and health care programs. Scripts guide the case worker in asking the intake questions that will guide the process toward the right programs based on eligibility rules. This can be done in real time so the citizen will not have to wait to know if they are eligible.
- **Benefit calculation.** When using a CRM system, the human services worker does not manually calculate the benefit amount. Instead, the CRM has programmed in all applicable benefit amounts so that it is automatically calculated. This can greatly improve the accuracy of benefit calculation. Using the system, case workers can track the status of benefit disbursements and review benefit history over time.
- **Service planning and coordination.** For case workers using a CRM, they can create a service plan customized to individual needs, such as employment training programs and child care. When needed, data sharing across multiple agencies is coordinated via workflow and push notifications to other agencies.
- **Data archive for audits and investigations.** In the event of an appeal by a citizen, or when there is an investigation of benefits via agency audit, the CRM automates the data collection and investigation process. All case history data is available for review by authorized parties, with an electronic audit trail showing the date and time of each edit or update to the data.
- **Ongoing tracking of service delivery.** Case workers do not have to take handwritten notes and place them in paper in file folders if they are using a CRM. Instead, for every visit, phone call, or letter to a citizen, the interaction can be automatically electronically recorded and included in the electronic file for the citizen. Monitoring the benefits received, and any correspondence from the citizen about changes in benefits (income change, address change, etc.), can be automatically tracked.

For a human services agency, service providers, such as employment providers, healthcare providers, day care providers, foster homes, counseling services, and others, are major stakeholders in the case management process. CRM systems allow payments, registration, and routine correspondence with the service provider to be automated. This can improve transaction efficiency and transparency and can increase satisfaction of the service providers. It also allows more accurate tracking of provider payments.

Considerations for Government when Choosing a CRM

Many CRM products were created for the private sector and were modified to be sold to the public sector. Not all products are equally suitable for government. The following discussion provides insight for government leaders choosing to purchase a CRM product.

- **Native functionality or add-on capability.** While basic case management functionality is resident in all CRM offerings, some may require add-on software tools to achieve full functionality or to achieve maximum effectiveness for selected functions. A key decision in

undertaking a CRM project is how much functionality is needed. Following that decision is the choice of whether to use the functionality native in the CRM or to choose specialized add-on software. When reviewing vendor descriptions, take care to discern if what is being described is included, or if the features are add-ons with additional cost.

- **Regulatory requirements.** Government requirements differ from city to city, from state to state, and from country to country. There are some that are national, such as the Americans with Disabilities Act (ADA) requirements for accessibility of web sites (Section 508) in the United States. Not all major CRM products are ADA compliant, and this will be an important question to ask when considering a CRM project.
- **Program rules.** If implementing a CRM for a specific program, such as a human services program, make sure the CRM can be customized to adhere to eligibility screening requirements as well as necessary audit and reporting procedures.
- **Flexibility for rule changes.** As circumstances change, legislatures can enact new requirements for programs. For example, in the economic downturn, rules for unemployment benefits and food stamps changed. A CRM will need to be able to adapt. For example, if an eligibility criterion for a program changes (e.g., an increase or decrease in an income threshold), it will be important to have the flexibility to implement this change to comply with the new rule.
- **Ability to connect to legacy systems.** If using a CRM typically deployed in the private sector, it will be important to ensure that it can connect to legacy systems in the government (e.g., finance) without additional cost or complexity.
- **Ease of use.** In the private sector, employees may see a benefit to them of adopting the CRM, such as more sales and more commissions if they use a new optimized system. This incentive structure may not exist for government employees; thus, it is important to choose a CRM system with ease of use that will foster adoption.

Considerations for Government when Deploying a CRM

When deploying a CRM, government leaders have several decisions to make, each of which will affect scope and cost.

- **Define channels to reach citizens.** When choosing which channels to use to reach citizens (in-person, phone, Internet, mobile, etc.), the key consideration is that the costliest channel is the in-person channel, considering the cost of labor. The next most expensive channel is the phone channel, as the call center must be staffed with trained personnel. The least expensive channels are those that allow citizens a measure of self-service. When choosing the suite of channels to be offered, keep in mind that each additional channel may incur a cost of integration of transactions from that channel to the central transaction database. Balance the number of channels with the ease of integrating all data into the system and connecting the citizen systems into legacy systems and back-end data stores.
- **Decide on build vs. buy.** For any technology project, a key consideration is whether to build or buy. Given the current state of development, there are many firms with CRM offerings, including small, medium, and large firms offering CRM solutions in nearly every price range.

Building a custom solution is desired by certain government buyers. However, it is hardly necessary given the current market. Time to deploy is often longer for a custom solution. Risk is considerably higher when building from scratch. Having a solution custom-designed to every unique need of the organization is a great temptation. But it should be undertaken with care given the increased risk and cost. Moreover, upgrades and maintenance can add cost unless significant internal resources are devoted on an ongoing basis.

- **Determine the degree of customization.** When purchasing a commercial off-the-shelf (COTS) software for CRM, a government client must decide how much customization of the standard business processes to perform. While it is tempting to customize the software to meet each individual variant of the process necessary for an installation, caution is advised. Every customization to a standard software package costs time and money. For each software upgrade or patch, the same customization may need to be performed again, increasing the cost. Balance the desire for customization with the efficiency of long-term maintenance.

The field of information integration in government is not new, but there are still no universal, clear standards of excellence or codified best practices. This section summarizes insights from a variety of fields and types of projects.

Scope is the key cost driver

When embarking on an information integration project in the government sector (or any technology project), planning at the start of the project is critical—planning for time and resources but also scope of the project. Scope is the key cost driver. During the planning phase, it is easy to develop a "blue sky" vision of a project that includes far-reaching functionality. Typically, more functionality equates to more cost. Creating a realistic vision for the project and a realistic definition of its scope is important. For example, a city might choose between integrating citizen information across all types of services, or might choose instead to integrate only human services information, or perhaps just one type of human service, such as cash benefits. A clear definition of the scope is important.

An excellent example of clearly defining a feasible scope is the Allegheny County Data Warehouse. They chose not to take on a complete integration of all systems or create new uber-system, but instead a data warehouse to connect the existing system and analyze data across the existing systems.

Key cost drivers

Cost data on government experience with integration of information systems are not easy to obtain. When available, comparisons are difficult because of the wide variation in project size and scope. Similarly, project costs can be driven by the level of maturity of underlying systems. Projects such as those described in this paper could range in cost from less than $1 million to more than $15 million. Rather than provide insight on specific dollar amounts, this section describes the key drivers of cost.

With any technology project, cost components include hardware, software, and implementation resources. When creating a new citizen contact center, physical plant and buildout costs must also be included. As with any technology project, costs are highest at the start, when significant hardware, software, and integration services fees are high, and they level off over time as maintenance and support costs stabilize.

Implementation resources include both agency staff and outside contractors. A key cost driver is the degree to which internal staff at the government agency can accomplish key staffing roles in project management, integration of systems, and change management. The few information integration implementations that have been done at low cost have been done with little to no reliance on outside vendors. Generally, software license cost is higher when using a national or international brand product versus a product from a smaller company that caters to a regional or

functional niche. An excellent reference for working through a cost estimate for a CRM project is found in Section 7 of the Government Finance Officers Association report, *Revolutionizing Citizen Relationships: The Promise of CRM Systems for the Public Sector*.

Clear goals are important

The most critical early decision is the goal or goals to be achieved. Projects without strong vision and governance can drift over time if the goals are not clearly articulated. When embarking on a major technology investment in government, often there is a temptation to "trim the tree," that is to add a little something for everyone involved in the project. Including more functions or more agencies than truly needed will unnecessarily complicate the project and drive up the cost. Discipline is needed to define clear goals for the project and to then stay true to those goals throughout the life of the project. For many executives, saying "no" to requests for add-on capabilities is hard. But failure to set boundaries will doom a project to disarray and gridlock. An example of success in staying true to project goals is the Boston Business Hub, where strong project management consistently guided the project forward.

Cloud computing offers new choices

When deciding on a path for a new technology project, a significant decision is whether to choose cloud-based or on-premises deployment. In recent years, the private sector has migrated large parts of computing to the cloud for cost and efficiency reasons. Cloud computing reduces cost, as IT managers need not constantly monitor server capacity and plan far ahead for future acquisitions to ensure adequate additional computing capacity. Another source of cost reduction is the time and effort saved for each software upgrade. With cloud-based services, the update is made only once, while with on-premises options, the update must be made for each individual instance of the software installation. IT infrastructure and application maintenance costs are greatly reduced with cloud computing.

A typical drawback of a cloud-based offering is that it allows far less customization, or none at all. For agencies requiring specific functionality, this may not be desirable or even feasible. For agencies seeking some customization, the tradeoffs must be considered.

While governments have not moved as quickly as the private sector toward cloud-based implementations, momentum is gaining. For example, the state of Hawaii established a "cloud first" policy for its agencies so that they can leverage the state's investment in its secure, state-wide government private cloud (GPC). Each agency in the state must now create a strategy for migrating its applications to the cloud. Agencies are strongly encouraged to use the GPC for new projects, and the state is also hoping to migrate existing applications to the cloud over time.

Not every government agency will want to move toward cloud computing. Key questions to ask in considering this decision include:

- Is a GPC an option?
- How will data security be managed?
- What are the costs and benefits of cloud-based versus on-premises implementation?
- What staff skills and resources are needed for each option?

- If the project involves multiple government agencies, can common standards be adopted across the cloud environment?

Statutory or regulatory roadblocks could impede progress

Numerous implementation challenges are specific to the public sector. One is procedural: regulatory or statutory issues may preclude some information sharing across agencies. For example, in New York City, there is an oft-told story of a social services worker who arrived at a home to help a family on the verge of homelessness but had to leave the home because a mental health case worker was present and there was a confidentiality barrier between the two agencies. While counterproductive for supporting the family, this event was part of the inspiration to create HHS Connect, a major cross-agency information integration effort. Collaboration and data sharing were compelled. Each of the nine participating agency commissioners were required to attend planning meetings for the initiative, and the mayor issued executive orders requiring data sharing. While this success is remarkable for its scope and scale, the fact remains that governments must consider regulatory privacy requirements when embarking on data sharing. In particular, school and health data are subject to federal data-sharing restrictions in the United States.

Documenting return on investment can help garner support and credibility

Funding can be a challenge, particularly when the ROI is measured in terms of citizen satisfaction or efficiency but not in concrete revenue gains or cost avoidance. This challenge can be overcome when efficiency gains translate into the ability to reduce headcount via attrition as increased self-service reduces workload.

Outdated or inefficient business processes should be reviewed and revised

Proceeding without pausing to improve current business practices or align them with the new technology is a much-overlooked challenge and project risk. Business process change is difficult because it requires staff to change patterns that are comfortable for them. Executive leadership at the policy level is critical to achieving necessary business process change. For example, a city mayor may make integration of systems and processes for registering a new business a high priority. This would mean that all related agencies (office of economic development, business permitting, business registration, procurement, minority and women-owned business development, minority and women-owned business certification, revenue, etc.) must work collaboratively, which alone can be a major success. Without significant attention to usiness processes change, an information integration project is unlikely to be successful.

Outdated back-end systems can slow progress

Recent history provides an example of good intentions with weak results due to failure to realize the complexity of dated back-end systems that needed to be part of the design. When the Affordable Care Act (ACA) was passed, it included a requirement that states develop a "no wrong door" approach for eligibility and enrollment for applicants for health insurance assistance. The long-term vision includes eligibility for income support and food assistance programs as well. For the near

term, the ACA envisions that a citizen can apply for health coverage through a state-run health insurance exchange or via the state's Medicaid agency (the agency providing free or low-cost health insurance to the indigent). Regardless of which "door" they choose, their eligibility will be determined for assistance with their coverage, and then the application is routed to the program for which they are eligible. Assistance is provided in three ways. For the indigent and individuals with disabilities, the government offers Medicaid; for children in low-income families, the government enrolls them in the Children's Health Insurance Program (CHIP); and for individuals meeting income eligibility requirements, the government provides subsidies to cover the cost of their insurance. States needed to develop integrated eligibility systems, and the federal government provided most of the funding for the systems.

After a $1.8 billion investment in these "no wrong door" initiatives in the states, almost none were able to complete transactions. As noted by the Government Accountability Office (U.S. GAO), "many states' eligibility IT systems were outdated and lacked the technical capacity to support such efforts." None of the states were able to send and receive applications to and from the federal exchange on the first day of the enrollment period. Many states are still working to achieve real-time transfer. Success has been achieved in some areas. For example, most states can connect to the federal data services hub to verify important data on applicants, such as social security number and employment (Social Security Administration), income (Internal Revenue Service), and citizenship status (Department of Homeland Security).

A previous effort to create a "no wrong door" approach to applying for all human services programs in Montgomery County, MD, faced consolidation of 136 separate systems into 10. This pioneering effort identified significant information-sharing obstacles, some necessary and others the result of antiquated rules. For example, school privacy rules prevent schools from sharing information on children who qualify for free lunches based on low income, and yet this information could be valuable to a services agency in being able to offer the family any additional services needed. Creating a seamless support network could help needy families. A study by the Urban Institute showed that of those eligible for government support for both food and health care, only a quarter of them received benefits for both programs. Instead of one point of entry, someone eligible for assistance must separately provide information and seek eligibility for help with health care, housing, food, child care, and income support.

Table 5 describes a framework for understanding all the component parts of comprehensive information integration implementation.

Table 5: Integration of information in Government- Components and their functions

Component/software tool	Purpose/key functions
Data warehouse	• Consolidate citizen information in a single location, allowing a "single version of the truth." • Enable cross-agency comparison of data per citizen. • Enable deeper analytics across citizens and agencies.
Citizen self-service channels (IVR, web portal, mobile, etc.)	• Provide 24/7 access to information and transactions for citizens, improving their satisfaction and reducing workload for staff as information and transaction processing is done via self-service. • Provide an access point for the citizen that is seamless and designed according to user tasks (register my business) rather than government data silos. • Provide a consistent experience regardless of channel so citizen gets the same accurate information via all methods. • Automate workflows, reducing the need for staff time spent on routine tasks such as sending confirmation letters, appointment reminders, or an automatically-generated status notification. • Note that each channel may be supported via a separate software add-on as the IVR technology will be separate from web and mobile. Also note push technologies for proactive notification for alerts may require additional software.
Identity management	• Verify that citizen is who he or she says she is when creating profile and each time they log on • Allow only permissible tasks for each personal profile in the system (citizen, government service provider, supervisor, etc.)
Case management	• Case management includes each step of a citizen interaction from the case mangers perspective, and allows a case to move through a workflow from request to completion. • Built-in rules, engines, and automated workflows guide the case worker or call taker through the steps in each case.
Content management	• Stores all necessary reference material needed for case management. • Information is updated only once in the central content management system rather than in separate systems for each application using the information. • Serves as a knowledge base for reference by all workers, and by citizens, thus providing a "single version of the truth" for any given question.

(continued)

Table 5: Integration of information in Government- Components and their functions *(continued)*

Component/software tool	Purpose/key functions
Master data management	• A single source of standard data across all applications and agencies for the key identifiers of the individual citizen, in a standardized format across agreed key data elements (name, address, status, etc.). • A change can be made once in the master data and then populated out to all the individual databases and systems connected to it.
Social media analysis	• Mine social media data (Twitter, Facebook, etc.) for comments, intelligence, or other key insights about agency policies and processes as well as citizen satisfaction with services provided.
Business intelligence/analytics	• Create graphics and dashboards to make sense of massive amounts of data. • Analyze trends in the data, looking for patterns over time, to show where additional resources are needed to meet citizen needs. • Analyze data for anomalies that indicate problems for citizens, such as bottlenecks in service delivery. • Analyze data for outliers or patterns that may indicate possible fraud. • Provide public reporting on trends and patterns in easily readable formats such as graphics and tables.

Data Warehouse

A data warehouse is a centralized, shared resource for multiple government agencies. A data warehouse allows analysis of historical trends across various data elements. The larger the number of disparate operational systems incorporated into the data warehouse the more powerful its analytic ability. The data warehouse stores data from multiple operational systems, for example the child welfare system and the health care system, or the job training system and the unemployment system. By centralizing the data, it is possible to integrate the data for a single citizen across multiple sources. Comparisons can then be made looking back over both current and historical data. Analysis can be done on an ad hoc basis, or can be scheduled to run on a routine basis such as weekly, monthly, quarterly or annually. Insights from reports produced by the data warehouse can help improve service targeting. Data may be in different formats in the separate operational systems and often needs to be standardized once uploaded to the data warehouse. Most of that functionality can now be automated to make it more efficient.

Citizen Self-service Delivery Channels

Choosing service delivery channels is a key early decision. The greater the number of channels, the greater the implementation cost and complexity. However, the more self-service channels, the

more self-service options the citizen has, thus reducing the need for in-person service at an office or to call an agency for information or a transaction. If the citizen can answer his or her question with an easy-to-navigate website, they will not have to call and take up the time of a call taker or case worker. If they can transact their business with the government via phone response system, their computer, or their mobile device, they will not have to come into a government office or call the office on the phone. The more transactions that can be achieved electronically, the lower the cost of labor to support any given level of requests. Regardless of whether an agency has suffered staffing declines due to economic austerity or to the retirement of baby boomers, the ability to do the same amount of work with fewer staff can free up resources to switch from lower-priority to higher-priority activities. The key is to determine the right balance between offering options and managing cost and complexity to implement. Each channel is discussed below.

Interactive Voice Response (IVR). With IVR capability, citizens can use the touchtone pad of their phone to complete their transactions. This adds convenience, as they can transact anytime and not be restricted to the business day. During the working hours of the citizen contact center, an IVR can offer the caller the option to hold on the line for a live call taker, choose an automated transaction, or request a callback. IVR provides more functionality than an automated attendant, which is the functionality to route a call based on caller input ("Thanks for calling the city of ___, for parks and recreation press 1, for sanitation press 2…").

Citizen transactions with government that are most suitable to an IVR are those where a series of questions can trigger a path of inquiry and the transaction can be completed without a government worker needing to step in and make a judgement call. For example, a citizen who is unemployed and needs to report in and document their continued unemployment and that they have been looking for work can use an IVR system to answer the questions and complete the verification without visiting an office or standing in line. In the private sector, a great deal of the customer support in the banking and credit card industries is done via IVR. IVR systems can provide detailed reporting on the number of calls, their duration, and the results.

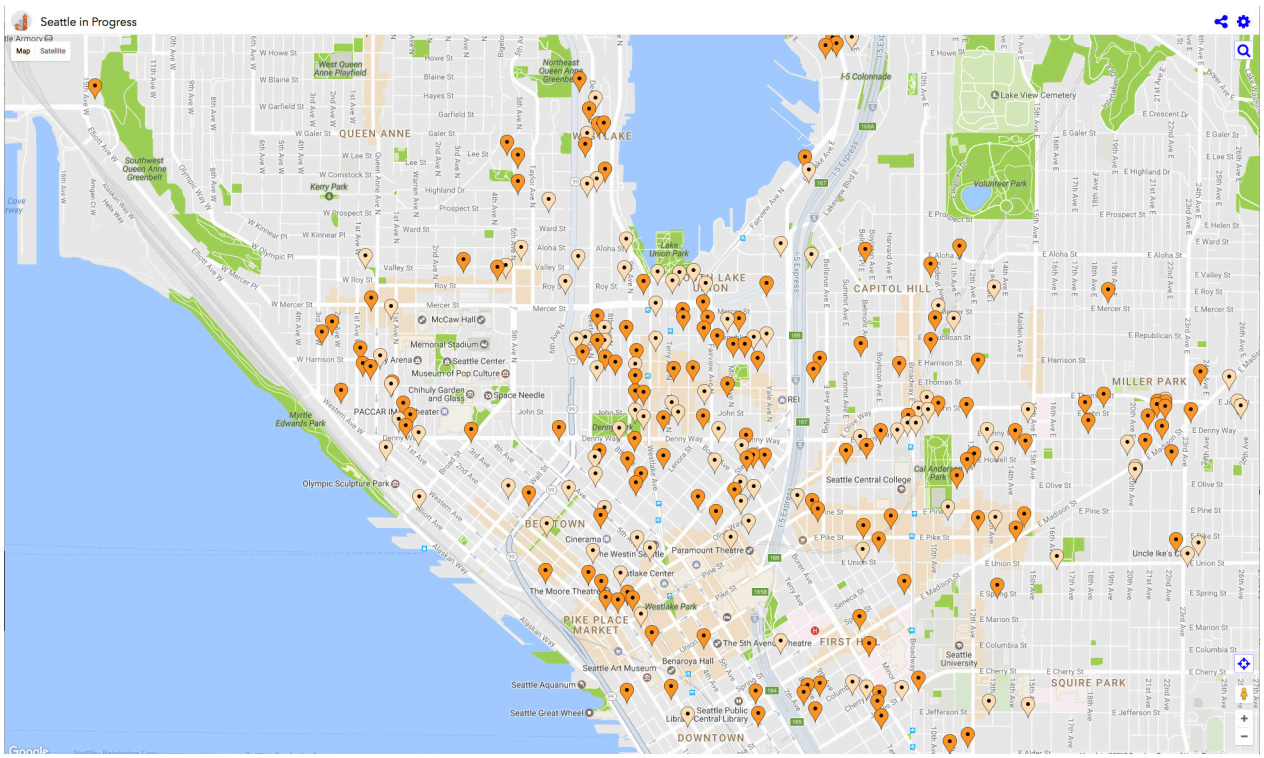
Web-based self-service. With self-service on a web portal, all information and some transactions are available to the citizen via any device with an Internet connection 24 hours a day, seven days a week. This allows the citizen to find out information (how to qualify for benefits, what day the recycling is picked up, how to register a business, etc.) at their convenience and without having to ask a government employee. Content published to the web site should be checked for accuracy and should be updated on a frequent basis. Typically, there is a designated team responsible for keeping the content up to date and accurate. In a 311 project, this is often a combination of centralized service center staff and agency staff who know the rules and news for their agency. Many transactions can be completed via the portal as well. For example, in Utah, a business can register with the state and transact each step on the same portal, crossing various state agencies, all with a transparent workflow to show where the application is in the approval process.

According to a recent national survey, online self-service has consistently been one of the most common service delivery methods for 311 centers in the US (Synergy, 2015). Many citizen service centers have had self-service portals for years. For example, Los Angeles County created their web self-service option (YourBenefitsNow) as a result of the feedback from walk-in customers

who wanted online access that was available 24-7. Most web-based transactions allow the user to track in real time the status of their request or case via a tracking number. Often an email notification of case status will have a link to the tracking site. This increased transparency can improve citizen confidence in government.

Mobile self-service. Mobile self-service for government 311 applications is an emerging area. The most common is the use of mobile apps for submitting service requests to a city 311 system. Typically, these are done via an add-on app created specifically for capturing photos, geographic locations, and details of the service request. One very successful 311 mobile app is Citizens Connect, used in numerous U.S. cities. In Boston, one of the first to deploy Citizens Connect, 40 percent of service requests are made via an electronic channel, reducing the volume of calls to be handled via live operators. This is largely driven by the adoption of mobile requests. One interesting application of mobile self-service is SeattleInProgress.com, which allows users to see what's being built in Seattle, a city with a high rate of urban development. SeattleInProgress.com identifies construction projects on a map (See Map 2) and provides the project description and status. Users can download the entire project proposal and architectural renderings, and they can register to receive an email with future updates as the project progresses.

Map 2: Construction projects in Seattle, WA



SMS/Text. Many 311 systems will allow citizens to input service requests directly via text message into the system. This capability is not yet ubiquitous, either in its availability within a 311 offering or in its uptake by citizens.

Identity Management

The identity management component ensures that the individual accessing the system has a personalized experience each time. Identity management also associates with each individual user' (citizen, worker, supervisor, etc.) roles and permissions. Permissions allow or deny access to actions within the system, as well as to associated files, databases, and servers. Permissions in the system can grant access to information only for certain types of users associated with their identity. This keeps a citizen from having access to controls that should be at the discretion of the call taker, case worker, or supervisor.

With identity management, users can create individualized profiles allowing them to see the system with their relevant information. For example, in a permitting system, users can create a personalized experience based on the profile they create, allowing them to see their application at each step of the approval process.

Case Management

Case management is the core function of an information integration system and is sometimes the key reason for creating or deploying the system. Case management allows a government worker to manage a case from inception to close, with incremental steps and automated workflows along the way. Wizards and rules engines help guide the citizen, case worker or call taker through the required steps in a case. Sample case processes for human services and for 311 calls are described in the CRM section of this paper.

Content Management

Content Management (CM), also called enterprise content management (ECM), is important for organizing all reference documents for a case. For a 311 operator, the knowledge base from which answers are sourced is the content management system. For a human services worker, content management includes both the library of rules and regulations of programs offered to citizens, and the management of documents attached to the case. Documents necessary for a case could include eligibility documentation such as wage verification, proof of citizenship, etc. A content management system can be viewed as an electronic library and filing cabinet for the information integration system.

Tools within the content management system can automate the process of uploading scanned paper documents to the case. Any paper forms filled out by citizens can be digitized and added to the content management repository. Content management systems greatly simplify the task of keeping records together. Instead of file folders stuffed with papers, there are electronic files with all associated documents stored where they can be easily accessed.

The outward-facing knowledge base supported by a content management system will likely include FAQs and a searchable library of commonly needed documents. This helps provide the public with a consistent, up-to-date, single version of the truth about any given topic of importance.

Master Data Management

Master data management (MDM) is critical to the success of an information integration project. To have an integrated view of the citizen, it is important to ensure that the citizen is the same person across various sources of data. Yet often the same citizen is identified differently in different systems even in the same agency. Addresses may be out of date; date of birth or other key data points may be missing or inaccurate. Using a MDM tool enables the development of a single source of standard data across all applications and agencies for the key identifiers of the individual citizen, across agreed key data elements (name, address, marital status, etc.). With MDM, a single, centralized repository stores all master data for each citizen. The data is not stored in the separate applications, but rather is populated to those applications from the central source. This ensures consistency for analytical and reporting purposes and provides accurate and complete data from a trusted source.

MDM can also be useful in uncovering fraud when an individual has applied for benefits for which they are not eligible or when they are receiving duplicate benefits. Some technology companies provide add-on services to their MDM products that are specifically designed to root out fraud in Medicaid claims or in unemployment benefit programs. Further, MDM has been shown to reduce the time and cost associated with redundant data entry of individual identifier data, and with finding and fixing errors (Forrester, 2013).

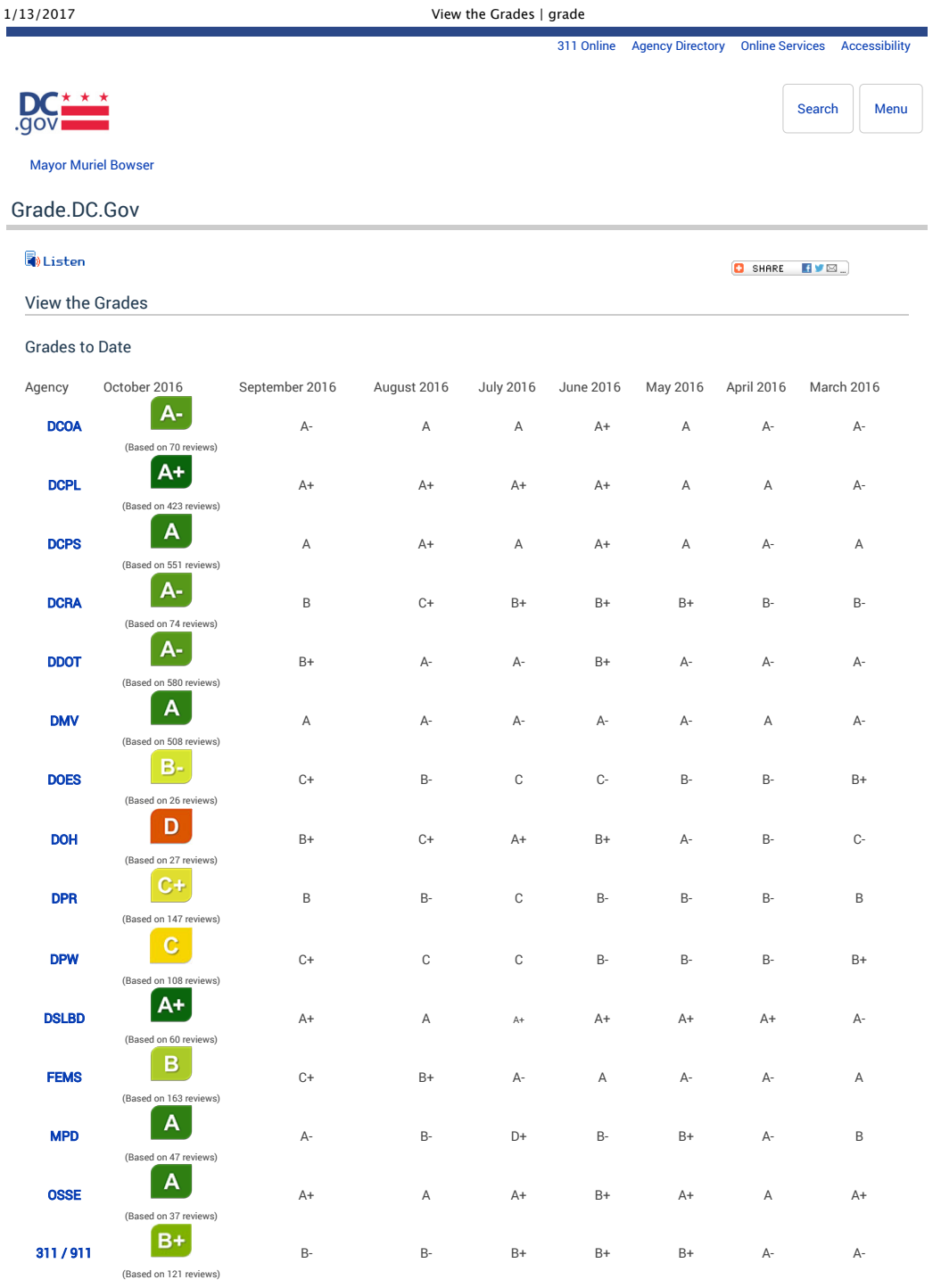
With MDM, data governance is key. It will be important to think through key questions such as Who will be responsible for data quality and integrity? Who will be responsible for data updates? How does the updated data get replicated back to applications in the agencies? The choice of who leads an MDM effort is also important. Often it will be the central IT organization, and sometimes it can be an agency with lead citizen-facing responsibility.

Social Media Analysis

Analysis of the content of social media allows a government agency to understand the tenor of what citizens are saying on social media—what they are concerned about, what they are impressed with, and what areas need improvement. Social media analysis is a new area for government, with only a handful of examples of success. In Washington, DC, social media sources are mined to assess how the public feels about each agency, and they receive a letter grade. These grades are shared on the city website and updated regularly on a dashboard called "Grade DC." (See Image 1) Santa Monica, CA, uses linguistic content analysis of public Facebook and Twitter data to assess the positivity and negativity of resident sentiment at the neighborhood level to make government services more responsive to citizen needs.

Because it is in its early stages, social media analysis is not generally incorporated into information integration systems. For some of the largest company offerings, CRM will include social media analysis, however many of the mid-sized and smaller company products will not offer this capability. Most social media analytics products allow analysis across multiple sources of social media (Facebook, Twitter, Foursquare, etc.). Some content analysis tools also allow views into the sources that are driving the comments (Twitter, Facebook, Yelp, Instagram, blogs, videos, news). Easy-to-read visuals help tell the story of what's on the minds of citizens. Historical analysis can also show how social media sentiment varies over time.

Image 1: Washington, DC agency grades in Grade.DC.Gov from March 2016-October 2016



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Mayor Muriel Bowser

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Grades to Date

Agency	October 2016	September 2016	August 2016	July 2016	June 2016	May 2016	April 2016	March 2016
DCOA	A- (Based on 70 reviews)	A-	A	A	A+	A	A-	A-
DCPL	A+ (Based on 423 reviews)	A+	A+	A+	A+	A	A	A-
DCPS	A (Based on 551 reviews)	A	A+	A	A+	A	A-	A
DCRA	A- (Based on 74 reviews)	B	C+	B+	B+	B+	B-	B-
DDOT	A- (Based on 580 reviews)	B+	A-	A-	B+	A-	A-	A-
DMV	A (Based on 508 reviews)	A	A-	A-	A-	A-	A	A-
DOES	B- (Based on 26 reviews)	C+	B-	C	C-	B-	B-	B+
DOH	D (Based on 27 reviews)	B+	C+	A+	B+	A-	B-	C-
DPR	C+ (Based on 147 reviews)	B	B-	C	B-	B-	B-	B
DPW	C (Based on 108 reviews)	C+	C	C	B-	B-	B-	B+
DSLBD	A+ (Based on 60 reviews)	A+	A	A+	A+	A+	A+	A-
FEMS	B (Based on 163 reviews)	C+	B+	A-	A	A-	A-	A
MPD	A (Based on 47 reviews)	A-	B-	D+	B-	B+	A-	B
OSSE	A (Based on 37 reviews)	A+	A	A+	B+	A+	A	A+
311 / 911	B+ (Based on 121 reviews)	B-	B-	B+	B+	B+	A-	A-

Business Intelligence Analytics

Information integration systems create a vast amount of data on the citizen and on the government transactions they complete. Extracting the data and making sense of it is much easier with a report writing and business intelligence tool. Many off-the-shelf products will have at least a minimal number of out-of-the-box reports for basic operational statistics. For additional analysis and insight and

to create custom reports, an additional tool may be useful. Business intelligence tools can facilitate data analysis with a user-friendly interface that makes it easy to drag and drop categories of data into a new report. Custom reports can analyze geographic areas, time trends, and clusters of activity that may need additional attention.

A business intelligence tool can enable the creation of dashboards with real-time updates to continuously monitor the status of various important key performance indicators. For a permitting system that could mean a dashboard indicating the number of new permits, the number in the queue, and the number overdue for any given step in the approval process. For a 311 system, business intelligence tools allow analysis of timeliness of completion of work orders by department, or the geographic areas of the city with the most service requests. Dashboards can create visualizations and can consolidate information from across the system into easy-to-read graphics and summary tables, summarizing activity across all citizens or departments. Analysis of trend data in a business intelligence system allows the manager to stay ahead of problems.

The following recommendations reflect lessons learned from a variety of technology projects designed to improve citizen services via integration of information systems. Recommendations are presented in the order of the phases of a project from project startup to implementation and summarized in Figure 3.

Project Startup Recommendations

- **Invest in experienced resources.** Your project manager could make or break the project. Given the many components of an integration project, a strong project manager capable of handling multiple simultaneous work streams is critical. Do not shortchange the project by hiring a project leader without significant experience. Look for someone who has successfully led a similar project before. Key deputy project leaders should also be experienced. When hiring a technology firm to assist with implementation, insist on experienced staff and on being able to replace any key staff who fail to meet performance standards.
- **Set clear goals.** Without clear goals, a project can fail. Yet, clear goals are not common. According to Gartner research, more than 60 percent of companies that implemented CRM did not have mutually agreed goals in place before starting the project. To increase the chances of project success, establish clear project goals then document and share those goals. Make sure that all project stakeholders—every agency participating in the project and at every level of the organization that will be affected—understand the goals.
- **Include key stakeholders in the planning and goal-setting process.** Confused stakeholders can easily become disgruntled and can possibly try to stand in the way of your projects success. Even if all stakeholders agree that the project is a good idea, if they don't know the specific vision and goals for the project, they may end up steering it off course. Before beginning, assemble a team that includes representation from all key stakeholder groups and then together determine specific, measurable goals for the initiative. Include participation from different levels of the organization, making sure that front-line workers are empowered to provide frank advice.
- **Prioritize and make the priorities clear.** It can be tempting to make the project too ambitious, seeking to provide something for everyone so that every agency will be on board. For example, in implementing a 311 system, taking on the creation or improvement of a work order system for a participating agency will greatly benefit that agency but will slow down overall implementation. This can be a costly mistake. Rather, it is more effective to set clear priorities for the project. What will provide the most value? Is the highest priority to automate the back-end processes, or to make the

customer interface more appealing and unified? Is there a pain point for employees or customers that needs to be addressed? It is also important to decide whether to launch as a multi-channel service or to roll out in phases by type of channel (phone, web, text, etc.). Once the priorities are clear, articulate them and share the document with all key stakeholders and with project staff. Post it on the wall in the break room and share with all involved staff so that there will be no doubt at any point during the project. Assure the priorities align with the agency's core mission and values and with the whole of your government's future vision for technology and service delivery.

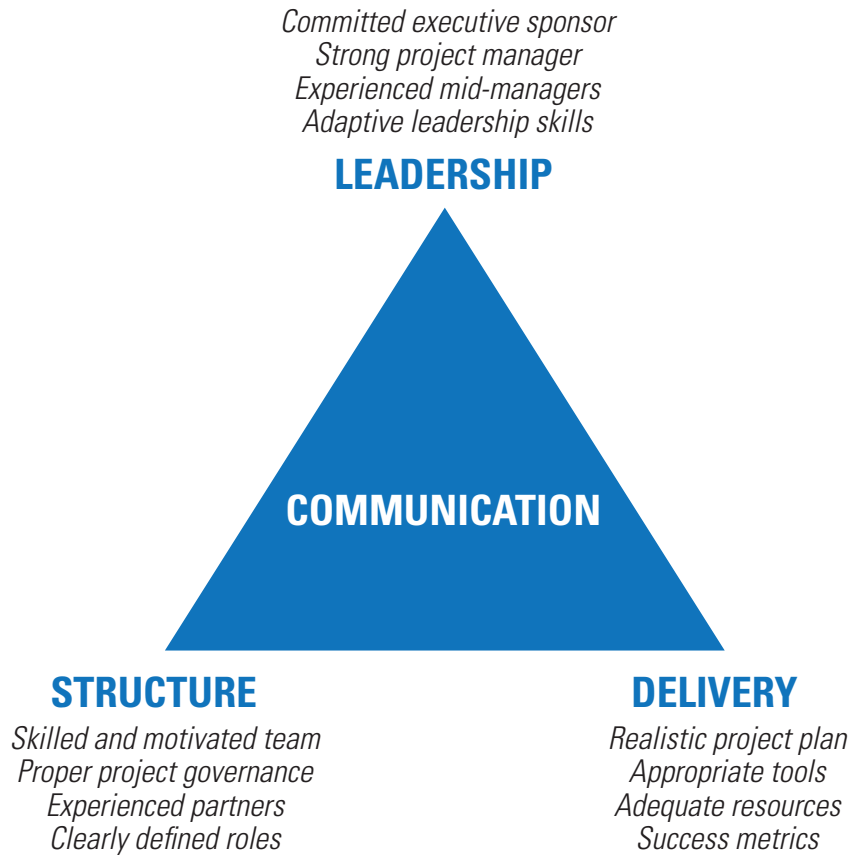
- **Document your business case.** After deciding on project goals, create a business case. The business case does not need to demonstrate a financial ROI. but it must clearly state the benefits to the citizen who receives the service, or to the taxpayer if greater efficiency of processing will result from the project. Make sure the business case is solid and can stand as a clear description of why you are undertaking the project. Ideally, the business case will convince the skeptics that your project is worthwhile. The business case may be valuable as you seek funding for the project.
- **Create a realistic implementation plan.** When creating an implementation plan, create incremental phases of work that build on each other. The initial phases should improve service delivery in whatever way is most visible and valuable to citizens. This will help build support among your external stakeholders. Use a project management software tool so that the plan can be shared electronically and so that individual task owners can easily share updates. This improves transparency. Think realistically about the staff time involved and the procurement process. Early successes can build momentum and excitement about the project. Conversely, with an overly ambitious plan, missing early milestones will create disappointment instead of pride and excitement. Once the plan is drafted, add 10 to 20 percent more time to allow for unanticipated delays. Make sure the plan reflects your organization's strengths and weaknesses and provides additional support where needed.
- **When using an off-the-shelf product, minimize custom design.** When buying packaged software solutions, it can be tempting to customize the package to suit the unique process needs of your organization. Each customization adds to the complexity, time, and cost of the project. Changing your process to meet the standard process built into the software package should only happen once. Changing the software to meet your process must be done every time there is an upgrade or patch.
- **Seek citizen input.** If your goal is to make your systems and processes more responsive to citizen needs, why not ask them what matters most. Consider inviting users of specific services to participate in a focus group and ask them how they want to interact with the government. You may find that you *think* you know what the citizen wants, but they want something else instead.
- **Research best practices.** Regardless of the nature and scope of the project, there are lessons to be learned from other organizations in the public and private sectors. Once the goals of the project are clear, find out what has worked well and what has been challenging

to others taking on a similar project. Abu Dhabi did this when they sought to learn from NYC311 before creating their citizen service center. Do research in two phases. First conduct desk research by reading about other similar projects. Then ask peers in other cities about their projects. You'll learn things when you call that you'll never see in a write-up. Many project write-ups are written by the vendor who implemented the system. They have a vested interest in promoting the project's success and won't necessarily include all the challenges and work-arounds when they summarize a project. Don't be afraid to reach outside of your domain for lessons. After all, Henry Ford invented the assembly line not by looking within the auto industry—he developed the idea when visiting a meat packing plant.

Project governance recommendations

- **Dedicated senior executive leadership matters.** Implementing any new citizen-oriented information system is a complex project involving both technology and people from a variety of agencies across government. An experienced project manager must lead the project. He or she must be able to make tough decisions and to hold others accountable. And that person must have the backing of the key executive. The strong and vocal public and private support voiced by Mayor Michael Bloomberg in New York City made a critical difference at key points in the implementation of the NYC311 project. His insistence on the project's being done right helped gain buy-in from reluctant agencies.

Figure 3: Keys to Successful Program Implementation



- **Clearly define roles.** Whether it be roles of the project leadership and team members, or the roles and responsibilities of the participating stakeholder groups, clearly defined roles and expectations are essential. Document the roles so that if there are issues the document can help clarify and re-set expectations. Clearly spell out both what stakeholders must contribute, and what they can expect to receive in return.
- **Convene an executive steering committee.** Invite senior leaders whose advice you respect, and those who can represent key stakeholder agencies to serve on your project's executive steering committee. Convene this group periodically (quarterly or semi-annually depending on the complexity and duration of the project) to serve in the role played by a board of directors in a corporation. Report your progress to them; it will force you to take stock of what you've achieved so that you can celebrate it, and to look at where your progress falls short of expectations. Give them problems to solve and ask for their help. Because they are not part of the day-to-day operations, they offer a fresh perspective on your project. Sometimes they will be able to help you find shortcuts to problems you face.

Project Management Recommendations

- **Don't be afraid to amend your project implementation plan.** As the project progresses, you will learn from early mistakes. You will learn where your assumptions have been too aggressive. This may be particularly true when making assumptions about how long it will take to gain buy-in across agencies. Don't be afraid to update your project plan to reflect the evolving reality you face. When you do make updates, be sure to report them to the executive steering committee and share them with key stakeholders. It is better to let everyone know and not hold back when you realize you will have a delay.
- **Communicate progress.** Your team and your stakeholders should receive periodic updates. Each will have a view of their part of the project but not the overall progress. Sharing news across the project helps keep every participant aligned with the common vision. This creates a sense of common purpose that helps keep the team motivated toward the goal.
- **Spend time on the back-end workflows.** Projects often spend too much time on the user interface and not enough time on the back-end transaction processing systems. While the "how does it look" effort certainly results in a good user experience, the back-end data flows are what make the project work. Consider, for example, the Massachusetts Health Connector, an online marketplace for the public to purchase health insurance. At the time of launch, the user experience was high quality. From registration to search to purchase of a health insurance policy, the user experience was an integrated and seamless process. However, the back-end systems to transfer policyholder data to the insurance providers was inconsistent, leaving some who had paid for insurance via the connector unknown to their provider. Further, the system for collection of premiums was out of synch with the rest of the system, resulting in policyholders who had paid in full being sent notices of cancellation for nonpayment.
- **Plan for data quality issues ("dirty data").** An often overlooked challenge is dirty data, that is, inaccurate, out of date, or simply spurious data in your database. Dirty data can slow down a process if you are not ready for it. Data are the lifeblood of an integration project,

and incorrect numbers, spelling mistakes, and outdated contact information can infect that system if left unchecked. Plan for time to clean up the data before inputting it to your new system. This will make for a smoother rollout.

Organizational Change Recommendations

- **Create a strong change management plan.** Believing that a new system is solely a technology project is a recipe for failure. Writing code to customize a system is far easier than getting employees to change how they do their work. Changing habits takes time. End-user frustration can be minimized with a solid change management plan. Change management addresses user needs and builds in the right amount of training and support to minimize disruption to routines when the systems are changed. When technology projects are seen as a panacea and not as part of a larger change in human behavior, they are unlikely to be successful. When building a change management plan, be sure to document and share the benefits to users as that will increase their confidence in the new system and help them withstand the inevitable bumps in the road of system transition. Create champions or super users who not only receive training but who are given the resources to help others with the transition to the new platform. They will serve as a great feedback source on how the rollout is going and what needs to be tweaked.
- **Expect challenges for cross-agency projects.** Any project that involves multiple agencies will be complicated. For example, a citizen contact center that consolidates the customer care operations of a variety of departments will need to navigate multiple information systems and multiple agency organizational cultures. This is not only a technology challenge; it is an organizational challenge to standardize back-end processes and develop a common citizen-facing flow. In developing its Business Hub, the City of Boston found that this step was time-consuming but valuable. Duplicative steps were eliminated by mapping all processes across the agencies involved in the business registration process. Organizational change can be threatening for some, and building in extra time to work with hesitant staff is important.
- **Build trust slowly for cross-agency work.** Collaboration across agency boundaries requires a great deal of time to develop buy-in. At the start, be sure to understand the key pain points of partner agencies—building your project to give them some benefit will help to gain their buy-in. Checking in with key external stakeholders along the way will help them not only be heard, but feel heard, which matters nearly as much. To trust others takes time. A state justice official in New Mexico was trying to forge a partnership with the justice system leaders of the Navajo nation. It took three meetings before she figured out the right person to talk to and then another two meetings before she was able to present her idea. Finally, she was successful in forging a mutually-beneficial partnership. Each meeting took her nearly nine hours of driving round-trip. This is an extreme example of the amount of time it can take to build credibility and gain buy-in across agency cultures. When planning a project that crosses agency lines, allow sufficient time to gain trust.

- **Celebrate success along the way.** With long projects, the team can lose sight of the end goal when they are in the weeds of their day-to-day work. Long-term programs with multi-year roadmaps tend to go through peaks and troughs of excitement. The challenge is to prevent these troughs from dragging down the morale of project team members, resulting in slowed progress. Celebrating significant project milestones builds excitement among the project team. It also demonstrates to external stakeholders that the project is on track for success. Celebrate victories at strategic moments to prevent lagging morale. Celebrating success can also keep key stakeholders and project sponsors motivated and involved.

Program Rollout Recommendations

- **Soft launch first.** Before going public with your new system, test it. Then test it again. If possible, involve citizens in the testing phase to get their feedback on usability and make improvements to the user experience. When ready to launch, pilot a few capabilities before launching the entire new system. Learning from the pilot will improve the final full launch. Proceed incrementally, releasing additional features and functions as they are ready. Piloting prevents large, public failures such as occurred with the U.S. government's Healthcare.gov launch in 2013.

Increasingly, leaders in government strive to achieve excellence in citizen service. Creating citizen-facing systems and processes and organizing the back-end transaction processing systems of government is a key step toward achieving this goal. For a leader considering a new initiative to improve citizen satisfaction with government service, aligning systems to the tasks citizens want to do (register a business, apply for benefits, report a concern, etc.) is more important than working within the existing silos of government. Lessons learned from prior implementations point to the importance of careful planning for both the technology and the internal organizational changes necessary. One common tool for creating a single view of the citizen is a CRM (customer relationship management). Prior efforts demonstrate that significant benefits can be achieved both in citizen satisfaction and ease of use and in financial savings due to efficiencies and avoided duplication or fraud.

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Interviews:

Marc Cherna, Director, Allegheny County Department of Human Services

Jeffrey Friedman, former Co-Director, Philadelphia Mayor's Office of New Urban Mechanics, current Director of eGovernment Business Development, Microsoft State & Local Government Solutions.

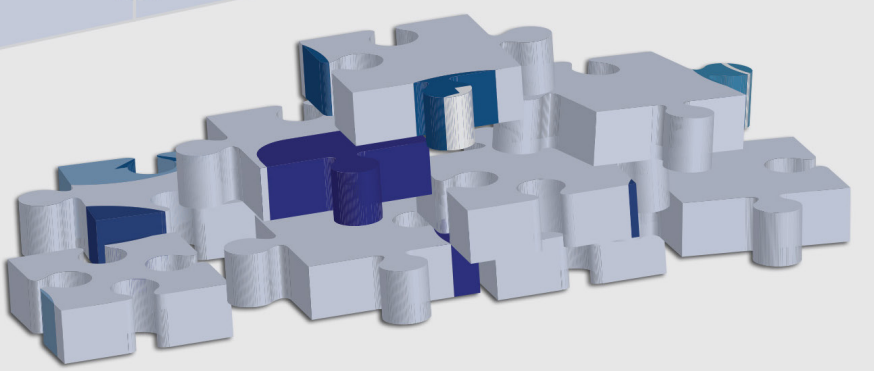
Stephen Goldsmith, former New York City Deputy Mayor for Operations, now Daniel Paul Professor of the Practice of Government, Ash Center for Democratic Governance and Innovation, Harvard University.

Brian Goodman, Innovation and Systems Manager, Office of Business Development, City of Boston, Boston Business Hub.

Mark Kmetz, (former) Commissioner, Massachusetts Department of Professional Licensure.

Mike Reade, Public Safety Specialist, IBM Integrated Smarter Solutions Team.

Andrew Saxe, Industry General Manager, State and Local Government, CSC.



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