TODAY’S DATA INTEGRATION IMPERATIVE

and a New Platform for Governing: Building Trust in 21st Century Government
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“WE LIVE CONSTANTLY IN THE SHADOW OF THE FUTURE, TRUSTING THAT TOMORROW’S WORLD WILL BE BETTER AND REDEEM THE INCOMPLETENESS OF THE PRESENT.”

— DAVID BROOKS, ATLANTIC MONTHLY

Introduction

Hurricane Katrina, the South-East Asia earthquake and tsunami disaster, the September 11 attacks on America, global terrorism and the potential for emerging pandemics including bird flu and mad cow disease have one thing in common. Each demonstrates that frequently governments are not prepared for events that many have foreseen. As evidenced by these events, two things are indisputable — in such moments people count on government to protect and promote the common good. These events also vividly demonstrate governments’ need to do a far better job at communicating internally and with the public.

In the shadow of these dark moments, the public questions government’s competence and worse yet, its motives. The public also expresses fear about whether government and its leaders will be any better prepared to face the modern, extraordinary challenges of governing.

Government at its very best inspires individuals to reach shared goals and accomplishments through the ingenuity of collective action. Government also embodies the worst of our human side: a willingness to fight over power, money and turf while Rome burns.

Public skepticism of government is neither surprising nor something to fear; skepticism is part of the fabric of a healthy democracy. Nevertheless, in the wake of governmental failures, the erosion of public confidence has both immediate and long-term consequences, including the ability of lawmakers to garner public support for the resources needed to meet the basic mission of governing.

Intelligence and basic infrastructure failures illuminated by September 11 and Hurricane Katrina resulted in part from people being unable or unwilling to share data and information effectively. Incomplete information thus led to poor decisions and in some instances, social calamity.

Kip Holden, mayor of Baton Rouge, Louisiana, recently spoke about communication breakdowns during the aftermath of Hurricane Katrina. In this example, citizen-to-government communication failure abounded. Shortly after the hurricane hit New Orleans, several individuals acting on their own acquired buses and drove into New Orleans, picked up evacuees and drove them out of the city. These good Samaritans did not realize that the shelters were already full in Baton Rouge. The well-intentioned citizens did not contact the city of Baton Rouge to find out where to take evacuees. When over-capacity local shelters turned away the buses, the drivers dropped off their human cargo on the streets of the city, leaving the evacuees homeless in an overburdened urban environment.

Yet there is little value in dismissing public officials as insensitive or incompetent or Samaritans as misguided vigilantes. The culprit was, at least in part, the communication failure due to a lack of reliable real-time information. Public sector IT community executives and practitioners need to participate in a discussion about and creation of a broader, business-driven view of data and information. The immediate situation calls for a response to the current data integration imperative: how can we make the present secure, complete and in itself redeemable?

Indeed, Today’s Data Integration Imperative is to design, deploy and exercise a “New Platform for Governing” to finally breach the traditional silos of government. This imperative will enable government to more effectively tap into the vast stores of enterprise data necessary for effective governing. This imperative also encourages greater civic engagement by providing citizens and communities of interest greater access to the full public record.

Finally, the imperative recognizes government’s pressing and perennial need for financial efficiency. Properly implemented, the new platform can help government mine significant costs out of existing processes but only if organizations are willing to breach the financial silos of government as public employees work to collapse the business and technology silos they inherited. To be clear, the confluence of new demands on government, systemic fiscal constraints and evolving technologies that can fulfill the long-held vision of government modernization represent a “strategic inflection point” or a “tipping point.”

Given that, it begs important questions for this generation of government leaders — what are you going to do about it? If not now, when? If not you, who? At its core, the intent of this paper is to help you think through the answers to those questions.
The Evolution of a New Platform for Governing

A few words about this new platform for governing are in order. In its simplest form, the architecture of the platform is designed around the Internet, which has already triggered data integration on a grand scale. That said, much of the work done to date in the public and private sectors has focused on the Internet’s ability to enable incremental improvements to largely physical processes. The new imperative builds on those improvements and shifts the focus on the Internet’s disruptive qualities — modernizing and often replacing physical processes with end-to-end electronic transactions that allow, as Nicholas Negroponte once predicted, “digits [to] commingle effortlessly.”

Given the evolution of networked business models and where the platform and its emerging standards are leading contemporary and globalizing societies, what does a new data integration imperative mean for government? What can government learn from the vanguard in these efforts? What should we be thinking, and how should we be thinking about doing the public’s business differently?

This paper is the first in a series on government data integration. Today’s Data Integration Imperative and the New Platform for Governing covers more broadly the promise of Web services and the case for understanding why governments should seize the opportunity to act now as part of their overall modernization efforts.

Although the structuring of a service-oriented architecture using open standards-based Web services over the Internet is similar across governmental communities of practice, the business processes of those communities vary greatly. Since private sector partners must be attentive to differences in business processes when designing product sets to meet differing programmatic needs, a series of specialty companion papers will follow to supplement this guide. These supplemental briefs will highlight first-movers and innovators among state and local governments and address several communities of practice in the governmental space including health, human services, criminal justice, public safety, finance and tax.

The Case for Data Integration: Managing Complexity and Resource Constraints

Information is governments’ business, and the lifeblood of any information business is data. Without the fundamental building blocks of data, government has no information and without information, it has neither intelligence nor knowledge. A government without knowledge is a plane without instruments flying blind into a storm.

Strategic planners assist government by helping leaders get control of the “instruments” and create some organizational discipline out of a “fog of information.” One tool at their disposal is the “use case.” When building use cases, planners often conduct a SWOT analysis, which includes an assessment of the strengths, weaknesses, opportunities and threats associated with a project or course of action. When analyzing the risks associated with integrating data, governments must also assess the dangers and threats associated with failures to act and seize opportunities when they are “ripe.”

Government leaders and technologists have long advocated data integration, but the case today for data integration has never been stronger. Faced with major communication and coordination challenges, governments would benefit from becoming more aware of and using the emerging technical tools designed to tackle these complex problems.

Clearly, governments are in desperate need of another new round of modernization. Government is faced with the twin challenges of increasing complexity and resource constraints. Increasing complexity exposes governments’ areas of weakness. These weaknesses contribute to failures that erode public opinion. The combined effect of eroding public opinion coupled with long-term structural deficits lead to resource constraints.

David Walker, the U.S. comptroller general, recently described what he called “a demographic tsunami” that “will never recede” due to the combined power of the imminent retirement of the baby boomers with Medicare, Social Security benefits, and the nation’s debt swamping the federal budget in coming decades.⁷

At the same time, government’s business and functional requirements are increasing at a compounded rate of 10 percent to 15 percent per year according to author and consultant Mark P. Angelo.⁸ As complexity increases, so do the unintended consequences of governmental action or inaction. The decisions of one section, division, department, branch or jurisdiction have a direct and often unplanned impact on other parts of government and ultimately, on citizens.

Complexity increases the risk of governmental failure, which leads to negative public perceptions about the competency and the motives of government. Over time this erosion of public confidence, if chronic, can lead to questioning of the basic capability or even the legitimacy of government itself, which, like structural deficits, leads to resource constraints.

As recent history has shown, constituents often perceive government as data bound rather than data rich, as focused on the irrelevant rather than immediate. The new demands of governing make old models of single, unified databases unworkable and unacceptable. The need for greater cost efficiencies coupled with the problems associated with increasing complexity make the need for new data integration strategies no longer a luxury but an imperative. Governments that begin to address communication problems and the lack of data integration in a serious and concerted way have a unique opportunity to roll back eroding public opinion as well as become far more agile at problem solving particularly during crises. Nevertheless, if the challenges are ignored, government also runs the risk of stalling in the face of complexity and resource constraints.
Today’s Data Integration Imperative

Still, there is a way out of this dilemma. Although often managed and complained about as if it were a liability, data actually is government’s greatest asset. To take advantage of this asset, data must be available where and when it is needed. To seize new opportunities, government should begin to view data as its most valuable resource and know how it is organized and exchanged.

Fortunately, data architecture is a mature discipline. Unfortunately, it has often been given short shrift in even the most detailed enterprise architecture efforts in state and local government. Instead these activities are more often dominated by infrastructure, platform and network concerns. Still, there is significant latent value waiting to be harvested by governments that are willing to adopt emerging standards and apply models of data architecture such as the Data Exchange Point Model and a service-oriented architecture, both of which are described later in this paper. Policy makers must shift the focus of this conversation, drive the change, and get buy-in on agreements to self-impose discipline while developing new applications and when converting legacy applications.

Defining Data Integration

To provide a common understanding of this key concept, data integration is defined here as a process that combines information and data from many different sources, permits analysis of the data often in new ways, and displays the results of the analysis/query through a single or common interface.

Another way of looking at data integration is not by what it is, but by what it does. Although it resides in two or more databases or systems, systems can share integrated data electronically, provided these systems comply with common standards. To achieve data sharing, systems can extract data from each source and store it centrally, or systems can retrieve data from each source on demand. Extensible Markup Language, known as “XML,” is one widely pervasive standard for data sharing and information exchange. Moreover, notable software industry initiatives establish sets of guidelines for how to publish schemas in XML and how to use XML messages to integrate software programs easily and build rich new solutions.

One last example helps define data integration not by what it does but by what it doesn’t do. In a recent interview, Otto Doll, CIO of South Dakota, related one of former South Dakota Gov. Jankow’s favorite pet peeves. Doll explained that when the governor would ask five agencies a question he would get “six different answers.” What the governor described is a pervasive state of data fragmentation.

Enterprise-Aware Government

As an alternative to data fragmentation, the power of a standards-based data architecture is increasing the ease with which data from one government “silo” can be combined with key data from other systems, organizations or jurisdictions. Without this architecture, decision makers are given an inadequate view of what is going on and why. For government to function as an enterprise, it literally must become more “self-aware” by perceiving itself as a single entity rather than simply a sum of its parts. This shift in perception from “they” to “us” is a first step toward engendering an environment where appropriate data sharing is encouraged and rewarded. Leaders in the executive and legislative branches should offer incentives to support thinking and acting across boundaries instead of within silos. Governments must also do a much better job of engaging the public by appropriately sharing rather than locking away the public’s data. Furthermore, government leaders should look to the public as data sources as opposed to simply data consumers. W. David Stephenson, homeland security consultant, suggests that governments need to do a better job of empowering citizens particularly during disasters to help solve problems as opposed to being mere victims of events.

While homeland security remains a work in progress, it does bring the issues of data integration into bold relief. Maj. Gen. Dale Meyerrose said inter-agency information sharing is a “blossoming requirement” for the newly created U.S. Northern Command, headquartered at Peterson Air Force Base in Colorado Springs, Colo. That may require abandoning the military’s traditional system for classifying information in favor of an integration model that allows the Northern Command to share real-time information with civilian agencies from federal, state and local governments that classify information differently than the military.

Meyerrose, who serves as the Northern Command’s chief information officer says, “My mantra is that I need to change from a ‘need to know’ to a ‘need to share’ foundation. That is fundamentally a different level of information-exchanging requirement.”

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Enabling Technologies, Architectures and Standards

If government chooses the right tools and policies, which are aligned and integrated, then better decisions and performance, which can be tracked, measured and improved, will emerge. Also, choosing an efficient data integration model is a key success factor. One emerging concept in data integration is the Data Exchange Point Model. This groundbreaking concept pioneered in the state of Washington brings a pragmatic alternative to more traditional approaches to data architecture. Briefly stated, a government using the data exchange point model would identify what key information their organization needs from data sets outside their jurisdiction and control, and then proceed to find out where the data is located. Instead of extracting enormous volumes of data and placing it in a data warehouse, the entity identifies a finite number of data points needed and only extracts that data from the originating system or systems.

Besides the approach outlined in the data exchange point model, several trends in technology and standards now intersect to make the barrier for entry into new data integration projects much lower than in the past. XML, Web services, service-oriented architecture and the emergence of a mobile Internet all offer excellent opportunities for forward thinking governments to capitalize on these trends.

### DATA CONVERGENCE

Data Providers:

- Districts • RSDU’s • NGO’s • Human Services • Public Safety
- Justice • State DEO H.E. • Workforce Agency

Data Base Applications:

DATA EXCHANGE Points and Standards

Data Users:

- Schools • Media • Government • Researchers • Legislature • Federal • Public

Characteristics:

- Consolidated collections
- Standard definitions
- Collect once, use many
- Electronic data collection
- Electronic access
- Shared data
- Support local improvement efforts
- Clear, easy to understand
To better understand the role these technologies play in the new platform for governing, we need to first acknowledge that although the platform and communications protocols that underlie the Internet are critical to this platform, the platform itself has services that run on it that provide the opportunity for more complete sharing of data on demand. One of these key linchpins is Extensible Markup Language, or “XML.”

Wikipedia accurately describes XML as a “W3C-recommended (World Wide Web Consortium) general-purpose markup language for creating special-purpose markup languages, capable of describing many different kinds of data.” It permits the sharing of data “across different systems; particularly systems connected via the Internet…programs can modify and validate documents in these languages without prior knowledge of their form.”

Web Services

Having defined XML makes it a bit easier to understand the concept of Web services. According to the W3C, a Web service is “a software system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine-processable format (specifically Web Service Definition Language (WSDL)). Other systems interact with the Web service in a manner prescribed by its description using Simple Object Access Protocol (SOAP) messages, typically conveyed using HTTP with an XML serialization in conjunction with other Web-related standards.” Software applications written in various programming languages and running on various platforms can use Web services to exchange data over computer networks — particularly the Internet. This interoperability is due to the use of open standards. W3C16 and OASIS17 are the primary committees responsible for the architecture and standards for Web services and e-business.

Web services are useful because they provide “a very loose coupling between an application that uses the Web service and the Web service itself.” This allows either piece to change without negatively affecting the other, “as long as the interface remains unchanged.” This flexibility allows software to be built by assembling individual components into a complete application.
Service-oriented architecture (SOA) "is an architectural style whose goal is to achieve loose coupling among interacting software agents. A service is a unit of work done by a service provider to achieve desired end results for a service consumer. Both provider and consumer are roles played by software agents (computer programs) on behalf of their owners."\(^{18}\)

Although the definition of SOA may apply to many services, for the purposes of this paper a service-oriented architecture is a design that allows for the coordination and use of a collection of Web services in ways that extend the value of legacy systems and their data streams. In other words, SOAs provide a "unified service infrastructure, which is composed of several services applications."\(^{19}\) Information technology architects believe that SOAs help organizations respond more rapidly and cost-effectively to the changing conditions they face by promoting reuse of existing IT assets across the enterprise. SOAs also allow government agencies to provide "plug-and-play" extensions to their legacy data systems thus making these islands of data accessible via the Web.

Otto Doll, South Dakota’s CIO, explains that IT organizations also can achieve the added benefit of keeping costs lower by extending the life of our legacy systems. Doll explains that legacy systems will not "go away in computer science, not in my lifetime." Doll continues, "Even though one day we may not use a mainframe, I can foresee twenty years from now that we’ll be wondering why anyone used servers." He concludes that there will "always be legacy worlds and we will always have to deal with stuff that we wish we didn’t need to use."\(^{20}\)

See the following figure for an example of an innovative approach to SOA creating the "Virtual Travel Service" on the Web. This example shows how various components would work together.

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**SERVICE-ORIENTED INTEGRATION**

![Diagram of Service-Oriented Integration](image-url)
In spite of the promise of XML, government practices lag many other sectors in its widespread adoption. A search of the Internet yields many examples of XML standards created to help unify companies and their trading partners in specific industries. Some examples include manufacturing XML, financial services XML, and shipping XML. Such standards are driving great efficiencies and integration in supply chains across myriad organizations and their trading partners.

By contrast, government has had an introduction to XML through the criminal justice and environmental communities, but the growth of real world examples has been slow. “First-step” implementations of XML in payment engines and content management syndication are developing due to increasing interest in Really Simple Syndication (RSS). Global Justice XML, the EPA’s Central Data Exchange, and health privacy and interoperability initiatives driven in part by HIPAA are some bright spots on the government radar screen.

One specific example of a successful government XML implementation is the Florida House of Representatives. The House developed Leagis, which is used to create legislative drafts, analyzes, calendars and journals. According to Lauren Perlman, applications manager, “users are allowed access to search and report against the legislative database and export this information to Microsoft Excel and Word for reporting and tracking purposes.” The next release of Leagis will allow “content to be authored in an XML format using Word and allow downstream processes to more efficiently utilize this content.”

As discussed earlier, promising advances in new XML standards for data queries will trigger a vast acceleration of data integration activities. Furthermore, these new specifications are also crucial for accelerating adoption of distributed computing models, such as Web services and Service-Oriented Architectures. In November 2005, the W3C ratified two breakthrough XML specs — XSLT 2.0 and XML XQuery 1.0. The standards were developed to permit transforming and querying XML.

Clint Boulton of Developer News describes the value of these new protocols: “Connections between applications, databases, operating systems, Web services and Web servers have traditionally used middleware to convert data between the formats used by various applications. XSLT 2.0 and XML XQuery 1.0 will make those conversions, enabling users to focus on more important business logic.” Major Middleware industry players including Microsoft, IBM, Oracle and BEA Systems worked closely with World Wide Web consortium to develop and promote these standards. These new standards allow users — particularly and notably machines — to search XML documents and relational database tables from different vendors’ databases.

Again, the opportunity for data integration now offered by these intersecting trends is larger than the barriers that have prevented it in the past. The opportunity for finally realizing integration is upon us because it “lowers the floor” and removes barriers. Such a change demands a fresh look at government modernization because of this maturing Web architecture. As the IT industry moves in tandem, XML standards are reinforcing the message that the Internet is the new platform upon which new data architecture is being designed. With organizations maintaining vast information stores, government is a prime candidate to capitalize on these trends and help realize the new data integration imperative that permits rapid easy access to — and use of — such data.

Eric Knorr, InfoWorld executive editor at large, in one of the most prosaic descriptions of SOA to date explains: “Service-oriented architecture is an idea, not a technology. Boundless in scope, it promises both unlimited software reuse and the interconnection of everything…” But he also cautions that organizations must create “an ecosystem of services that may ultimately have an army of stakeholders inside and outside the firewall.” Project managers and developers must face the challenge of trying to carefully determine “where to draw a box around a fixed set of requirements and how to build services that will yield tangible ROI while keeping an SOA fully extensible.”

Although Web services lend themselves more readily to interoperability than previous approaches such as CORBA, careful consideration must be given to SOA governance. The key success is achieving a balance between the “global demands” of the enterprise including an expanded definition of what the enterprise is, and the functionality needed by individual agency business processes. Although the enterprise architect may provide useful recommendations as to the technical requirements of standardization, the involve-
A Glimpse of the Future

Today’s Data Integration Imperative seizes the potential that open standards — when combined with the Internet platform and its vast and increasingly mobile communications infrastructure — will permit Web services to flourish. The platform will also permit governments, if they are prepared, to create a service-oriented architecture and thus spark data integration. Improved data integration can ultimately improve effectiveness and efficiency in decision making needed to meet the modern challenges of governing.

That said, what types of “products” are we seeing and will we see arising in this new environment? According to the California Institute of Technology, Internet-connected “sense and respond systems...detect critical conditions in an extended distributed environment and respond proactively. Proactive sense and response is an essential function in financial compliance, supply-chain optimization, electricity and gas distribution, logistics, health care and electronic trading.” Although we have inferred in our Web services discussion that we were only talking about computer-to-computer communication, the reach of Web services is much broader. For example, since Web services are platform independent it is possible to design advance sensor-based transportation systems where cars, streetlights, traffic flows and maps are all interacting simultaneously in a sense and respond mode. The Department of Defense is currently developing “sense and respond” for battlefield supply-chain management.

Governments that are in the beginning stages of building a successful SOA might benefit from initiating a variety of projects of various sizes and scopes beginning with small and medium size projects and working iteratively toward larger ones. Finally, governments should carefully consider the use of private partners and consultants that provide ready-made SOA products and solutions based on XML and Web services technologies designed to manage both integration and workflow. Major players in this marketplace include Microsoft, SAP, Oracle, BEA Systems and IBM.

To be clear, the technology is out of the lab and working in the field. Take the work of the Colorado Department of Agriculture to bring real-time communication and efficiencies of mobile computing to the labor intensive process of protecting the food supply. Some of the department’s 100 inspectors were on point to safeguard consumers in grocery stores by checking meat and eggs, enforcing labeling requirements and checking the accuracy of scales and bar code readers. Others inspected plants, packaged agricultural products at nurseries, and inspected livestock yards and farms.

The inspectors’ handwritten fieldwork forms often took three or four days to get back to the office where a data entry clerk would transpose the field reports into the inspection system (with the inevitable introduction of errors). Under the paper form process, a known problem remained unknown to departmental managers for up to a full week.

Five years ago, the Department replaced the paper-intensive process by arming inspectors with a tablet/notebook PC and XML-based forms software that automated the collection and transmission of data from the field to headquarters. The results speak for themselves: “We wanted to maximize our field force in terms of numbers,” says John Picanso, CIO of the Colorado Department of Agriculture. "We’re able to capture 20 more inspections per week.”

The adoption of a service-oriented architecture mindset may finally allow governments to move from limited implementation to wide-scale migration from paper-based document and workflow management into the digital era.31

Earlier, the paper presented a few case examples of governments that are beginning to experiment with Web services, RSS and XML. One government is experimenting with XML-based “mashups” a term pop music coined to describe a process where the voice from one sound track is digitally combined with an instrumental track from another. New components of Web services are being made freely available on the Internet. Forward thinking governments can begin using them at little or no cost. Microsoft’s Virtual Earth32 — itself the result of integrating seven formerly discrete initiatives on the Redmond, WA campus — and Google Earth are two examples in the maps realm.

The Center for Digital Government

Reclaim, Restructure and Reclaim

Three Steps to Data Integration: Structure, Restructure and Reclaim

1) Integrating by design: Disciplined data sharing must be at the core of architectural initiatives and all new applications development. Compliance with such design criteria should be tied to funding approval because integration-aware applications add more value than building tomorrow’s silos today.

2) Extending Value from Existing Investments: With legacy applications, government must restructure existing high-value data when it converts to new applications and platforms.

3) Knowing All of What Government Knows: Finally, government must reclaim the terabytes of unstructured data through enterprise-level search and analytics to mine value from previously indiscernible “data blobs.”
Mashups of data from government databases combined with virtual mapping lead to creative new forms of information display. One example of this innovative thinking comes from the Sheriff’s Office in Larimer County, Colorado, which combines advanced mapping capability with the county’s sex offender database. This system, which allows users to view a map that shows the address locations of Larimer County sex offenders, is currently available for eight different geographic areas in the county. Since government has vast amounts of data locked in various silos and behind firewalls, such “mashups” are a very low cost approach to building the new platform for governing a few bricks at a time.

Just as Web services and service-oriented architecture are discovering new and more efficient uses for the Web platform, the Internet is also in the process of morphing. One transformational development is the growth of the Mobile Internet, a key component in the new platform. According to Howard Rheingold in his book Smart Mobs, it would be shortsighted to assume the Mobile Internet is just the Web on a small screen (in the book the term “Mobile Internet” is used to mean both positive and negative collective actions).

As more mobile devices are connected to the Internet they will surpass fixed devices sometime during the first decade of the millennium. In the face of these overpowering trends, new uses inevitably will evolve. In this fertile climate, the Mobile Internet is not just about what government will do to leverage this opportunity for new civic engagement, but as Rheingold points out, it will involve how other social networks will use data both positively and negatively. With access to more integrated and also geographically based real-time data and services the behavior of individuals and groups will change as a result of this new knowledge and capability.

One chilling example of the Mobile Internet is the recent account from France in which rioters used text messaging to coordinate their actions in battles with police. In terms of positive collective actions, consider the eight-state Amber Alert Portal that, for the first time, provides unified warnings about child abductions to devices of all shapes and sizes — from broadcast alerts on radio, television and highway reader boards to thousands of lottery point-of-sale machines in retail locations across the participating states. A great number of individual subscribers also receive early warnings on cell phones, personal digital assistants and pagers. During the first months of operation, 20 children were returned home safely after word of their abduction was originated, escalated and distributed through the portal.

Think of a time in the not too distant “present” when “Smart Mobs” can coordinate their actions in real space with data suppliers from virtual community networks in cyberspace. Already, some of these communities have established their own “virtual currencies.” Now imagine a scenario where these virtual communities are connected in real-time with “Smart Mobs” acting in real space. Governments must look toward not simply leveraging these technologies anymore but figuring out strategies to respond effectively to the positive and negative challenges they face in this environment. In this scenario, is it too extreme to think about a “virtual state” declaring its own independence?

Conclusion

The catastrophic events of September 11, Hurricane Katrina, global terrorism and emerging pandemics, all point to the unfortunate truth that governments are not fully prepared for the present or the future. This lack of preparedness affects the ability of lawmakers to provide resources needed to govern in the face of an erosion of public confidence. This coupled with governments’ inability to come to terms with long-term structural deficits, makes this challenge daunting.

Today’s Data Integration Imperative — that is, the need for government to do a better job at communicating through improving its data and information sharing capabilities — has all the makings of a national priority. The public sector should adopt a new platform for governing to spark data integration across the traditional silos, and also to give it the ability to tap into, and provide to citizens and communities of interest, access to the vast stores of enterprise data necessary for effective governing and to halt eroding public confidence and civic engagement. For this approach to be effective, data must be shared and combined with key data from other organizations or jurisdictions, to give decision makers and the public a more complete view of what is going on and why.

Integrated data, although it resides in two or more databases, can be electronically shared, provided these systems comply with common standards for the exchange of data such as XML. Use of these data can be more efficient when government information technology organizations adopt and request their private sector partners to build Web services around a service-oriented architecture.

To do this, government leaders with the support of CIO’s must more clearly set their sights on data architecture, a mature discipline given short shift in state and local government. Currently though, governments have had only limited introduction to XML, mainly through their criminal justice and environmental communities. As a result, the growth of a real world critical mass of effective data sharing has been slow.

The Internet, including the ever-growing vast array of connected mobile devices, is the platform for this emerging data architecture that has the potential to trigger data integration on a grand scale if government is farsighted and aggressive enough to step forward and meet these new challenges.
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