Electronic Commerce:

A Blueprint for States

A product of the National Electronic Commerce Coordinating Council in conjunction with the Center for Digital Government

CENTER FOR DIGITAL GOVERNMENT

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NECCC Contact:
Brandon Lenoir, Director
NECCC
nasactbl@sso.org
202/624-8461
http://ec3.org

The Working Party

P.K. Agarwal
Past Chair
NECCC, NASIRE
California

J.D. Williams
Chair
NECCC, NASACT
Idaho

Dugan Petty
NASPO
Oregon

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NASACT
Delaware

Basil Nikas
ITAA
Public Purchasing.Net

Albert Powell
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Ohio

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NASS - Ohio

Bill Kilmartin
NACHA -AMS

David Gragan
Oracle

Michelle Grisham
Cisco

Scott Howell, IBM
Utah

Janet Caldow
IBM

Katie Hirning
NPR

Tom Unruh
NGA

Bill Opet
PSINet

Helena Sims
NACHA

Claudia Boldman
NASIRE
Massachusetts

Dave Ancell
NASPO
Michigan

Dick Ross
NASPO
New York

Steve Allison
NASACT
Idaho

Steve Kolodney
NASIRE
Washington

Rick Webb
NASIRE
North Carolina

Brandon Lenoir
NASACT

Relmond Van Daniker
NASACT

Pat Lundeen
NASIRE
Oregon

Gregory Voukon
NASACT
Arizona

Whitney MacDougall
Intuit

Nancy Rainosek
NASACT
Texas

Jan Fatouros
NASPO
Virginia

Staff

Michelle Gamble-Risley
Center for Digital Government

Kara LaPierre
formerly with NECCC

Introduction

In the summer of 1999, the NECCC set out to answer the following question:

"What should I be doing today to ensure a successful transition to e-commerce?"

With the help of the Center for Digital Government, the NECCC conducted a one and a half day symposium to start developing this paper. The participants, listed on the previous page, included members of the NECCC and representatives from key research organizations and industry sectors. This document is designed to provide the states a basis for their electronic commerce planning for the year 2000 and beyond.

This exposure draft, reflecting the shared thinking of the participants and others in the government electronic commerce community, was presented at the NECCC Annual Conference in November 1999. Conference participants engaged in an exercise to evaluate the document, question its content, and help shape the final product. Comments on the document were accepted through November 22, 1999.

The current iteration, Version 1.0, published on December 1, 1999, is intended to be a living document that will provoke thought and discussion about major areas of policy, strategy and infrastructure. We welcome your comments on an ongoing basis.

Enterprise Administration

Leadership and Governance

Electronic commerce will revolutionize government by cutting across organizational boundaries and introducing self-service models for citizens. Implementation of electronic commerce can be a force for positive change. This is especially critical in a government where "stovepiping" often makes it difficult to access services.

This revolution in government can be accomplished by aggressively addressing issues of governance, organization and leadership together with a comprehensive plan for adopting electronic commerce solutions and utilizing technology to support business needs. States can use several approaches to address these issues.

An enterprise approach to governance maximizes efficiencies and creates a sense of empowerment in the implementation of new business processes. This governance model entails identifying and bringing together the community of stakeholders to establish enterprise-wide policies on issues such as privacy, security and infrastructure. This has to be done without quashing innovation or preventing adaptation at the program/application level. Models for this approach include the NECCC and the EBT Council.

Other successful models include technology councils, projects managed through a technology fund program, and legislative committees that fund and approve technology projects. Leadership and vision at the executive level are also elements of success. The vision of the governor or a Cabinet-level CIO is very influential.

These models all depend on leadership and buy-in from across government in order to achieve their goals. The legislature, treasurer, secretary of state, and other leaders must be part of the process. Engaging auditors to proactively address their concerns is another element of success.

Each state must determine the most appropriate model for its operations, and best practices in each model should be shared with other states of similar construction. Regardless of structure, the most critical factor for success is a clear direction communicated with both authority and responsibility. Responsibility for implementation should rest with an empowered leader, such as the CIO.

The input of constituents, including citizens and business interests, should be sought. While some strategies will be internal, most projects will be directed at an external user group and must have a customer focus. It is critical to identify not only the needs of constituents, but also their priorities. (Is online driver's licensing more important to citizens of the state than tax filing?)

Well-meaning staff who often continue to operate in their functional stovepipes can scuttle execution of the best plans. The mission and outcomes need to be communicated to that staff. Government must adopt a philosophy of change management that institutionalizes the vision and the structure needed to carry it out, but does not shackle the state to a rigid course.

Privacy

Privacy concerns must be addressed if government is going to persuade citizens and business to conduct electronic commerce transactions. There is an inherent mistrust of government, bolstered by incidents where government has abdicated its role in protecting individual privacy, which must be overcome. There are also important public policy issues to resolve. State governments need to revisit and, if necessary, revise their approach to privacy from two perspectives: as a sovereign entity and as a functional entity.

A set of fair information reporting practices should be established with important safeguard principles such as:

- acquiring informed consent at the point of collection;
- limiting collection to required elements;
- allowing subjects to view and correct information;
- obtaining consent for any additional use of information.

For an overview of internationally accepted principles on data privacy, see the OECD Guidelines (http://www.oecd.org//dsti/sti/it/secur/prod/PRIVEN.HTM), adopted in 1980.

In implementing these practices, government must balance the requirements of Freedom of Information and other operational statutes. As an entity, a state must commit to operational rules that conform to fair information reporting principles while defining appropriate use and access to information for both governmental and non-governmental purposes. Revision of current laws and practices may be necessary, and the public needs to be educated about what is or is not private. Citizens don't want surprises when it comes to how government is going to use information they provide.

An important first step is to post your government's privacy policy on all Web sites. This privacy policy may need to describe public record laws under the state, as well as privacy and confidentiality laws, to adequately inform citizens of their rights. Some states have already posted privacy policy notices that do this (see information at http://www.iowaccess.org/main/privacy.html).

The privacy policy cannot be arbitrary, and all Web sites and electronic government portals must carry the same statements and adhere to the standards set by the state. This requires government to monitor how information is being used and make sure it is in compliance with the laws and the standards it has set for itself. The states' auditors or external auditors could perform this monitoring. Some states sell data to marketers and other third parties. While the practice may be legal, some instances have caused legitimate public outcry. Should a state wish to engage in this practice, it must clearly spell out, at the point of data collection, the terms and conditions under which it will do so.

The use of intermediaries who manage the distribution of public data is another issue that raises many concerns. If a state uses an intermediary to automate the provision of data which the state itself already provides (i.e., driver data to insurance companies), the sale and use restrictions on the end users should be the same as if the state were providing the data directly. Similarly, the state should carefully manage, through its contractual agreements, the relationship with the intermediary itself, including creating an oversight function (a contract manager or steering committee, for example).

An additional concern arises from the use of technologies, specifically relational databases, that provide unintended multiple views into the same sets of data. This provides the power to "mine" information from different databases, allowing the end user to put together a mosaic of information that can be extremely revealing.

This aggregated information is a compelling concern that can be solved if agencies collaborate on applications that have built-in technology that unilaterally prohibits the end user from digging and fitting. There also has to be a statewide cooperation that certain information is always protected. For example, a particular data element such as a home address or phone number might always be blocked. This, however, should not preclude legitimate sale of public records by the states.

To maximize the effect of the above recommendations, government should also engage in a campaign of public education regarding privacy and citizen's rights. This would include the addition of notice and opt-out language to all information collection forms, whether paper or electronic formats.

Security

Security and trust in electronic communications are critical for wider acceptance of the Internet as a medium for transactions. A trustworthy infrastructure for conducting electronic transactions ensures authentication of the parties involved, message integrity, confidentiality, access control, and non-repudiation of transactions.

Trust is not just attained through technological solutions, but is established through relationships — contracts, operating rules and participation agreements. While the technologies for authenticating and securing electronic transactions have improved dramatically, there are lingering public trust issues that will only be allayed with time, experience and the creation of solid relationships.

For many government electronic transactions, existing contractual or other types of relationships may already exist that can be used as an underlying basis of trust. The "rules of engagement" underlying government electronic transactions must be clearly spelled out for all participants. Issues such as liabilities, responsibilities and rights must be clearly understood to enable trust. The terms underlying electronic transactions, especially those covering authentication and authorization of the parties, are best determined by those directly involved with the transaction rather than by third parties.

In implementing security solutions, governments should support open standards and choose commercially accepted technologies. This is the only way to ensure that the experience of citizens and businesses in conducting electronic transactions is not substantially different between the public and private sectors.

Governments should look at security for electronic transactions as being one part of a continuum of security concerns for their entire enterprise. An enterprise-wide security policy ensures that minimum standards are set at all pertinent levels: network, application and data. Individual government agencies can then develop more detailed security policies for their unique applications based on the enterprise-wide standards.

Governments should also consider network infrastructure approaches that provide central, secure services for public access through the Internet. Enterprise Network architectures that utilize internal and external firewalls to protect internal systems from unauthorized access from the external world are one example. This type of central service eliminates the duplication of effort and risk associated with individual agency firewall management in the absence of uniform standards. Likewise, all types of remote access to agency systems should be subject to uniform standards.

The level and type of security required for individual applications needs to be determined through an individual risk and cost/benefit analysis (for a good primer on the issues and options, see the Government Paperwork Elimination Act Procedures and Guidance document referenced in the bibliography). Some applications, which are low-sensitivity and low-risk, may require only PIN-based authentication. There also may be transactions that are very high-risk and only represent minimal return on investment (ROI) that may not be appropriate for conversion to electronic transactions. The cost of the technology solution may outweigh the value.

When determining the level of risk associated with particular transactions, it is helpful to consider questions such as the following:

- How is the transaction implemented now?
- Does it require a signature? If so, is that signature currently authenticated in any way?
- Is there a statute or regulation that requires privacy, confidentiality or individual identification?
- Is this an area where there has been litigation or disputes in the past?
- How much financial, legal or public relations/confidence exposure is there for the agency if there is a problem with this transaction?

Governments can foster trust in electronic transaction systems by sharing information with the public about efforts to promote security and specific security features. This trust can also be reinforced with regular audits. However, providing too much information about specific security implementations can also jeopardize those efforts by providing unscrupulous individuals with exactly the type of information they would need to circumvent security features. Therefore, a fine balance must be struck between public disclosures and effective security implementations.

Electronic Payments

Secure electronic payments are crucial to electronic commerce and electronic government. Government needs to explore the full range of electronic payment mechanisms for both inflows and outflows, including:

- Credit Cards
- EFT
- Micropayments
- Electronic Wallets
- E-Checks

The public is ready to conduct electronic payment transactions online. According to survey results found in "Electronic Commerce: How are Utah Businesses Doing?," over 50 percent of the 500 businesses polled said they were interested in filing and paying taxes online; 88 percent wanted to be able to renew their driver's licenses over the Internet; and two-thirds said they would be in favor of using the Internet to access these types of government services even if there was a small convenience fee associated with it. This kind of strong interest necessitates the resolution of those issues surrounding electronic payment.

In order to accept electronic payments, government has to re-engineer existing paper-based business transactions. In some cases, this will require updated statutes and policies that encourage electronic transactions. Laws must be in place to support new and emerging technologies, such as digital signature, electronic records management and electronic payment. A cost/benefit/risk analysis should be performed to help determine what applications to use for electronic payments. True transaction costs for current payment processing and for new transaction types need to be identified and benchmarked against. Governments face an additional challenge of integrating new payment methods into existing legacy systems and processes.

Credit cards are probably one of the most effective ways to conduct electronic payments over the Internet. However, credit card use is not free. There are bank fees and other associated transaction costs. Generally, there are no budgeted funds to cover these fees. While some governments pass the costs onto the consumer as a convenience fee, others do not or cannot. Who pays and how can also vary by agency and even by transaction within a state.

Another aspect of this dilemma is the government acceptance risk model. It is distinctly different from other merchant types and represents lower risk. The banking community must be better educated about the uniqueness of the public sector - which in turn would reduce fees.

These issues are treated in much greater detail in the NECCC's Electronic Payments Primer, available at http://ec3.org.

Technologies

Portals

Government portals are frequently defined as the state's "single face." This description is used for citizens, employees and the state's trading partners. In order to create this "single face," many states have begun migrating or completely re-engineering their state Web sites into service delivery mechanisms.

Two general models prevail: a state-funded approach that uses an appropriation of the state budget and a self-funded model. The self-funded model, which has been adopted by states such as Indiana and Utah, requires a contract that grants the portal provider the right to sell access in electronic form to certain salable groups of data (for example, drivers' license records). This model allows a vendor to accept the reasonable risk related to the portal; allows citizens to benefit by rapid creation of a vibrant electronic portal for a variety of services; and permits the government to have many free services on the Web. Some of the questions raised by this approach include:

- Are the salable data rights appropriately regulated?
- Are security and personal data privacy protected?
- What are the pros and cons of outsourcing the state portal?

Some states have taken a different approach. They have established an enterprise portal strategy, and then contracted separately for each component, including services, links to e-businesses, etc. Each service offered on the portal may have its own financial footprint, advertising revenue, convenience fee and documented cost savings that all contribute to an overall financial strategy. Leaders believe many companies would pay a convenience fee to save on the current cost of doing business in the paper-based world, and perhaps would want to advertise on a statewide portal as well.

Portals provide an opportunity to re-engineer government functions and, thus, create an order of magnitude for a new value to the constituents (as opposed to creation of limited value by merely creating an online service version). This order of magnitude can be achieved by exercising sufficient care in the portal design. A functional portal design should include customer segmentation and be customer centric.

Customer segmentation could be achieved by subdividing a portal into subportals for citizens, vendors, small businesses, and other businesses. Additional portal segmentation possibilities would be for tourists and businesses considering relocation to the jurisdiction. Second, the subportals should be designed to be customer centric and use mass-customization techniques to deliver on the promise of huge value creation.

For instance, a customer-centric view of the citizen subportal could focus on topics such as "my car," "my health," "my education," etc. This would be done instead of taking an agency-specific view. An inquiry into any of these topics will aggregate all available information in government about that subject as it pertains to that individual. For example, a citizen using the "my car" area of the portal could see the following information upon entry of the driver's license number:

- online car registration
- number of tickets in the last three years
- real-time status via pager or cell phone of roadways involved in the commute
- information on car insurance company
- recall notices on my car, etc.

Such a customer-centric design creates high value, but requires a unified and coordinated view of the data collected by multiple agencies.

Applications

With an electronic commerce/government framework in place, governments have the opportunity to develop electronic government applications on a standards-based infrastructure. This means that Web-based applications can be more quickly implemented, with less user training, while providing greater efficiencies. Given the thousands of government applications currently in use today, there is an unsurpassed opportunity to consolidate, streamline and re-engineer applications to provide better services for constituents and businesses, while fostering interoperability.

Because there are so many different applications that government agencies require to function, it is often useful to think of applications in terms of the constituencies that they serve. Consider the applications that you need to serve:

- citizens
- businesses
- employees
- suppliers

Top electronic government applications today include Vehicle Registration renewal, One-Stop Permits, On-Line Health Benefits, and Internet Procurement to name just a few. The NECCC Electronic Commerce Transactions committee recently surveyed the states and has documented examples of innovative electronic government applications (see results at http://ec3.org).

Government agencies can expect similar payback in making other applications available on the Web so that citizens can "serve themselves." The self-service model works and has been applied to other government services, like paying parking fine payments in Indianapolis at http://www.indygov.org, electronically filing taxes in Kansas at http://www.state.ks.us, and job searching and career support in Washington at http://www.state.wa.us. Other innovative applications include Indiana's child care provider solution which allows you to locate state licensed child care facilities based on parameters like the child's age, county of residence or employment, etc.

For businesses, some of the top applications include: one-stop permits, being explored in Pennsylvania; online legal reference, as provided by the Oklahoma Supreme Court on www.oscnet.net; online real estate license renewals, as in Maryland at www.state.md.us; and Web-based tax filing, as evidenced by Washington's Electronic Tax Filing at www.state.wa.us. In California the Secretary of State has streamlined the business registration process by allowing owners to search the state's business registry databases directly, avoiding a long wait on the telephone or an unnecessary trip to another government office (see www.ss.ca.gov).

An area where there has been less emphasis is how electronic government applications can improve the internal operations of a government agency. By leveraging a standards-based infrastructure and browser-based tools, government agencies can streamline their internal processes and applications, enabling employees to use self-service tools as well. A good example is online benefits management that allows employees to enroll in health plans, access provider directories, and answer typical insurance questions online. There are myriad other possibilities: online travel and expense reporting, Web-based employee directories, time keeping and vacation requests, and many others.

Remember the relationships that your jurisdiction already has in place with third parties, like engineering and construction firms, non-profit organizations such as community-based health and social services providers, local governments, and financial institutions. You may be able to streamline communication and improve collaboration with these types of partners by leveraging the Web. For example, New York State is currently developing a statewide Human Services extranet involving both governmental and non-governmental entities involved in health and welfare. Similar applications could benefit other government functions.

Prioritizing the applications to develop and implement can be difficult. One strategy is to focus on transactions under a certain cost/value. Another is to target applications which will maximize internal efficiencies. Whichever strategy a state picks, it is important to appropriately implement and market applications as part of a consistent, overall plan.

Infrastructure

The Internet is the highway of electronic commerce. Most users access the Internet via dial-up connections that use an infrastructure that was designed to switch voice traffic, not data traffic. Although portions of that infrastructure permit high-speed transmission rates, networks still need to be upgraded to prevent bottlenecks. This is especially critical given the fact that 26.2 percent of U.S. households now have Internet access, and a tremendous growth curve is anticipated. States need to plan now for improved infrastructure to successfully implement electronic commerce.

Government must examine the current telecommunications infrastructure, both how it provides high-speed digital access and if it ensures user accessibility for undeserved areas (see Policy section, "Electronic Access," for more on this topic). It should also explore the utilization of infrastructures for cable, broadcast and wireless services, which may be key to making government accessible to all areas.

As more and more users go online, bandwidth is going to become a critical issue. Even when sufficient bandwidth is available on backbone transport systems, signals can become congested over lower-capacity network connections that attach to the user's access device. This problem is exacerbated by the increased bandwidth needs of high-end, data-intensive technologies like distance learning, streaming video and multimedia applications.

One way to examine the problem is on a mass radical scale, where planners anticipate what kind of audience they want to be able to connect to that bandwidth and anticipate traffic. Planners estimate demand by doing outreach with their local communities to assess their needs and manage implementation so that bandwidth is available.

States have taken different approaches to ensure sufficient infrastructure. Consolidating networks to create one universal network available to all facets of government and/or making state networks available to provide high-speed digital access for communities are two strategies. Some governments have built their own networks, which telecommunications companies then lease - or vice versa. Each approach has its own strengths and weaknesses which states must evaluate in light of local priorities.

Infrastructure costs must be viewed as a long-term investment - one that may not see a return on the money for a number of years, or ever. Cost savings may not be realized in tangible dollars and cents but in quality and speed of delivery.

Standards

The transition to electronic government will expose the inconsistencies that currently exist among agencies' standards if certain planning and protocols aren't adhered to. Consistent standards are important in order to ensure interoperability, compatibility and shared usage of electronic commerce resources. Consensus building also provides direction for the creation of standards on which the remainder of the electronic highway can be built.

Common standards cannot be developed in a vacuum. Agencies must unite and work as a team to develop electronic commerce standards together. This organized effort will put a "single face" to online government and help ensure that practices are consistent and not in conflict with private sector electronic commerce efforts. An electronic commerce council, such as those described in the "Leadership & Governance" section, could provide a mechanism to select standards and deal with inconsistency. Many states - like Arizona, North Carolina, Utah, Washington, and others - already have CIO councils or commissions that handle IT policy-related issues.

Standards evolve constantly, and the public sector needs to deal with the rapid pace set by the private sector. Government must keep its internal standards compatible with external industry standards. This is especially critical in the procurement arena where government conducts business with the private sector on a peer basis. For example, by using open standards such as Open Buying on the Internet (OBI), the multi-state Emall sponsored by Massachusetts enabled vendors to reuse their existing catalog investments instead of imposing a different catalog approach to conduct business with government. This issue will gain increasing importance as more and more cooperative purchasing arrangements are developed, such as the Louisiana Emall project, a cooperative electronic commerce project slated for debut in mid-2000.

With electronic mall-type projects well under way, many states are already resolving compatibility issues; however, these solutions do not reach across 50 state borders. The public and private sectors need to cooperate with each other to help build unified standards. One suggestion is for the private sector to focus on development tools, while the public sector focuses on infrastructure standards for things like networks and telecommunications.

Another idea is for the federal government and a national association like the NECCC to lead the way in establishing government EDI, OBI, XML and other standards, which would make it possible for all levels of government to interact electronically with each other and with the private sector. This means more cooperative purchasing ventures, more revenues saved by leveraging quantity purchases, etc.

Standards are needed at many levels to achieve a high degree of synergy and effectiveness. For instance, many governmental agencies are moving toward IP as their network standard. An IP standard for networks is not only an open standard but also reduces complexity and cost. As governments move toward the portal concept, there is a critical need for standards for e-commerce application development. These application standards allow for better application development, uniform look and feel, improved security, better site navigation, more sophisticated search capabilities, and improved performance.

Another worthy proposal by NECCC is to standardize the interfaces for low-risk processes and publish the application programming interfaces. This approach may unleash the creative potential of non-governmental entities in creating new applications or integrating government data in other applications to create new value. The area of security is another major area for electronic commerce standards enterprise standards. Security is critical as more and more serious applications are coming online, thus, creating security and privacy risks. As servers get dispersed, network security is only as good as the weakest link.

As discussed earlier, creation of healthy standards require effective governance mechanisms that promote collaboration and cooperation. The standard-setting bodies must align themselves with the enterprise electronic commerce vision and be prepared for constant change.

Management

Funding

Funding electronic commerce initiatives presents a significant challenge. Since it can be difficult to get funds approved for any new project, government executives need to devise innovative approaches to get these projects funded and launched.

An emerging trend for funding of new initiatives is the idea of partnering with private companies who pay for start-up or other aspects of the project, such as installation, operation and maintenance of the system. Costs are then recovered through user or transaction fees. This alleviates the general burden to taxpayers by applying a fee for service to the specific users, or by distributing the cost to government on a usage basis.

The development of partnered transaction-based fee-for-service systems may require different procurement and contract management strategies. This approach also may shift the liability from the state to the supplier, therefore requiring significant commitment and a high level of trust by both parties. One way to get suppliers to understand how the situation can be to their advantage is to conduct a pre-bid seminar before an RFP is released. Procurement specialists can sit down with a group of suppliers and show them how the equation works out in their best interest.

Fee-based services need to be carefully considered: Who is the customer - a citizen or a business? What is the value added to the service in the online environment? Is it a license or some other form of permission that the user is required to pay a price for? Should there be an additional fee for getting the good or service in person once an electronic means of doing business has been established?

Another funding method is an innovation fund. The states of Massachusetts, Maryland and Louisiana have developed different versions of this mechanism. In this model the state sets aside money, often earmarked from specific taxes or fine pools, and agencies submit proposals for the available money. The funding is often limited in dollars and resembles a grant in that it tends to be sharply restricted in usage.

An innovation fund typically covers the expensive start-up costs of a new initiative, but does not cover ongoing maintenance and upgrades. Agencies can reinvest cost savings generated by automating their process back into the system to fund its ongoing costs, or may need to seek appropriations for it. The function of the innovation fund is to give agencies an opportunity to demonstrate feasibility of a new program or application. An innovation fund is a very effective and appropriate device for pilot projects. Once a project is functional, it is much easier to keep it going.

Another approach is to aggregate funding requirements either across agencies or across several projects. Presenting a single case to the legislature as part of a strategic initiative to move government online or create a single portal may be effective. This may be done through an operating or a capital budget, or may become the subject of a bond sale.

All funding requests should answer the question, "What is the 'value added' by the new solution?" Whether that 'value added' is a cost savings, a positive return on investment or better service to citizens, these advantages should be highlighted when developing strategic plans for electronic commerce. These plans should provide a framework for a development and implementation cycle and should stipulate the end result or value added. Additionally, requests should be framed to answer the legislative body and/or governor's priorities, such as improved citizen services. Decision makers are more likely to support a project that is a clear win for the taxpayers.

Finally, electronic commerce projects — especially those with high start-up costs — may lend themselves to collaboration both within agencies and across the states. Seek opportunities to cut down stovepipes when implementing new systems.

Marketing

Marketing and public relations are integral parts of successful government electronic commerce initiatives. Government must promote electronic commerce through marketing efforts to reach both internal and external audiences.

Marketing efforts should focus on creating brand awareness of the online presence. Using traditional media methods and outlets to create the right image for this new delivery channel can accomplish this kind of "branding." One branding strategy is to use an advertising agency, such as those employed by many states for lottery advertising. The customer would learn to identify a particular slogan or message with electronic commerce activities.

Many states find that a good focus for their electronic commerce vision is to establish "one face of government," most often through the development of a portal. Portals are treated in more detail in the "Technologies" section of this paper.

Another important strategy is for agencies across the enterprise to present a unified front. All collateral materials sent to "traditional" customers should stipulate the source and location of the alternative electronic commerce way of doing business. For example, on a tax form there should be instructions and the same should be included on an automobile registration renewal form. The state of Pennsylvania has gone so far as to print its Web address on license plates.

Agencies should encourage front-line employees to promote to customers to go online next time they wish to transact business. Community outreach programs, including seminars, educational programs and speakers' bureaus, offer other potential channels to reach the public.

Marketing must not be viewed only as a "message to the citizen." An internal marketing campaign should be structured for the government employee. If employees are not convinced that electronic government is good for the citizen, and is also a dynamic, easy-to-use tool that will make his or her job easier and more productive, then the whole program both internally and externally will lack the motivation to make it a success.

Some states market electronic commerce services through a single electronic commerce service center that does outreach to targeted groups. Private industry that wants to conduct electronic business would be one group; private citizens who want to do things like file taxes online would be another group; and agencies that are implementing and using the systems would be the other. The service center would package the message, act as a hub to distribute media releases to the targeted markets and field media inquiries.

No matter what marketing methods employed, users must perceive online government services as easy to use, efficient and effective. States that want to attract both businesses and citizens alike to use electronic commerce systems will have to make these applications friendly to users who may have limited experience. If citizen or business customers of government go online to file their taxes and find that it is harder or more onerous than the paper-based process, they simply will not utilize the service.

Furthermore, such a negative experience may taint other online services in the mind of that customer who may hesitate or completely avoid another example of e-government. Although every effort should be made to ensure a successful service, contingency marketing plans should at least be drafted for immediate implementation in the event of negative incidents.

Personnel & Training

Electronic Commerce initiatives require staff to be trained in a number of areas.

Because electronic commerce changes the whole approach to service delivery, personnel involved in delivering customer services via traditional (in-person, paper-based) methods need to be oriented to options and capabilities of electronic commerce service delivery. Using these methods, staff can then be encouraged to think in innovative ways about process and service delivery redesign. In addition, customer service and change management training for customer service personnel can help them tactfully guide traditional users to new service delivery methods.

Technical staff also requires training in new technologies. Unique issues affecting technical staff involved with electronic commerce technical training include:

- Short lifecycle of technology: Today, a particular technology skill set may have a shorter useful life than in the past. Does this suggest alternative approaches to training, such as more on-the-job and/or applied training, rather than seminars?
- Variety of technologies: Because of the dynamic nature of the products and technologies surrounding electronic commerce, management must make strategic decisions regarding technology training. Should jurisdictions hedge their bets by training personnel on two to three solutions that may solve the same business problem, such as document management? Or should jurisdictions invest primarily in one technology, despite lack of market dominance or general acceptance of this technology?

Depending on how personnel resources are brought to electronic commerce initiatives (outsourcing vs. in-house staffing), there may also be a need for specialized training in management functions such as project management and managing an outsourced function.

Outsourcing presents a viable alternative for some functions. The traditional "outsource vs. not" analysis asks for a cost justification for outsourcing. Outsourcing for electronic commerce services may not prove cost justifiable, but this single consideration may not be the primary driving factor. Practical considerations, such as being able to identify and hire electronic commerce qualified staff,

may be of overriding importance when considering whether to outsource or not. Strategic considerations, such as needing personnel resources exposed to a wide diversity of solutions, and the very latest technologies may take precedence over cost justification considerations when deciding whether to outsource or not.

Given the unique and varied resources required to develop and implement electronic commerce solutions, certain roles may be outsourced, while certain roles may be retained on staff. As opposed to project management and implementation/rollout responsibilities, the technical development roles may be the ones most likely to be outsourced.

When outsourcing, it's very important that contractors don't fully own the IT function that has been outsourced to them. Knowledge must be transferred to IT managers, because at some point the function may be pulled back in house. This means coaches should be hired on a project team and liaison between the consultant and IT managers to make sure knowledge is passed back and forth, and managers are fully trained and possess up-to-date information about the system. This knowledge transfer should be spelled out in contracts.

Outsourcing considerations will also drive considerations surrounding training and retention. Programs to develop detailed technical electronic commerce skills can be de-emphasized or discontinued if this role will be outsourced. Recruitment and retention strategies can be oriented only to those employee groups then that will be hired as permanent staff.

As attractive as outsourcing personnel sounds, it doesn't solve the long-term problems of recruitment, retention, and especially compensation. Traditionally, government has not compensated its technical professionals as well as the private sector. Some proposed solutions include a salary pool that comes from cost savings generated by a project. Also, completion bonuses for personnel who complete a job on time and within budget offer a viable compensation method.

Unions play a critical role in any salary negotiation process. IT managers cannot forget to include them in any process -- whether it's to create a salary pool or to develop an outsourcing arrangement. Leaving unions out of the process will only lead to potential failure of any innovative compensation plans. It's important to engage unions in the change process. This can be done at the enterprise level by defining the rules for what is called "managed competition."

And remember, not everything is about pay. Many workers find quality-of-life issues at the top of their lists of priorities. So, if you're an IT manager who works in an IT department in the gorgeous, lush forests of New England or the golden valleys of Idaho, highlight these aspects when recruiting new hires. Place ads in big metropolitan newspapers like the LA Times and highlight the quality of life. Workers who wish to get away from the hectic pace of Los Angeles city living will see living in attractive, rural areas like Idaho or Montana as a desirable change.

Policy

Electronic Access

Important topics that government must address to assure widespread, equal access to electronic government services and all that the Internet has to offer include:

- ability to access government agencies electronically through portals and other means
- reasonable accommodations to meet the standards of the Americans with Disabilities Act
- sufficient bandwidth and appropriate infrastructure for access regardless of geographic area
- a plan to provide access to those without the economic ability to pay for it

As states embrace new electronic means of providing service to their citizens and other interested parties around the world, they quickly become aware of these critical access issues. As portals and bandwidth issues are treated in more depth elsewhere in this paper, this section will focus on access provision to special constituencies.

States with ethnically diverse populations may be confronted with the need to provide multilingual sites. This creates both financial and, potentially, human resource demands that should be contemplated during the planning and implementation phases of all electronic commerce projects.

Similarly, Web-based services need to assure access to the visually and hearing impaired, at a minimum, to meet ADA requirements. Additional issues arise when contemplating the needs of the mobility impaired, who may desire accessing services through government-provided hardware. When a state creates its electronic commerce plan and supporting policies, it should recognize these needs and build appropriate funding for compliance into projects as they are carried out.

The "Digital Divide" is a phrase that has been coined to describe the chasm between the Web-savvy and fully enabled user, desiring to do business electronically, and the Web-disconnected majority. Estimates vary, but currently around 26.2 percent of the American population is believed to have access to the Internet in the home. Although this number is rising steadily, there is a huge group of citizens without access or any real knowledge of the tools required to use the Web as a medium for conducting affairs. If steps are not taken to address this problem, many rural communities and individuals from poor socioeconomic backgrounds will be left behind.

The causes and symptoms of this lack of access are often the same: lack of Web-access hardware and software and therefore a lack of general knowledge regarding use of the Internet; geographic access limitations in rural communities; and costs. Just a few of the myriad costs associated with access include telecommunications taxes, infrastructure expenses, and the direct cost of hardware, software and Internet access.

Some solutions to providing access include deployment of networked computers to schools and public libraries; creating computing centers in public housing and at social services delivery points; and extending state-managed telecommunications networks into underserved communities.

As government strives toward electronic service delivery, it must take strong action to ensure that no communities of interest are left behind. The issues presented above hint at what states must address to begin bridging this Digital Divide.

Economic Development

The digital economy demands innovative new economic development strategies. A public policy environment conducive to electronic commerce is key to economic growth. The legal and policy environments established in a state create the foundation for competitive advantage in a digital economy.

Making it easier to do day-to-day business in the state or launch new businesses is also a competitive advantage in today's fast-paced marketplace. This is particularly true for e-businesses where three months equals one Web year. When a private business can do everything online, from obtain permits to renew licenses; the government is considered business friendly. Governments that don't implement these programs run the risk of not keeping or attracting business to the state. The question then becomes, "Why deal with a government that still conducts business in a 20th century way?"

The Internet allows local companies to sell goods and services both locally and globally. This means local businesses are competing with other companies in a whole new marketplace. Traditional brick and mortar companies going online ('Clicks and Morter') mean the difference between survival and demise in a digital economy. Leading-edge governments facilitate the transformation of traditional businesses to e-businesses through a variety of ways — grants, outreach, community programs to start or host e-business Web sites, education, and partnerships with associations or chambers of commerce. Facilitating networks or communities of interest, where Internet entrepreneurs with innovative e-business start-up ideas can connect with venture capital sources are also critical.

Once online, governments can help leverage e-businesses within their jurisdictions. According to a report released by the Institute for Electronic Government, "The Quest for Electronic Government: A Defining Vision,"— "In an economic shift to e-business, small and medium businesses are losing customers to heavily advertised Internet brands. Consider the scenario of a resident who remembers his mother's birthday and wants to send flowers or purchase a gift over the Internet. Search engines are still primitive and frustrating. Chances are the local resident will take the path of least resistance and go directly to a known Internet brand instead of searching for local online businesses."

A robust government portal that attracts citizens and other businesses in order to conduct convenient online services can also introduce easy access to local e-business resources. One idea is to develop a directory of local online businesses on the portal.

Still other ideas include developing a state business search engine that includes only local URLs. For example, when a business goes to obtain a license of any kind there could be a section to fill in its URL. This information would go directly into the search engine. The yellow pages or search engine can be included right on the state portal for the citizen/consumer to see immediately upon reaching the site. Make it easier for companies to research relocation in your jurisdiction. Those governments that leverage economic development data on their portal so that prospective companies can research warehouse square footage, rental rates, profiles of the workforce, proximity to airports, taxes, incentives, etc., will have the competitive advantage of speed and convenience in courting companies considering relocation.

Another idea is to use banner advertising. There are, however, complex policy issues that arise when accepting such advertising, such as speech and appropriateness considerations. Should ads for tobacco be accepted? What about those for religious groups or messages? These policies must be carefully considered by the portal's oversight body.

Somewhat beyond the scope of this paper, but integral to economic development is producing and attracting knowledge-workers to the workforce. Deciding factors include: incentives to keep university graduates in the state, attracting high-tech workers drawn by virtue of a robust e-business environment, education reform, good schools, state-of-the-art hospitals, safe streets, etc. All the traditional economic development assets benefit from the continued infusion of high technology. Knowledge-workers are looking for places to live and raise families where the social conditions are improved by technology whether it's in the squad car, in the fourth grade classroom, or in the shock-trauma unit at the local hospital.

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202/624-8461

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100 Blue Ravine Folsom, CA 95630 Tel: 916.363.5000 www.centerdigitalgov.com