



The National Electronic Commerce
Coordinating Council

*XBI—Cross Boundary Integration:
The Key to Successful E-Government*

2003 Symposium Paper
Presented at the NECCC Annual Conference, November 17-19, 2003, Raleigh, NC

NATIONAL ELECTRONIC COMMERCE COORDINATING COUNCIL

In 1997, as the use of the Internet was increasing at a stunning rate, a group of public and private professionals—government executives and information technology practitioners—met in San Antonio, Texas to discuss their common issues, problems and ideas. This first meeting was productive. Participants learned from each other. They felt that continuing to meet as a group would help them meet the challenges and opportunities posed by the rush of engulfing information technologies. This founding group formed the National Electronic Commerce Coordinating Council (NECCC), which has continued to meet regularly.

Today, NECCC serves as an alliance of government organizations dedicated to promoting electronic government through the exploration of emerging issues and best practices. Alliance partners are the National Association of State Auditors, Comptrollers and Treasurers; the National Association of Secretaries of State; and the National Institute of Governmental Purchasing.

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EXECUTIVE SUMMARY

Cross boundary integration (XBI) starts from the simple and familiar concept of cooperation: two or more entities work together to develop a product they could not create on their own. On an ad hoc or routine basis, this sort of activity occurs every day, in every work place.

XBI enters the picture because government entities have to do much more today than just cooperate. They need to share information and create partnerships between the public and private sectors, between different levels of government and between the government and citizenry. They have to utilize technology to become more effective, more efficient and more sophisticated. To do that, they have to take cooperation to a higher level, to “cross boundary integration.” XBI is the key to e-government.

Nobody should have any illusions about the difficulties XBI will present. There will inevitably be some tensions in a cross boundary project because there are reasons why the boundaries were established in the first place. Traditional authorities, institutions and practices are not always entirely arbitrary or irrational.

At the same time, XBI is important. There are now compelling reasons to cross many boundaries, no matter why they were originally put into place. Current budget crises are forcing government entities to re-think their roles and the ways they do business. XBI holds the promise of simplifying the interactions between government and businesses and citizens while increasing the efficiency of government. Over a period of time, with the increase of bureaucracy and because of incrementally evolving laws and statutes, even the simplest transaction may require tangling with multiple agencies. Starting a business could mean dealing with as many as 20 different government entities. XBI can turn those entanglements into “one stop shopping.”

Government also faces a technological crossroads. The legacy systems that have lasted 20 years or more are increasingly overworked, antiquated and circumscribed. Now is the time to consider their replacements. As these new systems are likely to serve just as long as their predecessors, now there is a once in a generation opportunity to shape government. The new systems should support the same functions as current systems. But, from the point of view of the customer, they would be most effective if they incorporated XBI. The emerging technology of Web services should help simplify building these, a feat unimaginable a few years ago.

Nonetheless, XBI won't be built in a day. But government entities can position themselves right now to move forward when the opportunities arise. If they build the right infrastructure - the cultural, legal,

organizational and technological frameworks for XBI – then they are making the correct, the fundamental investments.

Leadership will make this happen. Any pundit or professor can preach about the need for change and prescribe a multi-step program that gleams with potential. Somebody else has to make it work. Elected officials and agency heads have to become engaged; they have to lead and govern in order to realize XBI. There is a risk, but the end results can provide tremendous benefits. XBI can make good on government's promises of better, more effective and more cost-effective service to its citizens, its customers.

1. INTRODUCTION

What is cross boundary integration (XBI)? It starts from the simple and familiar concept of cooperation: two or more entities work together to develop a product they could not create on their own.¹ On an ad hoc or routine basis, this sort of activity occurs every day, in every work place.

XBI enters the picture because, in order to meet today's demands and expectations, government entities have to do much more than just cooperate. They need to share information and create partnerships between the public and private sectors, between different levels of government and between the government and citizenry. They have to utilize technology to become more effective, more efficient and more sophisticated. To do that, they have to take cooperation to a higher level, to XBI.

XBI will be the key to e-government.² With XBI, two or more entities work together to create a new, formal engagement that standardizes their processes and products, and uses information technology to enable a continuing exchange of data and the ongoing development of services.³ The results are a mutually beneficial enhancement of the value of the entire enterprise, far beyond what a single entity could accomplish. The whole becomes more valuable than the sum of the parts.

In the state of Utah, for example, the goals of its XBI projects are comprehensive: "Utah.gov is transforming the relationship between Utah citizens and their government – by establishing a new community of online government services that provide citizens and businesses with the information and services they want – in the way that makes sense for their needs."⁴ That vision is realized in a model XBI project: Utah's "One Stop Business Registration System." Through a single common and online process, businesses can register simultaneously with seven government entities, state, local and federal, to receive all their necessary licenses and ID numbers.⁵

To achieve a similar success, the plan for any XBI project has to include these four essential components.

- **Value**: The provision and measurement of better services, products and processes.
- **Governance**: The mechanism to negotiate, formalize and sustain collaboration.
- **Standardization**: The correlation of business rules, functions, architecture, policies and information structures.
- **Technology**: The hardware and software to make the connections.

Those cover such an enormous amount of ground that, even in a simple application, XBI could be a daunting prospect. For a long list of reasons, institutions, especially governmental institutions, are

resistant to change, while XBI, in all its aspects, demands change. The concept of governance alone raises questions about legal mandates and missions; administrative and cultural habits; and, perhaps most important, leadership and management skills. Answering those questions successfully would simply bring project partners that much closer to the challenges of standardization. In this arena, each incremental step towards true integration raises further issues of equal or greater complexity.

Given the difficulties XBI represents, the question immediately arises: why do it? And why do it now?

The “why” is compelling: the alternative is irrelevance. Every presidential administration since Jimmy Carter’s has promised to re-invent government. Governors have long been doing the same in the states. Today’s budget crises are an additional incentive; they make change an imperative. Government has now to undergo what American business suffered in the 1970s and 1980s; through what is likely to be a long and painful process of re-engineering, it has to make good on promises of better, more effective and more cost-effective service to its citizens, its customers.

President Bush’s recent memo on the importance of e-government argues the case: “Government reform is guided by three principles. Government should be citizen-centered, results-oriented, and market-based. Effective implementation of E-Government is important in making Government more responsive and cost-effective.”⁶

The “why now” is equally clear: the technology available today finally makes integration possible and affordable. Anyone who paid a passing glance to airport bookstores in the 1990s understands that many, many business books and management gurus have talked about “re-invention” during the past decade. Most pushed concepts and ideas very similar to the definition of XBI. Few of the efforts based on those books paid off.

Part of the problem was that successful re-engineering depended on information technology. Total quality management and business process re-engineering aimed for the same results as XBI, but in 1993, when James Champy and Michael Hammer wrote the book on re-engineering, the technological solutions available were expensive, largely proprietary and usually unstable.⁷ So costs piled up faster than benefits. As Champy notes in his most recent book, though, the situation has drastically changed.⁸ The Internet is on every desktop and, along with it, the basic, standardized architecture to share information and services. The difference now is that the Internet has lowered the cost thresholds, driving costs down to where integration is really affordable and possible. Nobody has to build from scratch the hardware, software and networks to share information and processes, as the Internet now enables the emerging technologies of web services that build on this common architecture.

But the technology alone will not be enough; XBI is not just a portal and just having an Internet connection does not result in government providing better services to its citizens. The Web may make e-government possible, but it does not address the other factors in the XBI equation. There still remain the organizational and cultural challenges to changing the way government does its business. To put it another way, even though the technology is now affordable, the job is not any easier.

Difficult as it may be, it is a job government has to do. The potential and the rewards are great. By understanding the business case for XBI, government can position itself to take advantage of the opportunities technology creates. By building on strategies for success and studying some proven models, government can act on those opportunities. The results will be worth the challenge.

2. MAKING THE BUSINESS CASE FOR XBI

At the federal level, re-engineering government is a priority. President Bush noted that “making Government more responsive and cost-effective” drives the effort. He also stressed directly the importance of XBI to this effort: “Our success depends on agencies working as a team across traditional boundaries to better serve the American people, focusing on citizens rather than individual agency needs.”⁹

Finally, the President made a business case that explained the specific importance of e-government to reform: it “is designed to make better use of information technology (IT) investments to eliminate billions of dollars of wasteful federal spending, reduce government’s paperwork burden on citizens and businesses, and improve government response time to citizens – from weeks down to minutes.”¹⁰

These statements cover the gamut of reasons for XBI. The primary motive in a business case for e-government is meeting the needs and demands of the citizenry. At a time when taxpayers and the media routinely question the value of government programs, it is especially important for government entities to start to improve their products and services. Among other things, that means increasing administrative efficiency, streamlining workflows and decreasing error rates in transactions.

There are also significant financial pressures to change. Currently, government is facing declining revenues and long-term trends towards reduced taxes. At the same time, there are calls for government to do more: to invest in technology, to ensure homeland security and to support business and economic development. Last but not least, government has to communicate its programs and decisions to its constituents: Web portals designed around confusing organizational charts don’t answer questions, don’t get the right messages across and don’t use technology effectively.

In all these areas, government can move from the debit to the credit column with XBI. But to inspire support and to create a compelling business case, any XBI-related project or program has to take these values into consideration:

- Effectiveness
- Efficiency
- Equity
- Economic development
- Legitimacy
- Privacy and Security

Effectiveness means delivering a return on investment: government's products and services should meet the needs and demands of the citizenry, while fulfilling statutory mandates. That is a sometimes frustrating formula, as citizens do not always appreciate the multiple purposes and constituencies government entities must respect. As well, the citizens' perception of government is often framed by experiences with the private sector, but buying books on Amazon.com may not be a fair point of comparison to a state licensing function. Nonetheless, perception frames expectations and, increasingly, many of government's constituencies expect to take advantage of technology in their transactions with government entities.

Efficiency means improving business processes, with better usage of time, resources and personnel. This concept also has different connotations to different constituents, but the principal point to understand is that efficiency cannot be solely defined in terms of direct benefits to government. Changing the way government entities work may deliver the most benefits to government's stakeholders. The most immediately attractive approach to increasing efficiency is to capture the potential economies of scope and scale offered as the Internet breaks down boundaries to communication and the distribution of information and services.

Equity means allocating costs and benefits in a fair and just manner. The "digital divide" recognizes that not everyone has easy access to technology. As a result, for e-government applications, the implication may be that improved digital processes will only complement, not replace, the paper-based processes that certain constituencies will continue to rely upon and use. Another aspect of equity applies to building e-government applications. Fairness to the private sector means not picking winners or creating monopolies. Laws such as the federal government's E-Sign explicitly address this by pointing towards the adoption of technology-neutral and infrastructure-independent solutions that allow many to compete in the marketplace.¹¹

Legitimacy means working within the framework of existing laws, processes and perceptions. This may come at a cost: for example, making sure that all the interested constituencies and all the levels of government are involved, with a voice in the development of an XBI project, may not improve efficiency, but it could keep an effort from sinking into a legal quagmire. As well, legitimacy does not mean that every constituent gains from a final product; the result might not be entirely equitable but it will be legitimate if the proper processes are followed. Finally, in some instances, due, for example, to the separation of powers, the distinctions among the three branches of government or citizens' rights, concerns about legitimacy may well prevent a cross boundary project altogether.

Privacy and security mean balancing some delicate concerns and managing change. For example, fully realizing the potential of XBI involves providing broader access to high quality and "decision critical" information. But while it is clear that people find the prospects of e-government attractive, there are some deep-seated and quite legitimate anxieties about the privacy and security of the personal information that an e-government application could collect.¹² Traditional, paper-based processes may well have demanded the very same information, but such data was then contained in bureaucratic silos, collected, used and protected in familiar and pre-determined manners. That information may even have been of public record, but it was not readily available, hidden by what the U.S. Supreme Court has called a "practical obscurity."¹³ New technologies can make information much easier to use and misuse, raising the specters of the invasion of privacy, identity theft and fraud.

All of these values will appear differently from the perspective of a government entity, individual stakeholder or e-government user. Each perspective will support a different evaluation as well. To add to the mix, these values do not have hard and fast definitions and, while some may bleed into another, others may be contradictory. Finally, each may have different short- and long-term impacts. But despite the complexity these values represent in practice, they can be very easy to summarize. In the United Kingdom, for example, the express goal of the agency leading the charge to e-government is "to improve the delivery of public services and achieve long-term costs savings by joining up online government services around the needs of customers."¹⁴

The simplicity of the message is important. The goal of a business case is not to belabor the contingencies and anxieties of re-inventing government. The real challenge is to convince the policy makers to make a decision, and they are probably not well placed either to understand or to evaluate the technological options. Instead, they will appreciate what the technology can do. That is why values are important. For similar reasons, personality is critical, as the normal human impulse is look to the messengers as much as or more than the message. A credible spokesperson, supported by the relevant constituents, will make the most credible business case.

3. STRATEGIES FOR SUCCESS

Here is the basic challenge: by definition, any XBI project requires cooperation across boundaries. Those boundaries can be cultural, administrative, technological, geographic, organizational or, most likely, all of the above. As a result, every XBI project entails moving and working outside the framework of established organizations, procedures and rules. The result is an ongoing process of invention, discovery and negotiation. Those skills have to be applied to answering questions about:

- **Governance**: The mechanism to negotiate, formalize and sustain collaboration.
- **Standardization**: The correlation of business rules, functions, architecture, policies and information structures.
- **Technology**: The hardware and software to make the connections.

In practice, the applications of those skills will take the form of:

- **Leadership**: Creating and supporting the governance structures.
- **Infrastructure**: Positioning organizations to do XBI through the development and adoption of the appropriate standards and technologies.
- **Methodologies**: Taking the steps to move from a good idea to a sustainable program.

Together, these variables outline the strategies for a successful XBI project. They are variables because their values will differ from place to place and project to project. With XBI, no one size fits all. Certain models and approaches will insure a greater possible return on investment, but these do not constitute a set of “best practices” that should be faithfully followed in every instance. Each environment has enough unique factors to ensure that the plan for each XBI project will be unique too; the surest route to success is a careful analysis and then a reasoned selection of the practices most appropriate to the particular situation.

3.1 LEADERSHIP

XBI demands educated and engaged leadership. The decision-makers in government have to understand the applications and particularly the potential of information technology; further, they have to be committed to articulating their vision and realizing it.¹⁵ A recent article in the *Economist* described the alternative: “Even today, IT departments, particularly in America, are often magic kingdoms full of technology wizards where basic business rules do not seem to apply ... This is not just the fault of IT people who cherish their role as lone gurus, but also of their bosses who often abdicate responsibility to

technologists and set no clear rules on how to make decisions.” The results are destructive: “High-tech consultants estimate that more than half of all IT projects go wrong.”¹⁶

To change that ratio, leaders have to become involved, and, once involved, leaders have to make sure that their vision is effectively realized. As Peter Weill, director of the Center for Information Systems Research at MIT, exhorts decision-makers, “Don’t just lead, govern.”¹⁷

Governance is more than charisma. Because XBI involves working across established boundaries, with different partners, a leader can’t just order immediate and full consensus. Successful governance will entail negotiating and supporting new patterns of and structures for ongoing cooperation. The political and organizational challenges are clear: extant programs and practices have distinct political constituencies, laws, regulations and funding. As something truly new will inevitably blur those distinctions, it will also create and raise anxieties, anxieties over the potential loss of autonomy; the depreciation of skills and knowledge; and the likelihood that re-invention will create some winners and some losers.

To address those concerns, governance will have to take into account all the partners and stakeholders in a project. Different projects will have a different mix of constituents, but, in every project, there will be multiple perspectives, needs and interests to consider. This is just a sample of the groups and the considerations XBI projects could involve:

- *Citizens*, both in the abstract and as organized communities.
- *Elected officials*, at all levels of government, who often provide project leadership.
- *Legislators*, to update and revise laws, to establish governance structures and to allocate resources.
- *Special interest groups*, especially organizations and associations acting as lobbyists, with indirect channels to the decision makers.
- *Agency management*, who will have to expand their vision beyond the walls of the agency.
- *Agency employees*, who are actually going to do the work and bear the brunt of the organizational changes.
- *Unions*, which often represent the agency staff and which negotiate work rules and responsibilities.
- *IT departments*, which will implement the technological applications and which will include both external (e.g., vendors) and internal (government staff and departments) groups.
- *Standards bodies*, of which a large variety are creating the framework for information sharing in many disciplines and subject areas.

- *Open government and privacy advocates*, who will be directly implicated in any e-government project.
- *Businesses*, including those that could be partners in or those affected by a project, notably including regulated communities and vendors.

XBI inevitably demands a leader skilled in negotiation and facilitation, because nobody could possibly be in control of all or even any critical mass of this diverse array of stakeholders. In this world, the traditional idea of a leader in charge, with command authority, simply will not work. Many of the stakeholders will be outside any traditional structure that can enforce consensus. In that context, leadership will flow less from position or status than from competency.

Very often, leadership will have to give something away in order to get support, as in setting aside questions of ego and power in order to move forward. Managing expectations, encouraging buy-in and maximizing communication will be essential. It will be challenging just to keep everyone informed and on the same page, especially over time, as projects continue to develop and evolve. But a lack of effective communication will help to accelerate the ever-present tendency to fear the unknown.

As this suggests, there is probably a geometric increase in complexity when the scale of integration expands. The more boundaries to cross, the more partners, stakeholders and vested interests there are to consider. Paradoxically, drawing a boundary then becomes the critical question for leadership. This means finding a way to balance the greater potential returns of a larger scale effort with the difficulties that come with more and more stakeholders. For example, imagine negotiating and structuring all the “hand-offs” among multiple partners engaged in sharing information and services on a wide scale. Practically, one project can’t have or do everything, so the leadership must understand the tradeoffs and negotiations involved.

While leadership has to move effectively in many dimensions to make XBI work, perhaps the most important dimension is time. Time is a critically important criterion because so many projects have to succeed within a barely open window of opportunity. Most officials are elected for four years, with a chance for another term. Within that period, projects have to be proposed, approved, funded, organized, developed, tested and established, with every step contingent on a variety of factors over which no one has much control. Considerations of time will effectively circumscribe what is feasible and practical when personnel and administrations can change so quickly and greatly. Leadership must keep this in mind; as James Champy put it, managers will have to practice a “brutal realism” in order to understand what can be done.¹⁸

3.2. INFRASTRUCTURE

Infrastructure is not just technology. For XBI, it will take two forms. First, developing infrastructure will position an entity and create the potential for XBI by developing a cultural, organizational and technological framework that will facilitate e-government. Second, after an XBI project is in place, infrastructure will maintain the achievement. For example, the negotiations consequent to XBI will inevitably lead to some ad hoc arrangements, but these will still need solid foundations if they are to foster ongoing programs. In an XBI project, somebody owns the data. As well, somebody owns the applications. Those arrangements must all be sustainable.¹⁹

Human capital is a critical element of infrastructure. An XBI project needs people with special talents, among them IT experience, communication skills and project management expertise. Not every government entity has staff who can take on XBI, as it demands not just thinking outside the box, but working outside the framework of established institutional procedures and norms.

The corollary is the need for an educational program. Consultants and special project staff can supply some of the unique and necessary skills to get a project started, but the regular staff of a government entity, the end users of the XBI application, will potentially have to learn a variety of new skills and master new areas of expertise in order to support a new workflow and to sustain a new technology.

Ideally, education will be an ongoing process, taking place within the cultures of collaboration that some organizations have fostered. Eli Lilly creates “communities of practice” that encourage sharing knowledge and skills, in order to foster innovation.²⁰ In *The Social Life of Information*, John Seely Brown and Paul Duguid describe compellingly how an educational infrastructure will support change.²¹ Sharon Dawes and Lise Préfontaine elaborate on that concept, noting that the institutional framework is just a starting point for what has to be a creative and entrepreneurial venture: “The formal structure also acts as the context for a rich array of complex, informal relationships. These informal relationships are the usual means for getting work done.”²²

What should people learn? Given that XBI implies working across organizations and systems, and that the technologies employed will rest primarily on the Internet, learning about standards that support interoperability is all important. There are many different areas where standards are necessary. One of the most important, and least understood, is metadata.

Metadata is often defined as “data about data.” Because digital resources are only accessible through some configuration of hardware and software, metadata is absolutely essential for their discovery, description, evaluation and management. Anyone who uses a computer has some informal approach to metadata, a set of conventions for naming word processing files or an arrangement of directories and

sub-directories for e-mail. As long as no one else needs access to those files, then an informal approach will work. But, for XBI, where the volume of records is multiplied across agencies or an entire state government; when there is a mandate to share and re-use information; and when there is a variety of policy or technological concerns pertinent to data sharing, then an informal approach to metadata will not work. In those cases, other people need access to the data. Only some commonly accepted metadata standards would support data and information sharing. The geographic information systems (GIS) community provides one of the best examples of how metadata can promote data sharing across boundaries.²³

Similarly, to share and then use data from one system in another, the data has to be re-formatted or, ideally, created in an infrastructure independent format. A format is a defined layout or structure for data. Many formats are proprietary and unique to particular applications. They work best (or only) in the specific software program for which they were designed. This greatly impedes interoperability. Most data can always be captured in some lowest common denominator format, such as ASCII, but that means losing a great deal of information and functionality lent to the data by the software that created it. Extensible markup language (XML) is becoming more and more popular as a way to capture information in an infrastructure independent format.²⁴ Because XML is not a proprietary format, a record formatted in XML might be used in many different applications. XML can create executable knowledge, with a greatly increased potential for sharing, re-use, preservation and customization.²⁵

Once captured, data still has to be used. From that perspective, another value of XML is that it can structure data in accord with business rules; it can create “executable knowledge.” The complex workflows demanded by XBI will entail specialized work and coordination in order to process and share information. XML creates the potential to structure information and embed rules. In this context, the rules define the information.

There are all sorts of business rules that XBI can standardize and technology can enact. For example, in the UK e-government project, records management is a focus of attention: “Electronic records management is a key underpinning element in the government modernisation programme. The government has set a target for all central government organisations to be able to store and retrieve their public records electronically by 2004, to ensure that they are able to meet the demands of working in an electronic environment.”²⁶ Records management is also on the Federal Quicksilver agenda.²⁷

Justice XML, sponsored by the Global Justice Information Sharing initiative, is one of the more impressive applications of XML to XBI.²⁸ The project is a collaborative partnership of federal, state and local government agencies and associations, crossing all branches of government, and including a broad array of private sector partners. All of these will profit from the ability to share standardized data. While not

everyone is immediately able to implement XML, each can benefit from the existence of the data standard. As the project description says:

The data employed must be brought into a standard, well-defined, meaningful, and consistent form if applications are to process the data effectively. In most cases, this needs to be done without significantly changing the existing data structure of the databases or systems already in use. The use of a common reference baseline that managers and developers can utilize for agreeing on meaning, structure, and form is critical for success. This is especially true as data is passed between jurisdictions (law enforcement, courts, corrections) and across local, state, and regional integrated justice information systems. The common reference baseline in this case can be the Data Model.²⁹

As this quotation suggests, to be most effective, standards for metadata, data formats and business rules should come together within the overall framework of an enterprise architecture.³⁰ An enterprise architecture creates potential. People often criticize government agencies and even departments within a single government agency for constructing separate information “silos,” systems that cannot communicate or share information. Indeed, the failure to promote interoperability among criminal justice and investigative agencies has been advanced as one significant reason why homeland security will be difficult to establish.

An enterprise architecture that promotes standards will position a government entity to develop XBI and interoperability. As always, an architecture means different things to different people. The Federal E-Government Act has defined it primarily as a data architecture, with references to metadata standards, information taxonomies and data formats. Even so, that same product can have multiple implications. For example, the U.S. Office of Management and Budget (OMB) said that the “FEA [Federal Enterprise Architecture] is a business-focused framework that provides OMB and Federal agencies with a way to monitor, analyze, and control Federal investments in information technology. The FEA will make possible horizontal (cross-federal) and vertical (Federal, state, and local governments) collaboration and communication ...”³¹

To have such potential, an architecture will have to cover a variety of factors. For example, the state of Minnesota’s enterprise architecture includes all these topics just for the topics of data and records:

- Data definition: creation, naming standards, metadata.
- Data storage: DBMS design, disaster recovery.
- Data access: privacy, security, legal classification, access methods.
- Data maintenance: stewardship, backup, recovery.
- Data /records retention: records management, preservation.³²

Infrastructure along these lines creates potential over the long term and positions an organization to act on opportunities. By fostering interoperability, the proper infrastructure allows any government entity to adopt and adapt technologies as they become available. When something comes up that is unanticipated, a coherent infrastructure will shorten the adoption cycles and make projects much more feasible. Sharing code for applications is one example. As *Governing Magazine* recently noted, “Before any kind of component exchange will work, the states must adopt systems that are more compatible with each other.”³³

In the short term, though, infrastructure represents up front and then continuing costs. Moreover, because infrastructure promotes XBI, it may well be viewed as limiting in its impact on single entities, such as a government agency, as enterprise standards could foreclose the technology option most favorable to the agency in favor of another that would benefit government as a whole. As governments and government budgets are organized around individual agencies, that makes creating and implementing an enterprise architecture problematic. For example, all XBI projects could use some significant initial funding, which often has to be scraped together, as most government budgets are specific to agencies, not cooperative ventures. Accordingly, infrastructure is also a matter of an administrative or institutional framework. “Because these [XBI] initiatives stretch across the boundaries of distinct organizations, they need to establish a new kind of institutional legitimacy.”³⁴ CIOs will most often be expected to make that work.

3.3 METHODOLOGIES

Leadership will provide the vision and infrastructure the blueprint for XBI, but combining those will still leave a project falling short of actual implementation. Putting those into practice demands closer attention to a larger context. As noted before, no single set of “best practices” can account for all the variables in an environment, and so no single approach will suffice for all entities looking to implement XBI. But there are still some methodologies that will greatly increase the chance for success.

Certainly one first step to take for a government entity is the development of an agenda that identifies the priorities for XBI. The Federal Quicksilver list is an example.³⁵ It details the choices made by the Bush administration to get e-government moving. Because there are, in theory, so many opportunities, it is important to focus on the most practical methods of moving from a good idea to a sustainable program.

There are a number of ways to go about developing an agenda. Some questions to ask are: where is success most likely? what is the low hanging fruit? The obvious but nonetheless useful approach is to determine what else has been done, to analyze the standards and projects on which others are working. Government entities all provide some similar services and perform some similar functions. To increase the potential impact of e-government investments, the OMB has recommended to Congress, for example,

that federal technology initiatives should be organized around six major “lines of business:” criminal investigations, health monitoring, financial management, human resources, data and statistics and monetary benefits.³⁶

Along the same lines, most local government entities are under some obligation to communicate and share information with state agencies; and states, perforce, are obligated to work closely with the federal government. These connections are all opportunities for XBI. Accordingly, what works in one jurisdiction is at least theoretically possible in another; for a variety of good, practical reasons, theory might never turn into reality, but at the very least, the examples of other government XBI projects are worthy of analysis.³⁷

Just as common functions are opportunities for XBI, so are common products or outputs. As Amazon.com has demonstrated in the private sector, the easiest things to market over the Web are standardized (or “standardizable”) commodities, such as books and CDs. Not every transaction produces a standardizable commodity of proportionate value, nor is every transaction a situation where both its business rules and its accompanying information can be defined, documented, standardized and shared. Given the effort that has to go into creating standards for metadata and data formats, information objects that can be packaged in a critical mass offer the best chance for a return on investment. On the contrary, if the business rules for a transaction are too complex or the information “commodity” too formless, then the cost of defining and enabling them in an executable format will probably be too high. Understanding the different conceptions of value is key to realizing what is practical in this context.

An example in government where the potential return on XBI is high are signatures, which can take many forms, but which are a feature, if only as authentication, in almost every transaction, paper or digital.³⁸ The federal government’s e-Authentication Gateway promises to be an infrastructure for both public and private entities to use.³⁹ Procurement is a more complex example: every entity within a government enterprise has to follow set procedures, often using set forms, to procure standard goods and services. How many agencies want to implement an e-commerce function? Standards for signatures (especially in terms of identification and authentication) and for payment can support the activities of many entities, with the potential of lowering the overall cost of technology to the enterprise and simplifying transactions from the point of view of businesses and citizens.

As all this implies, risk management is a necessary component of an XBI plan. The questions about which boundaries to cross and about what kinds of integration to effect extend on a scale starting from the individual citizen and then encompassing society as a whole. But each additional extension demands some greater level of planning and addresses issues of greater complexity. Many state governments are looking at XBI as a way of linking departments, crossing internal boundaries. Others want to cross the

external boundaries and link to customers, either business or citizens. These may all entail moving from small, consensus-oriented projects to larger, more controversial and more radical changes.

Clearly, there is an advantage tactically in starting small, if only because it is easier to walk than to run. There are also cultural reasons. If there is no tradition of active and substantive collaboration across boundaries and if there are no current practices of sharing information, then it will take some time to create the communities that will foster XBI. Some pilot projects to see what is feasible and which will promote cooperation are probably advisable. They may not generate improvements and efficiencies in and of themselves, but they will set the stage for more productive relationships and projects later on.

The greatest savings from XBI will be generated by continually expanding the range of analysis and activity, with more partners and processes further integrated into the enterprise.⁴⁰ The progression to envision might be moving from the integration of common programs, such as licensing; to the integration of processes and functions (e.g., help desk, procurement); then to the integration of organizations, on the model of what the Department of Homeland Security is attempting; and finally, the logical last step is integration with the private sector. None is without problems and challenges.

Particularly given the risks of failure inherent to any technology project, careful analysis and planning are the absolutely necessary prerequisites to XBI. The cold comfort is that the technology is available and can do the job; the trick is to apply it in the appropriate situation and realize a proportionate return on investment. Look at what others in similar organizations are doing. Look for clusters of systems and entities dealing with definable commodities, but communicating through and separated by clumsy, inefficient mechanisms for data exchange. Look for the standards and the communities that will foster collaboration. Momentum is important. Doing something becomes the key to doing something more important. Once a project is done, and its success demonstrated, that can then inspire other work. Those are the fundamental steps to take to position an entity to do XBI, to determine what is feasible, practical and valuable.

4. CAVEATS

Over and above all the variables mentioned so far, there are two that deserve particular attention. The first is privacy and security – the potential consequences of making data more freely available through XBI. The second is economic – the complexities that innovative, cooperative ventures present for budgets, asset management and returns on investment. To a certain extent, these are connected; addressing the former can easily have some budgetary impact and/or circumscribe some economic possibilities. Both, as well, will affect the presentation and the perception of the value of an XBI project.

XBI means providing better access to high-quality and decision-critical information. The application of that in the form of e-government is still exploratory, yet it is clear that people find the prospects attractive. But there are deep seated anxieties about privacy with e-government and government in general which to some extent will support and encourage the silo-building approach traditionally practiced by government entities, since, in those silos, the information agencies collect is protected by the very limitations of technology that XBI seeks to transcend.

Identity theft is one concern. Not a day or a newspaper edition passes without some reference to the misuse of technology in some criminal enterprise. The *New York Times* recently described an extraordinarily complex scheme involving ATM machines: a gang on the East Coast “installed devices that captured, or ‘skimmed,’ personal bank account information from at least 21,000 people, prosecutors say. They used that information in 2001 and early 2002 to make fake ATM cards, then stole at least \$3.5 million.”⁴¹ The article reiterates the “virtually unregulated” aspect of the ATM industry, in a manner sure to inflame the suspicions and anxieties of anyone with a debit or credit card. The article does not stress that the ATM network is part of one of the most far-reaching, sophisticated and best-designed XBI projects in existence, but certainly government entities should keep that in mind, lest they neglect to consider risk management as they plan their own XBI projects.

Citizens are not the only ones concerned about identity theft. In the post 9/11 era, criminal justice entities at all levels of government are thinking about how to distinguish between ordinary people and dangerous terrorists. This is most directly experienced by citizens at airports, but it has arisen in many other contexts as well. The U.S. State Department has complained to state government officials about the ready availability of birth records online, as those could be used “to create false identities by appropriating real names backed by official records.”⁴²

Privacy has another connection to technology. Among many, there has been an assumption that the development of e-government (seemingly per se) will result in greater accountability, make government more transparent and encourage a wholly new state of e-democracy.⁴³ But, as the Supreme Court’s development of the concept of “practical obscurity” illustrates, there are some fault lines here. E-democracy may not be an unmitigated good. When connected to the awareness of the “digital divide,” this points to the probable need for providing multiple entry points to government services, that there should be both “clicks and bricks,” as the saying goes, so there are options appropriate to the individual and the information.

All this raises the question of trustworthiness. Interestingly, the fears about privacy have as much or more to do with a concern for fraud or identity theft than they do with any anxiety about government doing something unsavory with all the personal information it collects. But there are undoubtedly individuals and

groups, from all ends of the political spectrum, that want to limit the potential power of government. Paradoxically, many of the people who are concerned about government abuse of privacy are surrendering far more information to the private sector without expressing so many qualms and without clamoring for quite so many regulations, but that does not eliminate the problem.

To counter the questions about privacy and security, government entities have to go the extra mile. Web sites that have clearly written and current policies that explain why information is collected and how it will be managed are important. Adequate and up-to-date documentation of recordkeeping systems is also key. Maintaining the trustworthiness and evidentiary value of electronic government records will go a long way towards managing legal risks.

To establish the accountability that courts, legislatures, citizens, business continuity and good management principles all require, government entities should document their records management and electronic records management strategies. Some of this documentation will take a legal form; most states, for example, mandate the use of records retention schedules, subject to a formal approval process. Other forms of documentation, relative to systems design, training or standards, can be more informal, but they will nonetheless have to be accessible, understandable and legally admissible, since they must be available over time and they may have to be produced in court as evidence.⁴⁴

As noted, taking steps to address the questions of privacy and security will have an economic impact. That is only one aspect of the economic impact of XBI to consider. XBI will demand innovative approaches to budgeting; it will have to demonstrate a clear return on investments to warrant the budgets; and, once successful, it will present some interesting questions about data asset management.

Budgeting, as noted, is a challenge for XBI. Any XBI project will demand some up-front costs, but government and agency budgets are being cut all over the country, leaving scant funding for new projects. As well, traditional budgets and budgeting processes do not adequately address the complexities of cooperative ventures. It is not easy to spread the funds, the responsibility and the accountability for a project among several different partners. Finally, there is undoubtedly some wariness among legislatures about the promise of technology. Even though XBI can offer a route towards greater savings and efficiencies, an XBI project still has to answer the skepticism of legislators who have heard such siren calls in the past.

The Federal Quicksilver program is an example to study. Despite the quality of its work, the skills of its staff and the explicit support of the President, the Republican-led Congress has recently provided only \$5 million, in place of the requested \$45 million, for the e-government program. Instead, agencies responsible for the separate initiatives will have to request funding on their own. This could increase

accountability, but does represent a challenge. To add to the complications, the program's director at the OMB, Mark Forman, has recently resigned.⁴⁵

The total outlay for the program, of course, is even higher than \$45 million. Forman recently summed up the costs and benefits: "If we centrally fund the 24 E-Gov initiatives, we could accelerate their implementation and save more than \$500 million annually. Achieving this goal would require redirection of \$300 million dollars in FY 2003 and \$276 million in FY 2004 to a central E-Gov initiative fund."⁴⁶ In the absence of funds dedicated to the program, support has to come from the agencies involved, which will inevitably raise questions about priorities and will probably slow the rate of development and expansion.

As Forman's statement suggests, a critical factor in the economic equation is return on investment. What savings will XBI generate? how can these be measured? and, most significant to those making the investments, how will the returns be captured and allocated?

These questions are not unique to XBI. In fact, governments have wrestled with them for many years and in many areas. No one has completely satisfactory answers to questions about performance measurement. In the context of XBI, though, certain questions will be more prominent. Cost avoidance is one: in a period where government is expected to do more with less, technology is one way of meeting increased demands for services without raising taxes. The overall size of the agency budget might not decrease in this instance, but neither will it have to go up to handle a larger volume of business.

Sharing savings will be an issue for XBI. If there are some, any legislature or any budget office might well appropriate a pot of savings whenever it becomes apparent or whenever there is a financial crisis. As well, despite all the best intentions in the world, it is unlikely that every partner in an XBI project will realize the same level of benefits. There will probably be inequitable results, with, in some cases, most benefits going to the private sector, and not to the public government entities, which are often doing much of the work and making most of the investments. Economic development is an important goal of government, so this is not inherently undesirable, but it does present some problems when justifying initial investments.

The corollary is the question of who owns the products of an XBI venture and who gets the profits, if there are any. Some states have formally addressed this. Indiana, for example, legislated the concept of "enhanced data access" and connected it to the development of a state portal maintained by a private third party, under the oversight of an enhanced data access review committee, in order to ensure that the allocation of profits from the sale of data proceeds equitably.⁴⁷ Other states have not addressed this, leaving room for confusion and conflict as digital resources then tend to fall under the rubric of the public access provisions of the public records laws.

Undeniably, data is an asset. In Minnesota, the state enterprise architecture begins with the statement that information is the state's most valuable asset.⁴⁸ Because of that and because it will be key to sustaining a program, someone in an XBI project has to have ownership of and take responsibility for the data it produces. But to avoid challenges over such issues as ownership, copyright, FOIA and usage, laws might well have to be revised to deal with XBI, both in the general and particular senses; certainly contracts and agreements should explicitly address the issue. Otherwise, the matter could end up in court.

5. CASE STUDIES

Three case studies will demonstrate how XBI might work in practice. The first is from Utah. OneStop Business Registration (OSBR) is a Web-based service, strongly sponsored by former Gov. Mike Leavitt and supported by a partnership of government agencies, at the state, local and federal levels. The service is available through the state portal, which is managed by a private company, Utah Interactive, Inc., part of the National Information Consortium.

The second is Minnesota's Electronic Real Estate Recording Task Force (ERERTF), which is a voluntary partnership of private and public entities, chaired by Secretary of State Mary Kiffmeyer. The ERERTF relies on XML to structure data and business rules in an infrastructure independent format.

The last is MassCARES, an effort to share social services data across agencies using a Web-based application linking legacy systems. It also uses XML and has a special concern with privacy and security.

5.1 UTAH.GOV: ONESTOP BUSINESS REGISTRATION

In the summer of 2003, the state of Utah introduced the OneStop Business Registration.⁴⁹ This service allows citizens to register a business in the state with seven disparate government entities through a single process. The goal of the project was to meet the demands of the business world for "faster-better-cheaper" service and particularly to build on the Internet to make a self-service site available seven days per week and 24 hours per day.

E-government is a special priority of Utah's former governor, Mike Leavitt, who established an e-government council to oversee, review and facilitate the inter-agency partnerships that will make such XBI projects works. Leavitt has stressed the importance of the council and of executive leadership: "In many cases, you're asking agencies to defer an agency priority for the purpose of the enterprise. The only way those judgments can be made are at the executive level."⁵⁰

The OSBR has these objectives:

- Reduce misinformation, frustration and time consequent to the registration process.
- Allow users to conduct business when and where they choose.
- Lower costs for government entities by eliminating redundancies and simplifying procedures.
- Provide scalable tools that let government entities do more without increasing their budgets.

The State Department of Commerce is the driver of the project, which is funded by a consortium of state agencies and local government. There is a proposed schedule for annual subscriptions to maintain the system. Only one user fee is part of the package, a cost of \$20 to reserve a business name, with payment by credit card or ACH.

The registration process can take some users just 15 minutes, although the system allows for up to 120 days to complete the registration. All users are given a “registration access code” that enables them to log off and on the system in order to consult with their colleagues and gain professional advice, should they need it. Security and privacy are explicitly addressed in a link from the service’s home page. The policy notes which information is public or private and describes how transactions are protected. “The OneStop Business Registration online application resides on a highly secure server. We use a universal Internet technology called Secure Socket Layer (SSL). When you send information from your computer to our servers at utah.gov it is encrypted (locked) so that the information is protected during its transmission.”

Expanding the system to include more government entities means developing a standard interface and a common architecture in order to make this cost-effective for most local governments. Currently, these entities are partners in the project:

- Utah Department of Commerce
- Utah Department of Workforce Services
- Utah State Tax Commission
- Provo City
- Salt Lake City
- Sandy City
- State of Utah’s CIO Office
- Internal Revenue Service

The system will export the data from completed registrations daily. Eventually, the OSBR will have XML interfaces to agency legacy systems, which will make for dynamic data interchange. Even so, smaller

units of government will only have daily downloads, as no one can afford to build customized interfaces for each and every unit of government.

Design and development of the system was carefully founded on contact with potential users, with several focus groups, especially from the legal and accounting professions. One challenge that was not overcome was coordination with the Department of Environmental Quality. Its reporting needs presented too many complications for inclusion in the service at this time.

The critical success factors for the effort were: the governor's vision; the incentives provided by the prospect of improved business processes (exemplified by agency commitment at the highest levels); and the development of a governance mechanism, the e-government council and cabinet level process to manage the XBI, with prioritization and charters to establish accountability.

5.2 MINNESOTA'S ELECTRONIC REAL ESTATE RECORDING TASK FORCE

In recent years, major changes in land development practices, mortgage financing, and conveyancing have increased the volume as well as the complexity of the documents presented for recording at recorder's offices throughout Minnesota.⁵¹ At the same time, rejection rates have increased, budgets have decreased and frustration with some aspects of the land records system have grown. The basic problem is that a wide variety of stakeholders in the public and private sectors create and use land records and data in sophisticated technology systems; for the most part, though, they exchange and share that data using paper records. As a result, the transactions that characterize recording are cumbersome, expensive and inefficient. XBI would be a tremendous boon to the overall system.⁵²

To address this, in April 1999, State Senator Steve Kelley asked Secretary of State Mary Kiffmeyer to convene a group of persons interested in Minnesota's land record system, to study the feasibility of electronically recording real estate documents. A number of Minnesota county recorders had shown an interest in this subject, and these efforts were combined and launched in the fall of 1999. The Minnesota Legislature, in Laws 2000, Chapter 391, authored by Senator Steve Kelley and then Representative (now Governor) Tim Pawlenty, directed Secretary of State Mary Kiffmeyer to establish a task force that would study and make recommendations on electronic filing of real estate documents for the state of Minnesota.

The ERER Task Force defined its mission as the need to study the current paper-based system and the feasibility of an electronic mode of real estate recording. In 2002 the task force conducted a survey and assessment of all 87 Minnesota county recording offices and Minnesota private sector stakeholders to

gather information on processes, requirements, concerns and considerations. Automated systems currently utilized in other states were also assessed and compared to national recording standards.

The ERER task force is broken down into several subcommittees. It is through subcommittees that much strategic, technical and analytical work is completed. Recommendations are then made by these subcommittees to the full Task Force for consideration and authorization. These are the subcommittees involved in task force work:

- Pilot Framework and Scope
- Legal Subject and Fee
- Pilot Proposal Review
- Recording Content and Workflow
- Technology
- Geographic Information Systems (GIS)
- Private Sector

Rather than mandate the adoption of a single application and system in order to automate transactions between different entities, the ERER Task Force determined that the use of XML would allow for the infrastructure independent exchange of standardized information. This approach takes the direction offered in the federal government's E-Sign Act (Electronic Signatures in Global and National Commerce Act), which says:

(A) ACCURACY, RECORD INTEGRITY, ACCESSIBILITY- Notwithstanding paragraph (2)(C)(iii), a Federal regulatory agency or State regulatory agency may interpret section 101(d) to specify performance standards to assure accuracy, record integrity, and accessibility of records that are required to be retained. Such performance standards may be specified in a manner that imposes a requirement in violation of paragraph (2) (C) (iii) if the requirement (i) serves an important governmental objective; and (ii) is substantially related to the achievement of that objective. Nothing in this paragraph shall be construed to grant any Federal regulatory agency or State regulatory agency authority to require use of a particular type of software or hardware in order to comply with section 101(d).

Minnesota studied closely and emulated as much as possible other efforts to establish standards in this area. The Property Records Industry Association (PRIA) standards were a starting point for e-recording. PRIA is a national association representing the interests of county recorders, auditors and treasurers.⁵³ In order to accommodate the requirements and fields needed by the preparers of mortgage documents,

Minnesota used also the Mortgage Industry Standards Maintenance Organization (MISMO) standards.⁵⁴ In addition, Minnesota studied Uniform Conveyancing Blanks in the initial building of standard requirements. Finally, Minnesota standards include legislated information that is mandated specifically for filings in the state of Minnesota.

A significant difference in Minnesota's approach to the development of standards, as compared to PRIA and MISMO, is in its paramount goal to meet the needs of not just one particular stakeholder (e.g., recorders or the mortgage industry) but to address the needs of all stakeholders. As stated above, membership is comprised of all stakeholders in electronic recording from both the private and public sector.

In contrast to PRIA and MISMO, Minnesota decided to document its standards using XML schemas rather than DTDs (Document Type Definitions). Both define the elements or record structure of an XML document, but schemas offer many more advantages. Schemas are expressed in well-formed XML, while DTDs are not. As a result, schemas allow all the functionality of XML for sharing, re-using and customizing data and its accompanying business rules.

For example, through the use of schemas, Minnesota can enforce data formats such as data types (dates), data patterns (phone numbers as [999] 999-9999) and default values, none of which can be done simply with DTDs. This ensures that standards will more effectively format and validate data, and that transactions will be more accurately and successfully automated. As well, this will alleviate the need for burdensome documentation, programming and development for anyone implementing standards. Developing schema-based standards better positions Minnesota for future needs and changes.

The ERERTF produced in June of 2002 the Minnesota Electronic Real Estate Recording Standards v.1.0, which were unanimously adopted by the task force members. These standards include the business rules for e-recording and a definition of the legal, technological, operational and functional context for making such an e-government system work. The development of the Minnesota's ERER Standards is an ongoing and evolving process that is designed to keep pace with the changing needs of the public and private sector stakeholders.

As of summer 2003, the standards are being tested in pilot counties that represent a diverse subset of Minnesota counties. Pilot testing has been broken into two phases. Phase I includes the electronic recording of satisfactions and certificates of release; Phase II will include deeds, assignments of mortgage and certificates of real estate value. Dakota County is the first of the pilot counties to complete its installation, and as of July 2003, it has recorded 584 satisfaction documents in a fully electronic fashion. The other pilot counties are in line to begin testing soon for this phase of work.

The overall budget for the ERER project will be approximately \$1.5 million. To fund this, in Laws 2001, First Special Session, Chapter 10, Article 2, Sections 98-99, the Minnesota Legislature set a \$.50 per transaction user fee charged to the filing of real estate documents at county offices and dedicated to a separate fund. This amount was appropriated and is available to the ERERTF until June 30, 2004. This budget is richly supplemented by the contributions in both time and resources of the task force members.

Given the complexity of the project and the multiplicity of interested parties, the ERER Task Force membership has to comprise a joint public/private initiative. The task force is a voluntary group that has dedicated time and resources for the past three years to the development and testing of electronic real estate recording standards. The 46-member task force includes county recorders, auditors and treasurers, members of the senate and house, the State Planning Office, city assessors, Fannie Mae, Builders Association of Minnesota, title companies, law firms, county surveyors, the realtor's association, the Land Management Information Center, the Department of Transportation, the Minnesota Historical Society, the American Society of Auditors, technology vendors, the Bankers Association, Department of Revenue, and faculty from Minnesota law schools.

National standards groups are also included in this process, including the Mortgage Industry Standards Maintenance Organization (MISMO) and the Property Records Industry Association (PRIA). Compatibility with the standards developed by these groups is a key goal of the Minnesota initiative.

From the results of the pilots, the ERERTF will learn how to develop a practical and cost-effective alternative to the current paper-based filing process. In a final report due in 2004, the ERERTF will recommend to the Minnesota legislature a final version of the standards for adoption as Minnesota's statewide methodology for electronic real estate recording.

5.3 MassCARES

In Massachusetts, the Executive Office of Health and Human Services (EOHHS) comprises one of the largest state government entities, with a current annual budget of about \$11 billion and oversight of 16 agencies.⁵⁵ Among those agencies, there was a significant overlap of constituents, with one citizen or family receiving services from multiple agencies. However, there was no unified view of the client base.

For agency managers, the lack of accurate, cross-agency client data complicated decision-making and resource allocation. For example, managers could not determine exactly how many citizens were receiving services in a given location, because there was no way to avoid double or triple counting clients

working with multiple agencies. And for staff and social workers providing services to clients, agency “information silos” could result in duplicated efforts and missed opportunities.

Other states face the same challenge and the same opportunity: a demand for increased efficiencies, improved outcomes and cost savings that requires a “system-wide infrastructure to support common operating functions and casework practices such as risk identification, resource allocation and strategic planning.”⁵⁶

For Massachusetts, building from scratch was not economically feasible. The new infrastructure had to be built upon the legacy systems in place. Towards that end, in 1999, the state selected Systems Engineering, Inc. to develop a Web-based system that would integrate data from the 16 agencies in the EOHHS. The result would be MassCARES (Massachusetts Confidential Access to Resources through an Electric Storehouse).

The core of the MassCARES system is a “Common Information Storehouse” (CIS), or data warehouse, built on an SQL Server 2000 database. Data is extracted from legacy systems, cleaned, de-duplicated, de-normalized, and placed in the CIS. Currently, the system collects 29 common data elements from eight EOHHS agencies on an ongoing basis.

MassCARES built ample security provisions around its data warehouse. The need to maintain confidentiality and privacy provisions is paramount. Separate programs may deal with the same constituents, but they do not necessarily collect the same information or share the same rights to all that information.

MassCARES uses XML to extract the common elements from the legacy systems and normalize them in the data warehouse. Along with the data, the system provides online analytical tools for EOHHS staff to realize the potential of the information. As Joe Guido, the system’s chief architect, explained, “We couldn’t modify every legacy system to accommodate the data of every other legacy system. We couldn’t demand that everyone change their applications. The only way to do it was to link to the legacy databases by providing a Web additive. We had to find a technology that everybody had on their desktop, that allowed us to add value and give universal fully-understood access to fairly complicated capabilities.”⁵⁷

MassCARES includes tools for extracting and analyzing data, including Online Analytical Processing (OLAP) and mapping capabilities. For example, pivot tables can be used to pinpoint the number of duplicate clients between any two agencies in a specified town. Similarly, managers can observe changes in the number of clients in a specified zip code receiving services over a series of time periods.

The MassCARES project also includes components that can be accessed by the public. The Resource Locator is a searchable online database containing information about over 23,000 third party health and human services providers in Massachusetts. The Community Wellness Web site supplies indicators for 351 Massachusetts cities and towns in six areas: demographics, safety, health, education, economics and civic involvement.

In short, MassCARES provides the infrastructure to enhance, transform and load data from multiple agencies into a central, consistent database. It provides managers of the Massachusetts Executive Office of Health and Human Services and its agencies with the ability to aggregate and analyze cross-agency data in order to improve resource allocation and make better operational decisions.

Data from MassCARES has already played an important role in helping the EOHHS carry out a process of consolidating and reorganizing its 16 agencies by giving an accurate, consolidated picture of the location and needs of its clients.⁵⁸ EOHHS managers are now counting on cross-agency data from MassCARES to help maximize the efficiency and effectiveness of their \$11 billion organization.

6. CONCLUSION

Nobody said XBI would be easy. The technology might be there to support it and the Internet might put the basic architecture for XBI on everyone's desktop, but technology does not function in the abstract. XBI means putting technology into a specific, practical context; it is all important to understand that context in order to make the technology work.

That is a challenge. Most of us work in familiar contexts. XBI means working in an unfamiliar context. It will demand innovation, flexibility, negotiation and leadership. That is why, although people have been talking about XBI and re-engineering for years, there are still precious few examples of it. Now there are more incentives and compelling reasons to move ahead with XBI. And now there is more potential for success, with technologies, tools and models that demonstrate the values to achieve.

Leadership can make it happen. XBI won't be built in a day. But government entities can position themselves right now to move forward when the opportunities arise. If they build the right infrastructure – the cultural, legal, organizational and technological frameworks for XBI – then they are making the right, the fundamental investments.

Again, it won't be easy. Any pundit or professor can preach about the need for change and prescribe a multi-step program that gleams with potential. Somebody else has to make it work. Political leaders and agency heads have to become engaged; they have to lead and govern in order to make XBI work. That is

a risk, but it can provide tremendous benefits. XBI can make good on government's promises of better, more effective and more cost-effective service to its citizens, its customers.

APPENDIX 1: SELECTED XBI PROJECTS

CapWIN: Capital Area Wireless Network

<http://www.capwin.org/>

CrimNet: Connecting Minnesota's Criminal Justice Information

<http://www.crimnet.state.mn.us/>

MassCARES

<http://www.masscares.org/main.asp?page=masscares>

Minnesota Electronic Real Estate Recording Task Force

<http://www.commissions.leg.state.mn.us/lcc/erertf.htm>

New York City 311 Service

<http://home.nyc.gov/html/311/home.html>

Texas Health and Human Services Commission 2-1-1 Service

<http://www.hhsc.state.tx.us/tirn/tirhome.htm>

[http://business.cisco.com/prod/tree.taf%3Fasset_id=103214&ID=48296&ListID=44692&public_view=true
&kbns=1.html](http://business.cisco.com/prod/tree.taf%3Fasset_id=103214&ID=48296&ListID=44692&public_view=true&kbns=1.html)

United States Department of Agriculture Forest Service, Firefighter Incident Qualifications and Certification System

<http://www.fs.fed.us/fire/iqcs/>

United States Department of the Interior, Recreation One-Stop Initiative

<http://www.recreation.gov/>

United States Office of Management and Budget Quicksilver Initiative

<http://www.whitehouse.gov/omb/egov/>

Utah OneStop Business Registration

<http://www.business.utah.gov/registration>

APPENDIX 2: SYMPOSIUM PARTICIPANTS

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Unisys

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Daniel Greenwood
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Robert Horton
Minnesota Historical Society

Robert Hull
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Janey Kalin
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E-Government
Executive
Education Project

CROSS-BOUNDARY E-**G**OVERNMENT: Designing Successful Projects

May 12-15, 2003

Appendix 3: Cross-Boundary Projects—A Diagnostic

Information technologies have been widely used to improve access to government services. Citizens are urged to go “online, not in line” for “24x7” services. However, what has yet to happen widely in government – even though it has been talked about for several years – is using technology to integrate services across program, agency, jurisdiction, and sector boundaries, and to transform work in a way that substantially improves cost-effectiveness.

This workshop focuses on designing and implementing initiatives for such cross-boundary transformation. We will explore analytic frameworks, evaluate leading practice, and seek to apply lessons to our home settings.

To get started, please make preliminary assessments of a dozen guidelines as described below. Practitioners and research support each of these guidelines – to some degree and in some settings. What will be important during the workshop is to assess the degree to which these (and other) guidelines are important to you and in your setting. What is most important? Where are you weakest and strongest? What should be your priorities for improvement?

Evaluation Scales

For each guideline, please think about:

1. **Involvement** (1=low; 5=high): To what degree is your organization giving attention or priority to this guideline?
2. **Value** (1=low; 5=high): What value (in excess of cost) would be created if your organization made additional resources available for implementing this guideline?
3. **Confusion** (1=low; 5= high): To what degree do people who would to support this guideline face confusion in knowing what to do or how to do it? With low confusion, people know how to proceed; with high confusion, people do not know how to move forward.
4. **Conflict** (1=low; 5=high): To what degree do people who need to support this guideline face conflicts that make them not want to be supporters? With low conflict, people agree they should give you needed resources and authority; with high conflict, many people are opposed.

The guidelines as described here are inevitably abstract. You may therefore find them difficult to evaluate. Nevertheless, do the best you can. Answer from the perspective of the public organizations you are most familiar with. Use as much of the 5-point scale as you feel comfortable with, and don't bunch all your answers together.

Guidelines for Improving the Design and Implementation of Cross-Boundary Initiatives

1. **If it's valuable AND feasible, just do it.** Public sector checks and balances tend to slow down and dissipate new initiatives and forces for change. When the window of opportunity is open, go through quickly, since it may not be open for long. Now, for example, is a great time to consolidate data centers and network support. "Take what the defense gives you." Create a bias for action.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

For projects that are high in confusion

2. **Plan – for people as well as technology.** Cross-boundary technology-related initiatives are complex and require planning to avoid expensive problems and "painting yourself into a corner." While governments typically mandate technical and economic feasibility studies for such initiatives, successful implementation depends even more on effective planning for the tasks and responsibilities of the people involved.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

3. Communicate with and engage stakeholders. To reduce confusion, take time to develop and share the vision, especially by using two-way communications and engagement for the most powerful sharing. The development of new technology-enabled relationships among independent organizations requires a politically sensitive sales campaign. Communicate, communicate, communicate.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

4. Educate and train at all levels. New technology-enabled organizational relationships and workflows typically call for new mental and physical skills and thus new education and training. In addition to building needed skills, educational and training investments offer cost-effective ways to improve communication and build support for the new work methods and relationships. Too many IT initiatives ignore the leverage offered by education and training.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

5. Leverage and contribute to the infrastructure. Standardized data, processing, networks, and other elements of information infrastructure offer enormous efficiencies of scope and scale. Use existing and newly developed capabilities – for geographical data, XML standards, wireless networking, etc. – to open up powerful new opportunities for immediate benefits and further infrastructure extension.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

For projects high in conflict

6. Understand interests and perceptions. The key to negotiating cooperation is first to understand the interests and perceptions that shape the behavior of potential partners and opponents. Fully use one-on-one meetings and other sources of intelligence to build knowledge of what assists or constrains cooperation with your initiative. Don't get stuck thinking too narrowly about insiders or positions – take a view that includes outside stakeholders and broader interests.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

7. Make cooperation attractive. Successful cross-boundary initiatives must make cooperation more attractive than non-cooperation on a sustained basis. Fortunately, technology often offers substantial productivity and other benefits that can be distributed to gain cooperation from employees, clients, taxpayers, and other stakeholders. Win-win is often possible, especially as benefits grow over time through economies of scope and scale.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

8. Make non-cooperation unattractive. While those in positions of authority can often motivate cooperation through forceful leadership, it can be difficult to make non-cooperation unattractive within a partnership of equals. By sequencing to build coalitions and by other moves, however, both at and away from the negotiating table, leaders can often weaken the BATNAs of potential partners, thus improving the prospects for ongoing cooperation.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

9. Design proper feedback and controls. Well-coordinated cross-boundary work requires good balance: goals neither falsely precise nor too vague, neither too easy nor too difficult, with feedback both fulsome and frequent without becoming overwhelming or distracting. Information technology can greatly improve access to information collection and analysis. This, in turn, can greatly improve engagement, creativity, transparency, and accountability.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

For projects high in confusion and conflict

10. Balance risk against return. Although often worth it, high value “reengineering” is usually riskier than more conservative investments. Understand fully the costs and risks, working to minimize them through techniques such as modular implementation and portfolio management. But effective leadership and judgment should focus on the balance between risk and return, not just on risk. While discretion may be the better part of valor, there is often no return without risk.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

11. **Break a large goal into modular increments.** Beyond a certain scale, project risks may grow substantially faster than returns. A well-designed initiative should be big enough to prove the concept yet small enough to manage. Breaking a project into modular and quick-to-implement elements may dramatically reduce both confusion and conflict, producing visible results within 90 days. Take advantage of incremental implementation and balanced portfolios.

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

12. **Use a “slow trigger/fast bullet” for difficult initiatives.** Some initiatives are difficult even after all the “best practice” risk reduction strategies have been applied. In such cases it is essential to take time to understand the situation and thoroughly prepare for action (“slow trigger”) and then – if the expected returns are worth it – to move as quickly as possible toward visible and defensible results (“fast bullet”). Don’t let your troops get “stuck on the beach.”

	Low			High	
a) Involvement of your organization	1	2	3	4	5
b) Value if implemented	1	2	3	4	5
c) Confusion to overcome	1	2	3	4	5
d) Conflict to overcome	1	2	3	4	5
Comments/questions?					

At this point, please go back to review and possibly revise your answers. Look at the guidelines that scored highest in terms of “value,” and whether those represent a continuation or a change in your level of involvement. Look at the high value initiatives guidelines in terms of the confusion and conflict that must be overcome for implementation. Do the high value options look relatively easy or difficult? How confident are you of your priorities? What information might lead you to change your scores and shift your priorities?

XB PROJECT DESIGN DIAGNOSTIC WORKSHEET

May 13, 2003

Using the 5-pt. scale (1=low; 5=high), transfer your ratings of the guidelines to the table below:

INITIATIVE	INVOLVEMENT SCORE	VALUE SCORE	CONFUSION SCORE	CONFLICT SCORE
1. If it's valuable AND feasible, just do it.	_____	_____	_____	_____
2. Plan – for people as well as technology.	_____	_____	_____	_____
3. Communicate with and engage stakeholders.	_____	_____	_____	_____
4. Educate and train at all levels.	_____	_____	_____	_____
5. Leverage and contribute to the infrastructure.	_____	_____	_____	_____
6. Understand interests and perceptions.	_____	_____	_____	_____
7. Make cooperation attractive.	_____	_____	_____	_____
8. Make non-cooperation unattractive.	_____	_____	_____	_____
9. Design proper feedback and controls.	_____	_____	_____	_____
10. Balance risk against return.	_____	_____	_____	_____
11. Break a large goal into modular increments.	_____	_____	_____	_____
12. Use a “slow trigger/fast bullet” for difficult initiatives.	_____	_____	_____	_____

Who are you? (circle the most appropriate answer for each)

Jurisdiction: Federal | State | Local | Other

Primary responsibility: Technology | Other

Primary role: Operations | Oversight (Legislative or Executive)

Sector: Private | Public | Non-Profit

Experience with strategic IT issues: Most experienced half | Least experienced half
(compared with others at this program)

*Feel free to use this sheet as your “working version” of the survey;
then transfer your final answers from this sheet to the sheet that follows.*

XB PROJECT DESIGN DIAGNOSTIC WORKSHEET (VERSION TO HAND IN)

May 13, 2003

Using the 5-pt. scale (1=low; 5=high), transfer your ratings of the guidelines to the table below:

INITIATIVE	INVOLVEMENT SCORE	VALUE SCORE	CONFUSION SCORE	CONFLICT SCORE
1. If it's valuable AND feasible, just do it.	_____	_____	_____	_____
2. Plan – for people as well as technology.	_____	_____	_____	_____
3. Communicate with and engage stakeholders.	_____	_____	_____	_____
4. Educate and train at all levels.	_____	_____	_____	_____
5. Leverage and contribute to the infrastructure.	_____	_____	_____	_____
6. Understand interests and perceptions.	_____	_____	_____	_____
7. Make cooperation attractive.	_____	_____	_____	_____
8. Make non-cooperation unattractive.	_____	_____	_____	_____
9. Design proper feedback and controls.	_____	_____	_____	_____
10. Balance risk against return.	_____	_____	_____	_____
11. Break a large goal into modular increments.	_____	_____	_____	_____
12. Use a “slow trigger/fast bullet” for difficult initiatives.	_____	_____	_____	_____

Who are you? (circle the most appropriate answer for each)

Jurisdiction: Federal | State | Local | Other

Primary responsibility: Technology | Other

Primary role: Operations | Oversight (Legislative or Executive)

Sector: Private | Public | Non-Profit

Experience with strategic IT issues: Most experienced half | Least experienced half
(compared with others at this program)

Most important advice for others considering cross-boundary initiatives? (Please use other side of paper if necessary.)

Your name (optional): _____

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ENDNOTES

¹ The Center for Technology in Government defines collaboration as: “A reciprocal and voluntary agreement between two or more public sector agencies, or between public and private or nonprofit entities, to deliver government services.” Sharon Dawes and Lise Préfontaine, “Understanding new models of collaboration for delivering government services,” *Communications of the ACM* 46(2003) p. 40.

² There are many works on e-government, but two useful primers are: NECCC, *E-Government Strategic Planning*, (NECCC, 2000) and NECCC, *Enterprise Electronic Government: E2Gov* (NECCC, 2001). <http://www.ec3.org/Pubs/PubSymPapers.htm>. The GAO definition of e-government is: “Generally speaking, electronic government refers to the use of IT, particularly Web-based Internet applications, to enhance the access to and delivery of government information and service to citizens, to business partners, to employees, and among agencies at all levels of government. See 'Electronic Government: Success of the Office of Management and Budget's 25 Initiatives Depends on Effective Management and Oversight' which was released on March 13, 2003.

³ Compare this to Jane Fountain’s definition of the virtual state: “a government that is organized increasingly in terms of virtual agencies, cross-agency and public-private networks whose structure and capacity depend on the Internet and the web.” *Building the Virtual State: Information Technology and Institutional Change*. (Brooking Institution Press, 2001) p. 9.

⁴ Quoted at <http://www.utah.gov/aboututahgov.html>.

⁵ <http://www.utah.gov/osbrdemo/>

⁶ President George W. Bush, “The Importance of E-government,” 10 July 2002 http://www.whitehouse.gov/omb/egov/pres_memo.htm

⁷ Michael Hammer and James A. Champy, *Re-engineering the Corporation: A Manifesto for Business Revolution* (New York, 1993).

⁸ James A. Champy, *X-Engineering the Corporation: Reinventing Your Business in the Digital Age* (NY, 2002), p. 7-8.

⁹ President George W. Bush, “The Importance of E-government,” 10 July 2002 http://www.whitehouse.gov/omb/egov/pres_memo.htm

¹⁰ Office of Management and Budget, *Implementing the President’s Management Agenda for E-Government: E-Government Strategy*, (April, 2003) p. 3.

¹¹ The Federal government's E-Sign Act (Electronic Signatures in Global and National Commerce Act) says, in part, “(A) ACCURACY, RECORD INTEGRITY, ACCESSIBILITY- Notwithstanding paragraph (2)(C)(iii), a Federal regulatory agency or State regulatory agency may interpret section 101(d) to specify performance standards to assure accuracy, record integrity, and accessibility of records that are required to be retained. Such performance standards may be specified in a manner that imposes a requirement in violation of paragraph (2) (C) (iii) if the requirement (i) serves an important governmental objective; and (ii) is substantially related to the achievement of that objective. Nothing in this paragraph shall be construed to grant any Federal regulatory agency or State regulatory agency authority to require use of a particular type of software or hardware in order to comply with section 101(d).”

¹² For details on the topic of privacy and technology, see the special report “e-Governing: Online privacy,” *Governing* 16(2003) 29-46. <http://www.governing.com/articles/9egintro.htm>

¹³ U.S. Supreme Court, *U.S. Dept. Of Justice V. Reporters Committee*, 489 U.S. 749 (1989). For a recent discussion of the concept of practical obscurity, see Megan Santosus, “The dangers of efficiency,” *CIO* October 2002. http://www.cio.com/research/knowledge/edit/k103002_efficient.html

¹⁴ Office of the E-Envoy, *Our responsibilities*, <http://www.e-envoy.gov.uk/Home/Homepage/fs/en>

¹⁵ This has been cataloged as eight imperatives: “If you want to be a leader in our networked world, you need to engage IT issues. You need to play a role in establishing strategic direction, implementing specific projects and formulating new public policies. The following guidelines are designed to help you develop your action agenda. Each guideline is an imperative -- something you as a leader *must* do.”

Harvard Policy Group on Network-Enabled Services and Government, *Eight imperatives for leaders in a networked world*, (Cambridge, 2000) p. 6.

¹⁶ Ludwig Siegele, "Cold killer application," *The Economist* 8 May 2003 <http://www.economist.com>

¹⁷ Peter Weill and Richard Woodham, *Don't just lead, govern: implementing effective IT governance*, MIT Sloan School of Management Working Paper; 4237-02 CISR WP No. 326. <http://hdl.handle.net/1721.1/1846>

¹⁸ Champy, *X-Engineering*, p. 147.

¹⁹ A recent example is available from the Federal OMB, which released on 1 August 2003 a memorandum on *Implementation Guidance for the E-Government Act of 2002*, at <http://www.whitehouse.gov/omb/memoranda/m03-18.pdf>, which describes the various steps agencies should take to develop the infrastructure to implement e-government.

²⁰ Champy, *X-Engineering*, (p. 125)

²¹ John Seely Brown and Paul Duguid, *The Social Life of Information* (Cambridge, 2000).

²² Dawes and Préfontaine, p. 43.

²³ For GIS, see the web site of the Minnesota Land Management Information Center, *Standards for GIS Users*, <http://www.gis.state.mn.us/committee/stand/index.htm> For metadata resources and standards, see the web site of the Minnesota State Archives, at <http://www.mnhs.org/preserve/records/metadata.html>

²⁴ This is the major distinction between XML and electronic data interchange (EDI). The latter is a tried and true means of linking entities for such activities as e-commerce, but its potential is limited by the fact that it involves all partners buying and maintaining the same hardware and software, as well as standardizing their business rules and workflows.

²⁵ There are many sources for information on XML. XML.org is one. Another is the resource list and introduction available through the Minnesota State Archives' web site, at <http://www.mnhs.org/preserve/records/xml.html>.

²⁶ Public Record Office, *Electronic records*, <http://www.pro.gov.uk/recordsmanagement/erecords/default.htm>

²⁷ National Archives and Records Administration, *Records Management Initiatives*, http://www.archives.gov/records_management/initiatives/initiatives.html

²⁸ Full information on the project is available at www.it.ojp.gov/jxdm. One of the more developed implementations of the standard is Minnesota's CrimNet project, described at <http://www.crimnet.state.mn.us/>.

²⁹ Global Justice Information Sharing Initiative, *Justice XML Data Model*, CD edition, version 3.0. (June, 2003).

³⁰ This is one of the goals of the Federal E-Government Act. For details, see the OMB's *Implementation Guidance for the E-Government Act of 2002*, at <http://www.whitehouse.gov/omb/memoranda/m03-18.pdf>.

³¹ OMB, *E-Government Strategy*, p. 4.

³² Minnesota Office of Technology, *Enterprise Services: Architecture*, www.ot.state.mn.us/architecture

³³ Christopher Swope, "Common code," *Governing*, August 2003, p. 38. Former Pennsylvania CIO Charlie Gerhards added, "The way you optimize this thing is for everyone to have strict standards when they're developing applications and adhering to that."

³⁴ Dawes and Préfontaine, p. 43.

³⁵ Details are available at the OMB web site: <http://www.whitehouse.gov/omb/egov/>.

³⁶ Ted Leventhal, "OMB sketches business model for federal technology systems," *GovExec.com*, 15 July 2003. <http://www.govexec.com/dailyfed/0703/071503td.htm>

³⁷ NECCC can serve as a catalyst or as an honest broker, help to define the issues, making sure that the states and local government are involved in projects

and facilitating projects where the fed government can play an important role.

³⁸ See Minnesota State Archives, *Electronic and digital signatures*, at <http://www.mnhs.org/preserve/records/electronicrecords/ersigs.html>.

³⁹ Information on the Gateway is available at <http://www.cio.gov/eauthentication>.

⁴⁰ Champy, *X-Engineering*, p. 104

⁴¹ Walter Bogdanich, "Criminals focus on weak link in banking: A.T.M. network," *New York Times*, 3 August 2003. <http://www.nytimes.com/2003/08/03/national/03ATM.html>

⁴² Dick Stanley, "State unlikely to restore its online birth records," *Austin American-Statesman*, 11 November 2001. http://www.austin360.com/auto_docs/epaper/editions/sunday/metro_state_5.html

⁴³ See, for example, the web sites described at <http://www.publicus.net/articles/edemresources.html>.

⁴⁴ See NECCC, *21st Century Government: A Primer on Technology for Government Officials*, (2002), chapter 13, for more on managing information technology and government records.

⁴⁵ Robert MacMillan, "Federal E-Government Plan Faces a Budget Shortfall," *Washington Post*, 18 April 2003, p. E5. <http://www.washingtonpost.com/ac2/wp-dyn/A48122-2003Apr17>

⁴⁶ Mark Forman, "Expanded electronic government," *GovExec.com*, 30 May 2003. <http://www.govexec.com/gpra/0503pma4.htm>. Forman resigned from the OMB in August, to return to the private sector.

⁴⁷ See Indiana Code sections 5-14-3-3.5 and 3.6 for further details.

⁴⁸ Minnesota Office of Technology, *Enterprise Services: Architecture*, <http://www.ot.state.mn.us/architecture>.

⁴⁹ The OneStop Business Registration homepage is at: <http://www.business.utah.gov/registration>.

⁵⁰ Ellen Perlman, "The Anti-Silo Solution," *Governing*, January 2003. <http://www.governing.com/1it.htm>

⁵¹ The activities and products of the Minnesota ERERTF are fully documented at the project web site: <http://www.commissions.leg.state.mn.us/lcc/erertf.htm>

⁵² The Minnesota ERER Task Force defined recording as: "the act of entering deeds, mortgages, easements, and other written instruments that affect title to real property into the public record." It defined electronic record as: "A publicly owned and managed county system, defined by statewide standards, that does not require paper or 'wet' signatures, and under which real estate documents may be electronically: created, executed, and authenticated; delivered to and recorded with, as well as indexed, archived, and retrieved by, county recorders and registrars of title; and retrieved by anyone from both on- and off-site locations."

⁵³ For information on PRIA, see its web site at: <http://taskforce.cifnet.com/priaus/>.

⁵⁴ MISMO's web site is at: <http://www.mismo.org/>.

⁵⁵ The home page of the EOHHS is at <http://www.masscares.org>. The MassCares website is at <http://www.masscares.org/main.asp?page=masscares>.

⁵⁶ Microsoft Corporation, "Microsoft Case Studies: Executive Office of Health and Humans Services," 26 April 2002, <http://www.microsoft.com/resources.casestudies/casestudy.asp?casestudyid-11475>.

⁵⁷ *ibid.*, p.6.

⁵⁸ See the press release "HHS consolidations to save millions and improve services," 10 March 2003, online at <http://www.masscares.org/detail.asp?page=press&id=129>.