



## Chapter I

# State of Wisconsin IT: Destroying the Barriers to Borderless Government

Matt Miszewski, State of Wisconsin, USA

## Executive Summary

---

*Wisconsin Governor Jim Doyle inherited a \$3.2 billion deficit when he took office in January 2003. His plans to institute a meaningful, long-term fix to the state's budget problems included using technology to streamline state government and build the foundation for ongoing cost savings. State CIO Matt Miszewski assumed he would have to carry out the governor's directive without any additional funds for information technology (IT), but then the legislature pushed through an additional \$40 million cut to IT funding across state agencies. This case study describes the strategies Miszewski and his colleagues in the state's Division of Enterprise Technology devised, and are in the process of implementing, to deal with having to do much more with considerably less.*

## Background

---

When Governor Jim Doyle came into office in January 2003, he inherited a \$3.2 billion biennial deficit in the state's general fund, based on projected revenue vs. required spend-

ing obligations. No Wisconsin governor had ever faced that much of a shortfall—not even close. State government had been operating amid structural deficits (the amount of money needed to maintain current services exceeding the revenue generated by the state’s current tax system) at least since the mid-1990s (Reschovsky, 2002), and it was up to the new governor to make the difficult choices needed to produce a balanced budget—not just on paper, but in practice.

Governor Doyle also resolved to fix the state’s budget without raising taxes, despite assertions on both sides of the aisle that it could never be done. But his 12 years as Wisconsin attorney general and his analysis of the state’s financial mechanisms convinced him the problem was not that Wisconsin residents and businesses were paying too little—the problem was how the state’s elected officials and public-sector organizations were using the money. Wisconsin government needed fundamental change in its approach to both budgeting and spending, and government units, both at the state and local levels, had to thoroughly reassess how they did business together. That was the only way to protect Wisconsin taxpayers and preserve the state’s traditional priorities of excellence in education, affordable health care, quality local services, and a clean environment.

Governor Doyle’s work to produce a more efficient and effective government for Wisconsin residents is by no means finished, especially considering the continuing financial pressures at all public-sector levels. But he has produced two consecutive biennial budgets that balanced the books while maintaining Wisconsin’s commitment to first-rate schools and public services. He also has made streamlining state government and building the groundwork for ongoing cost savings a top priority. His ACE (Accountability, Consolidation and Efficiency) Initiative is accomplishing this by focusing on efficiencies in four key areas: information technology (IT), procurement, state facilities and human resources. The governor’s approach to IT is one that most citizens can identify with, even if it has made my life as State CIO considerably more complicated. He correctly points out that citizens do not care about the supposedly unique needs of individual government agencies, or branches of government, or levels of government. Citizens believe that, through information technology, governments have what they need to work together, to communicate in common formats, to streamline services, to make government less expensive, and to make citizen interactions with government quick and easy. In contrast, I could point out the complex way in which government IT has evolved, and the fact that the public-sector IT environment is still characterized primarily by organizational silos and legacy systems. I could point out that traditional budgeting and funding procedures—that is, agency-by-agency, often with jurisdictional blinders on, an approach that, try though we might, we can’t change overnight—actually discourage collaboration.

But it would not matter. Governor Doyle agrees with his constituents. Government IT professionals have the tools we need. We already have the technologies necessary to make government more citizen-centered, share information, integrate systems, save money, and make those savings available for our schools, our infrastructure, and the health and prosperity of our families. The governor insists that what we have been missing is the organizational component—namely, the political and administrative resolve to collaborate across agencies and jurisdictions, and the determination to achieve integrated government services without additional funding and without waiting for budget processes to catch up. So, regardless of any protests I could come up with (which, quite honestly, I’m not inclined

to come up with—I agree with citizens and the governor on this one, too), the governor has told me: Make it happen. Get it done. Use state government IT to transform how governments work in Wisconsin, both internally and externally, and achieve the service levels and generate the savings that will make a real difference to our residents. (And, the governor could have added, do not bother him in the meantime, because he has his hands full with all our other public-policy priorities.)

This case study examines the overall goal, strategies, and initiatives developed and implemented by me and my colleagues in the state's Division of Enterprise Technology (DET) in order to meet Governor Doyle's challenge. We decided that his directive to us does not involve incremental changes—it requires a revolution. Here is how we are conducting that revolution.

## Setting the Stage

---

When Governor Doyle appointed me State CIO in March 2003, I arrived to find the state agency IT environment a combination of centralized and distributed systems, with a heavy emphasis on the latter. Mainframe computers and their associated services were centralized within the Department of Administration (DOA) as of 1992, while most agencies maintained separate information technology (IT) work units, complete with server support, network support, and application development and support. This evolution is typical of many large organizations and enterprises. The IT infrastructure was built piecemeal to serve specific needs for particular agencies or even individual applications. Separate support organizations were built within each agency as well. Wisconsin's CIO has statutory authority to manage the state's approximately \$400 million annual investment in IT, and enforce IT-related policy decisions across the executive branch, but that position and those powers were not created until the 2001-03 biennial budget. Prior to that, agencies were essentially on their own, and the enterprise IT environment I found reflected that.

This decentralized approach was not without its success stories; individual agencies had produced some popular e-government services, for instance, and Wisconsin generally fared well in assessments done by organizations such as the Center for Digital Government. But as the number of applications and servers on which they run grew over the years, this environment became increasingly labor intensive, expensive, and difficult to manage from an enterprise standpoint. One former DOA deputy secretary used to cite the example of an application DOA had procured for a common business need and was attempting to get into wider enterprise use; one particular agency declined, with the explanation—apparently provided in all seriousness and with no hint of irony—that the DOA-offered solution met only 22 of that agency's 25 listed requirements. That is not the approach that will promote integrated services between agencies and cost savings across the enterprise.

In early 2003, enterprise management essentially consisted of DOA providing and billing for mainframe services, a multi-protocol data network for state agencies, and voice/long-distance networks (via vendor service contracts) for state, university, and some local government customers. And while those services were (and are) by no means insignificant, virtually no

one at any agency was making the argument that this was the optimal IT environment for maximizing taxpayer value. The question was what should we be striving for instead, and how should we be trying to get there. And when those basic questions were raised, I saw discussions among even the best-intentioned and most-conscientious agency professionals devolve into mind-numbing exercises in bureaucratic paralysis. There seemed to be countless compelling reasons why we could not get better, when it likewise seemed obvious that we absolutely had to be better.

And then our friends in the state legislature gave us \$40 million reasons to keep trying. One of my first introductions to the legislature as the state's new CIO was a meeting with Joint Finance Committee member Senator Ted Kanavas, in which he told me that state agency IT budgets would be slashed by \$40 million for the 2003-05 biennium. He suggested I recognize this "opportunity" to reorganize the state's use of IT, or resist, and allow him and other Republicans to make life miserable for me and our Democratic governor (McKay, 2004). I decided I liked that first option a whole lot better, but really, using an enterprise IT approach to help reduce the state's budget deficit is how Governor Doyle and I had been operating all along. Again, the question was how to overcome institutional inertia, and, for the long run, eliminate the basic assumption that, because we were the public sector, this inertia was somehow inevitable.

Interestingly, and contrary to common perceptions of the public sector's ability to adapt, it was my own DET senior leadership team—longtime civil servants—who truly got us on our way toward operating as an enterprise with a genuine enterprise mission. I called these seven individuals together in mid-2003 to let them tell me what our vision for enterprise technology should be, and have them chart a path to achieve that vision. My short time in state government had already convinced me that public-sector IT professionals were by no means inherently resistant to change, or afraid to take chances. On the contrary, they were some of the most talented and visionary people I had ever worked with. They just were not used to being asked the kinds of questions I was asking them. I wanted to pull them out of thinking operationally (what are we doing now and what will the near-term logical results be) and, rather, get them to envision the future they wanted (what do I want to see if I return to these halls 30 years from now), and think about how we could build that future.

In response, the team re-examined and re-validated much of the work done through earlier strategic planning initiatives. In other words, they did not feel it necessary to start from scratch where the organization already had identified visionary goals that were still valid. But, without my prodding and to my definite surprise, they went an important step further. In various ways they proposed, and then we worked together to articulate specifically, what we ended up calling our BHAG. So, what in the world is a BHAG? The letters stand for Big, Hairy, Audacious Goal, and it is the guiding principle, the *raison d'être*, the one statement that captures the essence of why DET exists. The senior leadership team agreed that everything we do in this organization should relate directly to our BHAG. It should accurately describe what we are appropriately doing now and, most importantly, create a vision of what we should find, and what we should be doing, if we came back to DET 30 years from now. The DET BHAG is: We will revolutionize the delivery of services by destroying the barriers to borderless government.

The idea of using IT to enhance service delivery was not new in Wisconsin state government—most agency business leaders and technology professionals believed in the power

of IT and are by nature forward-thinking individuals. Institutionalizing a revolution is what is new. We determined we need to look at every avenue of service delivery and analyze whether we are delivering that service in the best way possible from the point of view of our ultimate customer: the taxpayer. Taxpayers are not impressed by the fact that they have to be licensed in separate departments for their boat and the trailer that carries it. They just want to be able to easily apply for and renew needed licenses in the quickest and most efficient manner.

Destroying the barriers to borderless government is a principle that applies almost universally across what we do in DET and what we feel we should be doing in the future. Eliminating the silo mentalities, both within state government and also throughout all levels of government, has never been more vital. Security, for instance, is an excellent example of how our old paradigm leaves our nation at risk within our interconnected world. If we do not share information on vulnerabilities, patterns, and attacks, we no longer risk the subversion of one or two systems—we put all our citizens in jeopardy. And when we destroy the barriers to effective information sharing, we help to defend everyone, as exemplified by the Wisconsin Justice Information Sharing (WIJIS) System (<http://oja.wi.gov/WIJIS/>). If a system such as that one, designed to destroy intergovernmental barriers, were in place in Florida before 9-11, Mohamed Atta, when he was pulled over by a Florida police officer, would have been detained, as he was already on a federal watch-and-detain list. Instead, that list was on a federal system not accessible by local police. We no longer have the luxury of building up or fortifying the walls that divide us.

Once we had our BHAG, we had to use it to shape and add specificity to our enterprise IT vision, our business plans, and our initiatives and projects. And so the stage was set for putting our BHAG into action.

## **Case Description: Establishing a Foundation for Enterprise Agility**

---

We believe our BHAG gives us a clear goal and a standard through which to evaluate all our efforts. But we needed a framework to organize, and to understand the interconnections between, our initiatives and projects. Since the 2001-03 biennial budget, DET is required to submit to the legislature, during the fall of even-numbered years, an enterprise strategic plan for the use and application of information technology (what we commonly refer to as our “enterprise IT plan”). This was our opportunity to use the BHAG to design an understandable, achievable plan for state agencies and our intergovernmental partners.

The last thing we wanted to do was repeat what we thought to be a basic mistake of past cross-agency IT plans: namely, they become a laundry list of progress reports on current projects. Those are just fine as far as they go, but such “plans” usually lack a coherent and unifying strategic vision (or, even worse, one is superimposed after the fact). We wanted to produce a plan that built a lasting foundation for true agility, efficiency, and cost-effectiveness in an interconnected and complex environment. More than just listing what we’re

doing and how it's all going, we wanted readers to understand why we're doing what we're doing, and how the activities fit together.

With the BHAG as our guiding principle, we used the enterprise IT plan to outline for our business partners three fundamental strategies: First, we will build an enterprise ecosystem that clearly defines the interconnections between the many technology infrastructures across all government levels. Second, we will build and balance the enterprise portfolio by making better-informed and strategic decisions about investing in our infrastructure. Finally, we will build a widely understood standard of enterprise accountability to establish an environment where we measure performance based on real data.

## **Build an Enterprise Ecosystem**

---

Technological agility requires recognizing the degree to which infrastructures do, or should, interconnect. Unfortunately, the ways that changes in one agency or one system can impact other agencies and systems throughout multiple jurisdictions were often unanticipated until service delivery was negatively affected. We are extending our enterprise view so that technology solutions take into account the business issues not only of state agencies but all other levels of government that affect citizens. We are seeking horizontal and vertical integration of IT functions to be truly efficient and cost-effective, and the potential ripple effects of system changes have to be comprehensively evaluated and understood on the front end. When those mechanisms and that collaborative mindset are completely in place, we will have built an “enterprise ecosystem”, where IT can be both agile and responsive, yet sensitive to the complex relationships between systems, agencies, and governments.

## **Build and Balance the Enterprise Portfolio**

---

We face significant challenges across the enterprise with inconsistencies in, or the lack of, information about IT assets. While major initiatives such as the consolidation of servers contribute to a more thorough understanding of our environment, we are continuing to build a knowledge base to extend our enterprise view. We are also implementing a framework to support alignment of technology investments with articulated business strategies. That requires a structured approach of continuous, repeatable, and easily sustainable processes for mapping technology decisions to business requirements. While several agencies had been exemplary in their use of IT portfolio management or IT investment management approaches, we must establish a consistent approach for aligning and balancing IT investments across agencies.

## **Institute Enterprise Accountability**

---

Convincing business leaders to invest strategically in IT during a time of severe budget constraints requires evidence of fiscal responsibility from us, the IT community. We must

measure this evidence, again and again, to continue to prove the worth of enterprise IT, which ultimately must directly contribute to the efficient use of taxpayer dollars.

*Evidence of Fiscal Responsibility with IT Investments can be Demonstrated by:*

---

- Specifying how an investment alternative directly or indirectly supports articulated business strategies;
- Identifying the degree to which available infrastructure components were reused;
- Evaluating the costs and benefits of a technology solution and alternatives;
- Re-engineering business processes when appropriate to take advantage of best practices and technology opportunities; and
- Exploring alternative approaches to delivering enterprise services, such as franchising or creating centers of excellence, where collaboration and resource sharing are the norm.

## **Foundation-Building Initiatives**

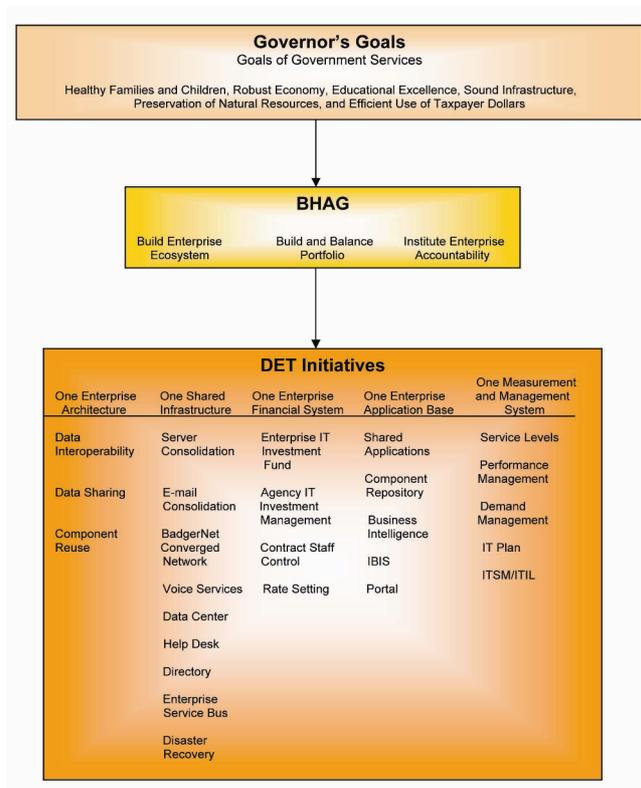
---

With those three fundamental strategies (build an enterprise ecosystem; build and balance the enterprise portfolio; and institute enterprise accountability) in place, we wanted to articulate foundation-building initiatives, that is, make it clear and specific what higher-level outcomes our individual projects and initiatives were working toward.

To achieve agility and balance within the enterprise, we need to establish a firm foundation for delivering cost-effective and high-quality services. To do that, we are establishing one enterprise architecture, one shared infrastructure, and one application base. Those initiatives form the underpinnings of an integrated environment that supports timely and efficient delivery of critical services. To effectively manage an integrated environment, we must institute a consistent and disciplined framework that guides decision making about the selection and funding of IT investments. To that end, we are establishing one enterprise IT finance system and one management and measurement system.

The remainder of this case study focuses on specific projects and efforts we believe particularly exemplify how we are pursuing our BHAG via our enterprise IT plan. But it's important to recognize that these projects all fit within our five foundation-building initiatives (and some clearly overlap between multiple foundation-building initiatives). No particular project's justification is taken for granted: The project has to contribute toward the foundation-building initiatives, which are in service to our fundamental strategies for achieving our enterprise IT vision, which promote our BHAG, as shown in Figure 1.

Figure 1. Enterprise IT plan



## Key Projects and Activities

We consider the following projects and activities to be essential—and emblematic—as we work to achieve our foundation-building initiatives and, ultimately, our BHAG.

### Input from the Extended Enterprise (Drives All the Foundation-Building Initiatives)

Governor Doyle has directed that we manage enterprise IT for our extended enterprise, that is, not just state agencies but all the levels of government that affect Wisconsin residents. Wisconsin has a long (and I would argue proud) tradition of decentralized government: We want our neighbors making the key decisions about how our municipalities and schools operate. That means that using an extended-enterprise approach to IT management has to involve addressing the challenges and concerns of local governments. This all sounded great to me, until I was reminded that Wisconsin has more than 1,900 general units of

government, including 72 counties, 190 cities, 400 villages, and 1,265 towns. In addition, Wisconsin has 11 federally-recognized tribal governments and 440 school districts. I had to find some practical manner of incorporating local-government and tribal feedback in pursuing our BHAG.

Fortunately, a vehicle already was in place to accomplish that, with only a few modifications on our part. The Technology Leadership Council (TLC), formed in October 2002, assists the State CIO by helping to provide policies, directions, and strategies in managing enterprise IT. Currently, the TLC comprises 25 members, including the CIOs or IT directors from 20 state agencies, the heads of the IT departments of three of the state's most populous counties (Milwaukee, Dane, and Waukesha), a representative of a professional organization of local-government IT employees (Governmental Information Processing Association of Wisconsin), and the IT director of the Great Lakes Intertribal Council. Among the changes to membership I made was expanding the state agency representation to its current level (especially to include our state Department of Public Instruction, which oversees PK-16 instruction) and adding the tribal representation.

The CIO serves as permanent TLC co-chair. Members select a rotating co-chair from among themselves on an annual basis. That co-chair serves for one calendar year and may not serve more than two consecutive terms. The TLC meets monthly, and during the course of the past three years, has chartered a number of sub-committees to address enterprise IT issues. While the number of active sub-committees has expanded and contracted as needed, they are organized around seven domains (i.e., topical areas): networks, servers, desktops, applications, information (e.g., records and forms management), IT management (e.g., budgeting and workforce planning), and information security and privacy. Sub-committees are chaired by a TLC member and a technical expert from DET, and staffed by subject experts from the IT departments of state and local-government agencies.

The TLC's activities could form an extensive case study in itself. But all of the initiatives cited next have been significantly influenced by TLC-generated feedback, and some were direct products of TLC sub-committees (e.g., e-mail consolidation and the consolidated desktop buy). Quite honestly, my day-to-day work would be a lot less complicated if I had not allowed mechanisms for continuous interagency and intergovernmental feedback, and there are TLC meetings where it seems the sole purpose was for members to tell me what a lousy job I'm doing. But the insights provided from a diverse forum like the TLC are invaluable for building an enterprise ecosystem, and in general, if you're thin-skinned, you probably do not want to work in enterprise IT management.

## **Wisconsin Enterprise Architecture Team (One Enterprise Architecture)**

---

In order to build an extended-enterprise ecosystem as described earlier—which is necessary for us to achieve our BHAG—I knew we needed a framework for developing technology solutions that meet the business needs of the extended enterprise in the most cost-effective and efficient means possible. At the outset of this process, Wisconsin, like most states, had a highly complex IT infrastructure made up of a large and diverse set of hardware and software configurations. Maintaining this highly complex web of IT systems across the enterprise

required significant support costs and created barriers to the effective information sharing needed for critical business functions.

By establishing a consistent and standardized technology direction, we will simplify the environment and save money in the process. Enterprise architectures offer a framework around which the state of Wisconsin can build a technological infrastructure to facilitate the responsible and efficient deployment of information assets. The state's enterprise architecture will provide high-level guidance for aligning business drivers and architectural requirements with underlying technological components.

In general, the overarching decision criteria of our enterprise architecture will be:

Does the proposal/project/activity promote interoperability? How does it play with the rest of the infrastructure—what are the impacts?

Does it lower the total cost of ownership or increase the benefits of performing the related business functions via this technology?

How does it affect enterprise agility? If implemented, would it require significant effort to undo/rollback or migrate from in the future? What is the depth of commitment required?

We have taken important steps toward establishing an enterprise architecture, starting with assembling the Wisconsin Enterprise Architecture Team (WEAT), to develop and help implement an enterprise architecture for the state. As a reflection of our extended enterprise, WEAT includes not only representatives from state agencies but also from the University of Wisconsin and local governments (Milwaukee and Rock counties). The team has produced a strategy and business plan.

In parallel, WEAT is providing invaluable consultation on a variety of enterprise issues, including reviewing all the standards and policies to be utilized for the consolidation of nearly 2,200 servers from individual agencies into a single data center supported by DET (see the Shared Information Services (SIS) Initiative described next). As part of its immediate target architecture work, WEAT also is taking on the development of an integration reference model, in order to break down the technology barriers to effective data sharing and interoperability. The expected result from this work will be a simplified technology infrastructure developed and deployed using open standards. Ultimately, this will result in streamlined intergovernmental services, as common application components are reused across the enterprise.

## **Procurement for an Extended Enterprise (One Enterprise Architecture and One Shared Infrastructure)**

An enterprise architecture also facilitates the leveraging of technology investments to provide cost-effective services to local governments. For example, a recent interagency, extended-enterprise approach to desktop purchasing resulted in a strategy to target a single provider and a single base desktop model for the majority of staff. This effort resulted in a

contract for buying desktops and laptops that's expected to save more than \$3 million per year across state agencies, with local governments able to take advantage of the contract's purchase terms as well. Milwaukee County has already reaped the benefits, having saved nearly \$84,000 on desktop purchases during 2004.

This is not an isolated example—DET has been explicitly conducting procurement negotiations with the extended enterprise (i.e., local governments in addition to state agencies) in mind. In late 2003, DET negotiated terms with Microsoft on an enterprise agreement that were as good or better than those for all other states except California and New York—not bad, considering Wisconsin's size compared to theirs. The savings on licensing per desktop is between \$500 and \$700, which adds up quickly, considering we have 62,000 desktops in the state executive branch alone. We saved nearly \$3 million on licensing during fiscal year 2005 just on the state agency level, and because local governments can also take advantage of the licensing terms, we expect multi-million-dollar savings for the extended enterprise per year.

Meanwhile, a contract we negotiated with a major cell-phone vendor offers local governments the same low pay-as-you-go rate plan the state has. Wisconsin taxpayers can expect more than \$2 million in savings for local governments during the three-year contract term. Our enterprise service bus (see the following) also was procured by the state so that it would be available to counties.

## **Shared Information Services (SIS) Initiative (One Shared Infrastructure)**

---

This initiative is also commonly known as “server consolidation”, but it includes consolidating both server and local area network (LAN) services throughout executive-branch state agencies. It's not an exaggeration to say that this is easily the most comprehensive, complicated and significant cross-agency IT initiative since mainframe services were consolidated in 1992, and it drove much of the customer service-oriented reorganization of DET in late 2005. The server portion of SIS also includes consolidating e-mail services and migrating to a new, enterprise-wide e-mail system.

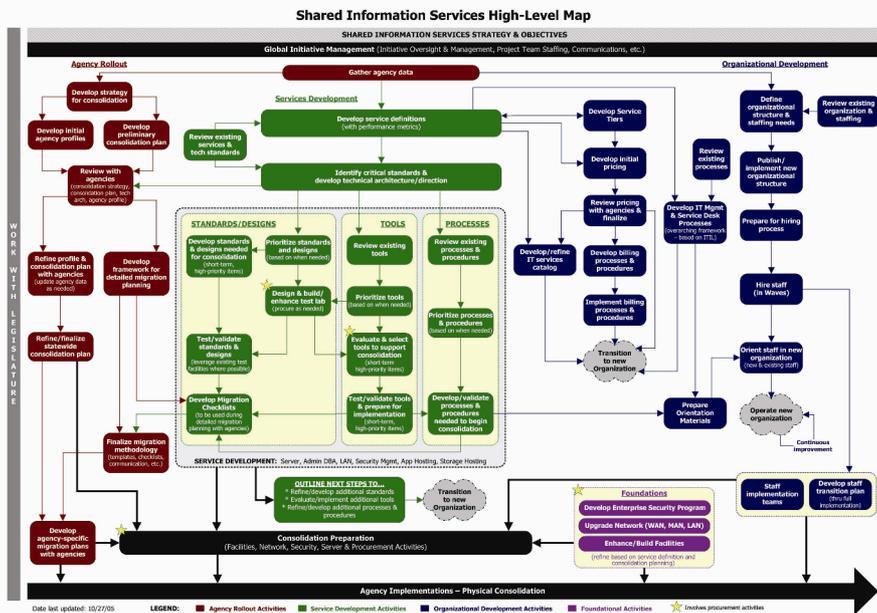
The bottom line is that we are consolidating within DET the operation of nearly 2,200 servers currently spread throughout state agencies, and, in doing so, reducing that server total to approximately 1,700. The number of e-mail servers in state agencies will go from 220 to about 30, resulting in a major cost reduction on a per e-mail account basis—from as high as \$15 per mailbox to about \$5.

Servers will be migrating to the DET data center beginning in mid-2006 and most likely through the calendar year 2008 (we opened a new, Tier 3 data center in April 2006, with some characteristics of a Tier 4 facility, based on the Uptime Institute's definitions of tiered data centers—the previous DET data center was Tier 1). With these services centered in DET and billed to agencies, we expect to maintain or improve service levels, reduce capital acquisition costs, reduce ongoing operational costs, and more effectively deploy information services. A cost-benefit analysis done in the fall of 2004 indicated that during the first five years, SIS will generate cumulative net savings of more than \$13 million, and by year 5, the ongoing savings should exceed \$8 million annually.

SIS implementation has required extensive interactions and synchronization between teams dedicated to technical foundations, organizational development, service development, and agency rollout, as shown in Figure 2. Moreover, the project teams were composed of staff from many agencies. Considering agency resource constraints and the time investment required from staff already eminently busy, these teams were not easy to assemble nor maintain, but we believe multi-agency participation is absolutely necessary. State staff must be prepared to take over and effectively manage the new shared-services environment when implementation is complete. That cannot happen unless state personnel play a critical role in developing that environment, with the buy-in and understanding that come from such participation. One of the major payoffs of SIS so far, with all the inventory assessments and interagency collaboration it has entailed, is that now the enterprise can manage IT using actual data generated from agencies, instead of vague estimates.

Having a consulting firm come in and essentially give state agencies their marching orders is another way to take on an endeavor like SIS. And, undoubtedly, there are plenty of firms more than willing to do it that way. We concluded that that's not the best strategy for maximizing the long-term benefits of SIS, and chose a consulting firm that agreed its role was not just to give us "the answers", but help the multi-agency project teams develop their own solutions. First of all, unless you're a true believer in one-size-fits-all enterprise IT—and

Figure 2. Shared information services



we're not—there probably are no obvious answers going into an effort of this magnitude. Secondly, SIS constitutes as much (if not more) a cultural change for enterprise IT as it does a technological change, and that kind of cultural shift must be generated within state government.

## **BadgerNet Converged Network (One Shared Infrastructure)**

---

Based on Governor Doyle's directions, the state is installing the BadgerNet Converged Network (BCN), a single and more powerful data/video network that will be shared by state agencies; local governments; tribal nations located in Wisconsin; public and private K-12 schools; the University of Wisconsin System; the Wisconsin Technical College System; private colleges and universities; libraries; and museums. The previous network configuration—known simply as BadgerNet—carried voice, data, and video independently on three separate networks. (BCN is designed to allow state government's voice services to be added at a later date if this option is determined to be desirable and financially feasible.)

Our vision was to create a seamless, flexible, high-quality network to serve the needs of all eligible customers through 2010 and beyond, and to ensure the highest levels of operability among customers. BCN was purposefully designed as a standards-based network to give it the flexibility to grow and be used by applications not yet developed. By standards-based, we mean that the network does not rely on a single proprietary protocol (i.e., the rules that govern the exchange of information on the network). In fact, BCN handles multiple protocols, and because we have created a standards-based network, we will not have to start all over if a particular protocol becomes obsolete.

BCN provides the foundation for another important activity now underway: the Shared Information Services (SIS) Initiative described previously. BCN is the highway upon which traffic will flow between the state's new data center, state agency locations, and external customers.

BCN also is an integral part of Grow Wisconsin, Governor Doyle's economic-development plan. In the model we've designed, state government is the anchor tenant, and the prime contractor must allow sharing of the installed infrastructure with commercial business and residential customers throughout the state, in addition to providing service to political subdivisions and other public entities. This will help spur the delivery of broadband Internet service to parts of the state where it was previously unavailable due to geographic and economic barriers. In the educational arena, BCN positions our schools and colleges to be at the forefront of e-learning.

Because this project is so fundamental to our BHAG, and the stakes were so high, a conscious decision was made from the beginning to involve people with many different backgrounds and skill areas throughout the design process. The business case for BCN was formulated by DOA and a customer advisory group that included representatives from all the user groups mentioned earlier, after meetings were held throughout the state where stakeholders and residents could offer input. There was no room for territorial experts or intractable positions—we wanted to hear all the ideas, whether they came from one of the network

engineers or a third-grade teacher at a focus group meeting in northern Wisconsin. If we had not established those collaborative approaches from the start, the likely result would have been the emergence of several smaller—and probably more expensive and less connected—networks throughout the state.

## **Geographic Information System Services (One Shared Infrastructure)**

---

By the end of 2005, I had successfully managed to create within DET an Office of Geographic Information and hire a Chief Geographic Information Officer to lead it. The Office of the GIO will be the statewide coordinating body for enterprise geographic information system (GIS) services.

Our vision for the Office of the GIO is that it will provide effective geospatial resources to state agencies and stakeholders to benefit and serve the public, the environment, and the economy. Delivering GIS in an enterprise fashion will improve critical services to state agencies and citizens and decrease their overall cost. The state will benefit from an enterprise GIS through sharing infrastructure (hardware and software), resources (people), and processes across agencies. In establishing the Office of the GIO, it was important for me to make the case for enterprise GIS as an important asset for the public—not just bureaucrats—and the need for integration of spatial data with tabular data for better decision making.

It seems fitting that while our IT environment is undergoing a transformation to an extended-enterprise approach, GIS is doing so at the same time. The state Department of Resources and Department of Transportation have built significant GIS infrastructure for program use during the last 10 years, and recently there are a number of state agencies—namely Military Affairs; Workforce Development; Agriculture, Trade and Consumer Protection; Justice; and Health and Family Services—which are quickly building their GIS capabilities. Beyond that, agencies such as DOA, Corrections, Public Instruction, and Revenue have an interest in using GIS to support their business objectives. Instead of repeating the mistakes of the past (i.e., independent development with little or no enterprise collaboration), we decided to bring these agencies together to share resources, infrastructure, and data administration. Additionally, it will benefit all agencies to build common GIS service offerings, develop data distribution and management policies and standards, and collaboratively work with local and federal entities to more effectively manage GIS information within the state.

Most importantly, implementing an enterprise GIS program provides a model for extended-enterprise sharing. The Office of the GIO will facilitate the coordination of previously disconnected efforts at the state and local levels to provide data sharing, standardization, and collaboration to improve the state's overall GIS landscape. That sounds like a formula we'd like to repeat in a number of areas.

Our current GIS activities include developing and implementing:

1. GIS communications program;
2. Wisconsin Enterprise GIS (WEGIS) strategic plan;

3. Enterprise GIS data repository;
4. WEGIS Web mapping infrastructure and services; and
5. Enterprise addressing tool.

## **Enterprise Resource Planning: Integrated Business Information System Project (One Enterprise Application Base)**

---

One of the primary challenges we face in achieving our BHAG is being able to communicate across organizational boundaries, both horizontally and vertically. It is impossible to manage any operation effectively without being able to see what is happening.

Government in Wisconsin has been hampered in its effort to manage scarce resources by the fragmented nature of its administrative systems and processes. Fragmented processes and applications reflect fragmentation in the underlying data, making it difficult or impossible to answer simple operational business questions across the enterprise. Instead, each individual repository must be found and the data understood and transformed, and then all the individual pools of transformed data must be pasted together to try to make a single picture. Too often, even this Byzantine approach to generating information is thwarted by inconsistent data identification. For instance, there is no common use of commodity codes across state government, so there is no way to determine our total spending for any commodity without examining each individual purchase order by hand and recoding it. That leaves us unable to make the best possible bargains with vendors.

If we are to revolutionize service delivery, we have to completely rewrite our basic administrative paradigms. The integrated business information system (IBIS) project is designed to pull all administrative systems of one kind together, and then take those consolidated systems and make them seamless by giving them common access to uniformly defined data. We plan to do this by standardizing administrative processes and replacing the many legacy systems that support those processes with a single enterprise resource planning (ERP) system. This will give us the consolidated functionality we need ready-made, rather than having to design and build it from the ground up.

Table 1 describes current scenarios compared to post-IBIS scenarios.

The IBIS project fundamentally involves examining existing business processes and standardizing them across state agencies. With new processes defined, we have documented requirements, and using those requirements as our guide, we are selecting the “closest fit” vendor package that has been used successfully by at least one state government. We intend to implement the package without customization but with supporting interfaces and “bolt-on” modules, where necessary.

When we complete the IBIS project, we will be able to manage state government more effectively and relate state government operations more clearly to the efforts of local governments. As an example, when we offer local governments the ability to “piggyback” on state contracts—which we intend to do to the full extent possible—it will be a meaningful offer for the best pricing we can get, with full information on the state of Wisconsin’s total spending on individual commodities.

*Table 1. Before and after the IBIS project*

As Is	To Be
No enterprise procurement or purchasing system. Unable to report statewide expenditures on commodities or across business areas.	An enterprise procurement system to facilitate strategic sourcing and provide a vendor service portal.
More than 59 systems maintained and supported to meet the state's needs for financial management.	One integrated financial system to maintain and support.
More than 38 systems support human resources and payroll.	One integrated human resource and payroll system.
Lack of data integration necessary to produce enterprise-wide reports.	Ability to produce timely, accurate, and decision-useful enterprise-wide reports.
Growing costs to support legacy systems.	A significant return on investment from replacing fragmented systems with a single, seamless package.
Business interfaces supported by manual re-entry of data with attendant costs and error rate.	Single entry for all transaction data into a central database with attendant improvements in reporting capability and reduction in costs.
Elevated risk of legacy payroll and budget systems failing.	Reduced risk of system collapse, both currently and in the future, as package upgrades take the place of repeatedly modified code.
Opaque systems unavailable externally.	Web-based services providing citizen and vendor self-service functionality.
Paper-driven human resources processes.	Employee self-service capability.

## **A Customer Service-Driven IT Organization (Enhances All the Foundation-Building Initiatives)**

As described previously, many of our enterprise efforts involve some form of consolidation or centralization of like services. One of the most complex is SIS, which involves the centralization of all distributed server and network services. Central to the success of SIS is the effective and efficient delivery of enterprise IT services—simply put, if DET cannot deliver for its customers after taking ownership of all the server and network services, we will have jeopardized all our efforts toward achieving our BHAG. To reach our goal, the enterprise needs to be responsive, flexible, and agile in IT service delivery, and improving the way we do business begins at home, with us, DET.

Organizational structures of the past were based on the mainframe model, where all services stemmed from one large server. Staffs were divided into components of the mainframe environment, creating a siloed approach to support. While this structure worked for the mainframe, it was lacking in flexibility and cross-communication when transposed on the distributed server environment, where diverse server platforms were integrated into single

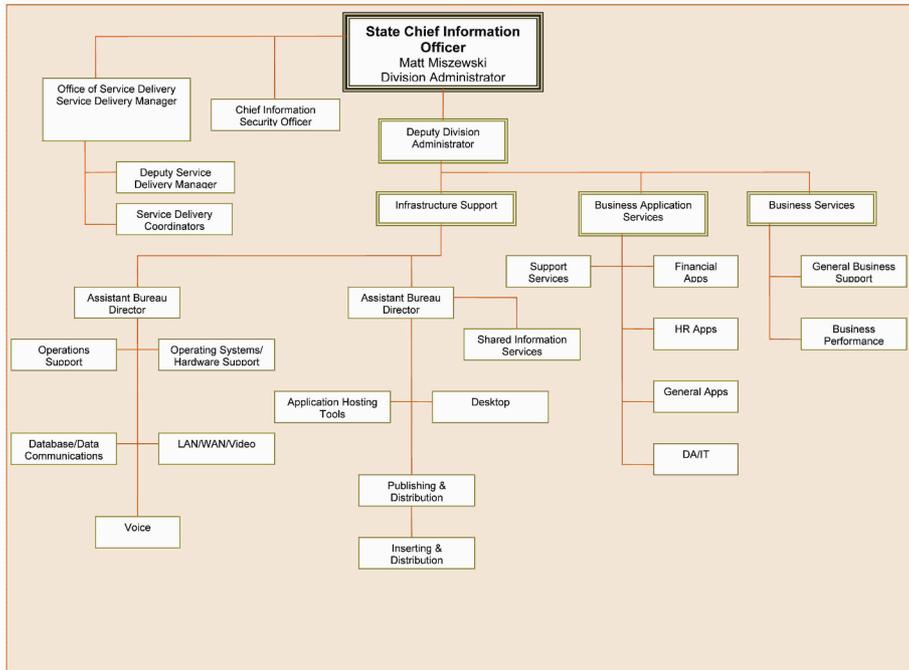
application systems. We needed a new organizational structure to provide cross-communication between technical groups and to focus on service delivery, rather than support of specific individual technologies.

Our new organizational design (see Figure 3) brought all technology areas into one bureau (Infrastructure Support). This facilitated standardizing support processes and procedures across technology sections. A Bureau of Customer Relations was eliminated and a new role of service delivery manager was created, which reports directly to the State CIO, giving the position delegated authority of the CIO for service delivery.

Positions were created for service delivery coordinators (SDCs). The SDCs have delegated authority to work directly with technical staff horizontally across the organization. Their focus is on service delivery across technology support areas. They have the ability to dynamically create SWAT teams to address service outages, the development of new services, and additional support that may be required by a specific agency. The horizontal approach to providing support eliminates the silos that existed in the old organizational models.

The SDCs are directly responsible for IT service delivery, deployment, management planning, design and development. They directly manage the complete life cycle of a specific service or group of services within our enterprise IT services catalog (see next). They must have a broad understanding of both technology and its potential to address the business needs of a specific customer constituency.

Figure 3. Organizational chart



We then established a second support role for outreach into the state agencies—the customer service manager (CSM). CSMs are designated as the liaisons between agency business needs and enterprise IT service offerings. In other words, they are enterprise staff who understand the business of the agency and provide support for enterprise services to that agency. They provide outreach, information, support, business services, and technical assistance to executive management, IT managers, and staff within state agencies and other governmental units.

Agencies also have the opportunity to assign an agency staff person to function either part- or full-time as their internal CSM. The agency-based CSM participates in all enterprise CSM meetings, facilitates resolving enterprise issues, and works with DET SDCs in developing new or enhanced services. They also work closely with their agency business units in IT planning and support. The agency CSM is paired with one of the enterprise (i.e., DET-employed) CSMs to facilitate DET coordination efforts, and spends a portion of their time on-site at DET—as much as their enterprise counterparts.

By opening the door to agency staff participation in customer service delivery, DET is beginning to establish a true partnership with agencies, acknowledging the complexities of their business needs, and demonstrating the commitment to a trust relationship.

It's one thing to have an organizational design and roles that we believe directly enhance our customer service. It's another thing to try to measure—again and again—the quality of our customer service. We decided we would let our customers tell us if we were delivering quality customer service or not. Our goal is to earn and maintain a rating of 4 or 5 (on a scale of 1 to 5) from at least 90% of DET customers. Once our shared information services initiative (see earlier) is fully implemented, those grades from our customers will be a crucial, ongoing measure of how well we're doing and where we need to improve.

## **IT Services Catalog (Enhances All the Foundation-Building Initiatives)**

---

When I became State CIO and began my discussions with agency business leaders, it struck me that most had no real understanding of the nature of the services DET provides. They relied on their IT directors for that, and even then, in larger agencies, I sometimes found you had to really drill down into the IT shop to find individuals who thoroughly understood what their agency buys from DET and how that relationship worked for particular services.

To some degree, that's understandable, considering the wide scope of issues dropped on agency business managers and the inherent complexity of many IT services. Still, this situation bothered me. If agency leaders and business managers had no resource that provided straightforward, understandable summaries of DET services and how they could be optimized to serve agency business needs, those individuals would always be hesitant to invest strategically in IT, especially amid budget constraints. Demystifying DET services for agency managers, I realized, was an essential ingredient for instituting enterprise accountability.

The solution we came up with was to design and publish state government's first-ever IT services catalog. The catalog devotes one page to each service DET provides, including a service description; bullet points about what the service entails; pricing information; cost-

saving tips for agencies; and consumption trends. The text and graphics are specifically constructed to be understandable by non-technical staff.

We published the first catalog in January 2005. Because the SIS Initiative resulted in the transformation of several services and the formation of new ones, we published a second edition in January 2006, which grew from 22 to 28 services, all of which were updated. Meanwhile, we have published an accompanying Web site, which expands the description of each service and provides a pricing tool that clarifies the available choices. To the best of our knowledge, no other public-sector IT service organization has published a service catalog comparable to ours.

With both editions, I've stressed to our customers that the IT services catalog will never be considered a "finished product". We always want to make it more useful and accessible. We've asked customers how we can improve it, and are using their feedback to update the Web site on an ongoing basis and the printed edition on at least an annual basis.

## **Service-Oriented Architecture (Contributes Toward All the Foundation-Building Initiatives, Especially One Shared Infrastructure)**

---

Like many large enterprises, the state of Wisconsin faces the challenge of optimizing a vast, fragmented IT landscape that has grown through the course of several decades and billions of dollars. Uncoordinated technical investment in short-term service improvements has led to increasing long-term technical deficits that have progressively burdened our funding base. Recognizing, as Albert Einstein once said, "We cannot solve our problems with the same thinking we used when we created them", Governor Doyle and DET have created a vision in which IT transcends the boundaries of government rather than reinforcing them, and provides citizens with transparent access to government services regardless of underlying jurisdictions.

Historically, IT initiatives tasked with overcoming government boundaries have been ad hoc affairs facing a governance void, bridged only by situational cooperation between agencies with little incentive to work together in the first place. The legacy of that includes innumerable point-to-point system communications and islands of duplicative and poorly synchronized data.

In response, we've pushed the concerns of system integration and information sharing to an extended-enterprise level, and embarked on the pursuit of a service-oriented architecture (SOA). An SOA will provide a foundation for extended-enterprise IT collaboration through a shared set of investments, patterns, standards, and practices. The effort began in late 2003 with the acquisition of an enterprise service bus (ESB) solution to serve as a backbone and catalyst for the state's emerging SOA.

ESB technology uses XML and Web services to simplify the task of exchanging information among incompatible applications and hardware platforms. Our ESB product selection was guided by support for open standards, flexible options for enabling existing resources, and a low cost of entry relative to past enterprise application integration solutions. Ultimately, the ESB is seen not as a product, but as a component role within a wider SOA context, and

the state's return on its early investment will depend largely upon its ability to sustain this distinction.

While the fundamental concepts behind SOA are not new, the wide and rapid adoption of integration-enabling Internet, XML, messaging, and Web service standards is unprecedented. We can take advantage of that trend to energize a shift in the nature of enterprise IT from a large collection of internally coupled, complex and fragily-connected silos to a community of peers, who orient themselves as service providers and consumers working together under a cooperative architecture. This definition of SOA will take time to evolve, but at stake is the fundamental mission of IT to serve the purposes of government rather than constrain them.

Fortunately, this has been recognized by a number of local, state, and federal government entities for some time. With converging agency momentum supported by a developing SOA infrastructure—and open standards available to guide interoperability, procurement, and development decisions—Wisconsin's enterprise IT is positioning itself to effectively meet the increasing number of information sharing needs arising from all government levels.

In the fall of 2005, University of Wisconsin-Madison CIO Annie Stunden and I held the state's first enterprise-wide SOA summit (documented at <http://soa.wisconsin.gov/>), which brought our organizations together with partners from across state and local government to share and discuss the extended enterprise vision and how SOA initiatives will support it. Through this summit and its follow-up activities, agency relationships are being reinvented through collaborative partnerships focusing on shared services, interoperability, and economies of scale. We are re-examining government service delivery through a citizen-oriented perspective so that the boundaries of government do not interfere with its mission.

Since the summit, DET staff are working with staff from state agencies, UW-Madison and local governments to: Schedule ongoing topical SOA events, including SOA as it relates to the mainframe, Java, Microsoft and open-source platforms, security and information management; Develop implementation guides to establish a common set of repeatable SOA-related architectural patterns for information and process sharing; Define SOA implementation and support process modules to bring consistent activities, roles, responsibilities, and project management practices across agency boundaries; Form enterprise integration and interoperability groups along lines of government business to establish interoperability standards, identify shared services, and collaborate on shared infrastructure; Identify and define requirements for shared investment in SOA-related product licensing; and Integrate our SOA architecture with other enterprise-wide initiatives, including identity and access management, portal implementations, collaboration services, and ERP procurement (our IBIS project described previously).

The future of IT in Wisconsin is not about better technology—it's about better government. Governor Doyle has made it clear that from now on, the problems of any agency or jurisdiction are the problems of all agencies and jurisdictions, and that the successes achieved within any agency or jurisdiction must be extended to all agencies and jurisdictions. That is the principle that drives our pursuit of an SOA, and, for that matter, all our efforts to achieve our BHAG. Ultimately, our success will not be measured by the elegance of our IT infrastructure. Our success will be measured by the quality of the lives of our residents, their families, and their communities, in whose interests our government was created.

---

## Conclusion

---

I recognize that most of this case study focuses on what we are in the process of doing, not what we have already fully accomplished. That simply reflects the scope of the revolution we're instituting in state government IT.

I do not believe in incremental change, at least not when it comes to the enterprise IT environment (or lack thereof) that I inherited when I became State CIO. We needed to rebuild, from the ground up, how we thought about and managed enterprise IT, and more basically, how we even defined our enterprise. We had to—for what was really the first time—focus our efforts on activities that clearly supported business outcomes. We had to become accountable for the decisions we made and the outcomes we produced.

The projects and activities described in this case do not represent magic bullets—even if another state adopted a BHAG and an enterprise IT plan very similar to ours, it could understandably generate different kinds of projects, depending on that state's particular circumstances. But I do believe that all our activities are now oriented toward generating sustained change across our extended enterprise, destroying the barriers to borderless government, and fundamentally improving service delivery for Wisconsin residents. I believe we now have a readily identifiable goal and framework for our enterprise IT efforts.

When I submitted our enterprise IT plan to the legislature in the fall of 2004, I made it clear that the strategic direction laid out represented a multi-year effort demanding rigorous alignment and realignment of priorities to be successful. IBM's initiative to simplify its technology environment and create a shared infrastructure spanned 10-plus years from initiation to realization of results (Working Council for Chief Information Officers, 2003). Similar efforts to streamline and simplify corporate enterprise technology at Cisco Systems (Working Council for Chief Information Officers, 2001) and Allstate have been multi-year efforts with significant measurable results (Working Council for Chief Information Officers, 2002). So we understood the reality of what we were taking on. We will not attain enterprise agility overnight. But we will focus our enterprise work on establishing a firm foundation for enabling agility and, ultimately, achieving our BHAG.

---

## References

---

- McKay, J. (2004). The odd couple. *Government Technology*, January 6. Retrieved January 4, 2006, from <http://www.govtech.net/magazine/story.php?id=83610&issue=1:2004>
- Reschovsky, A. (2002, May). *Wisconsin's structural deficit: Our fiscal future at the crossroads*. Article published by the Robert M. La Follette School of Public Affairs, University of Wisconsin-Madison. Retrieved January 4, 2006, from <http://www.lafollette.wisc.edu/publications/otherpublications/wisconsinprimer/2002/StructuralDeficit2002.pdf>.
- Working Council for Chief Information Officers. (2001). *Visualizing IT value creation: Tactics for communicating IT contributions to corporate strategy*. Corporate Executive Board, Washington, D.C.

Working Council for Chief Information Officers. (2002). *Enabling enterprise data visibility: Case studies in alignment of data architecture and business strategy*. Corporate Executive Board, Washington, D.C.

Working Council for Chief Information Officers. (2003). *Institutionalizing IT cost efficiency: Disciplines for embedding ROI transparency and accountability*. IT Cost Savings Series, Corporate Executive Board, Washington, D.C.

## Author's Biography

---

*Matt Miszewski* was appointed Wisconsin State CIO by Governor Jim Doyle in March 2003. He oversees the state's approximately \$400 million annual IT investment. Prior to his appointment, Miszewski worked in the private sector. He started his own company, Topical Networks, which provided IT consulting and enterprise resources systems to national clients. He also was a founding partner of the firm *people.political*, which supplied political data-management tools to candidates and labor organizations. As an attorney in private practice, he focused on labor law and advised high-tech firms. Miszewski became president of the National Association of State Chief Information Officers (NASCIO) in October 2005. *Government Technology* magazine named him one of the Top 25 Doers, Dreamers and Drivers for 2004.