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E-Government

For the Congressional Internet Caucus
Advisory Committee - E-Government Task Force

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Introduction

For almost three decades, SAP has helped government agencies run more effectively, quickly, and efficiently by electrifying their business processes. Now, SAP has introduced the only complete solution for doing business over the Web to help government move at Internet speed. Combining the powerful capabilities of SAP's business applications with standard Internet technologies, mySAP.com empowers citizens, employees, customers, and the partners of government agencies.

mySAP.com, which was introduced in September 1999, is a comprehensive, open, e-business environment composed of portals, industry-specific enterprise applications, Internet applications, information, services, and XML-based technology that enables government agencies to participate in the Internet economy.

mySAP.com enables business collaboration scenarios that range from high-performance application software to virtual marketplaces. These scenarios cover electronic commerce, customer relationship management, business intelligence, supply chain management, human resources, logistics, manufacturing, financials, knowledge management, industry-specific templates, virtual training classes, and professional services provided by SAP and its partners.

Background and History of the E-Government Market

SAP has a proven track record for providing interenterprise software and a proven solution for cost-conscious state and local governments and federal agencies. SAP government customers have achieved a 20% to 40% return on their investment after implementing SAP solutions. SAP has adopted open standards for Web accessibility, application connectivity, Web-based document exchange, cataloging functions, and marketplaces. The solution offered by SAP Public Services – mySAP Public Sector provides all the prerequisites to reform and modernize government agencies, including:

- Integrated processes for fast, productive, and tightly organized management
- High-quality business systems for service-oriented administration and cost management
- The availability of information vital to decision making, which provides precise planning and controlling of resources and costs
- The integration of advanced technologies to develop forward-thinking and user-friendly services

Transforming Government

Using the Internet, government agencies can change the way they deal with citizens. The Internet empowers citizens, who are viewed as stakeholders in their government, to make decisions as owners of government. Using the Internet, routine government services are available 24 hours a day, 7 days a week, and their easy accessibility enables citizens to do online what in the past required standing in line.

mySAP.com delivers the opportunities of e-government. mySAP.com also delivers all of SAP's assets to government agencies – our extensive product portfolio, customer base, partner community, and expertise in integrating business processes.

mySAP.com: The Complete E-Government Solution

mySAP.com integrates all the systems used by government agencies into a Web portal. It acts as a single point of entry so everyone who accesses e-government services sees the same view of those applications and services no matter where they physically reside. With this common citizen interface, government agencies can streamline access and services to all constituents who have Internet access and a Web browser.

mySAP.com provides personalized, collaborative solutions on demand. It integrates SAP solutions, of course, but it also extends beyond the boundaries of SAP to integrate the content, services, and software from other companies and legacy systems. Figure 1 shows the mySAP.com solutions that are part of the total SAP e-government solution.

SAP Cross-Industry Solutions and mySAP Public Sector

The mySAP.com e-government business platform contains both cross-industry solutions and mySAP Public Sector solutions. The following sections provide brief descriptions of the cross-industry and mySAP Public Sector solutions that are most relevant to the mySAP.com e-government platform:

E-Government Cross-Industry Solutions

mySAP Supply Chain Management

mySAP Supply Chain Management (mySAP SCM) maximizes e-business processes across an extended supply chain and provides powerful features and tools for collaboration, network design, transportation planning, vehicle scheduling, feature-based forecasting, and planning. For example, with mySAP SCM's network design features, government agencies can model, design, and redesign their supply chains with their major suppliers until every element and every link in the chain fits the organization's e-business goals.

mySAP Product Life-Cycle Management

mySAP Product Life-Cycle Management delivers engineering and project collaboration features that draw geographically dispersed and diverse teams over the Web. This type of real-time collaboration improves process designs and helps government agencies deliver services to citizens at an accelerated rate.

mySAP E-Procurement

mySAP E-Procurement enables open, full-cycle, interenterprise procurement from the desktops of government employees, resulting in dramatic cost reductions and much improved vendor management. According to a recent study by Grainger Consulting, SAP e-procurement solutions provide significant value. In maintenance, repair, and operations, SAP e-procurement solutions reduced process costs by 32%, inventory costs by 25%, and materials costs by 5%.

SAP e-procurement solutions handle the three e-government scenarios: government-to-consumer, government-to-government, and government-to-business. For instance, the government-to-consumer scenario provides a direct connection to citizens who want to buy surplus equipment.

mySAP Business Intelligence

There is a large and growing need for analytic capabilities for new e-commerce applications. mySAP Business Intelligence (mySAP BI) combines data warehousing and analytical tools to extract, analyze, and report on information in SAP, non-SAP, legacy, and external systems. It speeds the decision-making processing using up-to-the-minute transaction information. It also provides advanced Web reporting and the ability to drill down from summary information to greater levels of detail.

SAP Knowledge Warehouse

SAP Knowledge Warehouse delivers Web-based functions that enable users to author and edit text using a Web browser. It provides preconfigured models for training and curriculum documents and information structures. Other tools include SAP iTutor, which creates interactive Web-based distance learning tutorials.

SAP Strategic Enterprise Management

SAP Strategic Enterprise Management (SAP SEM) is a tool that makes strategy a continuous task in the day-to-day business of a government agency. It enables senior managers to communicate with all

stakeholders in real time, translate strategies into action faster, and assess and enhance organizational value. Some of the features of SAP SEM include:

- Integration of key components with mySAP Business Intelligence
- Balanced Scorecard function
- A catalog to define, categorize, and map to data stored in mySAP Business Intelligence using key performance measures
- Financial planning
- An activity-based management tool set
- Multicube planning
- Web GUI access to consolidation functions and consolidated financial reports
- Automated data collection

SAP Records Management

SAP Records Management is specifically designed to administer records generated by government agencies. It integrates all records areas within government agencies, ranging from simple business processes to specific technical procedures.

Based on cutting-edge information technology, SAP Records Management enables government agencies to manage documents and records on paper and in electronic form. When tied to SAP Business Workflow, SAP's workflow component, SAP Records Management constitutes a complete workflow management system that can map both predefined and ad hoc process flows.

mySAP Financials

mySAP Financials includes financial solutions for intraenterprise and interenterprise Internet business activities, including 17 user roles, comprehensive integration with and support of marketplaces and other business-to-business processes, and automatic transfer of payment advice notes.

mySAP Human Resources

mySAP Human Resources (mySAP HR) handles everything from basic payroll and benefits to leading-edge personnel development and compensation programs. It uses employee portals, interactive voice technology, and workflow to accelerate and enhance business processes, and it includes Internet and intranet links to give government organizations access to a global marketplace. The solution's self-service applications empower employees and managers to handle common HR tasks, freeing HR personnel to focus on strategic activities. mySAP.com HR comes with preconfigured functions for 15 different user roles.

The mySAP.com Architecture

IT architectures in the Internet age have to be extremely scalable, yet deliver a reliable, high-performance backbone. An architecture like this can only be developed using clearly separated architectural layers that deal with Web-based user interaction, business application logic, and database management. Each layer must be open and flexible to deliver on Internet business goals.

Every day users have to access multiple systems using multiple different interfaces – but not with mySAP.com. mySAP Workplace provides a personalized, role-based interface that acts as a single point of entry to all the applications, information, and services government workers need to do their jobs. This visual integration layer builds upon application components that provide the functions necessary to operate a government agency. To ensure a seamless flow of information, application components need to be tightly integrated to unleash the ultimate power of the Internet: customers, employees, suppliers, and business partners working together as if they were one entity. With mySAP.com, which is built on SAP's Internet Business Framework, SAP delivers an open solution architecture.

mySAP.com for Government

The mySAP.com e-government solution can be accessed from numerous different sources, and it meets or exceeds all recommended federal, state, and local government security standards for accessibility and data transfer. As Figure 4 shows, mySAP.com's open architecture allows the IT department to change and add technology step-by-step so government agencies can capitalize on their existing investments.

Citizens may access the e-government portal by using their own PCs, public computers in libraries, or touch-screen kiosks. The mySAP.com e-government solution also supports mobile devices like Palm Pilots and Pocket PC devices so citizens can access it from anywhere. The SAP e-government solution even handles voice recognition and telephone entry so constituents don't even need a computer to use it. In short, you can access SAP's e-government solution in just about every way imaginable.

mySAP.com Workplace provides role-based access to information and applications so that citizens, government employees, and business all see what is appropriate for them. This role-based approach makes the experience extremely user friendly, and it simplifies system administration because only the roles need to be maintained, not individual profiles.

mySAP.com meets the highest security standards set by government for all data entered or transferred over the Internet. It fully supports SSL, digital certificates, and public key infrastructure (PKI).

Extensible markup language (XML) is the standard Internet protocol for data exchange. The open interfaces of mySAP.com fully support XML so the solution can communicate with virtually any computer system. That means documents in a government-to-business transaction can be exchanged easily with businesses and other government agencies no matter what system they use.

E-Government Framework

SAP's framework for e-government supports the entire spectrum of services from Internet portals for citizens and government employees to enterprise resource planning (ERP) system integration. It offers a variety of configured solutions, such simple, unintegrated forms or intelligent forms that include data from a business partner.

The basic components of the framework include:

- Internet Service Request, which includes intelligent forms connected to a knowledge repository to interact with citizen requests
- Integration with mySAP.com backbone systems for financial management, purchasing, sales, facilities and work management, human resources, real estate, and so on
- Internet accounts for citizens and business, which provide master account information about private or business use of government services
- Interaction with citizens and businesses via mySAP Customer Relationship Management (mySAP CRM), which handles Internet applications and call center functions
- Web-based workflow tools for approvals and a connection to other departments
- Electronic records management, to archive, access, and manage government records electronically

This flexible architecture covers a variety of scenarios for communicating with citizens, businesses, and other government agencies. SAP also offers many generic functions and services in the external portal services for government. The solution evolves with each standardized service and can connect to third-party portal subscription and news services to create value-added content and achieve government's objectives of a single portal to the citizen.

Security and Privacy

Clearly, the issues of privacy and security in e-government are vital to maintain the public trust. The issue of what is done with private information is becoming more of a concern as e-government becomes more of a reality. The National Electronic Commerce Coordinating Council (NECCC), an organization consisting

of various federal, state, and local government agencies, indicates that the future of e-government includes conducting all varieties of transactions over the Internet. (For more information about NECCC, go to www.e3c.org.) Transactions including paying license fees, paying taxes, and exchanging business documents like invoices, bids, and purchase orders will all be conducted through e-government in the near future. But in *Advancing Electronic Commerce in the 21st Century* report¹, the NECCC named security, authentication, and privacy as the major barriers to making e-government a reality. Various federal agencies and state and local governments have addressed this topic. The mySAP.com e-government solution meets or exceeds all of the security, authentication, and privacy requirements stated by the NECCC in the report.

Federal Government

The Federal Trade Commission (FTC) has formed an advisory committee to address online access and security. (For more about the FTC's work, go to <http://www.ftc.gov/acoas/>.) In a final report dated May 15, 2000, the committee presented a variety of findings on the issue. The underlying theme is that information collected by the government must be secure and protected and that those people who provide personal information have the right to privacy. The Executive Office of the President directed all departments and agencies as of September 1, 2000 to clearly post their privacy policies on all Web sites that contain personal information collected from the public. While the responsibility for ensuring that privacy is maintained and privacy policies are posted rests with each agency, all components of mySAP.com meet or exceed the FTC's established guidelines.

The minimum FTC security requirement for subscriber accounts is the use of an account name and password. mySAP.com easily accommodates this requirement, and it also incorporates additional security measures, such as the use of digital signatures, which are discussed later on in this section. In addition, collected data should only be accessed by those requiring access to the specific information. Authorization in the mySAP.com e-government solution can be easily established to meet this requirement.

The mySAP.com e-government solution ensures that all recommended security standards are incorporated into the current solution, and SAP continually updates it to meet or exceed the federal government's established guidelines.

State and Local Government

The NECCC addresses privacy at the state and local levels in a document released on September 26, 2000 entitled *Privacy Policies: Are you Prepared? A Guidebook for State and Local Government*. Many of the standards and guidelines that the FTC established are also recommended by the NECCC.

As the NECCC points out in its position paper on privacy, the debate over online privacy has created a double-edged sword for public sector policy officials. On one side is the need to develop fair information practices. The challenge here is to guarantee that laws and practices imposed on the private sector are also being followed in the public sector. On the other hand, a challenge unique to the public sector is the necessity to fulfill obligations imposed by Freedom of Information Act. How does a government agency strike the right balance between the dual responsibilities of ensuring the availability of public records while still protecting privacy?

One example cited by the NECCC is the state of Texas, considered a leader in Internet security. The state requires that each state agency conduct a transaction risk assessment and implement security and privacy safeguards before providing access to information or services on a state Web site that requires user identification. At a minimum, state Web sites that require citizens to enter such information as name and social security number, identification code and password or payment information, must use an SSL session to encrypt the data. (For more on Texas's requirements, go to <http://www.state.tx.us/Standards/S201-12.htm>.) The mySAP.com e-government solution incorporates SSL technology to meet this requirement.

¹ By: PK Agarwal at the ITC Conference, Las Vegas, NV, 1999. www.ec3.org

Security

Authenticating documents is an issue in government-to-business applications. How can documents like purchase orders that must be signed before they are legal be transferred over the Internet? State and local governments need to address this issue individually, but the federal government has standardized on digital signatures. In early 1999, an executive order was signed authorizing the use of digital signatures in the federal government. Some states and local governments have followed suit. Digital signatures are a safe and secure way to authenticate individuals and to authorize documents. The mySAP.com e-government solution supports the use of digital signatures for all business transactions.

Conducting secure business transactions, whether through integrated applications on an intranet or with partners, associates, or citizens over the Internet, requires the establishment of trust and identity between parties. This type of trust and identity is now available for the mySAP.com family of online marketplaces, workplaces, and e-government solutions. SAP's Trust Center Service gives mySAP.com government customers strong security for e-government transactions based on digital certificate encryption.

The Trust Center Service provides user authentication and single sign-on convenience for those accessing mySAP.com. It also provides a smooth migration from password-based authentication on an intranet to certificate-based authentication on the Internet. In addition, the service can be extended for use with partner solutions, such as smart-card solutions.

The Trust Center Service integrates seamlessly with mySAP Workplace. System administrators need only register their mySAP Workplace with the Trust Center Service and grant authorization to selected user groups.

Single Sign-On in mySAP Workplace

One major advantage of the mySAP Workplace compared to other portal technologies is its support for single sign-on for all integrated applications – both SAP and non-SAP applications. Basic authentication is performed with a user name and password when a user logs onto an application. A cookie is sent by mySAP.com Workplace and either contains the user name and an encrypted password (an SSO cookie) or a digitally signed ticket (a mySAP.com Logon Ticket). When the user calls an application or starts a specific transaction from within mySAP Workplace, the system sends the cookie with the HTTP request.

The system performs more advanced authentication with digital identities and certificates, typically called SSL client authentication or certificate-based authentication. The digital identity can be stored in different places – the user's browser, in an encrypted file, or on a smart card. If the digital identity is stored in the browser (the simplest case), there is no need to install additional software on the user's PC. If additional software for accessing an encrypted file or a smart card is used, this software can provide the digital identity to the browser for some time without the user needing to enter the password. Thus, in this situation, other operating systems could also be used.

Advanced Encryption Standard

In October 2000, the US Commerce Department adopted the latest encryption formula, Advanced Encryption Standard (AES). (For more information, go to <http://csrc.nist.gov/encryption/aes/rijndael/>.) AES replaces data encryption standard (DES), adopted by the National Institute of Standards and Technology in 1977. Developed in Belgium, AES is a global standard that will pave the way for the secure exchange of e-commerce data. Because mySAP.com has an open architecture, SAP's e-government solution fully supports AES using third-party encryption solutions.

Connecting Smart Card to the Web Browser

The two major browsers are Microsoft Internet Explorer and Netscape Navigator. Together, they cover more than 90% of all browsers used. Both browsers have an interface for accessing an external cryptographic device (a smart card) that holds a digital identity.

The smart card itself can be a chip card. In that case, a smart card reader has to be connected to the user's PC. An alternative for a chip card might be a USB key. In that case, the smart chip is placed in a device together with a USB controller. In this case, only a USB port is needed; there is no need for a smart card reader.

Digital Signatures and mySAP.com

Digital signatures are the ideal technology for providing evidence and nonrepudiation of business transactions across companies and systems. When using smart cards issued by a trust center that provides qualified certificates, the digital signatures carried by these smart cards are legally binding in some countries.

mySAP.com e-business platform supports digital signatures, and every SAP solution implemented on such a platform can use digital signatures.

There are two ways to access a digital identity using mySAP Workplace to create a digital signature. The first is to use an ActiveX control delivered with mySAP Workplace that works only with Microsoft Internet Explorer. The application triggers the digital signature, transfers the ActiveX control to the user's browser, and displays the item or transaction that has to be signed. This external identity can reside in software or a smart card. Thus, when digital identities are installed in the browser (as with SAP's Trust Center Service), digital signatures can be used and therefore software needs to be installed on the client.

The second method is to install additional programs on both the user's PC and the application server. In this case, the additional software on the application server has to implement the SSF interface, which is the SAP Basis interface for document security (digital signature as well as encryption). When called by the applications, this SSF server implementation contacts the client module, which then carries out the digital signature on its own fashion and displays the data that has to be signed.

Verifying Digital Signatures

The verification of digital signatures whether from mySAP.com or from some other system can be done on the server side by using the standard SAP library. If additional features (such as checking against certificate revocation or issuing OCSP requests for checking the validity of a certificate) are required, a third-party product implementing the SSF interface is needed.

Smart cards and the mySAP.com Trust Center Service

SAP's Trust Center Service can be used by any government organization using mySAP.com. In addition, by using an intranet, any authorized government employee can automatically receive a digital identity and a certificate called the mySAP.com Passport. To support passport enrollment, the CSP installed must implement RSA key generation. If these conditions are met, the mySAP.com Passport enrollment can be used in conjunction with smart cards, provided that smart card readers are installed on the user's PC.

Idetrus and mySAP.com

Identrus is a specific public key infrastructure (PKI) provided by a consortium of international banks. It focuses on the use of digital identities and certificates to enable secure electronic business. Therefore, Identrus requires the use of smart cards with two different digital identities, an external tool to display the transaction that has to be signed, and OCSP requests for checking the validity of certificates. The certificates are issued by specific trust centers that provide a high security environment for the generation of the keys and the personalization of the smart cards.

Identrus smart cards can be used for single sign-on and digital signatures in the mySAP Workplace and mySAP.com components.

Federal Procurement

Federal government procurement has traditionally been a complex and time-consuming process that often involved hours of paperwork for each transaction. Before the advent of procurement cards, the smallest purchase could sometimes take weeks – even months – to be ordered and delivered. According to federal executives, government employees find themselves working on outdated systems and following labor-intensive processes that were established more than 30 years ago. According to the Office of Electronic Government (<http://www.ec.fed.gov>), government purchasers struggle to keep on top of the 10 million plus procurement transactions that the federal government completes annually.

Further adding to the pressures faced by government buyers, Congress recently passed the Government Performance and Results Act, the Government Management Reform Act, and the Federal Acquisition Streamlining Act (FASA) that was designed to ensure the efficiency of the federal procurement process. The legislation reports to Congress on the performance of federal government procurement. Given these new reporting requirements, and increasing demands for budget cuts, federal purchasers are finding they have to do more with less.

The following excerpt is telling. It comes from the President's Management Council's Electronic Processes Initiatives Committee's (EPIC) *Electronic Commerce for Buyers and Sellers, a Strategic Plan for Electronic Federal Purchasing and Payment Report*, which was submitted to Congress as required by Section 850 of the FY98 Defense Authorization Act

“By the year 2001, all Federal agencies will support their programs by making available customer-friendly electronic purchasing tools integrated with end-to-end commercial processing of payments, accounting and performance reporting information.”

In an effort to help purchasers do more with less, the federal government, from the president on down, has committed itself to electronic commerce. In 1997, Section 850 of the Defense Authorization Act established Section 30 of the Office of Federal Procurement Policy Act, which mandated the use of electronic commerce in Federal procurement:

“In general, the head of each executive agency, after consulting with the Administrator, shall establish, maintain, and use, to the maximum extent that is practicable and cost-effective, procedures and processes that employ electronic commerce in the conduct and administration of its procurement system.”

The Office of Electronic Government estimates that the federal government spent \$7 billion in electronic procurement in 1999, nearly 4% of its total procurement spending. By 2003, this number is estimated to grow ten-fold to \$70 billion.

If done effectively, with the right partner in electronic commerce – for example, GSA Advantage, the Department of Defense E-mall, and other commercial marketplaces, such as Exostar – government purchasers can expect to save hundreds of millions of dollars in improved efficiencies with their current staff.

According to the Federal Supply Service, federal procurement has been a time-consuming and laborious process. Given the rapid rise and adoption of electronic commerce for procurement in the private sector, estimates are that the \$50 cost to execute a paper transaction can be reduced to \$2 if done electronically.

mySAP Workplace

mySAP Workplace is an role-based enterprise portal that provides all federal agencies with fast, easy, and convenient Web-based access to all of the internal and external federal systems and services that they need for day-to-day business. mySAP Workplace empowers directors, managers, administrative level personnel, and all other users in federal agencies to perform effectively in a dynamic, fast-paced setting, putting the important applications and information just a keystroke away via an interface that is easy to learn, customize, and use. Links to the real-time status of all supply chain and acquisition and procurement activities are only a mouse click away.

SAP and Commerce One

SAP and its partner Commerce One have teamed to establish MarketSet[®] and Enterprise Buyer[®] as the single-source online marketplace and procurement tools for the federal government. These tools make the jobs of government purchasers easier and more efficient while helping federal agencies meet mandated goals (such as being e-commerce-enabled and purchasing more from well-qualified minority-owned or women-owned firms). Regardless of the current legacy procurement system an agency uses, federal users can access the Internet, enter an electronic marketplace, and start ordering from global supply sources committed to providing dedicated services to the federal government.

MarketSet is an open, electronic hub that can provide services and integration for all federal agencies, enabling them to communicate and collaborate across business processes, conduct all e-commerce activities, and interact in a professional community. These activities can occur within a specific agency, with other federal agencies, or with the private sector. MarketSet provides internal on-ramps for procurement and auctions, access to vendor catalogs in the supply chain system, as well as to external federal marketplaces, such as GSA Advantage! MarketSet seamlessly links users to buyers and sellers of nonproduction goods and services around the globe. Total access to global procurement and supply chain management is available instantly.

SAP and Commerce One have designed MarketSet so that users can feel confident that they are receiving the best value. MarketSet also enables users to compare items and to generate RFPs and RFQs that are automatically sent to competitors. It ensures that every transaction is completely secure. It includes standard, embedded features that make purchasing more efficient, such as savable electronic shopping carts and electronically generated purchase orders (POs), which allow for easy routing and approval, as well as quick reordering of frequently purchased items.

Section 508 of the Rehabilitation Act: Web Accessibility

SAP is committed to meeting and exceeding its legal requirements in support of all employees with disabilities and with the direction set forth by Section 508 of the Rehabilitation Act. SAP already has specific programs in place that dedicate development efforts toward compliance of all federal employees with disabilities. Along with its partners, SAP monitors Section 508 and works with leading third-party developers to offer the most up-to-date and technologically advanced products such as screen and text readers, voice recognition software, and multimedia audio information that supports the Section 508 mandate.

The United States Federal Government: The Next Frontier for E-Business

While e-commerce is changing nearly every aspect of business, our federal government is moving to adopt e-government by 2003. This change is driven by the National Performance Review, Congress, citizens, and business. Executives in the federal government have been focused on increasing the cost-efficiencies and improving citizen service across federal agencies by implementing e-solutions. The FirstGov.gov Web site, which provides information about state, federal, and local government, is early evidence of the advancement to electronic government.

The Market Drivers

Bolstered by a booming Internet economy and projections for a hefty budget surplus, the fiscal 2001 budget proposal sets a new agenda for government investment in technology. Federal government information technology executives are now focusing on modernizing programs, which were neglected during the deficit years. The 2001 budget proposal requests \$39 billion for IT spending for FY 2001 for the Departments of Energy, Defense, and Health Services and for NASA. (For more information on these appropriations, go to <http://ec.fed.gov>.) Clearly, this will fuel the movement toward e-government, and it will present significant opportunities for federal agencies to adopt enabling technologies for e-government.

The Transition to E-Government

Many federal agencies currently have modernization initiatives underway. On their own, these initiatives will improve overall efficiency and performance. At the same time, they are tremendous opportunities to save valuable funds. Commercially proven technology is coming to the forefront in a realistic campaign to significantly reduce government paperwork and to transform operations. To the direct benefit of both citizens and government, the fruits of private research and development are being applied to the federal government in an effort to launch the new era of e-commerce. Federal e-commerce program goals include performance measures for better service and lower costs as well as increased focus on the customer. The e-commerce effort is being guided by legislative mandates, such as the Federal Acquisition Streamlining Act, The Government Paperwork Elimination Act, and The E-Freedom of Information Act. (For more information on these acts, go to <http://www.fss.gsa.gov>.)

Boundary conditions exist in the form of security and privacy acts and OMB Circular A-130, which mandates federal privacy measures. The previous administration made its stand on e-commerce clear in a December 1999 memo to department heads that stated "Agencies shall promote the use of e-commerce...for faster cheaper ordering on federal procurements that will result in savings to the taxpayer." (To read the entire memo, go to <http://www.fss.gsa.gov>.)

The use of e-commerce in the federal government will grow in electronic delivery orders and invoices, credit cards, smart cards, and e-funds transfer. mySAP.com allows the federal government to interact directly with government employees, as well as with public citizens, state and local governments, and other entities through an architecture that is well-suited for the Internet. SAP is working closely with its business partners to address each and every area of the federal e-commerce initiative. The standard and familiar business-to-business relationships take on new and different roles.

Government-to-Government (G2G)

Government-to-government scenarios means that federal agencies can achieve efficiencies of scale by using one portal to access federal agencies. It also means effecting transactions and sharing data between federal or state and local agencies. According to the Office of Electronic Government (<http://www.ec.fed.gov>), the federal government spends approximately \$200 billion annually through the

GSA's Federal Supply Service to buy goods and services. Federal IT expenditures reached \$33 billion in 1999 and are expected to increase at least 4% this year. In 1998, the government spent \$311 million on Internet services, and this figure is expected to grow to \$2.85 billion in 2003, representing an annual growth rate of 56%.

Government-to-Business (G2B)

Supported by proven best practices from business, federal agencies hope to achieve economies of scale in their procurement processes and the application of new IT technologies to their operations. Clearly, the objective of the federal government is to increase customer service or to initiate a self-service government. The federal government has initiatives to deliver government programs and services and procurement online. According to the Office of Electronic Government, most e-government spending will be for middleware, data warehousing, storage, communications, and data security.

Government-to-Citizen (G2C)

The federal government has initiated a movement to reach out to citizens. It is the vision of the federal government to be capable of having citizens take advantage of government services, such as receiving direct payment for social security payments, being able to apply for federal student loans online, and surfing the Internet to find the nearest veterans' hospital or to reserve a campsite at a national park, and so on. As citizens become more familiar with buying products and paying bills online, they will come to expect online services from the federal government.

E-Government in Defense

The defense business is changing radically. Defense organizations are involved in new and challenging roles as the pressure for greater effectiveness and accountability grows. As highly complex organizations with unique requirements for e-commerce, security, logistics, supply chain management, and personnel, defense organizations need to be able to manage their resources and assets more efficiently. They also need administrative systems to interface with operational systems in the back office and in the field, and they need technology that will stand up to the rigors of combat or peacekeeping duties in difficult environments.

Defense Reform

Today, the Department of Defense (DoD) spends a third of its budget – more than \$80 billion annually – to operate its logistics systems. By paring DoD's massive support infrastructure and putting it on a commercial footing, savings of \$20 to \$30 billion are possible. These freed-up resources can return the ratio of tail-to-tooth spending to historical levels with more than enough left over to pay for force readiness and modernization, according to Jacques S. Gansler, Under Secretary of Defense for Acquisition and Technology, in a speech at the January 1999 21st Century Symposium at Robins AFB in Georgia.

The DoD logistics system is organized into four distinct operating functions: materiel management, maintenance, distribution, and transportation. Over time, each has evolved its own management and organizational structure in the military services and the Defense Logistics Agency. The logistics system's \$80 billion annual price tag is nearly equal to the total military budgets of Germany and France combined. Containing, even reducing, such enormous costs is a goal.

However, overcoming inefficiency and hundreds of obsolete legacy software systems may be even more of a challenge. It is also more important because that is where the true savings are realized. Recognizing the need to keep pace with revolutionary changes in force structure, the Pentagon has targeted logistics as the last area that prevents the Department of Defense from moving to a world-class service and support infrastructure, according to a December 1998 briefing, *Logistics Transformation: Key to Full Spectrum Engagement*, for the Defense Science Board Summer Study Task Force.

From a private sector perspective, the size of DoD's logistics enterprise is impressive. As of October 2000, it included 16 inventory control points, 19 distribution depots, and 21 maintenance depots. From its catalogs you can order from among five million active national stock numbered items. DoD warehouses also store an inventory valued at \$64 billion. To track everything, the supply network is made up of over 450 different information systems, which process over two billion transactions per year at a cost of around \$1.5 billion. Meeting the e-business transformation challenge will require revolutionary changes, and the potential gains are huge. As a result, even small improvements in performance can save billions each year. (Gansler)

The DoD transportation grid, a combination of both military assets and commercial support, is similarly in its huge size to the DoD's internal logistics infrastructure. The US Transportation Command (USTRANSCOM), DoD's single manager for airlift, sealift, and ground transportation, operates 1,725 aircraft and more than 100 ships around the globe (<http://ustcweb.safb.af.mil/>), with an internal operating cost of approximately \$4.2 billion, according to the General Accounting Office. In a 1998 speech to the National Defense Transportation Association in Houston, Texas, Secretary of Defense William Cohen, highlighted the fact that despite the massive transportation infrastructure that exists today within USTRANSCOM, in-house effort, 85% of DoD's required support in peace and war comes from buying transportation on the commercial market.

Supporting DoD

SAP is committed to supporting the Department of Defense with mySAP.com, and it is working with command-level organizations to improve and modernize their logistics programs.

"Many of the world's largest, most complex and diverse organizations have done it – reengineered, automated, and integrated their business processes to achieve results far beyond their wildest expectations. For private companies, the results show up in the bottom line. For us, the ultimate success will be improving Warfighter effectiveness in an era of high demand and limited resources. The tool to guide our business transformation is called "enterprise resource planning or ERP. And I firmly believe that it is the key to our Navy's future."

*-Vice Admiral John A. Lockard
Commander, NAVAIRSYSCOM*

Expanding DoD capabilities with SAP, ESRI, and GIS Technology

The military services have a unique opportunity to partner with SAP for transportation and fleet management. The logistics challenge is an enormously complex problem that involves moving huge volumes of materiel to the right location at the right time. Geographic information systems (GIS) are a critical foundation technology.

The process of ensuring total asset visibility and accountability is changing as the DoD overall and each of the military services are reengineering inefficient logistics practices. Defense-related planning requires accurate, timely decisions. For DoD transportation and fleet management, knowing the exact location of a commercial or tactical vehicle in the field or in a populated area, its occupants, its cargo, and its maintenance status at any given time leverages assets for optimum deployment, increased command and control, security, safety, and overall cost savings.

GIS, global positioning systems (GPS), and automatic vehicle location (AVL) technologies provide critical information to commanders. Together with business partner ESRI, SAP can expand DoD transportation and fleet management needs by providing Internet-enabled transportation solutions that can readily be implemented. These solutions include convoy planning and fleet scheduling, real-time monitoring of

vehicle location and status, real-time cargo visibility, Desired Order of Arrival Staff Tables (DOAST) planning (military terminology for planning the loading of assets on ships, aircraft, and roads to ensure that they arrive in a theater of operations in the correct order), and vehicle maintenance scheduling and diagnostic capabilities all through GIS/GPS and AVL framework technologies.

GIS interfaces give mySAP.com users the ability to integrate data stored in various databases into a standard, seamless environment that will boost productivity, cut costs, and streamline workflow.

Mobile Computing and Wireless Internet Devices for DoD

With mobile technology and mySAP.com, DoD and military service members can harness the power of the Internet instantly through wireless devices. The availability of a broad range of mySAP.com business applications for handheld and wireless Internet devices further expands the possibilities for greater command and control, visibility of the supply chain, and even management and supervision of large working groups. Military personnel working in transportation operations and fleet management; facilities maintenance; maintenance contact teams in the field and in depots; supply and inventory control personnel located within a specific region or dispersed throughout an area of operation; nuclear, biological and chemical (NBC) defense teams; recruiting organizations; defense travel organizations; and the military medical community can easily and effectively conduct their day to day business through the use of mobile computing, handheld and wireless Internet devices.

From customer relationship management and supply chain management to business intelligence and e-business, mySAP.com enables the military to conduct business from virtually any location accessible with wireless devices with complete integration into existing business processes. mySAP Mobile Business, part of mySAP Workplace, is a central navigation tool for accessing information, services, and applications that users need outside the office. By providing a workplace for a broad range of mobile devices, SAP enables DoD and military personnel to extend their information reach beyond the traditional areas of operation. Existing SAP customers are already leveraging applications for mobile devices, such as Mobile Service, in addition to the supply chain solution for radio-frequency devices. Other components available through the Mobile Workplace include the SAP Business Information Warehouse (SAP BW), Travel Management, and industry-specific components for base operations and facilities maintenance.

Acquisition and Procurement for DoD

Acquisition and procurement has evolved since the 1980s when procurement processes in DoD were generally manually intensive. There were some automated systems, but each tended to be unique to its own organization. Few performed all of the procurement functions, and they all involved high maintenance costs and had weak links to the finance community, according to Eleanor Spector, director of defense procurement, in a speech at the 5th Annual Dun & Bradstreet Conference in Washington on June 16, 1997. Eventually procurement systems evolved into more standardized, interservice and interagency systems.

Many reform measures seek to make it easier for the government to participate like other buyers in the marketplace. In doing so, traditional acquisition rules may no longer apply. Commercial practices can help to simplify government acquisition processes and make them more efficient and user friendly. However, the major challenge in acquisition reform is merging military and commercial capabilities to maintain a healthy and responsive industrial base.

SAP acquired the Procurement Automation Institute (PAI) to provide contract management solutions and support services for the federal, state, and local government agencies as well as DoD. The joint procurement solution makes requisitioning easier, generates contractual documents, fully automates source selections, and gathers and generates vendor past performance reports. The SAP/PAI solution is dedicated to implementing procurement software that mirrors DoD and federal policies and procedures, providing structure and organization to the business processes, and enables a DoD organization or military service to

achieve a paperless procurement process. With the use of mySAP Workplace and mySAP Marketplace, SAP provides DoD procurement officers with end-to-end acquisition and procurement capabilities.

mySAP Workplace

The mySAP.com Workplace is an enterprise portal providing defense and military users alike with fast, easy, and convenient Web-based access to all of the internal and external defense applications and services that are used during day-to-day operations. mySAP Workplace empowers commanders, leaders, managers, and users throughout the chain of command to perform effectively in a dynamic, fast-paced environment, putting the important applications and information just a keystroke away via an interface that is easy to learn, customize, and use. Links to real time status of your entire supply chain, acquisition and procurement activities, and status of maintenance, repair and overhaul (MRO) operations are only a mouse click away.

Security

Secure and reliable operation of all defense applications is a primary requirement for all defense organizations. Extremely high security measures have been implemented by a wide range of security layers, such as user authentication and authorization, user profile administration, profile-based user access, transactional integrity, secure network communication, and Internet and intranet security. These features include central user management, support for user management standards, single sign-on support, digital signatures, and public key infrastructure. When combined with third-party encryption standards, mySAP.com meets the security requirements mandated by the U.S. Government.

State and Local Government

The major challenges facing state and local governments are nothing new: , taxpayers calling for fiscal restraint, spiraling demand for services, workforce development, and fierce competition to expand economic viability. What **is** new is the solution set that is available. E-government solutions use proven and innovative technologies to combat these issues.

The key premise of e-government is secure access to government information and services anywhere, anytime for anyone. The most obvious benefit to constituents is more convenient access to information and services without worrying about normal governmental boundaries and office hours. For example, companies that do business with the government gain from the ability to share planning and project information. State and local governments benefit by being able to offer state-of-the-art environments to attract businesses and workers and by lowering their costs to collect information and interact with constituents.

Ordinary automation of services and delivery of static content over the Internet are not enough to satisfy these aims of e-government. Government agencies must resist the temptation to create an electronic copy of their traditional hierarchical structures. Implementing e-government requires that government agencies reinvent the way they appear to and interact with their constituents. The emphasis should be on presenting an outward face to constituents that reflects a menu of services, not organizations.

Normal, over-the-counter service transactions must be translated into fully featured electronic versions. The underlying customer interaction and data collection processes must then be streamlined and made available any time, anywhere. This requires that information, payments, authorizations, and authentications be submitted and captured online. A citizen's exchange of information with government must become a more dynamic, personalized, and interactive experience.

An open, yet secure environment is an essential element to enable true communication with constituents and collaboration with partners. Access options must be expanded to encompass Internet-enabled kiosks, multiple languages, interactive voice recognition, text-based viewers, and the like to bridge the

technological divide and serve the needs of an increasingly diverse population. The resulting constituent empowerment, seamless cross-government cooperation, and more attractive business environment will ultimately lead to greater community stimulation and more opportunities for economic development.

Requirements for State and Local E-Government

The most basic prerequisite of an e-government strategy is an enterprise portal that presents a new, single face of government to its constituents. Ideally, the portal should be easy to use, open, scalable, and secure. A portal's navigation and features must be easy to use and intuitive to potential users, especially those with disabilities or those who access sites with limited viewers (such as pagers, palmtop devices, and Web-enabled phones). It should be open to allow integration with existing systems, as well as with partner systems. The portal should be scalable to allow for growth. Secure transactions are a must for both the government agency and its constituents and customers. An additional feature should be the ability to run a portal as a hosted solution through an application service provider. This option makes portals an option for government agencies that do not wish to invest in the hardware and support staff for running the solution themselves.

A major challenge facing any government agency today is the ability to get its new digital solutions functioning smoothly and running effectively as soon as possible. Governments face more obstacles than companies because they must be concerned with delivering services and information while protecting constituent privacy rights and complying with evolving access standards. Government agencies need to have access to the most recent best business practices to aid in configuring and delivering their electronic solutions to the public.

Constituent Relationships

Contact management (typically called constituent relationship management or CRM) is also a necessary element of an e-government strategy. CRM needs to track centrally all of the ways in which customers contact the government (normal telephone call, Internet self-service, fax, e-mail, voice-enabled response phone calls, and so on) plus any activities that result from those contacts. The CRM system should provide the necessary tools for handling all aspects of a citizen contact, regardless of how the contact occurs. The system should provide assignment and tracking capability across government departments for required follow-up activities through to the point of resolution.

CRM is an ever-changing process, usually involving comparison of service levels of similarly sized entities, monitoring of trends and feedback, and subsequently adjusting operating procedures. So it is critical that government be able to capture information from a variety of internal and external sources, analyze that information to detect trends and correct problems, and display the analysis of results in a way that is easy to understand.

Citizen contacts invariably lead to some kind of response from governments. This typically takes the form of a service request or provision of information. Whether it is an application for a license, a new voter registration, or a trouble report, the opportunity to complete every reasonable facet of the transaction online should be available. Payments can be made by credit card or direct draft, in a secure environment. Authorization can be provided in the form of a digital signature, which also guarantees proper authentication of the person initiating the transactions. These services must be available 24x7x365 as self-service options and as directed transactions through a call center.

Economic Development

Delivering service to citizens is just part of the e-government equation. Attracting businesses for economic development and workforce enhancement is also a critical need. The stakes are high because the type and quality of businesses in a locality directly influence the availability of jobs and the standard of living. Financial incentives are only part of the total package that businesses consider when establishing operations in a particular location. Companies look for environments that are progressive and conducive to doing

business. Therefore, it is essential for state and local governments to have more than the perception of being innovative. They have to do more than streamline registration processes and simplify taxation. These entities must demonstrate their commitment to technology by being an active participant in the e-government arena.

Tourism is another area where state and local governments can foster economic development. Not only does the Internet open the doors to a wider audience and additional revenue channels, it also allows for tremendous flexibility in monitoring feedback and tracking Web traffic. This information can be used to plan campaigns for specific groups, thus reaching the desired audience.

Information Management

Information management is the final piece of successful e-government. Constituents expect to be able to filter the information available from a government so that they view only what they want to view when they want it. Constituents also want their privacy rights protected. In addition, government has an obligation to open the doors to communication exchanges with the public. This is but one step on the way to digital democracy. The ability to access e-mail, chat rooms, and online public meetings is crucial to reopening the dialog with the voting public. The feedback received in these exchanges must then be incorporated with the wealth of transaction-based data. The objective here is to use all of this information to determine the direction for future policy initiatives.

SAP Public Services Solutions

An enterprise portal built with mySAP.com addresses government's need for a constituent-centric Internet point of contact. An enterprise portal presents a safe, secure view of government services and information for constituents that can be personalized, and it is easy to use. Whether a user enters as a private citizen, business customer, or partner, an enterprise portal can provide a convenient list of the government designated functions that are appropriate to the specific needs of each customer group, such as a business applying for a professional business license or a citizen filing a complaint.

The government agency is also protected by the same secure environment, and it benefits from the open, scalable, and configurable architecture that allows safe access to existing systems while still accommodating changing constituent demands and future growth. Open architecture means that any existing system or application – SAP or not – can be integrated into an enterprise portal. This allows government agencies to extend the life of niche legacy applications and to integrate SAP solutions.

An enterprise portal is an industrial-strength application that scales as needed to accommodate the most demanding usage requirements on a global framework. The freedom of system users to configure applications based on changing business rules and processes has long been a hallmark of SAP solutions. Configuration gives government agencies the flexibility they need to meet customer demand.

Enterprise Portal Services

An enterprise portal offers additional options. It can be run in a hosted environment and in traditional operational environments. This hosted option is a cost-effective alternative to a costly investment in hardware and software. Another option is content provisioning, which allows for government information, news releases, announcements, and legislative updates to be pushed to constituents. Concerned citizens can tailor the information and filter out information that does not interest them. This helps government keep the information channels open for citizens who might otherwise be disaffected by traditional communications. An enterprise portal also contains important content for citizen information as well as points of contact, such as e-mail, chat rooms, and video broadcasts, to facilitate the exchange of ideas in support of the democratic process.

Collaborative Scenarios

SAP recognizes the desire of governments to leverage best business practices for the Internet in the same way they are accustomed to applying them in their normal operations. To that end, SAP offers predefined Collaborative Business Scenarios and mySAP Workplace roles to use as is or as guides for setting up the constituents' view.

Collaborative Business Scenarios provide a framework for solving a series of common situations routinely encountered in serving constituents' demands. Constituent self-service applications and a constituent information center are two examples of the customer-centric scenarios. Each scenario employs best business practices to simplify and direct the interaction between constituents and government representatives or functions, including an optional registration process for collecting user information.

The needs of private citizens, business customers, and partners differ significantly when interacting with government. mySAP Workplace roles filter content and functions appropriate for each type of constituent. Different types of constituents can personalize their roles, so they can meet individual needs. This provides for better security and easier navigation through the plethora of government services and departments. Combined, the Collaborative Business Scenarios and workplace roles provide governments with a basic foundation for ramping their solutions up to Internet speed without delay.

The centerpiece of SAP's customer-centric e-government solution is Customer Relationship Management (CRM). As with all other mySAP.com solutions, mySAP CRM is fully integrated with an enterprise portal built on mySAP.com. mySAP CRM provides government agencies with the flexibility to address the full range of their needs in controlling, monitoring response, and answering demands from their constituents.

The solution features:

- An interactive contact center for fielding and synchronizing contacts across all possible points of entry into the system in a personalized setting by constituent
- A searchable knowledge repository of answers to frequently asked questions
- A mobile service element to orchestrate the assignment of repair or maintenance teams in the field, including a self-service area that provides citizen contact through the Internet or via interactive voice recognition systems
- Fully integrated workflow for assigning follow-on tasks and status tracking of those tasks
- A marketing and campaign planning and management segment for developing and implementing tourism and public awareness campaigns
- An online store for selling surplus property, collectibles, publications, commemoratives, and transit or toll passes or any item of inventory with fixed pricing.

SAP adds partner solutions in spatial technology offered by companies such as ESRI to combine constituent and transactional data. Blended into the government's geographic database, this data can be displayed on jurisdictional maps. The predictive value of the information takes on a new perspective when set against the backdrop of the entity's map by using a GIS. Now, information trends take on a new dimension. Government can better target areas of need or concern using the capabilities of ESRI's GIS software in conjunction with SAP application solutions. Constituents also directly benefit by being able to clearly point out problem areas, like damaged roadways or malfunctioning traffic signals, in an interactive, online setting. Businesses can also view the space available for development within designated zoning constraints, which aids the government in attracting new businesses.

The information in mySAP.com – and in non-SAP and legacy systems – can be accessed using mySAP Business Intelligence (BI). It provides a fully featured data repository, analysis, and reporting solution. mySAP BI enables government agencies to capture and store information from any source, even government legacy systems. It also includes tools for performing data analyses to benchmark against other similar operations, detect trends, and anticipate potential problems. Reports and graphs can be published directly on the Web, including reports with dynamic drill-down capability to lower levels of detail. mySAP BI produces graphical representations of data analyses in both traditional and unconventional formats. It presents information in a way that is easy to understand.

Public Works and Transportation Agencies

States, local governments, and regional and joint power agencies provide basic public needs for public facilities and transportation. They provide such basic services as water as well as facilities needed to move people and goods throughout the world. The effect on the public is universal. Nearly every person and business depends on and is affected by these facilities. Over the years, the need to include the citizens in operational and decision-making processes has become paramount.

These agencies also manage assets of tremendous value. For example, building the U.S. interstate highway system alone required over a one trillion-dollar investment, according to the Federal Highway Administration. This makes transportation and public works agencies prime candidates for new methods of communicating with the public and other agencies and for the improvements in daily operations that e-government offers.

Currently, most agencies have taken cautious steps into e-government. They have created informational Web sites where the public and businesses can obtain information, usually static, on services provided; how to obtain those services; information on water testing results; and plans for major future projects. Some localities have taken steps beyond static information and now provide the ability to make requests through Web sites or e-mail, obtain permits online, and provide data on traffic conditions either internally, or through third-party providers. Many transit agencies have begun to sell tickets and provide trip-planning services online. Most of these systems are stand-alone or tied to single background systems.

E-Government Needs

Transportation and public works agencies spend over \$190 billion dollars each year on the operation, maintenance, rehabilitation, and construction of facilities. Public works functions – flood control, the publicly operated component of solid waste handling, and others – are not included in the estimate. The agencies responsible for these works are politically important because they have a significant effect on residents and businesses, and they need to communicate with them on a daily basis.

E-government becomes especially important when you consider that the public compares government services to the services they receive from private companies. Increasingly, commercial services are provided over the Internet, thus the public expects 24x7x365 access to make work requests, check status, and view upcoming work.

Enterprise portals powered by mySAP.com allow government agencies to provide carefully controlled access to administrative work management systems. Using these portals, government employees can access and review work requests, and citizens can access transactions over the Internet. The use of maps to locate items being repaired eases the processes for the public, and improves the accuracy of the information for the government. Constituent relationship management provides a customer interaction center that agency employees can use when responding to telephone, e-mail, and in-person requests. When all citizens have access to the same information, regardless of the means of communication, a consistent message is given to each member of the public. Estimates in savings in communication costs to the public are 10 to 20%. The benefits of providing better information to the public are measured in customer satisfaction.

Obtaining Permits and Services

Many types of public works agencies issue permits, connect services, and charge fees. Allowing people to handle these services over the Internet or other automated communication systems has become very popular. Using Web-based forms, residents and businesses can apply for building permits, pay water bills and parking tickets, purchase monthly transit and toll passes, and sign up for recycling or other services.

Maintenance

The scarcity of sufficient labor, materials, and equipment complicates the massive job of maintaining the public works infrastructure. It is important that existing resources be put to the best possible use, ensuring that downtime is minimized by having the right mix of skills, work projects, materials, and equipment in place. Effective maintenance management systems can help, but arbitrary government districts often mean that the area covered by the logical project may be the responsibility of multiple agencies.

Yet materials to do jobs must be on hand when needed. Unfortunately, this has led to high levels of duplicate inventory in nearly all agencies to ensure shortages do not affect work. This is expensive and consumes resources to manage inventory that otherwise could be put toward more productive work. Specialized equipment used by public works and transportation agencies are expensive to buy and maintain, but they are absolutely critical for certain jobs. Agencies often buy specialized equipment, which then often sits idle for most of the time. Rental agencies are one possibility, but they're not a safe bet if the equipment is mission critical.

The answer to these problems is simple to figure out, but hard to achieve: sharing resources between agencies. Unfortunately, the way that government works in general tends to counteract the solution. The people making day-to-day decisions on whether to share resources have good intentions. However, their normal work receives little note or reward. Then, when a major breakdown occurs, the results are often reported by the local newspapers, radio, and television.

To avoid insufficient resources, employees soon learn how to deal with this situation: be certain that more than enough labor, materials, and equipment are available. Lending out resources make sense to them in the abstract, but in day-to-day decision making, it's a formula for disaster. It's a quick path to not having the necessary resources available to avoid negative situations.

Government-to-government marketplaces can solve this dilemma by providing the tools to ensure that sufficient resources are available through automatic agreements with other agencies. Using collaborative project information to share work, inventory, and resources over the Web, maintenance personnel can ensure that seldom-used materials already in stock in a nearby town or specialized equipment operated by a regional agency will be available when needed.

Procurement

The automated procurement of materials and equipment over the Internet can speed the purchase process, reduce the effort spent in obtaining the goods, and allow use of collaborative buying pools and bidding that reduce the price. And the sale of used or unneeded equipment and materials can provide much needed funds. mySAP.com and Commerce One have jointly developed a single marketplace called E-Procurement for auctioning as well as direct, maintenance, supply and pre-negotiated procurement items. This solution allows government to conduct strategic sourcing to fulfill inventory and purchasing requests.

Managing Infrastructure

Public works and transportation agencies are also typically responsible for infrastructure projects. These projects vary from major multimillion dollar roads, reservoirs, airports, and water treatment plants to small, relatively inexpensive playground improvements, bus repairs, or pavement treatments. However, each of these projects typically involves multiple entities inside and outside of the agency. Some individuals have the responsibility to manage, design, or review different components. Others work on the construction and inspection. SAP Collaborative Engineering and Management brings a new dimension to this process by allowing all personnel involved to access CAD drawings and other information. Through Internet access, agencies can exchange Web-based documents to collaborate on project planning, design and construction. In addition, mySAP.com allows project managers to easily monitor and manage the processes, while it handles security and version controls.

Benchmarking

Because large numbers of agencies do similar types of work in transportation and public works, much work is being done to benchmark between agencies so they can find out if others' methods would improve their work. Considerable effort also goes into comparing methods and conditions among agencies so that differences in unit costs or other productivity measures can be explained. Unfortunately, due to the effort involved, that information is seldom updated more than once every few years.

Many agencies use key performance indicators (KPI) developed during benchmarking and further developed by professional associations to make these comparisons. Now, they can cooperate over the Internet using mySAP.com Business Intelligence data warehousing and analysis tools to compare KPIs regularly.

The Workplace: Role Based Solutions

Public works and transportation agencies are typically staffed by a wide variety of employees – from unskilled laborers to highly experienced professionals and agency leaders – all of whom must use Internet-based systems. The tasks performed and needs of each group of users differ from each other, and they require that individual setups are made for each group of users.

mySAP Workplace provides this specialization. mySAP Workplace users see all the tasks that they are required to perform, all the information they need for their daily work, and all the links to the IT systems they are authorized to access. mySAP Workplace roles are logical collections of activities and functions that match specific job descriptions – field worker, supervisor, buyer, engineer, financial manager, and so on. The roles define the content of the entire workplace.

mySAP Workplace consists of two key areas. The LaunchPad is the area on the left of screen from which users can select the functions that are relevant for their particular role. The LaunchPad can contain links to systems, reports, Web pages, and intranet pages. MiniApps, small applications for role-specific jobs, are located on the right side of the screen. Buyers, for example, would display purchase orders, sales clerks would display sales order. One important role common to most users is that of employee. Employee self-service applications allows employees to handle personal data, such as address changes, benefit information, and so on. Also accessible through the workplace are SAP Strategic Enterprise Management (SAP SEM) and SAP Business Information Warehouse (SAP BW) reports, and the SAP Knowledge Warehouse where training and other materials can be found.

Mobile Computing

Public works and transportation, by its very nature, involves working over a large geographic area to provide service across the municipality. Personnel are normally out in the field, not in the office. This makes access to necessary information, reporting of work accomplished, and accountability of forces much more difficult.

mySAP Mobile Business, a solution of mySAP.com, is a suite of tools designed to meet the needs of the field service force. It provides field employees with an integrated view of customers, actual and historical service orders, a customer's installed base, service contracts, and other relevant information. Using mySAP Mobile Business, field personnel can use a variety of remote devices such as PDAs, Internet-ready cell phones, in-vehicle terminals, and dedicated hardened units to conduct work. They can download information during the next trip to the office or instantaneous communicate with the information system. Beyond completing service requests, field personnel can also create new requests, answer client questions, record inspections, or complete many types of forms. mySAP Mobile Business can also be tied to geographical information systems (GIS) to provide maps to speed identification of work, give directions to workers to find their next assignment, and, when tied to global positioning systems (GPS), give positive confirmation of the locations where work was completed.

Tax and Revenue Management

Administering and managing public revenues places many demands on public sector organizations. For example, agencies must effectively collect revenue and manage the collections automatically, in real time, and in a constituent-friendly manner. In addition, public sector organizations that collect tax revenues are working to improve communication and service to their constituents, including taxpayers, tax practitioners, legal advisors, and other third parties, as well as internally and with other governmental organizations.

To answer the demand, mySAP.com e-business solutions gives tax and revenue agencies a complete view of individual taxpayers, provide better internal and external services to its customers, help decrease outstanding receivables, detect nonpayers and nonfilers faster, handle a higher contact rate in the call center, increase response time to taxpayer inquiries, and facilitate the efficient use of resources in audits and investigations.

Tax and revenue management agencies may have millions of customers, process millions of transactions each year, and collect billions of dollars. These agencies are primary candidates for the improvements in daily operations that e-government offers. To get an idea of tax processing volume, consider the following example. According to the State of Florida Department of Revenue, it processes over 9 million financial transactions annually from approximately 1.2 million taxpayers. The department collects \$25 billion in tax revenue annually from 36 tax revenue sources. It processes over 5 million sales tax returns and over 475,000 corporate income tax returns annually. During fiscal year 1998-1999, the department issued over 671,009 delinquency notices and 494,924 bills. More than 500 employees spread throughout the state work on collection cases.

Tax and revenue management agencies been involved in e-government since the 1980s. According to *Electronic Commerce Best Practices: A Guide for Taxing Authorities*, (September 2000, Federation of Tax Administrators), the era of electronic filing of tax returns and electronic payment of tax liability began in 1985 when the Internal Revenue Service (IRS) implemented its proprietary Individual Income Tax electronic filing system. The state of Indiana enacted legislation mandating certain electronic funds transfer (EFT) payments in 1987.

The guide also highlights some of the major programs of tax agencies and identifies current technology solutions for taxing authorities:

- The Internet
- E-file, especially federal and state filing programs
- Interactive voice response (IVR)
- Electronic data interchange (EDI)
- Payment methods
- Communications technologies
- Extensible markup language (XML)

mySAP.com provides the framework to address all of these technologies recommended for tax authorities.

Security

Newspaper reports of hackers compromising the credit card numbers of electronic commerce customers appear frequently. Internet fraud is a real threat, so any Internet-based tax program must protect confidential tax data to build the taxpayer's confidence in the security of e-government tax processing. SAP has implemented exceptional security measures in a wide range of security layers in mySAP.com. These measures include user authentication and authorization, user profile administration, profile-based user access, transactional integrity, secure network communication, and Internet and intranet security. Security

features include central user management, support of user management standards, single sign-on support, digital signatures and public key infrastructure. mySAP.com meets or exceeds all security requirements as mandated by government agencies.

More services are being provided over the Internet so the public expects 24x7x365 access to make various types of registrations, request tax information, check account balances, and view upcoming tax events. Using enterprise portals powered by mySAP.com, government agencies can provide secure access to systems and allow taxpayers or their legal representatives to enter and review of tax information.

Paying Taxes Online

Most tax and revenue agencies have taken small steps into e-government. So far the main use of the Internet for tax and revenue agencies has been for filing taxes. Agencies have created Internet portals where the taxpayers and businesses can obtain tax information. Some agencies have gone beyond just offering information and now provide the ability to make requests through their Web sites or using e-mail. In addition, the use of the Internet for tax administrative functions other than tax filing is growing. Most tax and revenue agencies now provide copies of their forms in downloadable format on their Web sites. Many offer online inquiry into the status of individual income tax refunds. According to the Federation of Tax Administrators, more advanced administrative uses of the Internet focus on account maintenance and customer service. mySAP.com provides advanced online account maintenance, account access, and customer service to citizens and businesses filing taxes and requesting related information.

To provide greater service levels, mySAP.com can also support self-service applications on the Internet by allowing tax and revenue agencies to enable their services for Web access. Constituents can go to one site – a one-stop tax authority – for interactive services. A single point of entry means that constituents have a liaison officer and don't need to know about the different departments that are involved in processing taxes.

Business Tax Support

Business access to the Internet is growing. As of 1998, there were 72 million businesses nationwide with Web access. By 2003, that number will grow to 260 million, according to the Gartner Group. A 1999 survey of small businesses by International Data Corp (IDC) indicated that over 52% of all small businesses across the nation were accessing the Internet. By 2003, that percentage will climb to over 70%.

During the 2000 annual FTA meeting in Boston, Frederick A. Laskey, Commissioner of Revenue for the Massachusetts Department of Revenue, said that 77% of the tax returns and filings in the commonwealth are for businesses. He acknowledged that the real value of its Web site lies in the interactive features that enable the department's constituents to perform such transactions as registering to be a business taxpayer. He indicated that nearly 1,000 businesses registered online between mid-April, when the Web application went online and the end of May 2000. Currently, about 40,000 businesses register in the state annually. Commissioner Laskey indicated that capturing registrations electronically will speed processing and accuracy tremendously.

Taxpayers Online with mySAP.com

mySAP.com account maintenance enables taxpayers to handle many tasks online: taxpayer registration, name and address changes, checking account balances and outstanding liabilities, locate information on tax laws and their interpretation, and paying outstanding balances. For example, SAP Internet Service Request can be used for taxpayer registration, tax type registration, and any other form of processing.

In addition, mySAP.com provides intelligence for the flow of information and tasks within the tax and revenue agency. This includes automatic routing of registration information for approvals with e-mail

notifications back to the taxpayer. Taxpayer self-service applications are available at the taxpayer's convenience, anytime, anywhere.

For tax and revenue agencies, customer service means responding to inquiries and requests from various customers, including taxpayers, tax practitioners, legal advisors, and other third parties. SAP Knowledge Management can provide constituents with general information and answers to frequently asked questions (FAQs) on a variety of tax topics in a format that is simple to navigate. SAP CitizenService applications provide functions similar to a solutions database for supporting administrative decisions. mySAP CRM provides tax and revenue agencies with the tools to communicate with their constituents regarding their services.

Constituent Service

mySAP CRM provides all the customer support tools that tax and revenue agencies need to meet the demands of their constituents today and tomorrow. It transforms customer service into a cost-effective organization that generates collections, strengthens customer relationships, and contributes directly to taxpayer satisfaction. It provides:

- **Constituent service through call centers**
Depending on the point of entry, different information is available about constituents. The number that constituents call can be used to invoke an automatic answering system. If the caller's number is available, information about that number (name and address) can be displayed to the operator.
- **Identification of required service**
Based on the constituent information provided, a service request is accepted and routed to the applicable service area. Required services are easily identifiable because the definition of services is not limited to one single view of services, such as technical services, customer support, or professional services. The application helps tax agencies offer any or all of these service types to their customers.
- **Resolution management**
Resolving taxpayer inquiries is an important function for government. Call center management functions allow customer service representatives to provide specific answers based upon a caller's number or to initiate workflow for further action. Problems are logged and continually monitored by call center management for resolution as well.
- **Service and tax information**
Requests for certain kinds of information like office hours are connected automatically to the call center. Information on taxes and services is enhanced by a number of features that allow you to configure the most complex customer base and to track all tax and revenue types.
- **Call center management**
This function covers any physical or virtual hub that conducts the telebusiness of an organization. Telebusiness can include telemarketing (inbound and outbound) or teleservice (inbound). Call center representatives use such aids such as a computer telephony interface (CTI), scripts, and predictive dialing mechanisms. The call center can act as a revenue generator, a center for collections, a taxpayer information house, a complaint center, a service dispatch, or executor of any other business practice that can be facilitated via telephone. Call centers are evolving into contact centers or customer interaction centers. Help desks and technical support organizations are usually separate and distinct organizations from the traditional call center.

Centralized Databases

mySAP.com provides the tax and revenue agencies the ability to allow constituents to enter e-mail directly from a Web site. The e-mail information can be targeted to the specific area that can respond to a particular subject area. To ensure timely responses, mySAP.com makes it easy to respond to e-mail inquiries. mySAP.com can route and distribute e-mail, track responses, and escalate messages if the e-mail is not answered within a specified time limit. This information can be tracked along with information provided by other means, such as interactive voice response (IVR), or integrated with that from conventional

communication channels, such as telephone, fax, EDI, or paper documents because all data resides in one database. Because staff members can access the same information regardless of the means of communication, constituents receive a consistent message.

mySAP.com CRM also tracks the history of the taxpayer's relationship with the tax authority. mySAP.com provides access to taxpayer e-mails, images of paper correspondence, summaries of telephone contacts, as well as filing history and account status. The contact center provides a centralized facility for handling telephone, e-mail, and paper-based requests for assistance. A contact center specialist armed a complete history of a taxpayer's interaction with the agency in electronic format at his fingertips is much better prepared to resolve problems quickly and correctly without additional follow-up. mySAP CRM is also useful to auditors and revenue officers in working with taxpayers to resolve compliance issues. mySAP.com CRM may also allow a taxing authority to distinguish between contact types, and to set up specialized services for tax practitioners and other third-party intermediaries. Estimates in savings in communication costs to the constituents range from 10 to 20%. The benefits of providing better information to the taxpayer are measured in customer satisfaction.

A solution for Tax and Revenue Management

Through SAP's strong commitment to high performance, mySAP.com serves as the technological foundation to efficiently process the very large volumes of posting data generated by the business transactions of large tax and revenue management agencies. This technology has already been released in the world's major markets for insurance companies and utility providers and has been constructed and programmed to provide the highest possible performance.

SAP Tax and Revenue Management is an e-government solution that enables fast, accurate, and efficient collection of taxes and other public funds. It has been developed to automate and improve cash-flow management, and to provide a single logical financial framework for the management of public revenue collection and payment processing.

SAP Tax and Revenue Management offers tax and revenue agencies a complete subledger accounting system based on the world-leading mySAP.com standard components for accounting, controlling, treasury management, and cash management. The solution provides all the required accounting functions, such as transfer of receivable documents, payments, dunning, correspondence and year-end closing as well as efficient handling of constituents.

In addition, Sap Tax and Revenue Management can be used to transfer all the posting data from associated systems such as assessments, verified tax returns, claims, and public services. Similarly, the solution will also cover management and administration of constituent accounts, clearing accounts (for revenue transfers to other public sector organizations) and collector accounts.

A creditworthiness record shows the payment history of the taxpayer. The creditworthiness indicators are used in dunning and return activities and for the determination of charges. Late payers can be transferred into an outbound call queue for further processing by a clerk in the call center.

SAP Business Partner (taxpayer ID) is a component embedded in the SAP Internet Business Framework. The link to the Internet Business Framework guarantees the integration of taxpayer IDs into an existing system landscape as well as cooperation with other external applications. By using mySAP.com, tax and revenue agencies can derive real benefits for both their organization and their customers: taxpayers, tax practitioners, taxpayers' legal advisors, and other government organizations.

E-Procurement in E-Government

Streamlining the entire procurement process is a challenge. According to the NECCC survey, the business drivers include:

- High paper process, both in bidding and purchasing process
- High administration, staff resources
- Lost opportunities to take advantage of state volume

Requisitions that can be generated online via the Web by end users can greatly reduce cost and improve customer service. According to a 1999 study by Grainger Consulting Services, the cost of processing a purchase order, with associated approvals, often exceeds \$100. However, this transaction processing cost is static. In other words it makes no difference whether the item is \$5 box of pens or a \$5,000 computer, the \$100 processing cost remains the same. The Grainger study showed that an integrated e-procurement solution can generate a return on investment (ROI) of 245 to 400% for buying organizations. According to the Aberdeen Group, a complete manual purchase requisition cycle lasting about seven days can be reduced to two days with an automated solution.

Results from the recent National Electronic Commerce Coordinating Council (www.ec3.org) survey of the states indicates two themes are emerging about government e-procurement:

- Complete versus partial process automation
- Automated bidding

You can find examples of these themes in *Placing Contracts On Internet To Receiving Bids Electronically* on the council's Web site at <http://www.ec3.org>.

Procuring materials and services is an important aspect of e-government. E-procurement includes competitive procurement processes, Web-based catalogs, aggregated buying, electronic marketplaces, and online auctioning, to name just a few of the vehicles.

E-procurement allows purchasing departments to spend more time focusing on negotiating contracts, managing contracts, and providing better customer service, both internally and externally. Using online catalogs, pricing can be controlled and authorization limits can be easily incorporated into online workflow. Funds availability can also be checked and encumbered against budgets. All the processes that historically had to be done manually can be done electronically, improving the necessary controls, drastically improving turnaround time, and ultimately lowering costs and providing better customer service.

Enterprise Buyer: E-Procurement Solutions

Several mySAP.com solutions involve e-procurement. Enterprise Buyer, which is developed jointly by SAP and Commerce One, provides you all the tools you need to deploy a Web-based solution. By combining technologies, SAP and Commerce One can offer a complete solution for government procurement.

Enterprise Buyer can run as a stand-alone component or it can be fully integrated with your ERP system or legacy administrative systems. Online catalogs of all your contracted items can be easily maintained and updated. Enterprise Buyer supports all procurement means (procurement cards, purchase order, and so on), and it integrates with government financial systems.

Purchasing professional can use online bidding or Web tendering. Web tendering dramatically increases the opportunity for competition, increases bid control, and drastically streamlines the bidding function. Documents can be generated in any format that you require – printed documents, fax, EDI, or via the Internet – directly to government suppliers via standard protocols like XML. XML is viewed as the future means of electronic document exchange, supplementing and potentially replacing EDI. Through mySAP.com, you always have an open architecture that allows you to communicate with any type of ERP system or legacy system. This architecture also allows you to implement Enterprise Buyer without

replacing all your other systems, greatly decreasing the time it takes for you to begin experiencing the benefits of e-procurement.

Enterprise Buyer can serve as an on-ramp to electronic marketplaces. By using an electronic marketplace, such as MarketSet, government purchasers can collaborate with all their partners – suppliers, banks, and other government entities. In addition, the marketplace can aggregate your purchases with other organizations, helping to reduce prices for goods due to the volume quantities purchased. The solution also supports all types of auctioning, both forward and reverse auctions. Reverse auctioning (one buyer-many sellers) is becoming more popular as a way to drive prices down by increasing competition through online bidding to supply goods and services.

SAP also provides a hosted procurement solution for government agencies that cannot maintain their own Internet solution. Hosted solutions provide all the functions listed above is available, but they are typically managed by an application service provider that is certified to support mySAP.com and to provide high levels of service and performance. You can develop a customized hosted solution using mySAP.com and Commerce One technology, or you may choose to use an already established marketplace solution. SAP has partnered with some of the industry's leading hosted procurement marketplace companies, such as Simplexis.com, to further increase your procurement options. Simplexis.com is a fully hosted online marketplace for the K-12 education market. Simplexis.com runs on an Enterprise Buyer-based platform, which easily integrates with mySAP.com.

SAP realized the need to drive down the cost of procurement and order fulfillment while meeting the need to use improved supply chain technology with governments' major suppliers. E-procurement is an important part of e-government, and SAP has a dedicated solution to meet your needs in this area.