

# Digitally Integrating the Government Supply Chain: E-Procurement, E-Finance, and E-Logistics

E - G o v e r n m e n t S e r i e s



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IBM Endowment for  
**The Business  
of Government**



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## F O R E W O R D

February 2003

On behalf of the IBM Endowment for The Business of Government, we are pleased to present this report, “Digitally Integrating the Government Supply Chain: E-Procurement, E-Finance, and E-Logistics,” by Jacques S. Gansler, William Lucyshyn, and Kimberly Ross.

This report represents a year long partnership between the IBM Endowment for The Business of Government and the University of Maryland School of Public Affairs’ Center for Public Policy and Private Enterprise. The Center, under the direction of Dr. Gansler, hosted a series of three Thought Leadership Forums at the Aspen Institute’s Wye River Conference Centers, held over a 12-month period. The Forums brought together government and business leaders to examine how the federal government could “digitally integrate” its supply chain. Specifically, the challenges of implementing e-procurement, e-finance, and e-logistics were examined.

The Forums produced 50 recommendations for the federal government to consider. This report sets forth an exciting agenda for the Office of Management and Budget, cabinet departments, and individual agencies. By implementing many of the recommendations contained in this report, the federal government can both save money and speed up the operations of government. The report provides specific recommendations on how the supply chain can be “digitally integrated,” including recommendations on system architecture, coordination, human resources, and overcoming barriers.

Many of the participants at the Forums commented on the relationship between the government’s supply chain and the President’s Management Agenda. Two of the President’s government-wide initiatives were directly addressed at the Forums: improving financial performance and expanding electronic government. Two other initiatives were viewed as key elements in the implementation of digitally integrating the supply chain: the strategic management of human capital and competitive sourcing.

We trust that this report will be both informative and useful to executives throughout government as they examine how the operations of government can be dramatically improved by implementing e-procurement, e-finance, and e-logistics in a timely manner.

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# Overview\*

For much of the last decade, the business world has been striving to adapt to the tidal-wave-like changes brought about by exponential improvements in information technology, particularly as offered by the Internet. These changes have had a dramatic impact on the way business is conducted. Companies are exchanging goods, services, and information in new ways that are more efficient, blurring geographic boundaries and shortening cycle times. Even though the expectations for this new wave of technology-enabled trade, broadly defined as “electronic commerce” (e-commerce), have been high, e-commerce still represents a small fraction of total economic activity. Although much of the initial focus was on the business-to-consumer (B2C) segment, the emphasis has shifted to the more complex, higher payoff business-to-business (B2B) relationships. It is estimated by Forrester Research that B2B e-commerce will grow from approximately \$1.0 trillion in 2000 to \$2.7 trillion in 2004 (as reported in “Logistics @ Internet Speed: The Impact of E-Commerce on Logistics,” *Year 2000 Report on Trends and Issues in Logistics and Transportation*, Cap Gemini Ernst & Young with the University of Tennessee).

To fully understand the potential benefits of B2B e-commerce, one needs to look at the supply chain—the flow of goods and services, beginning with the procurement of raw materials, through manufacturing, storage, transportation, delivery, and maintenance, and ending with disposal. Information management is the key factor in successfully moving

products through the supply chain. Organizations forecast final demand for their products, and then use that information to plan production schedules and alert suppliers. The suppliers plan and schedule production runs and arrange for the delivery of intermediary goods. The produced goods are stored, shipped, and tracked through the distribution network. Sales are monitored and compared to projected demands in order to avoid unintended surpluses or shortages at the retail level. Maintenance is monitored to project the need for repairs and spare parts. Finally, when products are no longer needed they are reused elsewhere if they are still functional, or they are appropriately disposed of.

Large volumes of data need to be coordinated, updated, and communicated at each step of the supply chain. Legacy paper-based systems are labor intensive, prone to error, and significantly slower. Additionally, a complex supply chain will generate large volumes of documentation—catalogs, orders, specifications, invoices, shipping notifications, payment information, etc.—that need to be kept up-to-date. The information technology available today is well suited to handle the transfer and storage of this data in digital form.

These advances have not been lost on senior federal government officials. The federal government, with its size and complexity, has a supply chain that dwarfs that of any private sector enterprise—even small savings and performance improvements would have significant overall impacts. At the same

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\* The authors would like to thank our former Graduate Research Assistants for the Center for Public Policy and Private Enterprise for their contribution to this report: Gaurav Kapoor (*Understanding E-Procurement*), Pelin Turunc (*Understanding E-Finance*), and Jennifer Moughalian (*Understanding E-Logistics*).

time, the government is increasingly integrating private sector services into its operations. The challenge is to adapt these practices and integrate these services in ways that will produce the overall greatest results, not just optimize selected elements of the supply chain.

Along with logistics, procurement and financial management—two often overlooked supporting processes—have a major impact on the overall government-industry supply chain. In fiscal year 2000, the federal government procured approximately \$219 billion of materials and services. Automation and process improvements can reduce procurement costs as well as increase organizational effectiveness. Likewise, integrated financial management systems that directly interface with procurement and other supply chain processes can provide a mechanism to monitor and improve overall operations, reduce costs, and add value. At the same time, improved logistics can reduce inventories held, improve fill rates, and reduce delivery times. Yet, in many government organizations and applications, these functions (procurement, financial management, and logistics) tend to be treated as separate and unrelated functions. In order to achieve the maximum benefits, it is critical that government continue to automate these functions and also integrate them into the supply chain.

When electronic procurement and electronic financial management systems are integrated with logistics systems, employees can procure supplies and materials online from allowable vendors. Invoices and electronic funds transfers can automatically follow, with all the transactions automatically recorded. Data has to be entered only once, avoiding duplicative tasks and eliminating unnecessary reconciliation. Equipment utilization rates can be increased with the improved availability of spare parts. The resultant integrated supply chain will produce significantly improved performance at significantly reduced costs. Additionally, with an integrated digital supply chain, organizations are more likely to have accurate, useful, and timely information for day-to-day as well as strategic decision making, budgeting, and external reporting.

Today, legacy systems restrict the ability of the government's overall supply chain to respond to the frequent rapid changes in requirements. For exam-

ple, during the ongoing conflict in Afghanistan, even though funding was available and the logistics system could handle the volume of shipments, the current paper-based procurement system could not process procurement requisitions quickly enough to meet the requirements of the fast-paced military operations.

To engage government and business leaders in addressing these issues, the Center for Public Policy and Private Enterprise at the University of Maryland's School of Public Affairs hosted three different three-day Thought Leadership Forums:

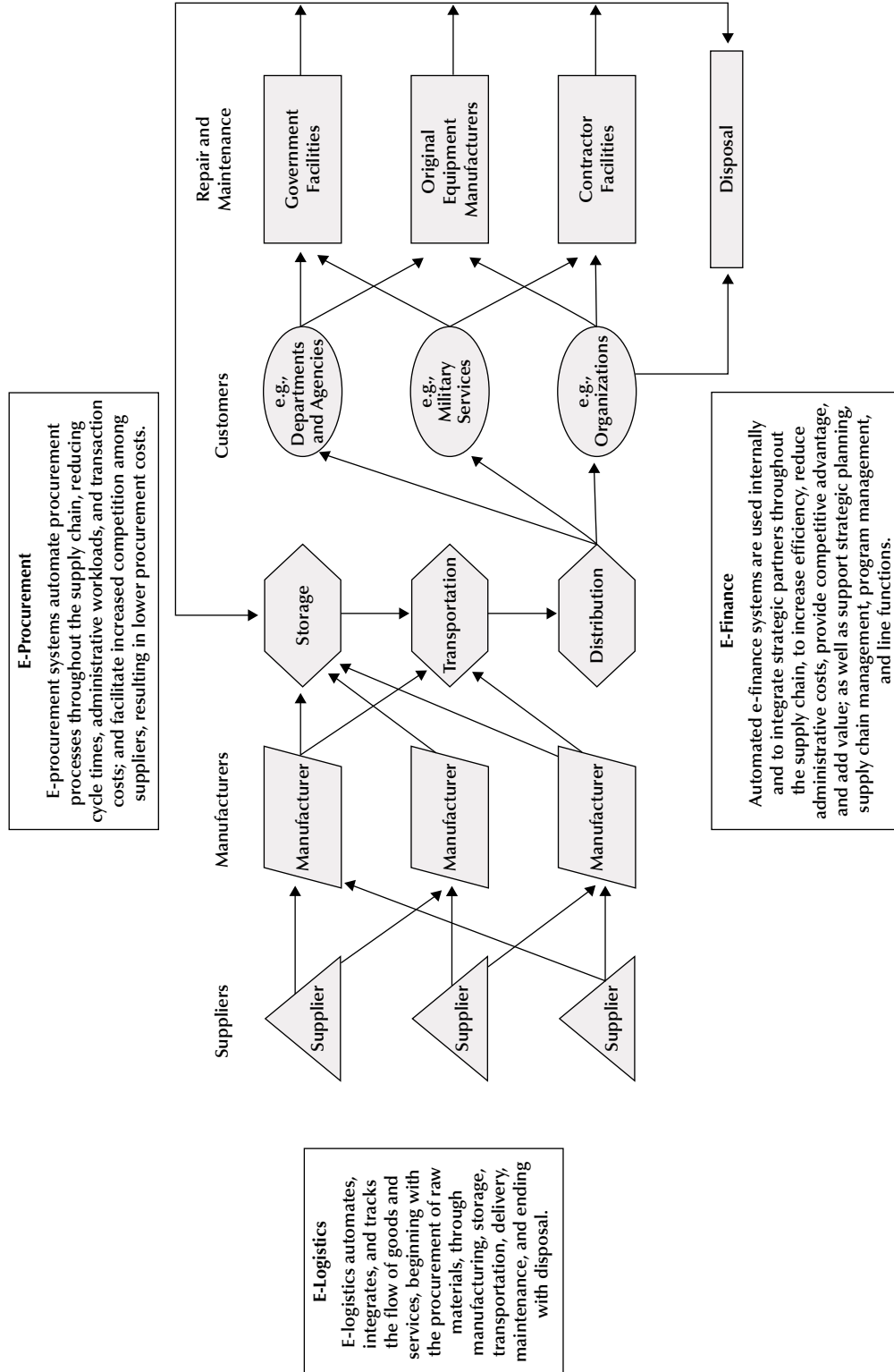
- "Delivering on the Promise of E-Commerce: Greater Government Effectiveness through e-Procurement," December 2–4, 2001
- "Incorporating Financial Management into a Digitally Integrated Supply Chain," April 28–30, 2002
- "Achieving a Modern Government Logistics System: The Critical Element in a Digitally Integrated Supply Chain," October 27–29, 2002

These forums were funded through grants from the IBM Endowment for The Business of Government. Forum participants from senior government, industry, and academia examined business and government case studies, identified key issues, and analyzed lessons learned from successful public and private sector efforts. They then made recommendations for the implementation and integration of electronic procurement, electronic financial management systems, and automated logistics systems into an overall, digitally integrated supply chain. These recommendations are presented in the tables on pages 8, 9, and 10.

The participants at all three of the forums identified committed senior leadership as the most critical element to achieve a transformation and integration of the government's supply chain, and to overcome existing legislative, regulatory, and organizational barriers. These leaders must develop incentives and metrics to change the culture and monitor progress—they need to empower employees and then hold them accountable for progress. As new systems are developed, they must link the procurement and finance functions with logistics into an integrated, digital supply chain with an architecture that cre-



Figure 1: Integrating E-Procurement and E-Finance with E-Logistics into a Supply Chain



ates interoperability within the government and with the private sector. The participants also recognized the government's existing interaction with the private sector and the benefits derived; and recommended increasing public-private interaction to create the "best value" for the government. Finally, they also acknowledged that, as the government moves to an automated and integrated supply chain, the nature of many government jobs will change. To facilitate the transition to this new environment, they concluded that government agencies and departments must aggressively develop and provide training to reshape and sustain the workforce.

With the current nexus of the advances in information technology (from communication to computing), the motivation for change, and the clear need and opportunity for government process improvements, forum recommendations will be useful for leaders in the Bush Administration to realize the potential of electronic procurement, electronic financial management, and logistics systems improvements in an overall, digitally integrated supply chain.

The IBM Endowment for The Business of Government will also be publishing a book, *Transforming Government Supply Chain Management*, which integrates the results of the three forums and includes featured case studies.

### Recommendations from the Wye River Forums

E-PROCUREMENT RECOMMENDATIONS FROM WYE RIVER FORUM I		
Recommendation Area	Implementor	Recommendations
Leadership	Department and agency heads	<ol style="list-style-type: none"> <li>1. Identify and strongly support an agency "Leader of Change."</li> <li>2. Set the vision and strategy for implementing e-procurement, and achieve some early successes.</li> <li>3. Transform procurement processes while investing in technology.</li> </ol>
Architecture	Office of Management and Budget in conjunction with department and agency heads	<ol style="list-style-type: none"> <li>4. Develop a government-wide architecture.</li> <li>5. Ensure interoperability within the government and with the private sector.</li> <li>6. Integrate the supply chain; don't just focus on procurement.</li> <li>7. Adopt commercial "best of breed."</li> <li>8. Implement appropriate security controls.</li> </ol>
Integration/Coordination	Office of Management and Budget in conjunction with department and agency heads	<ol style="list-style-type: none"> <li>9. Improve public/private interaction and cooperation.</li> <li>10. Improve interagency coordination.</li> </ol>
Human Capital	Office of Management and Budget in conjunction with department and agency heads	<ol style="list-style-type: none"> <li>11. Develop the required human capital.</li> </ol>
Overcoming Barriers	Office of Management and Budget	<ol style="list-style-type: none"> <li>12. Increase the micro-purchase threshold.</li> <li>13. Remove regulatory barriers.</li> <li>14. Provide the required resources.</li> </ol>

**Recommendations from the Wye River Forums (continued)**

<b>E-FINANCE RECOMMENDATIONS FROM WYE RIVER FORUM II</b>		
<b>Recommendation Area</b>	<b>Implementor</b>	<b>Recommendations</b>
Leadership	The President	1. Create the vision.
	Office of Management and Budget	2. Identify a financial management “Leader of Change.”
	Department and agency heads	3. Identify and strongly support an agency “Leader of Change.” 4. Assume change and manage it.
	Office of Management and Budget in conjunction with department and agency heads	5. Develop a strategic plan to add value. 6. Use a balanced scorecard to measure progress.
Integration/ Interoperability	Office of Management and Budget	7. Standardize interfaces, not systems.
	Department and agency heads	8. Reengineer financial management processes while automating. 9. Make finance a key part of operations. 10. Define essential requirements—and stick to them. 11. Focus on security and privacy.
Public-Private Interaction	Department and agency heads	12. Buy or outsource; don’t build. 13. Partner with the private sector.
	Office of Management and Budget	14. Develop a Center of Excellence for public-private lessons learned.
Overcoming Barriers	Office of Management and Budget	15. Streamline the oversight process—reduce paperwork. 16. Adopt activity-based costing.
	Office of Management and Budget in conjunction with department and agency heads	17. Provide the required resources.
Human Resources	Department and agency heads	18. Transition to a knowledge worker environment. 19. Link appraisals to performance.

**Recommendations from the Wye River Forums (continued)**

<b>E-LOGISTICS RECOMMENDATIONS FROM WYE RIVER FORUM III</b>		
<b>Recommendation Area</b>	<b>Implementor</b>	<b>Recommendations</b>
Leadership	Office of Management and Budget in conjunction with department and agency heads	1. Make logistics a top management priority.
	Department and agency heads	2. Develop transformation momentum. 3. Create incentives to change the culture. 4. Measure the right things. 5. Get the facts and make them widely available.
Coordination and Collaboration	Office of Management and Budget in conjunction with department and agency heads	6. Develop a strategic plan. 7. Develop standards to improve interoperability. 8. Improve interagency coordination.
Public-Private Interaction	Office of Management and Budget in conjunction with department and agency heads	9. Use pilot programs to build trust and demonstrate value. 10. Use COTS and the web. 11. Ensure information security and privacy.
Overcoming Barriers	Office of Management and Budget in conjunction with department and agency heads	12. Review and modify acquisition guidance. 13. Implement activity-based costing (ABC). 14. Provide the required resources.
	Office of Management and Budget in conjunction with the secretary of defense	15. Address the "50/50" rule.
Human Resources	Department and agency heads	16. Redesign logistics jobs. 17. Greatly expand education and training.

**Part I:**  
E-Procurement

# Understanding E-Procurement

## Introduction

One development, recognized as having an almost immediate return on investment by reducing costs, improving processes, and providing the data required for the digitization of the supply chain, has been electronic procurement (e-procurement)—business-to-business electronic trade. In manufacturing industries, the end manufacturer usually adds only 20 percent to 30 percent to the value of the product delivered to the customer; the remaining 70 percent to 80 percent is acquired from external sources. Additionally, large enterprises can spend more than 30 percent (this figure can be significantly higher at service organizations) of their revenue for the purchase of nondirect goods and services.<sup>2</sup> As companies attempt to become more competitive in the face of more demanding and sophisticated customers, they increasingly look to the promise of information technology to improve their supply chains by automating and digitizing their procurement processes.

There are several recognized benefits achieved through implementing e-procurement practices. An enterprise can lower its administrative cost associated with procurement by reducing the number of people and time associated with the procurement process. In a typical manual system, users would first have to find a supplier, obtain the appropriate paper catalog, select the item, and seek and obtain management approval. Then, after review and approval of the requisition by a procurement professional, a purchase order would be faxed to the supplier. This fax would be followed up with a phone call to verify receipt, and then copies would

be sent to shipping and receiving, accounting and finance, and department managers. This paper-based system is sequential, prone to errors, encourages the carrying of excess inventory, and makes enterprise-wide integration very difficult.

With e-procurement, the process is significantly different and more efficient. Employees can access approved vendor catalogs from their PCs, identify and compare needed items, and order them. Product availability and delivery information is readily accessible, and payments can be made electronically. Rule-based software can either provide automatic approval for routine orders or route the request to an available manager for approval. Costs for manually processing a purchase order can range from \$125 to \$175. E-procurement can reduce those costs to \$10 to \$15 by eliminating faxes, phone calls, document preparation, and approvals.<sup>3</sup> Accumulated process savings can be significant: General Electric's "e-Buy" effort saved GE more than \$400 million in the first six months of operation.<sup>4</sup>

An e-procurement approach can also significantly reduce the price of materials and supplies. Buyers can more easily identify the best value when they have access to more suppliers. This not only results in increased competition, but the new visibility also creates new opportunities for small businesses that were previously unavailable. Additionally, using online auctions and reverse auctions, buyers and sellers can quickly exchange information and bids, which often results in significant savings. Using reverse auctions, General Electric businesses experienced savings from 10 percent to 20 percent,

while reducing the time needed for negotiations by approximately 40 percent.<sup>5</sup>

Implementing e-procurement helps to facilitate data collection and allow real-time information management. Digitized transactions provide a complete, instantaneous, and far more accurate audit trail that allows management to track the status of orders, and identify and fix problems sooner. Such increased insight into purchases, inventory levels, and delivery status enables significant improvements in supply chain management that lead to significant pay-backs—including 25 percent to 60 percent inventory reductions, 15 percent to 30 percent delivery performance improvements, and 10 percent to 16 percent overall productivity increases.<sup>6</sup>

This data collection also allows organizations to monitor off-contract purchasing, a significant target for cost-cutting improvements. These maverick purchases are out of compliance with the organization's volume purchase agreements. As reported by Dean Witter, the Institute for Supply Management (formerly the National Association of Purchasing Management) estimates that fully one-third of all corporate purchases are maverick purchases. Maverick buyers pay an average of 18 percent to 27 percent above the volume purchase agreement prices.<sup>7</sup> Thus, the increased visibility into the procurement data will facilitate the ability to reduce suppliers across the enterprise, centralizing common purchases.

## Government Procurement

The combined federal and state government procurement spending each year for materials and services purchased from private firms is estimated to be \$550 billion.<sup>9</sup> Federal government spending alone on materials and services in 2000 was approximately \$219 billion.<sup>10</sup> The federal government has been continuously searching for ways to integrate the latest commercial developments into its procurement processes. Consequently, as the commercial marketplace has embraced e-procurement to increase and ease access to information, reduce transaction costs, and improve supply chain management, the government also is seeking to capitalize on the potential of e-procurement to improve how it does business. These efforts are an integral part of the federal government's overall

effort to become more accessible, accountable, and efficient. If it were possible for the federal government, with its vast economy of scale and massive need for maintenance, repair, and operating (MRO) materials, to reduce the cost of procurement 10 percent, taxpayers could realize annual savings of \$55 billion.

Government spending not only accounts for a huge amount of taxpayer revenue, but also is big business, responsible for sustaining an enormous number of suppliers throughout the world. The benevolent focus of government means that a strong move toward electronic business by the federal government could serve to dramatically stimulate and upgrade the economy in the coming years. In adopting B2B e-commerce, the federal government can provide an enormous incentive for suppliers to become web-enabled and stimulate economic growth in this area. It can thereby provide an important endorsement for a shift toward the efficiencies and accountability that come from procuring online. The sheer magnitude of total government spending provides a market opportunity so enticing that software vendors, private e-markets, and auction sites are already competing to incorporate the security, contract, and tendering functionality that is required for government bidding. The Gartner Group predicts that government-to-business e-commerce spending will expand dramatically in the next few years from its current \$1.5 billion to more than \$6 billion by 2005.<sup>11</sup>

## Case Studies

Government leaders have recognized the potential that e-procurement offers for cost controls and supply chain integration. Yet they face a range of challenging issues from interoperability and security to process changes and more. Given the variety of goods and supplies that most large organizations need, their supply chains and related procurement systems are complex functions that cut across organizational boundaries. Many organizations report that significant improvements come not only from adoption of new technologies to implement e-procurement systems, but also from reengineering their strategies and processes. Valuable lessons for addressing these challenges can be found in the private sector's extensive experience with e-procurement, as well as in successful government

## Evolution of B2B e-Commerce<sup>8</sup>

Technology improvements and development of the Internet have allowed B2B e-commerce to evolve dramatically over the past decade: from rigid, inflexible, expensive, proprietary systems to systems with lower costs and open standards hosted on the Internet. This new environment blurs geographic boundaries, creates more efficient markets, and allows organizations to restructure their supply chains to maximize efficiency and value. The following is an overview of the four stages of B2B e-commerce evolution. Although technological advancements have enabled some enterprises to move to Phase IV, most organizations still operate at multiple levels of sophistication in their implementation of e-commerce.

### **Phase I—Batch EDI (Electronic Data Interchange)**

EDI networks represent the first phase of electronic B2B e-commerce. EDI was designed to process high volumes of very structured data but is a very inflexible tool since only batch orders can be processed. In addition, it is difficult to adapt to the dynamic marketplace, since all transactions are defined according to published standards. The point-to-point connections of EDI provide no community or market transparency; therefore, the buyer has to have a pre-existent relationship with the seller and be familiar with the precise product. Businesses with well-defined trading relationships continue to use EDI. It is, however, expensive to implement since it relies heavily on proprietary point-to-point networks and does not yet leverage the Internet. Consequently, it is outside the reach of most small and medium-size companies. Additionally, EDI is only useful for transactions involving replenishment orders for direct production goods tied to a previously negotiated contract.

### **Phase II—Basic E-Commerce**

In this phase, basic e-commerce is initiated between buyers and sellers without an intermediary opening the way to more transparency. Companies operating in this phase push their websites as a primary sales channel. The early adopters were mostly technology companies, such as Cisco and Dell, with technology-savvy customers. Companies operating in this phase focus on displaying catalog content and publishing marketing material, with only 15 percent able to accept orders and only 6 percent capable of providing order status information.

### **Phase III—Communities of Commerce**

This phase represents the rise of third-party web destinations that bring together trading partners into a common community of enterprises, known as Internet Trading Exchanges. Once buyers and sellers start to regularly arrive at a common destination, all variety of possibilities arise: Buyers can find new suppliers, suppliers can find new customers, and market transparency facilitates determining market price and availability.

### **Phase IV—Collaborative Commerce**

The collaborative commerce phase is currently developing, and it is envisioned that it will fill in the gaps around e-commerce. Collaborative commerce will be a more complete reflection of the complex workflow between demand and supply chains. It will permit a wide range of interactions beyond ordering supplies and equipment, such as sharing product specifications, production plans, and demand data, to closely synchronize behavior with key partners.



programs. To better understand the experience with e-procurement, we undertook three case studies. The case studies will be available in *Transforming Government Supply Chain Management*, edited by Jacques S. Gansler and Robert E. Luby (Rowman and Littlefield Publishers, 2003).

### **Covisint**

Developed by an automobile industry consortium (initially among General Motors, DaimlerChrysler, and Ford, and then expanded to include Nissan, Renault, and Peugeot) Covisint offers a vertical exchange where manufacturers and suppliers of all sizes can come together in a single business environment using a common user interface and tools. The service aims to provide a best-of-breed, scalable, and secure environment, based on an open Internet standard, in order to offer users a collaborative environment that enhances product development and supply chain management. In addition to procurement functions, the system also offers other value-added services needed by automobile industry buyers and suppliers. Covisint operations have resulted in \$45 billion worth of goods sold in over 1,000 online bidding events. Customers using the collaboration tools are seeing 4 percent to 17 percent savings, and those using the procurement tools are seeing savings of 7 percent to 16 percent.<sup>12</sup>

### **DoD EMALL**

The DoD EMALL is an Internet-accessible portal that provides a single entry point for Department of Defense and other government customers to find and acquire off-the-shelf, finished goods and services such as IT equipment, textiles, and training. EMALL negotiates the best purchase prices from both the commercial marketplace and government sources. It can be viewed as a horizontal exchange for government users, with a target market in excess of \$4 billion. The EMALL demonstrated an almost immediate and significant reduction in procurement transaction costs, from \$146.00 to \$11.31 for manual transactions, and from \$25.62 to \$11.31 for purchase card transactions.<sup>13</sup>

### **Defense Medical Logistics Standard Support (DMLSS)**

The DoD DMLSS system is an integrated system created to accommodate the needs of the armed forces at the wholesale and retail levels for medical logistics support. The DMLSS relied on e-commerce and web-based technology to reengineer the entire medical supply chain and speed delivery of pharmaceutical and medical/surgical items to customers—negating the need to stock large inventories at depots and military treatment facilities. In broad terms, it has many similarities with a commercial vertical exchange. When fully implemented, DMLSS will replace the functionality of nine legacy systems, saving the costs of maintaining these stand-alone, nonintegrated systems. DMLSS process improvements and automation have resulted in significant savings for the DoD. During the period 1994 to 2000, DMLSS reduced the wholesale medical inventory by \$429 million, the medical treatment facilities inventory by \$130 million, and saved \$389 million in the cost of drugs, while maintaining a supply availability rate of 95 percent.

## Online Exchanges Develop

As the Internet developed and redefined the business environment, new business opportunities emerged. Market makers recognized these opportunities, and using software to automate transactions, they created virtual marketplaces to bring together huge numbers of buyers and sellers in business-to-business (B2B) online exchanges. These exchanges offered businesses the opportunity to do more than just automate existing relationships; they could quickly identify and establish relationships with new partners, and define new types of transactions—auctions, reverse auctions, online catalogs, RFQ/RFP, and, of course, direct sales—without middlemen or brokers. The market makers saw the potential to generate revenues by developing these exchanges and assembling the buyers and sellers who participate in them. Revenues are generated by the licensing of proprietary exchange software and integrating it with the participants' back-end systems, charging a per-transaction fee (usually only to sellers), or charging a subscription fee to buyers and sellers who use the exchange. More than 700 such exchanges were founded between 1995 and 2000.<sup>14</sup>

In order to understand these online exchanges, it is helpful to understand what enterprises buy. Enterprises purchase a wide range of products and services, ranging from bulk commodities like steel or chemicals, to administrative supplies like pens, paper clips, and paper.

Traditionally, these purchases have been broken down into two categories: direct and indirect. Direct purchases are for the raw materials and commodities that are used directly in the process of manufacturing a product. These materials are usually bought in large quantities, and in companies with any level of sophistication, the requirements are foreseeable. Additionally, they generally require special logistics requirements—dedicated shipments and special handling. Consequently, these goods are generally purchased from vertical or industry-specific suppliers.

Indirect purchases, on the other hand, describe those procurements that are not used to manufacture finished products, but are day-to-day necessities of the workplace. They are often referred to as maintenance, repair, and operating, or MRO, goods, and include office supplies, furniture, computers, travel services, and spare parts. These items generally are not industry specific and normally do not require special shipping or handling. As a result, these products are bought from what are described as horizontal suppliers. Market makers, either neutral third parties or the dominant players in an industry, have developed online exchanges that fill these two types of business needs.

### Horizontal Exchanges

Horizontal exchanges attempt to reduce the cost of procuring MRO supplies. In order to be effective, horizontal exchanges need to have a large number of suppliers participating. This allows buyers to do one-stop shopping for all their supplies and to make easy price comparisons among suppliers. In general, the ownership model for horizontal exchanges is third party (i.e., the exchange is owned and operated by a third party that is not considered to be a trading partner).

The largest and best-known horizontal exchanges were developed by the e-commerce technology providers Commerce One and Ariba—serving the MRO market for large businesses and their suppliers. They offer features such as limiting a participant's choice of goods to pre-selected items from vendors with which a corporation has a contract, and integrating the exchange with a corporation's enterprise resource planning (ERP) system. Another good example is the site maintained by W. W. Grainger, the powerful MRO supplies group. It provides a single web portal that gives customers access to six industry-leading MRO suppliers. The service includes online ordering and invoicing and provides customers with a single point of contact for access to a wide variety of indirect products. One registration to this site gives buyers access to its over 12,000 suppliers and immediate access to 100,000 brand names and more than 5 million products that include cleaning and painting supplies, lighting supplies, pumps, tools, and repair parts.<sup>15</sup>

### Vertical Exchanges

Vertical exchanges focus on one particular industry—for example, aviation, automobile, chemical, steel, or energy. These marketplaces provide deep domain-specific content and domain-specific relationships while trying to reduce the cost of buying raw materials, components, and equipment required for manufacturing products. To achieve these objectives, vertical exchanges attempt to assemble as many of the targeted industry buyers and sellers as possible. Unlike MRO purchases made at horizontal exchanges, where the focus is on obtaining standard supplies at the lowest price, direct procurement generally involves a long-term relationship with a vendor, who will deliver a known quality of goods. Unfilled orders or poor quality can shut down a production line or an entire factory.

An interesting development made possible by the Internet is the joint sponsorship of vertical exchanges by consortia of large, rival industry leaders. Based on the size of these companies, their market influence, and financial sway, these exchanges quickly reach critical mass. Two prominent examples are Covisint in the automotive industry and Exostar in the aerospace industry.

# E-Procurement Recommendations from the Wye River Forum I

## Overview

The Center for Public Policy and Private Enterprise at the University of Maryland's School of Public Affairs hosted a three-day Thought Leadership Forum December 2–4, 2001, entitled "Delivering on the Promise of E-Commerce: Greater Government Effectiveness through E-Procurement." The Forum, funded through a grant from The IBM Endowment for The Business of Government, was held at the Aspen Institute's Wye River Conference Center on Maryland's Eastern Shore. The Forum brought together 27 senior government leaders, business executives, and academics representing a wide range of federal government organizations and various functions and sizes of industrial and software firms. (See list of attendees on page 25.) Its goal was to facilitate serious discussion and examine e-procurement issues within government and business, including featured case studies, and to specifically identify valuable lessons and recommendations that can help lead to the rapid integration and modernization of supply chain management systems in the government.

The Forum featured public and private case studies and speakers that spurred lively discussions about the lessons these offered about successes and potential e-procurement solutions to challenges currently faced by the federal government. This section highlights key lessons learned from the Forum, along with strategies and potential future public policy actions recommended by the Forum participants to rapidly realize the full potential of government e-procurement.

E-commerce—of which e-procurement is a major subset—is changing the way government works in both subtle and dramatic ways. E-government is one of President Bush's five key elements in his 2002 President's Management Agenda. The objective is to achieve strategic improvements, and internal efficiency and effectiveness, through e-business practices that improve the performance and reduce the costs of federal government administration.

The President appointed Mark Forman as associate director for information technology and e-government in the Office of Management and Budget to help meet these goals. Forman was a keynote speaker on the opening night of the Forum and presented an overview of his key initiatives. Emphasizing the importance of identifying ways to rapidly realize the potential of government e-procurement, he pointed out that the federal government is at least two years behind the private sector in e-commerce practices and technology. Furthermore, financial management modernization will be a significant driver of e-government. It is not a question of will e-business practices be incorporated into the administration of government, but rather how it will be done in order to realize rapidly the benefits offered and to ensure that the federal government's unique concerns and goals are also met.

The Forum concluded that strong *leadership* throughout the federal government is critical to realize the comprehensive changes needed. A clear vision of an integrated, modernized, digitized supply chain management system is required to implement an effective e-procurement system. This must involve a real transformation of procurement and

## Definitions

- **electronic commerce** (e-commerce): Electronic techniques for accomplishing business transactions to include electronic mail or messaging, Internet technology, electronic bulletin boards, purchase cards, electronic funds transfers, and electronic data interchange.
- **electronic procurement** (e-procurement): A major subset of e-commerce that focuses only on business-to-business electronic trade. This covers the entire cycle of the procurement of goods, from requisition to receipt of the product.

related processes rather than just digitizing all existing processes. A strategic *architecture* (an overall, coordinated plan for e-procurement processes) is needed that ensures an integrated supply chain system, appropriate security controls, and interoperability of diverse agency systems; and one that incorporates commercial best practices and utilizes commercially available systems.

Real success will depend on integration and coordination between the public and private sectors, as well as within and among government agencies. While the focus of the Forum's discussions often focused on ways to improve government practices, the private sector participants found that the challenges faced by the public sector as opposed to the private sector are not as different as they initially had thought. Certainly there are additional constraints because of the government's unique role in meeting socioeconomic goals—ensuring competition and other important goals beyond cost savings. Yet businesses and government face many common challenges. Participants found that similar solutions might be applicable in both the public and private sectors. To quote one, "There was truly learning going on both ways. I will be taking back tangible examples of what works and doesn't work that will also help [my company]."

Specific recommendations were developed to increase more structured opportunities for cross-

sector collaboration and exchange of ideas and best practices.

## Leadership

The Forum participants identified leadership as the most critical element in achieving government-wide, effective implementation of e-procurement and, ultimately, in optimizing the government's overall digital supply chain. Creative, committed leaders at all levels and in all the agencies are essential to make this vision a reality. The following critical leadership factors from the private sector were identified and discussed:<sup>16</sup>

- Top leadership must establish very specific goals and metrics for success.
- The head of the organization must provide a strategic vision and give line managers the authority to implement it.
- Top leadership needs to think big and comprehensively, but start small and scale up.
- Programs need to show consistently increasing value.
- Organization and individual incentives must be aligned.

Lack of consistent leadership in the government due to frequent turnover of political—and, in the case of the Department of Defense, military—personnel was identified as a significant issue. Since cooperation and integration are much more difficult to achieve without support from leadership, most agreements last only as long as the "enforcer" is in place. There was also a discussion of reasons for failure of e-commerce efforts in the private sector. These included the following:

- The head of the organization was not out front or committed.
- There was no senior person in charge of implementation; line managers were held accountable.
- E-commerce systems were custom built and failed because enterprises spent all of their resources on development and could not keep up with state-of-the-art technology.
- Enterprises did not manage cultural changes, communication, and training.

## Department and agency heads should:

### **1. Identify and strongly support an agency “Leader of Change.”**

As is the case with any organizational transformation, strong leadership and sound management are critical. The government-wide “Leader of Change”<sup>17</sup> is responsible for the coordinated achievement of the President’s e-government initiatives, which include the implementation of e-procurement, throughout the federal government. His “leadership team” must have a strong leader in each government agency. These leaders must understand the procurement practices in their agencies, how information systems support them, and how to bring about a transformation that creates a coordinated system throughout the federal government.

The overwhelming consensus, based on the experience of participants from both the public and private sectors, was a clear need for an individual with an enterprise-wide perspective—a CEO perspective rather than a CIO perspective. To be effective, this individual must have the responsibility and authority to make (or at least directly influence) resource allocation decisions across agency internal boundaries, and must have the visible and continuous support of the agency head. As is the case with any organizational transformation, strong leadership and sound management are critical. There was a strong sentiment that rather than being directive, the transformation should rely on incentives to promote the desired innovation, sharing, collaboration, and system use.

### **2. Set the vision and strategy for implementing e-procurement, and achieve some early successes.**

A critical task identified for department and agency leaders is to bring coherence to the process by defining goals and the vision for the implementation of e-procurement within an integrated supply chain. This vision should establish the government as having the “best practice” for optimizing the supply chain. The strategy should set e-procurement practices within the context of the supply chain and utilize “best of breed” commercial practices. Measures of success should be established through the use of one- to three-year (maximum) customer service goals with corresponding explicit quantitative metrics and milestones. Using a sense of urgency—as required with a compelling problem—

the program needs to show some early successes (6–12 months), and then build on those successes, using them as a springboard to create a cycle of continuous process improvement.

### **3. Transform procurement processes while investing in technology.**

The key to achieving the greatest increases in procurement efficiencies is to recognize that technology is just an enabling tool—business processes must be improved to gain the benefits of applying technology. In fact, this process transformation should not be viewed as a technology issue, but one of critical organizational change management. The difficulty arises in attempting to change behavior and, ultimately, in developing a culture of continuous process improvement. Agency leaders must establish a permanent and widespread communication program, aimed at changing the culture to create shared values, beliefs, and norms, and shifting attitudes toward the positive aspects of the changes taking place. As one of the Forum participants observed, “Digitizing a bad process just results in doing something bad faster.” Once the processes are reengineered, everyone agreed, the necessary technology would step up to meet the needs. The transformation should be made via a stream of visible deliverables while progress is continuously monitored using realistic, measurable expectations.

## Architecture

Two sets of issues were addressed by the participants: the need for a strategic enterprise-wide architecture and the attributes of that architecture. This architecture is necessary because the complexity of procurement within the federal government, coupled with the large number of stakeholders, makes it difficult to maintain a view of the “big picture” while working on the parts. In the past, this overall complexity has led to solutions being developed that are limited in scope and not interoperable within and across agencies. This architecture will provide a high-level operational and technological perspective of the “as is” environment and the “to be” environment. It should also include an investment road map for moving between the two environments. Discussions brought out that, given the diverse size and number of federal government agencies, it must be recognized that one size does not fit all. Additionally, rather than attempt to

develop a “perfect system,” identifying and defining the 80 percent solution may be “good enough.” Finally, there was wide agreement that the architecture must take a broader view than e-procurement—it must identify commodity sectors and look at all of the supply chains of these sectors.

#### **OMB in conjunction with department and agency heads should:**

##### ***4. Develop a government-wide architecture.***

The OMB “Leader of Change” must develop a strategic architecture to provide a common vision and guidance for the effective and efficient use of the multiple and diverse systems that provide the underpinnings of the business operations of the federal government. Through this common vision, the multitude of agencies and organizations will be able to develop compatible e-commerce solutions, resulting in the use of common interface infrastructure implementations, with interoperable hardware and software. Just as the commercial sector has done, the government must also recognize the difference between procuring commodities or services and the acquisition of major systems. Rather than take a single organizational view, each agency should define natural commodity segments and work with OMB to develop an integrating architecture based on those segments. It must be emphasized that the objective of this strategic architecture is not commonality of equipment or software, but interoperability of systems. Finally, this overall architecture (and the individual agency elements thereof) must allow for continuous evolutionary advances and potential future competition, minimize complexity, and have little or no customization.

##### ***5. Ensure interoperability within the government and with the private sector.***

The federal government is a large, complex enterprise, with many elements. The proposed architecture should strive to ensure interoperability within the government and with the private sector. The agencies should establish an executive agent for each commodity sector, government-wide, to develop and maintain that interoperability. Additionally, these commodity-sector executive agents, in conjunction with their industry partners, then should establish and adopt appropriate standards to include systems compatibility, data formats, part numbering, and electronic contract

formats. Of course, the new architecture must also consider the interface to the extant legacy systems until these systems are phased out.

##### ***6. Integrate the supply chain; don’t just focus on procurement.***

When examining and reengineering e-procurement processes, the processes must be viewed in the context of an integrated supply chain—the flow of and payment for goods and services—beginning with the procurement of raw materials, through manufacturing, storage, transportation, delivery, and maintenance, and ending with appropriate disposal. Although procurement processes alone offer the potential for significant improvement, federal agencies must work to improve the effectiveness and efficiency of the entire supply chain. And efficiency involves the optimization of both time and costs. Focusing on and optimizing this one element, e-procurement, could in fact cause a sub-optimization of the overall supply chain.

##### ***7. Adopt commercial “best of breed.”***

The federal government should adopt proven commercial products and systems. The government benefits by both reducing the system development cycle and costs, and by sharing a common base of products with the private sector. An additional benefit is being able to quickly incorporate the private sector’s developed changes and improvements in the rapidly changing world of information technology. Finally, by using open architectures, the government will be able to periodically compete for their systems among the best commercial sources available.

##### ***8. Implement appropriate security controls.***

The flood of computer worms and viruses, hacker attacks, and web-page defacing can make federal officials and businesses reluctant to conduct procurement transactions over the Internet. For e-commerce to flourish, all necessary steps must be taken to ensure that all parties feel comfortable using electronic means to conduct sensitive business. The federal government must work with the private sector to develop and promulgate standards for public key infrastructure (PKI), data encryption, and data ownership rules and rights.

## Integration/Coordination

The federal government is one of the largest and most complex organizations in the world. Effectively managing procurements across this complex array of departments and agencies is a formidable challenge. The Forum recognized that the private sector has increasingly looked to the promise of information technology to improve its supply chains. Based on its extensive experience, the private sector has much to offer the government's effort to improve its processes, and every effort should be made to take advantage of this. There was also recognition that greater integration was needed among government agencies and departments since there is a willingness for agencies to share information, but much less willingness to use or depend on anyone else's information. There is a clear need to improve interagency coordination.

### **OMB in conjunction with department and agency heads should:**

#### ***9. Improve public/private interaction and cooperation.***

To formalize and develop a continuing infusion of commercial best practices, the administration should create a standing Private Sector Practices Council composed of prominent business leaders and senior government executives. The Defense Science Board's e-Procurement Task Force could be used as a model, focusing on best commercial practices. The Council's objective should be to bring independent and objective thought leadership to the government, to recommend e-enabling best practices for government operations, and to provide change-management strategies. The government should identify opportunities to use private sector expertise by creating more public-private partnerships. There are many opportunities to match government needs with private sector capabilities using options such as joint ventures, outsourcing, investment, and privatization.

#### ***10. Improve interagency coordination.***

Federal agencies continue to develop agency-unique systems and capabilities. Increased coordination is required to obtain the maximum benefit from technology investments and to leverage successful projects and programs. Every effort should

be made to develop common tools and to collect data only one time, sharing to the extent appropriate. The use of successful projects and tools, such as the Central Contractor Registry, the federal procurement Internet portal FedBizOps, and the Federal Procurement MIS, should be expanded and integrated. The Government-Wide Acquisition Contracts (GWAC), Multiple Award Contracting (MAC), and Indefinite Delivery, Indefinite Quantity (ID-IQ) contracts should be competed across federal agencies, and all agencies should be allowed and encouraged to use them. Finally, the successful prime vendor concept (a new approach for the procurement of readily available items that eliminates the layering of supplies at multiple sites and shifts inventory management cost to commercial firms) should be expanded and evolved into commercially managed trading exchanges for the use of government buyers. These could ultimately be linked to commercial trading exchanges such as Covisint and Exostar.

## Human Capital

Numerous Forum participants recognized that one of the most critical elements of any comprehensive effort to change the federal government's procurement system is the people who use and manage the procurement process. All members of the government's workforce will need to be familiar with, and support, the changes and improvements to the procurement system. Effective e-procurement will not be the sole province of procurement officials or technology experts. For maximum effectiveness, these changes must be incorporated into the habits and mind-set of government leaders, managers, and workers at all levels.

### **OMB in conjunction with department and agency heads should:**

#### ***11. Develop the required human capital.***

Without developing staff capabilities, federal government agencies will not be in a position to take full advantage of the benefits presented by utilization of information technology. First, adequate staff must be provided via full-time equivalents (FTEs) or contract support. Second, employees must have the training and tools they need to do their jobs. The federal government must take full advantage of the distance learning/training methods developed by

the private sector. Additionally, based on the pace of development and change, federal agencies must create cross-fertilization opportunities between the government and industry. Using techniques such as rotational assignments (between government and industry—both ways) would not only offer valuable experience for government personnel in the private sector, but also offer valuable insight for private industry experts into the unique challenges faced by government procurement officials.

## Overcoming Barriers

Although the Forum identified no specific legal barriers to the implementation of e-procurement, participants noted that Congress has passed several laws that preclude commercial-like procurement. These laws can add to the complexity of negotiating the broad agreements required to place an entire vendor's catalog on contract in order to make it available online for government buyers. The Forum specifically addressed laws that create restrictions to procurements (particularly DoD's large volume of procurements) such as those contained in the provisions of the Berry Amendment (DoD Appropriations Act, 1993). Such laws are intended to promote social and economic contracting goals, yet some consequences can be problematic. In the example cited, DoD purchases must be produced from specified U.S. grown or produced materials. Unfortunately, commercial sources may not know and do not identify where the materials in finished products come from, greatly complicating the government's ability to place a vendor's entire catalog on contract. (Note: The Berry Amendment applies to procurements above the simplified acquisition threshold, currently \$100,000 in most circumstances. The real barrier is the small-business set aside above \$2,500, and taking this on is difficult.)

Another issue discussed by the Forum was how to expand the use of micro-purchases, a very successful e-procurement technique. This involves simplified procedures for purchases below a \$2,500 threshold, which were authorized by the Federal Acquisition Streamlining Act of 1994. Allowing program officials to make such micro-purchases without going through contracting offices has resulted in speedier acquisitions and a reduction in paperwork. Reducing or eliminating the time spent by government procurement staff on the high vol-

ume of small-dollar, routine purchases could significantly increase the time available to address the major, large-dollar purchases of federal agencies. This could be accomplished by increasing the use of government purchase cards when making micro-purchases.

While there was no consensus on specifics, there was a clear agreement that the micro-purchase threshold should be increased significantly when using approved tools. These simplified purchases, using government purchase cards, accounted for over \$12 billion in FY 2000 and have proved very effective—their use should be greatly expanded.<sup>18</sup> Another factor discussed was that although banks pay the government a rebate on the use of the cards, currently these rebates do not benefit the buyer's organization—this disincentive should be changed.

Finally, the Forum discussed the challenge of insufficient resources, which has often inhibited the effective and efficient implementation of e-procurement. Because e-procurement is often a low priority, and it is difficult to develop a business case (because of poor baseline data), there was agreement that OMB and the agencies should simplify the procedure for project initiation, and identify and allocate sufficient resources for e-procurement efforts.

### OMB should:

#### **12. Increase the micro-purchase threshold.**

The OMB "Leader of Change" should seek an increase in the micro-purchase threshold to promote greater efficiency and the ability to use the purchase card without an underlying government contract. This would increase online purchasing. Finally, to further encourage the use of purchase cards, purchase-card rebates should be returned to the buyers' organizations.

#### **13. Remove regulatory barriers.**

The OMB "Leader of Change" must work to significantly reduce the complexity of, or waive the requirement for, the development of a detailed business case for key e-procurement projects and infrastructure. Given the history of change in this area, and the poor baseline cost data available, simple business cases should be sufficient.



**14. Provide the required resources.**

To ensure a dedicated and consistent effort, the OMB “Leader of Change” must support/require the agencies to provide adequate funding so each of them can implement e-procurement. OMB should assist in prioritizing projects and should specify key strategic projects and infrastructure actions. Overall, implementation will be impossible without funding—and the great promise, in improved government performance and reduced costs, will not be realized.

# Endnotes

1. *Logistics@Internet Speed: The Impact of E-Commerce on Logistics*, Year 2000 Report on Trends and Issues in Logistics and Transportation, Cap Gemini Ernst & Young with the University of Tennessee.
2. B. Reilly, J. Hope-Ross, and E. Luebbers, *E-Procurement: A Blueprint for Revolution or Hype*, A GartnerGroup Strategic Analysis Report, R-10-3402, February 9, 2000, p. 4.
3. C. Phillips and M. Meeker, *The B2B Internet Report: Collaborative Commerce*, Morgan Stanley Dean Witter, April 2000, p. 31.
4. Mark Stonich, *What It Takes to Make E-Procurement Work*, PRTN'S Insight, Summer/Fall 2001.
5. David Levine, *GE Global Exchange Services Briefing*, presented December 3, 2001, at Center for Public Policy and Private Enterprise Thought Leadership Forum, "Delivering on the Promise of E-Commerce."
6. Bob Trebilcock, *Planning For Supply Chain Success*, Modern Materials Handling, May 1, 2001.
7. C. Phillips and M. Meeker, *The B2B Internet Report: Collaborative Commerce*, Morgan Stanley Dean Witter, April 2000, p. 31.
8. C. Phillips and M. Meeker, *The B2B Internet Report-Collaborative Commerce*, Morgan Stanley Dean Witter, April 2000.
9. Mathew Symonds, "The Next Revolution," *The Economist*, June 24, 2000.
10. *Report on Annual Procurement Preference Goaling Achievements*, FY 2000 Through Fourth Quarter, Federal Procurement Data System.
11. "Banking Giant Forms Government E-Procurement Company," *E-commerce Times*, part of NewsFactor Network ([www. NewsFactor.com](http://www.NewsFactor.com)), July 7, 2000, p. 2.
12. Covisint data as viewed at [http://www.covisint.com/about/pressroom/speeches/oesa\\_10\\_22\\_01.shtml](http://www.covisint.com/about/pressroom/speeches/oesa_10_22_01.shtml), November 2001.
13. Personal interview with Donald O'Brien, Program Manager, EMALL, November 2001.
14. "While Welch Waited," *The Economist*, May 19, 2001, U.S. Edition.
15. Grainger data, <http://www.grainger.com>, October 2001.
16. Ron Kerber, presentation on status of Defense Science Board Task Force on the Impact of E-Commerce on Department of Defense Acquisition Processes, December 2, 2001.
17. President Bush appointed Mark Forman the Associate Director for Information Technology and E-Government, Office of Management and Budget. As the government-wide "Leader of Change," he has been designated to ensure that the federal government takes maximum advantage of information technology and commercial best practices to improve its quality, effectiveness, and efficiency.
18. In a 1999 study, DoD found that at the Defense Logistics Agency it cost \$146 to process manual transactions, while only \$25.62 for purchase-card transactions. There is a potential for significant savings with increased purchase-card use, coupled with appropriate safeguards and controls to guard against abuse.

# E-Procurement Forum Participants

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**Part II:**  
E-Finance

# Understanding E-Finance

## Introduction

“I think it is an object of great importance...to simplify our system of finance, and to bring it to within the comprehension of every member of Congress.... The whole system [has been] involved with impenetrable fog.... We might hope to see the finances of the Union as clear and intelligible as a merchant’s books, so that every member of Congress, and every man of any mind in the Union, should be able to comprehend them to investigate abuses, and consequently to control them.”

With some minor language changes, this could easily have come from a current General Accounting Office report, but it comes from a letter written by President Thomas Jefferson to the Secretary of the Treasury in April 1802.<sup>1</sup> In the intervening years, the federal government has grown and become much more complex, but with regard to this area, very little has changed. Federal agencies still have difficulty producing understandable, auditable financial reports not only for budgeting purposes but also—perhaps even more crucial—for cost-control and management purposes. Based on technological advances and continuing budgetary pressures, there has been a renewed interest in automating, integrating, and improving federal financial management systems, along with government operations in general.

Although automating business processes really took off during the last decade, the federal government began using computers in business applications in

the mid-1950s, with the overwhelming majority of systems being used for supply, logistics, and financial management operations. Even in these early applications, financial accounting operations were integrated into the supply transaction reporting system.<sup>2</sup> These early improvements achieved a degree of automation of operations (especially in the supply chain), a higher accuracy in reporting, improvement in management control, and a limited consolidation of data. There wasn’t much improvement in the ability to audit; the increased accuracy of data in separate reports, however, saved the auditors’ and managers’ time by not having to check the data repeatedly. Thus, it provided them with more time for other strategic analysis. Management control and analysis tools were developed to use data to show trends and relationships, enabling some routine decisions to be made electronically. Even these efforts at automating this segment of the supply chain resulted in millions of dollars in savings for the government.

As the complexity of the government increased, these systems evolved more rapidly with improvements in information technology. However, they were designed by individual organizations and were not well integrated. They produced volumes of data and reports—most, however, were not timely, accurate, or useful.

The government’s drive to become more efficient and adopt commercial best practices has driven a decade-long effort to improve the federal government’s ability to manage its finances. The federal government has come a long way with the passing of the Chief Financial Officers Act of 1990. For

fiscal year 2000, all 24 federal agencies submitted their financial statements on time (in March after the close of the fiscal year, as required by the act). Of those, 18 received unqualified opinions on their independent audits. However, 12 of the 18 were found to have major weaknesses with their internal control systems. And as Comptroller General David M. Walker pointed out, "... a majority of those received that clean opinion only because they engaged in 'heroic efforts'—whereby they spent millions of dollars and thousands of person-hours ... adjusting journal entries and reconstructing the books."<sup>3</sup> However, at a time when some major corporations can close their books in a day, the federal government still has much room for improvement.

## The Value of Improving Financial Management Systems

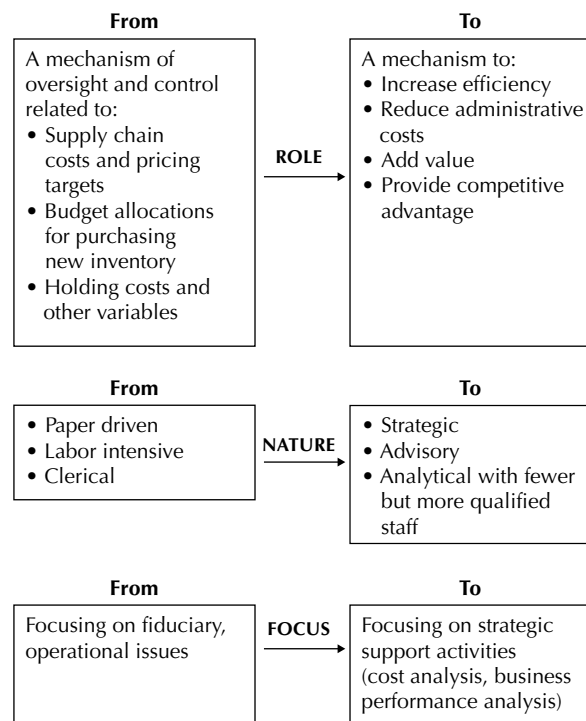
The information revolution has caused change not only in the technology, but also in the role, nature, and focus of financial management throughout the business world. Its role has evolved from primarily an oversight and control function into a way to improve effectiveness, reduce costs, add value, and eventually provide a competitive advantage for the enterprise.<sup>4</sup> The major changes in the role, nature, and focus of financial management over time are summarized in Figure 1.

To stay competitive, organizations have to adapt these changes and integrate financial management with other strategic and decision-making functions to serve the overall mission and goals of the organization. The private sector was the first to apply these innovations. The federal government, based on its continuing effort to improve efficiency and the ever-present budgetary pressures, has been slowly evolving its financial management system in an effort to achieve similar results.

## Challenges

The key to effective financial management involves developing a fully integrated financial management system, supported by effective technology, reliable and timely financial statements, and effective internal and external control. Government is well on its way to more effective financial management systems that provide useful and accurate information and can be better used for decision-making pur-

**Figure 1: Change in Role, Nature, and Focus of Financial Management**



poses. However, these still lack some necessary features. Currently, the major challenges that government faces can be summarized as follows.

### Lack of Integration

One of the major challenges that departments and agencies face is the lack of digital integration between internal functions such as logistics, personnel, accounting, and property systems. Combining and integrating data from these functions provides very useful financial information. In some departments, each function within the organization has its own system. Generally, there is no common enterprise architecture system. Supporting systems can be very different, and sometimes even the structure and components of each system are different, making integration difficult or even impossible. Currently, to produce integrated financial information, most government agencies have to spend extra effort, time, and personnel to manipulate the data from disparate databases and systems. This extra time significantly increases the cycle time of reporting, as well as costs.

Inefficiencies created by the lack of integration include the following:

- The effort required to manually share, check, or enter data is always greater. Since data is not shared within a reliable computerized environment, transfer of data may not be complete and reliable; thus manual work is required to provide correct transfer and entry. In addition, the required reconciliation is done manually.
- Financial statements often cannot be audited because of the heterogeneity in the system, leading to poor management control.
- Delays in obtaining, processing, and reporting data are significant.
- There is a lack of accuracy, completeness, and timeliness in financial data reported to strategic management for decision-making purposes.

#### **Weak Security Controls over Information Systems**

Weak security in the IT systems of federal agencies is a common problem—often resulting in misuse, unauthorized modification, inappropriate disclosure, and loss of critical data—and creates a significant challenge. The major issues include:

- Increased exposure to outside hackers
- Decreased reliability and availability of data, thus an inability to produce accurate data for decision-making purposes
- Unauthorized access to systems, which can lead to disclosure, modification, or loss of sensitive data

An effective information security program, centralized management, security awareness and training, effective controls, and effective authorization restrictions are required to minimize the potential impact of these threats.

#### **Insufficient Reconciliation and Standardization**

Reconciliation is a key internal control activity listed under the federal government's standards for internal control. Reconciliation, manual or automated, means bringing together, combining, and comparing records from different systems within an organization. The more heterogeneity there is within a large system, the less efficient the system

becomes. Different formats, applications, or systems at different subdivisions of a government organization often result in communication difficulties, loss of time and data, and less meaningful strategic financial data. Reconciliation is a need that arises from lack of, or deficiencies in, integration and standardization. Reconciliation needs are minimal in fully integrated enterprise architecture.

The financial management systems of some government agencies are not capable of producing the data required for complying with the Federal Accounting Standards and the Standard General Ledger (SGL). Thus, they contribute to the problem of insufficient standardization and reconciliation. Agencies have to follow SGL standards at the transaction level, which helps to obtain consistent, comparable, and, thus, meaningful reports within their organization.

#### **Lack of Accurate, Timely Recording of Information**

Timely recording is critical as it increases the accuracy of the data stored and ensures up-to-date financial information for management. Accuracy and timeliness of data can best be achieved in a standardized and integrated system, which minimizes manual entry requirements.

Above all, the major challenge related to financial and supply chain management issues is providing financial data for the dual functions of financial accounting and program management, as discussed in more detail in the next section.

### **Mutual Dependence of Financial Management and Supply Chain Systems**

Nearly all systems within an organization have a direct or indirect relationship with the financial management system in the organization. Finance is the core of most organizations, with costs, profitability (in the private sector), and efficiency of the company being evaluated and reported. Virtually all strategic management decisions in both the public and private sectors are based on financial data. Although government managers do not consider profitability, the drive to increase efficiency and effectiveness, while reducing operating costs, is forcing an increased coordination between financial management divisions and supply chain man-



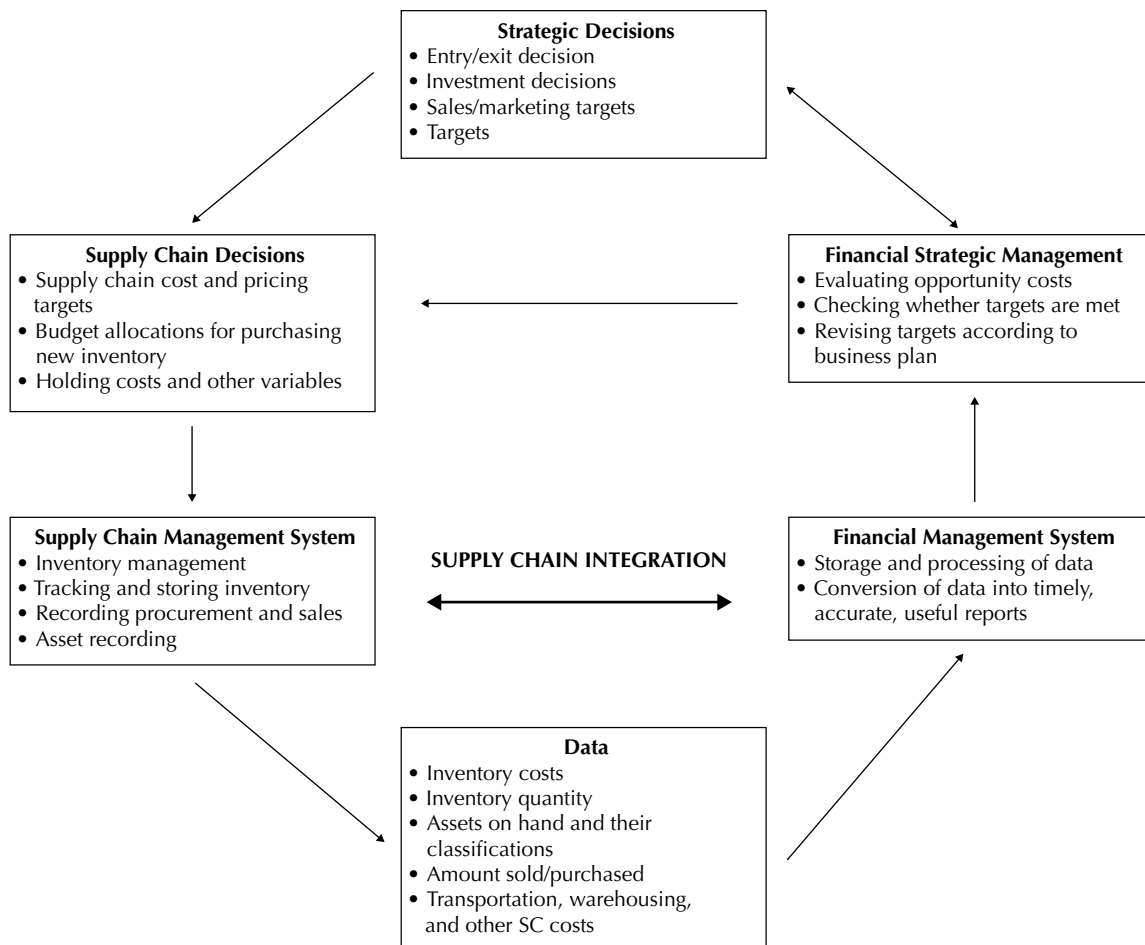
agement systems, which in the past has been weak to nonexistent.

In most enterprises, the financial management division coordinates closely, although sometimes ineffectively, with the supply chain management (SCM) system. This is why there are separate inventory cost accounting departments in most organizations, focusing primarily on supply chain operations. The financial management (FM) system has to track all the costs, location, and classification of assets and liabilities, revenues, and cash flow. Supply chain operations involve the purchase, storage, and movement of millions of dollars' worth of equipment, materials, and goods. Each step through the supply chain is tracked and reported in the FM system to control and report the costs incurred,

revenues earned, and status of assets and inventory. Financial data is then fed back into the SCM system and influences strategic supply chain decisions. The relationship between FM and SCM systems, data flow chart, and decision-making process are summarized in Figure 2.

As a result of this close two-way interaction between supply chain and financial management systems, inefficiencies in one of these two critical systems of the organization also create problems in the other. The major issues in each system, their effect on one another, and the importance and benefits of integration between financial management and supply chain management systems are explained in more detail below.

**Figure 2: Data Flow and Relationship between Supply Chain Management and Financial Management**



### Supply Chain Issues and Their Relation with Financial Management

Operating materials, supplies, and equipment account for nearly 50 percent of all assets of most government organizations.<sup>5</sup> Tracking, locating, reporting, and protecting these assets of the supply chain are very important for preventing errors and for providing a cost-efficient system. The major inventory control issues and their effect on financial management systems and the efficiency of the organization are as follows:

- *Incorrect reporting of assets:* When there is a lack of strict physical control over inventory and other assets, the quantities reported in the financial reports are usually incorrect. Such errors endanger the reliability of financial statements and result in strategic decisions based on incorrect data. As an example, decisions are made to allocate the budget to buy equipment or supplies that exist in excess but are reported to be lacking. This brings two unnecessary cost burdens to the organization: the expense of unnecessary supplies and growth in inventory carrying costs.
- *Protecting the spare parts:* Lack of accurate inventory information prevents necessary actions from being taken to safeguard the supplies. This can leave spare parts, such as modems, disk drives, and circuit-card assemblies, prone to theft, unauthorized use, and improper disposition.
- *Operational effectiveness:* Inaccurate inventory information also undermines operational efficiency. For example, essential parts of mission-critical systems may not be located when needed, and parts and systems that need modifications or updates are left unmodified because of inaccurate information about their location and quantities.
- *Misclassification of assets:* Inefficient supply and inventory management systems can also result in misclassification of information under financial statements. For example, if inventory assets are understated, operating expenses including maintenance costs will be overstated, distorting the maintenance-cost amounts and, consequently, the projections and budget allocations based on these historical costs.

Similarly, if information on the existence and useful life of long-term assets is inaccurate, long-range investment plans will be impaired; if revenue-bringing assets are wrongly recorded, revenue stream and cash-balance expectations will be affected.

Consequently, an ineffective supply chain and inventory management system negatively affects the costs, operational efficiency, and, most important of all, the accuracy and reliability of financial management data on which many critical strategic decisions are based. Given that, for most enterprises, the majority of their costs are within their supply chain, such misinformation greatly affects the reliability of financial management information. When inventory and supply chain information is not correctly recorded and the system is not integrated with the financial management system, strategic decisions are based on inaccurate information, which can have serious consequences for the success of the organization as a whole. Thus, it is critical to have a sound supply chain management system that is well integrated with the financial management system of the organization.

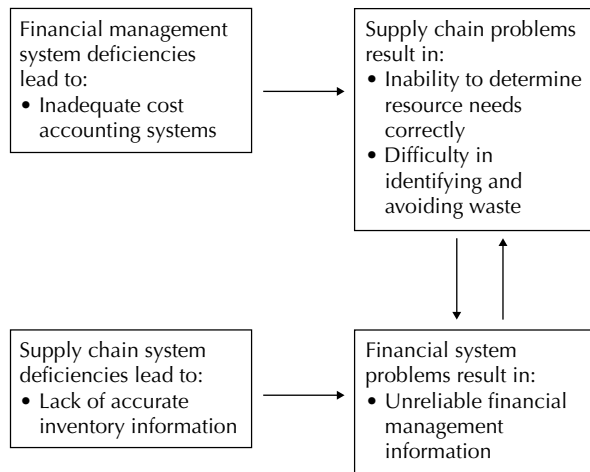
### Financial Management System Issues Related to Supply Chain

One of the most important sources of problems in operating materials, supplies, equipment, and property management is poor cost accounting systems within the financial system of the organization. Lack of a reliable system for accumulating project cost accounting information is one cause of incorrect inventory and supply data. The cost accounting system should be integrated with the supply chain system, and all work-in-process information should be correctly included and transferred to related asset or expense accounts so that supplies, operating materials, and equipment will not be misstated. The effects of financial management and supply chain system issues on one another are summarized in Figure 3.

### Importance of Integration between Finance and Supply Chain Divisions

Providing integration between the finance and supply chain divisions should be the first consideration in integration efforts because of its significance in achieving cost savings. Even the first steps of inte-

**Figure 3: Effects of Financial Management and Supply Chain Management Issues on Each Other**



gration taken in 1957 were for integrating supply chain with the finance and accounting systems. The reason is the critical role of inventory management in the total costs of an organization. Huge inventories are held, especially in organizations such as the Department of Defense, and the lack of integration of supply accounting operations increases these costs even further. Some government organizations hold hundreds of million of dollars in inventory, and a 1 percent decrease in inventory held results in millions of dollars of cost savings.

Besides the inventory issues discussed, acquisition financing in development and procurement costing are critical issues that add to the importance of integration between FM and SCM systems. Moreover, providing complete management visibility in both finance and supply chain issues is necessary for an effective decision-making mechanism. Because finance and supply chain systems have an inevitable mutual dependence on each other, the best way to eliminate such problems is full integration between the two systems.

## Reforms

### Legislative Reform

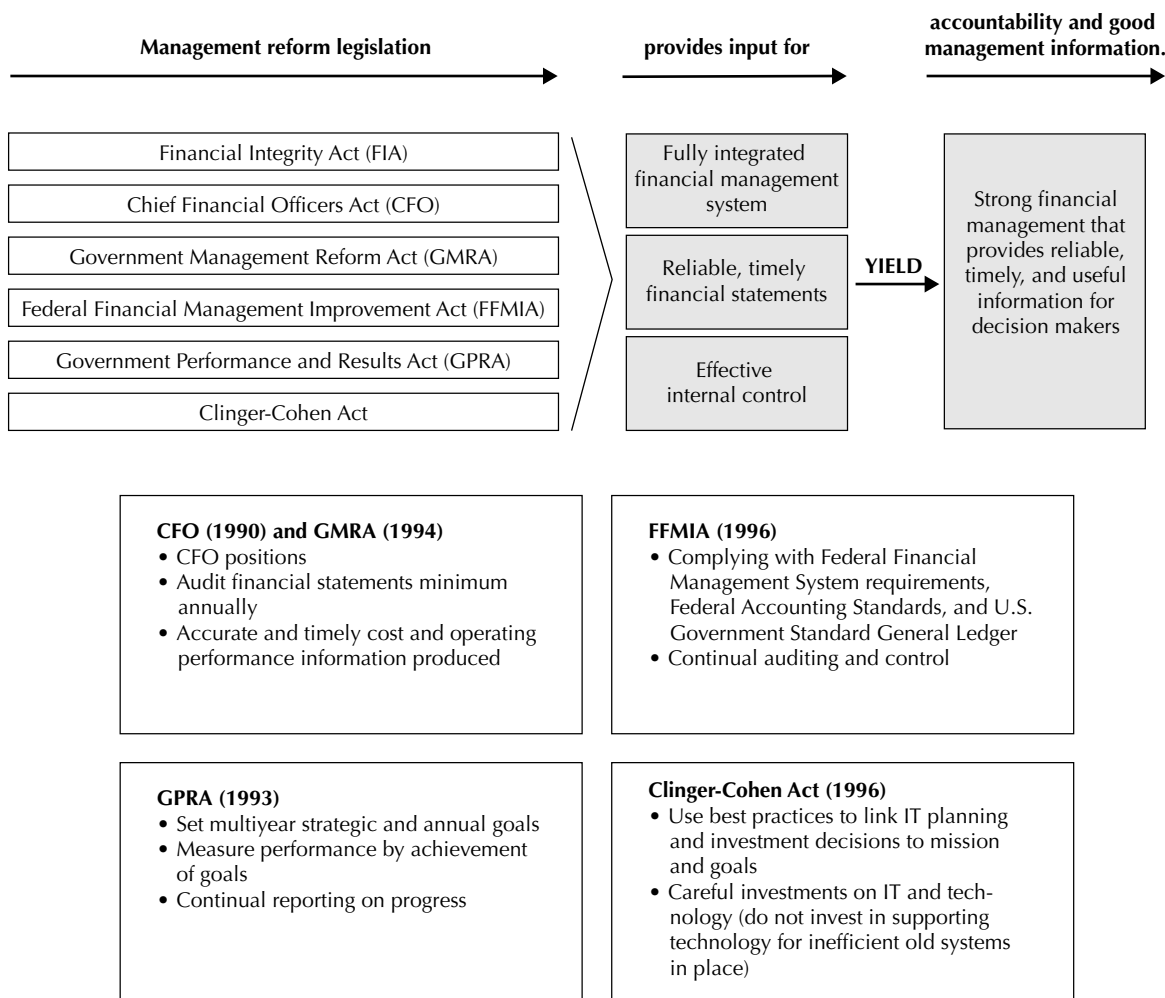
Congress has passed a series of legislation aimed at eliminating inefficiencies and encouraging the incorporation of commercial best practices. Figure 4 provides a summary of these laws.

### Financial Reform Steps

After examining the application of financial reforms in a variety of companies, it is evident that most successful reformers start with a sound definition of goals, continue with implementing changes, and continuously provide an effective control mechanism. According to world-class application examples, the steps that an organization should follow to implement and sustain a successful financial reform are as follows:

1. *Definitions:* Have a good definition of the organization's mission, values, goals, and strategies in order to plan finance department strategies in line with them.
2. *System changes:* Eliminate or streamline inefficient activities. Consolidate, standardize, and reengineer transaction-processing activities and combine them at a single shared service center (e.g., the Defense Finance and Accounting Service). Integrate the financial management system within itself and with other departments. Move strategic activities such as cost accounting and financial analysis to business units to support strategic planning and decision-making needs of the business unit. Consider outsourcing routine accounting activities. Utilize COTS systems, which have been tested and are in use, instead of developing new systems.
3. *Implementation:* Sound leadership and continuous support from top management is critical. Conduct fast implementation, and ensure that all parties are well trained. Use new technology to support new functions and improve efficiency. Check security and ease of control of the system. Hire a qualified workforce for strategic functionalities, analysis, and reporting.
4. *Control and maintenance:* Have a strict financial reporting and auditing system, and update technologically as advances are made.
5. *Financial reporting and audit:* In order to make sure that useful, timely, correct, and complete financial data is produced, a discipline of preparing routine financial statements and annually subjecting them to an external audit (besides the internal auditing system) is crucial. An independent audit can see the system with an objective view and provide stricter control. The company should make sure that all trans-

**Figure 4: Reforms Introduced by Some of the Government Acts**



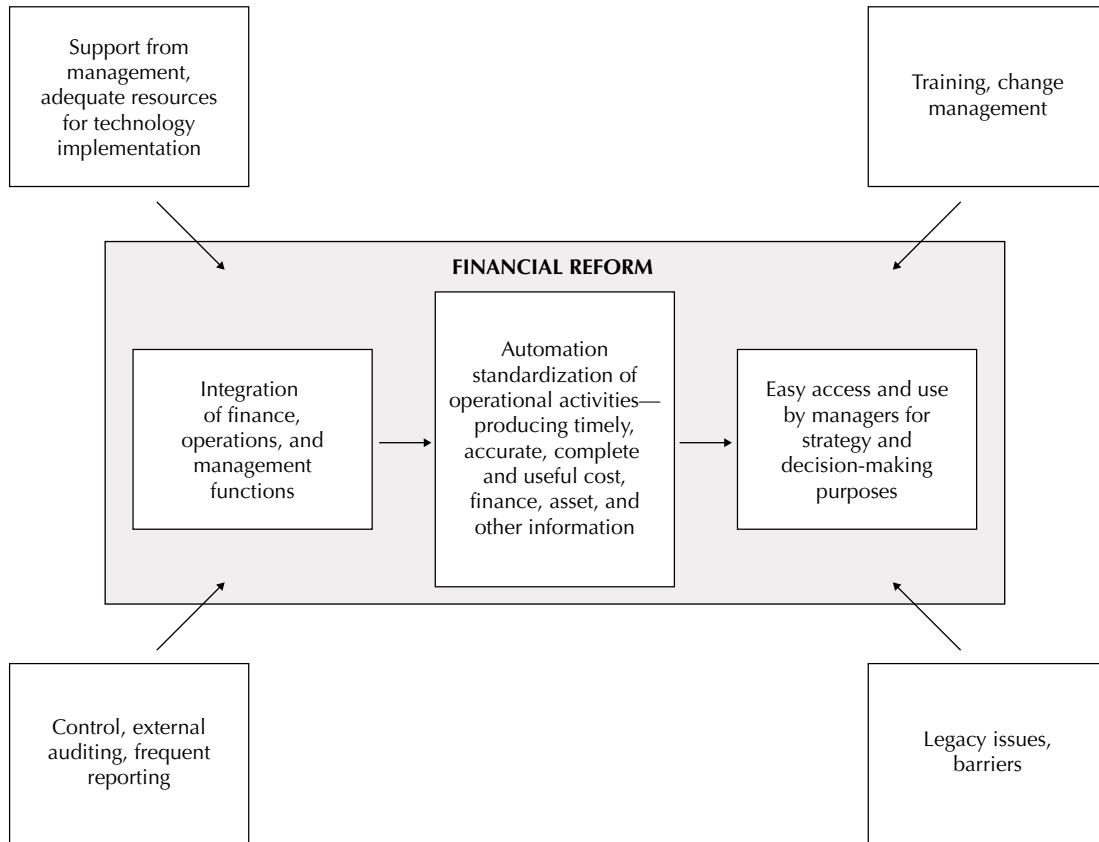
actions are appropriately recorded and reported, all assets are recorded and protected, policies are followed, and resources are used economically and efficiently.

A summary of financial reform steps, expected results, and factors that feed into the reform environment is illustrated in Figure 5.

### Case Studies

Four cases were undertaken to provide concrete examples of high standards in financial management systems. Because of the huge benefits supply chain integration offers, special consideration is given to the integration of the supply chain with financial systems. Challenges to be overcome, best technology and implementation practices,

and the costs and benefits of financial reforms are examined in the four cases. To ensure that both public and private sector perspectives are covered, the cases chosen included two examples from each: Cisco Systems, Inc., and The Boeing Company; and the Defense Finance and Accounting Service and the National Science Foundation. The major criteria in choosing the two commercial cases were their relevance to successful implementation of integrated financial management systems, similarity to the government in size and complexity, and experience working with the federal government. The case studies will be available in *Transforming Government Supply Chain Management*, edited by Jacques S. Gansler and Robert E. Luby (Rowman and Littlefield Publishers, 2003).

**Figure 5: Financial Reform Steps and Supporting Factors****The Boeing Company**

After Boeing merged with Rockwell and McDonnell Douglas, serious inefficiencies resulted from running its existing financial management system in conjunction with the legacy systems of the acquired companies. To solve these problems, Boeing reformed its financial management with two objectives: decentralization of financial management functions to business units, and financial consolidation of Boeing's world headquarters. According to the new architecture, all operating groups would map and load their own data; corporate would perform all consolidation activities and produce the trial balance, which operating groups would continue to review; and businesses would extract customized views of their financial data from the new system to meet specific group needs. During the implementation of the new system, Boeing used

commercial-off-the-shelf (COTS) software instead of developing in-house applications. Hyperion Enterprise was chosen as the consolidation tool based on several criteria. The system has been in use since February 2002, and the company reports good success with the system so far.

**Cisco Systems, Inc.**

Cisco Systems, Inc., the worldwide leader in networking for the Internet, transformed its financial management systems, achieved a one-day close, cut finance costs in half, and improved the decision-making mechanism for management. The major components of Cisco's financial management system are core financial processes, the planning and analysis function, performance evaluation, treasury, e-banking, and revenue management and electronic customer credit. Cisco believes that the

building blocks of a successful financial management system are strong management commitment, building a reliable network infrastructure, standardizing and reengineering business processes, developing a strong link between the IT department and the rest of the organization, skillfully integrating web-based applications, creating an Internet culture, and continuing to review and improve processes. Cisco's goals for the future are to view processes and systems holistically, encourage more cross-functional cooperation, and maintain standardization in the back end while increasing personalization of information delivery to management and analysts.

### **Defense Finance and Accounting Service**

In 1991, the Department of Defense established the Defense Finance and Accounting Service (DFAS) to perform and oversee finance and accounting within DoD, and to address the problems of the existing financial structure. Although DFAS could not achieve a completely integrated system, they reduced the number of systems significantly and designed new financial data-management architecture to address the problems of incompatibility. In the new architecture, data from unique systems are converted into standard data, are stored at a centralized data system, and can be reached according to authorization status of the user. For a smooth and successful transition to a new financial management system, DFAS recommends as lessons learned from its own implementation: having an awareness of political sensitivities, getting buy-in from all levels, delivering prototypes, paying attention to security issues from the very beginning, and reengineering processes.

### **National Science Foundation**

With its integrated financial management system, the National Science Foundation (NSF) serves as a model for other government organizations. The Financial Accounting System (FAS) is closely integrated with three major applications—the Standard General Ledger, Fastlane, and IPAY. The FAS uses a Sybase database system, which was built in-house. Fastlane is NSF's website, which enables all users to interact electronically with NSF staff and departments. Fastlane is integrated with FAS, providing financial services to customers, efficient turnaround, and timely availability of money. IPAY is

the integrated payroll system, which is well integrated with FAS, timecard, and human resource modules of the agency. NFS believes the keys to its success are active top leadership and support, a centralized IT system, a long-term focus in choosing systems, and effective change management that involves all employees in the technology development process.

# E-Finance Recommendations from the Wye River Forum II

*"It takes the federal government five months to close our books.... This is not the stuff of excellence."*

Paul N. O'Neill, former Secretary of the Treasury

## Overview

Improving the management and performance of the federal government has been a decades-long goal. Integrated financial management systems play a vital role in improving and evaluating the value derived from the government's programs and spending. Such systems also provide leaders with more accurate and timely information to manage costs, measure performance, make program and funding decisions, and analyze outsourcing or privatization options. Although the Chief Financial Officers Act, which was passed in 1990, initiated the reform of the government's financial management systems, the federal government is still well behind the leading private companies, as indicated in former Secretary O'Neill's quote.

The President has made financial management reform and the use of information technology a key part of his FY 2002 President's Management Agenda. The continuing pressures on the federal budget, the drive to transform business practices, coupled with the availability of technology, make the vision of a "best of breed" financial management system, fully integrated into the supply chain and other core functions, not only achievable but imperative.

The Center for Public Policy and Private Enterprise at the University of Maryland's School of Public Affairs hosted a three-day Thought Leadership Forum April 28–30, 2002, entitled "Incorporating Financial Management into a Digitally Integrated Supply Chain." The Forum, funded through a grant from The IBM Endowment for The Business of Government, was held at the Aspen Institute's Wye River Conference Center and brought together 27 senior government leaders, business executives, and academics. (See page 47 for the list of attendees.) The goal was to examine business and government case studies, facilitate serious discussion, exchange ideas, and develop public policy recommendations to realize the full potential of government e-finance.

The Forum featured keynote addresses by John Hamre, president and CEO of the Center for Strategic & International Studies (former deputy secretary in the Department of Defense) and Mark Everson, deputy director for management, Office of Management and Budget (then comptroller, Office of Federal Financial Management), as well as presentations of four case studies (two from the public sector and two from the private sector). A lively interchange among the Forum participants ensued about the challenges, barriers, and the potential

offered by a more integrated financial management system. This was followed by four working group sessions to distill and report on the findings and recommendations of the participants.

Currently, state-of-the-art financial management systems allow organizations to improve coordination of different functions as well as improve planning, efficiency, management, and control. These systems are designed to have data entered only once, avoiding duplicative tasks—thus eliminating unnecessary reconciliation. Additionally, with an integrated financial management system, organizations are more likely to have accurate, useful, and timely financial information for day-to-day as well as strategic decision making, budgeting, and external reporting. Integrated financial management systems also enable integration of inter-enterprise supply chain management. Many agencies with legacy financial management systems find that they have to expend major effort and resources to develop information that integrated systems should be able to provide on a daily or recurring basis.

The information revolution has also made it possible to significantly change the way financial transactions are handled. With most of the legacy financial management systems, the finance organization was at the center of most interactions between an organization and its employees, customers, and suppliers. In enterprises with a digitized, integrated financial management system, customers can place their orders online, and employees can use e-procurement to procure supplies and materials. Invoices and electronic funds transfers can automatically follow, with all the transactions automatically recorded. Self-service systems allow employees to access payroll systems and submit expense reports directly. The direct involvement of finance can be reduced or eliminated—reducing costs and increasing organizational effectiveness.

This section contains recommendations, from the Forum and its participants, to rapidly realize the full potential of integrated financial management.

## Leadership

Forum participants identified strong executive leadership as being critical to changing deeply rooted organizational cultures, especially when it comes to implementing an integrated financial management system. The President, together with his leadership team, must develop a vision and action plan to achieve a more rapid and effective implementation of Internet-enabled business processes that will lead to integrated financial management to support better, more proactive decision making. One of the major goals of business process enhancement must be to improve the ability to measure and evaluate federal programs—to make the government *more accountable*. To accomplish this goal, budgets, financial management, and performance measurement should and can be linked.

Forum participants also discussed the benefits of improving the planning process, specifically discussing the Defense Department's recent contract award to develop an enterprise financial management architecture. They discussed the need to be able to measure progress and hold organizations and people accountable with the use of a simple monitoring and evaluation tool, like the balanced scorecard. Finally, there was unanimous agreement that sustained strong management and leadership to support these changes is critical, particularly considering the diverse incentives of a large and complex federal government.

### The President should:

#### 1. Create the vision.

The President with his leadership team must continue to emphasize the importance of an integrated financial management system as a key to reforming the federal government. He must create a vision for a government that is:

- More accountable so that programs can be evaluated and compared
- More efficient, with little or no duplication between agencies
- Integrated and seamless
- More accessible to citizens, businesses, and employees



**OMB should:****2. Identify a financial management “Leader of Change.”**

The Office of Management and Budget must appoint a “Leader of Change” to provide the sustained day-to-day leadership to control resources; guide the needed financial management integration and reforms; and establish clear lines of authority, responsibility, and accountability for the reforms. This leader must provide clear, timely guidance to the agencies in order to facilitate successful implementation; then provide the monitoring and oversight of agency programs; and finally supply appropriate consequences for action or inaction. Additionally, this leader must spearhead the drive to bring the needed changes to fiscal laws, ledgers, and so on, to enable the financial reform efforts.

**Department and agency heads should:****3. Identify and strongly support an agency “Leader of Change.”**

Agencies should address financial management integration and reform as part of a comprehensive, agencywide business reform—to include the agency’s supply chain. Agencies must make this a priority commitment and identify an accountable “lead” and an “A” team to lead the transformations. There must be an understanding that full transformations will take several years to implement and will require a sustained commitment. Finally, this shouldn’t be viewed as an independent action to simply reform the financial management system, but as only one of several interrelated activities required to fully integrate and automate financial management with the supply chain and other agency functions.

**4. Assume change and manage it.**

Financial management systems are closely linked to rapidly changing information technologies, where the only constant is change. Agencies must not look to a static future, but assume change and manage it. When developing new systems, they should use spiral development.<sup>6</sup> Agencies can, in this way, pick “quick win” initiatives. These should be no longer than six-month efforts that show early successes to build and maintain momentum for the long-term change.

**OMB in conjunction with department and agency heads should:****5. Develop a strategic plan to add value.**

As is the case with any major change, a well-crafted strategy and plan will facilitate the implementation of an integrated financial management system. This process should begin by defining the organization’s finance mission, vision, goals, and core values to support the overall organization’s mission. The goals should include increasing the value and relevancy of the finance organization by reducing costs, improving and streamlining business processes, and developing a capability to rapidly close the organization’s books. The recognition that these cannot be addressed in isolation or stovepiped, but should be addressed within the broader supply chain, is critical. To create incentives for supporting organizations, plans to have them keep or share in the savings should be developed; however, they should not take any savings in advance of implementation. Finally, the strategy and planning information should be used to develop a communications plan to promote the reform to all of the stakeholders.

**6. Use a balanced scorecard to measure progress.**

Departments and agencies need to monitor the effectiveness of their changes by continuously benchmarking and tracking the finance organization’s metrics associated with its strategic plan. These must include measures of customer success/satisfaction and time as key performance measures—with the results used to evaluate and change processes. A simple, consistent metric that is easy to use and understand, like the balanced scorecard, should be used to supervise with accountability. These measures can be readily adapted and passed down through the organization and made directly relevant at all levels. That way, all assigned personnel can appreciate the organization’s performance as well as their own. Senior management can use these scorecards to track agencywide implementation and report upward. Line managers can use them to monitor and hold their employees accountable.

**Integration/Interoperability**

Forum participants acknowledged that although the federal government has invested and continues to invest large amounts in information technology,

the results are often disappointing. Several reasons were discussed. First, there was a general tendency to use information technology to automate existing processes rather than create more efficient solutions. This often resulted in disappointing gains in productivity and effectiveness. Second, organizations bought systems that were directed at internal requirements, and there was often difficulty getting them to work across the organization or between organizations. This resulted in the need to enter and reconcile the same financial data several times, and made it difficult to share information. Third, the general bureaucratic fear of reorganization and the tendency to oppose change created resistance to integrating and sharing systems. Participants agreed on the need to standardize key data elements, but recognized the need for agencies to maintain some flexibility. They also outlined a series of system attributes they believe will be important to consider in any reform effort. Finally, there was general recognition of the criticality of ensuring the system's security.

**OMB should:**

**7. Standardize interfaces, not systems.**

As part of the President's Management Agenda, OMB is developing a government-wide business architecture. OMB has recognized that there are crosscutting processes that transcend agencies and lines of business, including supply chain management and financial management. Although standardization across the government may seem appealing, participants recognized that it was probably not desirable or achievable. Instead, OMB should focus on the core financial management requirements of agencies based on their fiscal and budgetary responsibilities, identify the relevant and necessary common information required from the agencies, and develop interface control documents to control the data at the interfaces. This will allow the agencies to tailor financial management systems to meet their specific requirements, yet provide OMB with the data it needs in a standard format.

**Department and agency heads should:**

**8. Reengineer financial management processes while automating.**

To gain the maximum benefit from financial management system changes, agencies should evaluate

their existing financial processes and eliminate, streamline, or reengineer inefficient processes and activities—then utilize these “best practices” across the agency. During this examination, nothing should be left unchallenged. The financial management data elements should also be evaluated and reduced to the minimum required, as well as standardized. While the processes are being reengineered, they should be automated and then periodically benchmarked against other organizations—public and private.

**9. Make finance a key part of operations.**

The role of the finance organization is changing from performing paper-driven, labor-intensive clerical functions to performing analysis on common finance, budget, and operations data and then providing strategic business advice with the potential to improve the effectiveness of the agency's operations functions. Agencies must encourage and accelerate this integration by ensuring that there is buy-in from operations when modernizing their financial management systems. The benefits to operations will include reduced cycle times and more accurate information in real time, as well as the increased efficiencies of a more integrated supply chain.

**10. Define essential requirements—and stick to them.**

Financial management systems should feature accountability, transparency, performance, customer service, and integration with other systems. To affordably develop and rapidly implement these systems, agencies must reduce “scope creep” by defining core requirements and then stick to them. These core requirements must be defined with an eye toward the future and should consider the following factors:

- The architecture of the new system must be modular to allow for future scaling up to include additional functions and operations of the organization.
- The system should be web-based, incorporating an enterprise portal with an executive information “dashboard.” Executives should be able to customize this dashboard so that it will provide alerts when their chosen indicators hit selected values.

- The system should standardize common administrative support functions and be accessible to employees with appropriate “need to know” access, and yet provide managers and individuals with self-service “total access” capabilities.
- Although the government closes its books only once a year, the system should aim for a two-week (14-day) “close” throughout the year. This will ensure the currency of the data, and will readily meet the accelerated timelines for producing the year-end financial statements.
- To the extent possible, the system should be designed so that data is entered only once, simplifying and assuring reconciliation throughout.

### **11. Focus on security and privacy.**

Over the past several years, attacks on federal websites have demonstrated the vulnerability of many agencies’ information systems. Such attacks are a symptom of broader information security issues across the government. Weaknesses include the inability to detect, protect against, and recover from viruses, website break-ins, and other attacks. In addition to intruders, there is the risk that disgruntled employees can take unauthorized actions without detection. These real or perceived weaknesses will dampen the enthusiasm for, and utility of, integrated financial management systems. Agencies must focus on security and privacy and make them system-level requirements from the beginning. These must be coupled with an active training program and regular security audits (“Red Team” testing) after system implementation.

## **Public-Private Interaction**

Forum participants recognized that managing the federal government’s finances is a very large, complex task and that in order to develop the best solutions, the government should leverage the talent and expertise of the private sector. Participants recognized the *similarities* between the public and private sectors such as the cultural resistance to change and the requirement for process reengineering and change management. The *contrasts* were also identified: greater accountability in the private sector, the focus on financial management in the private sector and on financial accounting in the

government, and the ability of a middle manager to influence change in the government (power of the bureaucracy).

Consensus was reached in two areas. First, the government must take maximum advantage of commercial off-the-shelf systems (COTS). There was overwhelming agreement that COTS should be the preferred solution and that agencies should think long and hard before endeavoring to develop unique systems. Second, the government should maximize the use of competition for all non-inherently governmental work. Agencies and organizations are examining alternative mechanisms to transfer functions to the private sector and become more efficient and effective.

Several strategies are available: outsourcing, competitive sourcing, public-private partnerships, and privatization. To implement these strategies effectively, organizations need help—and not in the form of more guidelines from OMB. Currently many organizations are grappling with the same issues, and they all don’t have the time to conduct research into these practices. Most organizations have devoted limited assets to documenting and distributing results, lessons learned, and best practices. Although there are many consultants that can be used, none of them come at these issues from the federal government’s perspective. Participants discussed the need for establishing a center to create and maintain a repository of lessons learned from competitive sourcing, outsourcing, privatization, and public-private partnering.

### **Department and agency heads should:**

#### **12. Buy or outsource; don’t build.**

When developing integrated financial management systems, agency heads must resist the temptation to develop their own unique systems. They can minimize the development risk, shorten the development cycle, and reduce “scope creep” by using COTS software and the Internet. Using COTS software, even if it requires limited changes to the existing business processes, must be preferred over in-house design and development of the system. Agencies can in this way buy proven products and focus on process reengineering—not product development. Using developed COTS systems also should provide testable privacy and security performance.

**13. Partner with the private sector.**

To harness the power of competition, agencies must examine all their finance functions and identify those that are not inherently governmental, and those that do not contain a core process or maintain a required competency. Then they should partner with the private sector to shed those functions. This partnering can take different forms—outsourcing, competitive sourcing, privatizing, public-private partnerships—all of which introduce an element of competition. Although savings are anticipated, cost should not be the only consideration; rather, agencies should select solutions that provide the “best value and performance” to the government.

**OMB should:****14. Develop a Center of Excellence for public-private lessons learned.**

OMB should initiate the establishment of an unbiased, independent Center of Excellence to identify, analyze, and disseminate best practices and lessons learned based on government efforts to outsource, competitively source, privatize, and form public-private partnerships. The center would become the repository of expertise and studies based on examining the results of previous efforts—based on real data, not just anecdotes. In addition to helping with current and future efforts, this data could be used to analyze projected impact from proposed legislative changes. Finally, the center could provide federal organizations with training for planning and conducting these transitions.

**Overcoming Barriers**

The Forum identified several intangible barriers resulting from the size and complexity of the federal government—not unlike the general nature of large bureaucracies. These include staff competency, poor planning, risk aversion, stovepipes and turf, and resistance to change. These barriers are addressed under the Leadership and Integration/Interoperability recommendations.

Legislative and regulatory barriers also were identified, and the discussion focused on the paperwork burden imposed by reporting and oversight processes. The two laws that were highlighted were the Government Performance and Results Act of 1993 (GPRA) and the Information Technology Management Reform Act of 1996 (Clinger-Cohen).

One of the goals of GPRA was to show the performance consequences of budget decisions, but these were framed in general terms. And, as was highlighted in the discussion, neither the authorizing nor appropriations committees focus on the impacts. GPRA did, however, impose a significant reporting burden, which should be streamlined.

The goal of Clinger-Cohen was to improve the management and use of information technologies by imposing specific management practices. Although the requirements imposed were developed based on current “best practices” at the time, legislation that is relatively static over time may not be the best mechanism to promote good management practices. Forum participants believed that there is a need to change the business case requirements so that the documentation produced reflects the requirements, costs, and performance of a project without putting up unnecessary bureaucratic hurdles.

OMB circular A-76 (competitive sourcing) requirements were also discussed, and again the participants believed the process needs to be shorter and less cumbersome. The adoption of activity-based costing was discussed as one mechanism that could be used to accelerate the process and make the A-76 studies more effective. Thousands of these A-76 studies have been completed, but the studies and the competitions can take up to four years to complete. Activity-based costing is a method of deriving the costs of an enterprise’s output by identifying processes used in the production and delivery of the output, as well as the resources used in the performance of these processes. Activity-based costing would improve the A-76 process by making it easier to compare the government’s true cost for performing a function with the cost of a comparable service provided by a contractor.

Finally, there was recognition that for this transformation to be successful, it would require adequate resources—requiring OMB and agencies to “put their money where their mouth is.”

**OMB should:****15. Streamline the oversight process—reduce paperwork.**

OMB should work to review and change the reporting requirements for GPRA and Clinger-

Cohen to make them more meaningful and less burdensome. OMB should also review the business case requirements for IT projects and infrastructure, and work to reduce the complexity. A simple business case that examines the risk and focuses on outcomes should be adequate.

#### **16. Adopt activity-based costing.**

OMB should strive to revise OMB circular A-76 to accelerate the study of competition of commercial activities. Adopting activity-based costing throughout the government would help streamline the process by allowing better analysis of organizational functions and better identification of costs—or alternative approaches—for performing them. Activity-based costing also would help managers analyze organizational requirements and structures by focusing on the costs to perform individual activities.

#### **OMB in conjunction with department and agency heads should:**

##### **17. Provide the required resources.**

Although the promise of an integrated financial management system is great, the transition will require a long-term commitment with the investment necessary to complete it. OMB must support the agencies, or in some cases require the agencies, to make the necessary investments to develop integrated financial management systems and to provide the necessary training. OMB, with its inter-agency perspective, will have to assist in identifying and ranking candidate projects to facilitate a unified approach. Without a consistent vision and sustained funding commitment, the desired changes will not be realized.

## **Human Resources**

In today's dynamic environment, with technology continuously changing, the character of government work is evolving—from “the doers” to “the managers of doers.” The federal government will need to develop new strategies to recruit, develop, and sustain a workforce prepared to meet the challenges that these changes present. As new financial management systems are developed and fielded, and processes automated, many employee functions will change. The role of finance in the private sector has changed from that of being a gatekeeper

(only collecting information) to becoming a full business partner (continuously monitoring and analyzing critical data that is both internal and external to the enterprise). Government finance organizations are undergoing similar changes in functions.

Forum participants discussed the need to transform the government's workforce to adapt to these new, more complex roles, recognizing that this will not be a quick or easy process. There was also a recognition of the aging of the federal workforce (since 1990 the average age of the federal workforce has risen from 42 to 46) and looming retirements (by 2010 over 70 percent will be eligible to retire), which could create serious gaps.<sup>7</sup> Several of the participants, however, thought this may be an opportunity, if properly managed, to accelerate those changes in culture and skill mixes that are required. Agencies will have to review the relationship between their employees and technology and redefine the skills base they need. A successful transition strategy will include workforce education and training. Senior leaders and managers, who may not know how they can use the new, better data, will also need education and training.

Additionally, as the government's financial management system begins to look more like the private sector, talented personnel can flow more freely between the two. Participants also believed that supervising for accountability and managing for results were paramount to achieving genuine change. There was some question as to whether human resources (HR) should be responsible for the employee accountability function. However, there was almost universal agreement that although HR would be involved in developing the tools and recording results, HR would need significant training and reorientation to adequately perform this function.

#### **Department and agency heads should:**

##### **18. Transition to a knowledge worker environment.**

As many, if not most, of the data entry and clerical functions are eliminated through the automation of financial management systems, agencies will have to recruit and cultivate personnel who are able to develop and use analytic support systems. Agency personnel should be trained in the higher-order skills of analyzing and interpreting data to support

the organization's strategic-planning and decision-making needs. Agencies also should develop programs to expose senior managers to case studies and benchmarks so they can better appreciate improvement possibilities. Employees will need more frequent training to stay current with the rapidly evolving systems and technology. To minimize employee concern and anxiety, agencies must also develop and maintain open communication throughout the transition.

***19. Link appraisals to performance.***

Establishing a results orientation is another key element of successful reform. Agencies must set a policy to ensure the accountability of personnel throughout the organization—developed and measured against organization-wide goals—and provide agencywide implementation that provides feedback on the status of agency goals. This feedback could be used to provide incentives and penalties to motivate personnel to initiate and implement efforts that support and result in the desired, reformed financial management system. Personnel throughout the department must share the common goal of establishing a financial management system that routinely generates useful, reliable, and timely financial information for day-to-day and strategic-management purposes.

# Endnotes

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3. Tim Reason, "Federal Offenses," *CFO Magazine*, March 6, 2002, Vol. 18, No. 3, p. 42.

4. GAO Executive Guide: Creating Value Through World-Class Financial Management (GAO/AIMD-00-134).

5. GAO/AIMD Report: Financial Management: Federal Aviation Administration Lack Accountability for Major Assets, AIMD-98-62, February 18, 1998.

6. A term long used by the commercial software industry for the process of rapidly providing new products, and fixing bugs that crop up through technical updates and patches. Now more generally used to describe an evolutionary approach where the ultimate capability is delivered to the user in two or more blocks, with increasing increments of capability.

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**Part III:**  
E-Logistics

# Understanding E-Logistics

*It ought to be remembered there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders among those who may not do well under the new.*

—Machiavelli

## Introduction

The promise of the digitally integrated logistics network is undisputed. By reengineering processes and applying recent breakthroughs in technology to streamline the way suppliers, manufacturers, warehouses, and customers interact, the private sector has automated and integrated logistics functions to transform their supply chains, resulting in reduced costs and improved service through the use of real-time data to lower inventory and optimize the flow of goods through the supply chain. The results are admirable.

Translating these results to the public sector presents both great promise and great challenges. The scope can be staggering—the Department of Defense alone spends over \$80 billion per year on logistics, uses over 1,000 different information systems, and maintains over \$60 billion in inventory. The capital investments necessary to develop new systems are difficult to obtain in a federally funded environment subject to strict budgeting constraints and processes. Federal agencies can also have unique goals and processes that differ from the private sector. Privacy and security are a vital national concern, especially in defense and intelligence agencies. And in order to successfully implement

advanced supply chain management solutions, the people in the organization must be receptive and engaged in the process. These factors mean that the public sector must pay careful attention to the strategy it employs in automating logistics processes and transforming supply chains.

Despite these challenges, the proven success stories present compelling reasons to invest in the modern supply chain. Consider the following:

- Between 1997 and 2000, the Department of Defense (DoD) lowered average logistics response time by 50 percent and increased in-storage asset visibility to 94 percent. These improvements were accomplished by adopting a private-sector supply chain management approach that utilized strategic outsourcing and information technology.<sup>1</sup>
- During a five-year pilot project, the Defense Logistics Agency replaced civil servants at Warner Robbins Air Force Depot with contractor Hamilton Standard to supply C-130 engine replacement parts valued at \$25 million. As a result, the time for engine overhaul was reduced by 50 percent and parts availability improved by 30 percent.

- Five years ago, the Federal Aviation Administration (FAA) Logistics Center outsourced all of its logistics functions and restructured divisions to resemble a private company. As a result, the FAA now gives same-day responses to customer questions and has reduced the time it takes to review warehouse stock levels from 20 days to three.<sup>2</sup>

## Background

### Brief History and Evolution

Finding speedy and cost-effective ways to manufacture and deliver products has always been crucial to a business's success. During the 1980s, many companies discovered new and innovative ways to reduce manufacturing costs. More recently, companies realized that their manufacturing costs have been reduced as much as possible. As they looked for ways to gain further efficiencies, they began to apply a "systems thinking" to their logistics networks and found the opportunity for cost savings and improved service. This approach led to the recognition of the interdependence of the many disparate processes involved—logistics management became supply chain management—and the need for greater integration along with automation.<sup>3</sup>

During the last decade, companies have dedicated resources to reducing costly inefficiencies throughout the supply chain. Examples of these inefficiencies include redundant stock and uneconomical transportation practices. Companies have developed strategies like just-in-time manufacturing and total quality management to maximize the value of their supply chain. Critical to these changes has been technological innovation and the development of systems to automate processes such as warehouse management systems, transportation management systems, and enterprise resource planning. Additionally, the ubiquity of the Internet has enabled businesses to begin to seamlessly integrate these various aspects of their businesses.

### Definitions

Logistics has been referred to by many terms, such as distribution, materials management, and supply chain management. In general, logistics deals with the management of goods or material from the point of origin, through the point of consumption,

to the point of disposal.<sup>4</sup> Highlighted below are the definitions used by the Council of Logistics Management, and by the Department of Defense, which is much broader.

### Value

The primary motivation for increased investment in the digital logistics network is the potential value that can be realized by all partners in the network. A manufacturer, supplier, or transporter can achieve cost savings to invest in other areas of the business or to be passed on to the customer. The customer can receive a product or service more quickly, increasing customer satisfaction and loyalty. Inventory storage costs can be reduced, or the warehouse

## Definitions

### Council of Logistics Management<sup>5</sup>

**Logistics:** That part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements.

**Supply chain management (SCM):** The management and control of all materials, funds, and related information in the logistics process from the acquisition of raw materials to the delivery of finished products to the end user.

### Department of Defense<sup>6</sup>

**Logistics:** In its most comprehensive sense, those aspects of military operations which deal with: (a) design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; (b) movement, evacuation, and hospitalization of personnel; (c) acquisition or construction, maintenance, operation, and disposition of facilities; and (d) acquisition or furnishing of services.

**Supply chain management (SCM):** A cross-functional approach to procuring, producing, and delivering products and services to customers. The broad management scope includes sub-suppliers, suppliers, internal information, and funds flow.

may be eliminated by a direct delivery system. Overall, the potential benefits are great for all.

## Critical Success Factors

To achieve the numerous established benefits, there are several “must do’s” in establishing a digital supply chain. Principally, an organization must understand its strengths and develop a strategy that involves both internal and external stakeholders. The following are critical strategies to employ:

### **Understand core competencies and the role of logistics within the organization.**

Every organization has a mission and several unique and essential functions that are critical to its success. Identifying these competencies and then focusing resources to develop an edge in these areas makes the organization successful. If supply chain management is a unique skill of the organization, it should focus on continuously refining technology and systems to maintain that edge.

More often, supply chain management is an important aspect of the organization’s mission, but not a core competency. In these cases, conventional wisdom recommends outsourcing to a business partner focused on supply chain management. This solution is generally considered a cost-effective way to gain access to the latest technology and use it to improve performance by exploiting identified core competencies. For example, the Department of Defense has a singular core competency of fighting wars and conducting military operations. Recognizing that, DoD increasingly relies on many private contractors to maintain the complex logistics network necessary to accomplish its mission.<sup>7</sup>

### **Find trusted contractors that serve as business partners.**

Finding a contractor that will partner with an organization to manage the supply chain is critical. To focus exclusively on core competencies, an organization must be able to trust that its supply chain will function efficiently in good times and bad. This is especially critical to organizations that encounter unforeseen events (i.e., wars and natural disasters) requiring quick actions that strain the supply chain.

Although a contractor is tested in times of crisis, much can be done during quieter times to build and test contractor reliability. Two-tiered strategic plans must exist so that the supply chain can expand when needed. The contractor must have an established and strong relationship with the often numerous subcontractors that will be critical to success. These strategies help to build a relationship that will be ready when tested.

### **Institute change management and a supportive organizational structure.**

Modernizing and/or outsourcing logistics functions requires major changes to organizations comprised of people who may be resistant to those changes. These people may have more interest in protecting their personal job functions and job security than the overarching organizational needs involved. As a result, their actions may slow or even stop the process.

A well-thought-out organizational strategy related to supply chain management is critical to success. There must be a clear vision that concisely articulates the necessity for changes to the supply chain management system and that can be concisely communicated to all within the organization. The organizational leadership must devote time and resources to ensuring that the organization is ready and willing to accept these changes.

## Challenges

Even with a great strategy, any organization instituting major changes will encounter challenges. The more the organization anticipates and addresses these challenges, the more likely it is to achieve positive results. Several common challenges are outlined below.

### **Privacy and Security**

For some government agencies, security requirements may be even more stringent than in a corporate environment. Although typical corporations must contend with the possibility that pricing schemes or product designs could leak out to competitors, government agencies, especially the military, must protect information vital to national security. However, banks, hospitals, airlines, and

many other private sector operations also have critical security requirements.

Government agencies must be confident regarding not only their own security standards, but also those of their contractors and vendors. This challenge highlights the importance of choosing contractors who will become business partners that share in the mission and goals. Both the organization, and its business partners, must invest in the most sophisticated technology available to protect vital data and information.

### **Financial Systems**

The historically based processes in place in many federal agencies are not necessarily conducive to implementation of a systemwide supply chain management system, especially one that involves numerous private contractors. Often a financial case justification is required, but the cost data necessary to make this case is not available. In addition, any outsourcing of services to private contractors reduces the areas available to absorb overhead costs in an era of increased budget pressure. These budgetary pressures can cause decision makers to hesitate in awarding contracts to unknown logistics vendors, despite the potential benefits that may be realized. Clearly, there are many ways in which processes can be streamlined.<sup>8</sup>

### **Metrics That Demonstrate Success**

Government agencies today face significant pressure to measure and demonstrate quantifiable results. Common metrics to demonstrate successful supply chain management include reduced logistics costs, reduced logistics assets, shortened average order cycles times, and lower inventories.

However, choosing which numbers best demonstrate effective logistics improvements can be complicated and necessitates a strong understanding of operations. For example, while the goal may be reduction of overall process time, a key underlying indicator like parts availability can be the deciding factor in meeting this goal. Thus, to truly understand the strengths and weaknesses of supply chain operations, one must carefully examine metrics and be open to examining new metrics to gain a clearer understanding.

### **Change Management**

The types of changes necessitated by the digitally integrated supply chain are complicated and cumbersome. Strong leadership and realistic goals are necessary to ensure success. In particular, management must commit to a consistent and realistic strategy to implement both technological and procedural changes. Particularly helpful is avoiding large and often overwhelming multiyear projects. Incremental changes are easier to manage and more likely to be accomplished successfully.

### **Integration: Legacy Systems, Security, and Standards**

Synthesizing different sources of information into a cohesive whole is difficult for several reasons. Most data is presently in older legacy systems that do not have consistent standards. One option is to upgrade legacy systems into newer, standardized systems—a costly and time-consuming proposition. Another option is to employ middleware that integrates the standards of older systems. However, leaving data in legacy systems means that substantial resources will have to be allocated to the maintenance of many different systems.

An additional concern for governmental organizations is security. While the Internet offers new and exciting options for real-time information exchange, it also presents the danger of hackers and other breaches of security. While encryption technologies continue to improve, they require continuous investment and upgrades.

### **Coordination: Inter-Agency and Intra-Agency**

Digital integration of logistics requires the efforts of more than just the procurement group. The finance, operations, and IT departments will be significantly affected by a new system. Billing and expenses will change, as will the processes of doing business. The IT department will be especially affected by the integration and maintenance of new systems. In addition to internal processes, affiliated agencies will have to alter their processes to accommodate changes. As a result, early communication with all these groups is important to success.

## Case Studies

The case studies will be available in *Transforming Government Supply Chain Management*, edited by Jacques S. Gansler and Robert E. Luby (Rowman and Littlefield Publishers, 2003).

### Defense Logistics Agency—Business Systems Modernization

The Defense Logistics Agency (DLA) manages a supply chain valued at nearly \$10 billion, providing extensive, worldwide support for the Department of Defense. In the late 1990s, DLA conducted Y2K testing that showed its legacy databases were obsolete and noncompliant. As a result of these and other concerns, DLA is undertaking an extensive overhaul of its logistics system, a project called Business Systems Modernization (BSM). Through the implementation of the BSM program, scheduled for completion in 2005, DLA has redesigned its business processes and is upgrading its information technology infrastructure. As of July 31, 2002, the BSM project is on schedule and on track to stay within its expected total cost of \$500 million.

When complete, the BSM system will manage 4.5 million DLA items. It will allow DLA to track product deliveries, budgets, demand projections, and supply schedules in real time. As a result, delivery times, cost effectiveness, and inventory control are expected to improve dramatically.

### Caterpillar Logistics Services

Caterpillar Logistics Services, Inc. (Cat Logistics) is a subsidiary of Caterpillar Inc. that provides both internal logistics support to Caterpillar and third-party logistics services to external clients. Cat Logistics recognizes that reliability is a major concern for customers who purchase their equipment, and their goal is to ship 99.8 percent of customer replacement-part orders on the same day the order is received. To accomplish this goal, Cat Logistics has developed a robust digital logistics system that is tied to the company's strategic objectives of providing both high-quality logistics service and reductions in client costs. Additional benefits include supply chain visibility, global reach, economies of scale, end-user satisfaction, and lower overall costs.

### General Electric

General Electric (GE) is a multinational technology and services company that successfully operates in diverse industries like aircraft engine, manufacturing financial services, medical imaging, television programming, and plastics. Through its Corporate Research and Development department, GE has devoted significant resources and applies Six Sigma practices to the development of advanced supply chain management techniques. One such technique, Remote Monitoring and Diagnostic technology (RM&D), integrates all aspects of GE's supply chain, including supply, manufacturing, distribution, and maintenance. Through advanced data storage and processing speeds, GE has used new statistical modeling techniques to better forecast failures, identifying critical factors to examine in a failure.

### Lockheed Martin JSF Logistics

The Joint Strike Fighter (JSF) Program is developing an affordable, highly common family of next-generation multi-role strike aircraft for the Navy, Air Force, Marine Corps, and U.S. allies. Lockheed Martin was selected as the prime contractor for the System Design and Development (SDD) phase, the next step toward production of the JSF, and will be providing maintenance and logistics support. The JSF Program has developed a vision for a comprehensive logistics support environment that will have the following key features: a highly reliable aircraft that encompasses Prognostics and Health Management; a technologically enabled maintainer; a Joint Distributed Information System; and a logistics infrastructure built on best practices that is streamlined, fast, and interactive. The result will be a lean, responsive logistics infrastructure.



# E-Logistics Recommendations from the Wye River Forum III

## Overview

Federal government agencies continue to manage their logistics systems using inefficient and outdated business practices, resulting in excessive inventory levels, poor customer service, and delays in the repair of expensive equipment. Why, for example, should the Department of Defense continue to accept rates of aircraft *not mission capable due to supply problems* approaching 15 percent—and often much worse?<sup>9</sup> Commercial airlines would not and could not tolerate that kind of inefficient use of high-value capital equipment; why should the government settle for less? The current systems get the job done, but generally do so by using an uneconomical brute-force approach that depends on large inventories and can tolerate system-wide inefficiencies.

The private sector has recognized the benefits of digitally integrating its logistics networks. World-class companies have achieved significant results by reengineering their processes and applying recent advances in technology to streamline the way suppliers, manufacturers, warehouses, and customers interact. By automating and integrating logistics functions, they transform their supply chains, which results in reduced costs and improved service, through lowering inventories and optimizing the flow of goods through the supply chain. Translating these results to the public sector presents both great promise and great challenges. The scope can be staggering: The Department of Defense alone spends over \$80 billion per year on logistics, uses over 1,000 different information systems, and maintains over \$60 billion in inventory.

Federal agencies, in many instances, have objectives such as national security that are different from the private sector, so there need to be differences in the supply chains, but gross inefficiencies and ineffectiveness cannot be accepted.

In recent years, government agencies have recognized the potential of improving logistics processes, and have had isolated successes. For example, DoD began using “prime vendors” to provide medical supplies, which account for 2 percent of the consumables that DoD manages. This change alone resulted in savings in excess of \$700 million from 1991 to 1996, with improved performance. The private sector made major strides in transforming logistics processes and has many valuable lessons to offer in addressing the challenges to making such changes. To this end, the Center for Public Policy and Private Enterprise at the University of Maryland’s School of Public Affairs hosted a three-day Thought Leadership Forum October 27–29, 2002, entitled “Achieving a Modern Government Logistics System: The Critical Element in a Digitally Integrated Supply Chain.”

The Forum, funded through a grant from the IBM Endowment for The Business of Government, was held at the Aspen Institute’s Wye River Conference Center on Maryland’s Eastern Shore. It brought together 25 senior government leaders, business executives, and academics from a range of federal government organizations and private sector firms of various functions and sizes. (See page 65 for the list of attendees.) The goal of the Forum was to facilitate serious discussion and examine logistics issues within government and business, including

featured case studies, and to specifically identify valuable lessons and recommendations that can help lead to the rapid integration and modernization of logistics management systems in the government.

The Forum featured Major General John Phillips (USAF, Retired), vice president of government services for Honeywell International, Inc. and former deputy under secretary of defense for logistics, who delivered the keynote address. He highlighted the similarities between the private sector and government supply chains, but emphasized that there is also one major difference. For some government supply chains, such as DoD's, the cost of failure can be catastrophic.

There were also four speakers from the public and private sectors who presented case studies. These presentations stimulated animated exchanges on the lessons they offered about successes and challenges, as well as potential solutions to logistics issues currently faced by the federal government.

This section highlights key lessons learned from the Forum and case studies, along with strategies and potential future public policy actions recommended by Forum participants to rapidly integrate government logistics systems.

The participants concluded that the federal government cannot afford to tolerate ineffective logistics systems that result in too much inventory and excessive order-to-ship times. Logistics is the single factor that drives *reliability* and, more importantly, in the case of the military, *readiness*. It is also the single most important factor that drives *cost*. Transforming the existing systems will require making logistics a top priority and a major reengineering effort. As in the previous Forums, participants unanimously identified strong leadership as being critical to a successful transformation of government logistics systems.

Real success will depend on integration and coordination between the public and private sectors, as well as within and among government agencies. While the focus of the Forum's discussions often addressed ways to improve government practices, the private sector participants found that the challenges faced by the public sector are not very different from the ones they face. The participants also

examined the existing barriers to change, as well as the resources required. Specific recommendations were developed to increase more structured opportunities for cross-sector collaboration, and to address barriers and human resource issues.

## Leadership

Transforming logistics is not about making statements, but about changing beliefs. As in the previous Forums, participants identified committed senior leadership as the most critical element in achieving transformation of government logistics into an integrated supply chain. Employees need to understand and emphasize logistics processes, both internal and external to the organization, and pay particular attention to the outcomes. Managers must focus on creating the best value for the government, and not just look for the lowest cost solution.

This cannot be just another new program, but a way of thinking that must be adopted by the entire organization. For most government organizations, this will require a major cultural change, which will come about only as a result of consistent high-level leadership—leadership that must come from above the logistics, procurement, and finance functional level.

Long-term leadership is a particular problem in government, with the turnover of senior leaders (their terms are often limited by political realities). Add to this the fact that they can reasonably achieve only three to four major goals during their tenure, the question is: How do we make logistics transformation one of them? And unless the transformation can be extended beyond the horizon of each incumbent, this process can easily revert to a Sisyphian<sup>10</sup> undertaking, where each subsequent administration regresses and starts anew.

To overcome this problem for their Business Systems Modernization program, the Defense Logistics Agency established a Modernization Executive Board, with a senior executive from every functional area, to establish and maintain program tenets. The program had to adhere to these tenets unless the board approved a change. The board members' buy-in and involvement, from concept through implementation, created enough inertia to see the program through development with minimal changes.

Forum participants also noted that the *creation of the correct incentives* is critical to changing the culture of government organizations and making the vision of an integrated supply chain a reality. Employees need incentives to overcome a natural fear of job loss and change. In most cases, job losses are minimal, but changes in how employees do their jobs may be significant. Managers also need incentives to keep making process improvements. Incentives for businesses providing services or products to the government must also be evaluated and restructured. Industry incentives are, at times, perverse and at cross purposes with government objectives. For example, private firms currently can make more money selling parts for government equipment than by improving the performance of that equipment.

Finally, the participants agreed that leaders need to *focus on changing and optimizing the entire logistics process*, and not just tinker with smaller segments, which in the end may sub-optimize the whole.

#### **OMB in conjunction with department and agency heads should:**

##### **1. Make logistics a top management priority.**

True transformation of the government's logistics system will require a consistent, long-term focus from department and agency heads. The overarching vision must be to put in place an interoperable, end-to-end, integrated logistics system. Identifying logistics transformation as a top management priority will help establish and maintain that focus and help to address the organizational and bureaucratic issues that tend to create resistance to cultural changes. It will also create the imperative to push for the necessary legislative and regulatory relief.

At the department and agency level, strong cross-functional senior leadership is required to integrate the related functions of logistics, procurement, and finance that will ensure the optimization of the entire supply chain, not just elements of it. Department and agency heads should establish a day-to-day champion of logistics transformation—someone senior enough to be responsible for achieving results. Major departments should consider the establishment of an assistant secretary for logistics—with funding authority—to emphasize the importance and permanence of this initiative.

#### **Department and agency heads should:**

##### **2. Develop transformation momentum.**

Since these efforts generally take longer than one leader's tenure, department and agency heads need to create organizational mechanisms to develop and maintain the transformation momentum over time—mechanisms that can resist unnecessary program changes and help to transcend the turmoil created by normal leadership changes (particularly due to political leadership changes). The Defense Logistics Agency's Modernization Executive Board and its program tenets is one approach that Forum participants were eager to implement. The key, however, is to institutionalize the modernization efforts so the effort can extend beyond any leadership changes and be fully implemented.

##### **3. Create incentives to change the culture.**

New technological solutions and business processes provide many opportunities to improve logistics management. Achieving the greatest improvement will require significant changes to the current government culture. Employees, customers, and contractors must abandon the belief that higher logistics performance will always incur higher cost. They must believe that they can develop interoperable systems and make business process changes to improve performance, and do it with cost savings. For well-designed efforts, the data shows that this is consistently the case. In order to create the desired culture, agency heads need to create new incentives for employees, managers and leaders, and contractors.

Agency heads need to develop incentives for employees to encourage them to embrace the changes and look for ways to improve the logistics processes. One example offered was to reward employees for changes that improve system performance.

Agency heads also must use all available incentives when dealing with contractors, such as including performance guarantees (which will affect both contractors and government personnel and processes) and encouraging multiyear contracts (to encourage contractors to make greater investments).

##### **4. Measure the right things.**

Departments and agencies will achieve their desired results only if they develop the appropriate metrics

to monitor the effectiveness of their changes. These measures also can be an incentive. The metrics should support the logistics vision, be based on desired outcomes, and be designed to achieve the desired behavior from both employees and contractors. Performance, not cost, should be the primary metric, but with effective supply chain integration, cost reduction will follow. The metrics also must include customer satisfaction as a key performance measure. These metrics can be used by senior management to measure progress toward agency goals, by line managers in the supervision of employees, and by program managers to evaluate the performance of partners, suppliers, and vendors. Using the wrong metrics, such as how many parts are on the shelf, will only encourage the behavior that will result in more parts on the shelf, but not necessarily the real results intended, such as improved system performance. Agencies must use more appropriate metrics such as inventory turns (the number of times inventory turns over per year), fill rates, delivery times (hours, not days), and equipment reliability.

#### **5. Get the facts and make them widely available.**

Although there have been many isolated instances of improving government logistics processes, most of which were very successful, myths abound. In order to make the required changes and accomplish a true logistics transformation, in the face of emotional and incomplete arguments, department and agency leaders must have enough real data and information on successes, not just anecdotes, to be effective advocates. OMB should sponsor the collection of this data from government experiences (e.g., the Army's Logistics Modernization program in St. Louis and the Navy's Auxiliary Power Unit management program at Naval Aviation Depot Cherry Point<sup>11</sup>) and the subsequent development of comprehensive case studies. In addition to being very useful in developing and evaluating future initiatives, this material would also be useful in department and agency training programs, and for the development of improved modeling and simulation of government logistics processes.

## **Coordination and Collaboration**

In large part, transforming logistics and integrating the supply chain involves improving visibility: visibility into internal processes, visibility into supply chain partners, and visibility into customers' demands. The issues are compounded in a large, complex organization like the federal government. Recognizing this, Forum participants pointed out that improving coordination and collaboration within government agencies, between agencies, and with their industry partners is a major antecedent to transforming the federal government's logistics processes. The participants stressed that the goal must be interoperability, not commonality, for legacy systems (used for intra- and inter-agency operations and databases). Currently, the larger agencies and departments cannot even share logistics information across the organization, much less with other departments and agencies—and the sharing that does take place is relationship based, not systems based.

Improving interoperability within the government, with the resulting improvements in coordination, would allow for greater asset visibility of inventoried items. These could then be treated as a national asset and more easily shared between agencies when needed (emergencies and natural disasters). Increased interoperability would also facilitate the consolidation of requirements and the sharing of demand data with suppliers, and make leverage buying possible by capitalizing on the strategic supplier relationship. Participants discussed the creation of a cross-government logistics management council as a mechanism to develop and coordinate strategy and oversee execution of the logistics transformation. There was also a lengthy discussion of the benefits of joint program offices in DoD, such as the Joint Strike Fighter. When the program managers are properly empowered, these serve as a good forcing function for logistics interoperability.

The participants discussed the development of standards that would improve interoperability within the government and with the private sector. Some of the specific items discussed were the development of common inventory/asset tracking systems, information technology standards, transportation standards, common data descriptions, and an interoperable cost accounting system.

## **OMB in conjunction with department and agency heads should:**

### **6. Develop a strategic plan.**

OMB, together with department and agency heads, must develop a strategic plan that will provide a common vision, goals, and the conditions for program success for a government-wide logistics transformation. The plan should outline requirements for cost accounting, privacy, security, and interoperability. The process of inter-agency coordination and approval will help ensure stakeholder buy-in, and help to develop agreement on the scope, priority, and urgency of the transformation efforts. In the end, this will reduce the natural organizational resistance to change.

### **7. Develop standards to improve interoperability.**

Lack of accepted standards inhibits interoperability. OMB, in conjunction with the agency heads, should develop standards for items, such as common data descriptions, information technology standards, inventory/asset tracking systems, and cost accounting systems, to improve interoperability.

Logistics transportation in the future will have to take full advantage of commercial transportation capability. Departments and agencies should collaboratively develop standards for common transportation and material-handling equipment that will interface with commercial air and ground transport.

### **8. Improve interagency coordination.**

Left to their own devices, federal agencies continue to develop agency-unique systems and capabilities. Increased coordination is required to obtain the maximum benefit from technology investments and to leverage successful projects and programs. OMB should establish a cross-government logistics council to develop an interoperability strategy and to oversee the execution of the logistics transformation. One important distinction is that this strategy should emphasize interoperability, not commonality. The use of inter-agency and joint exercises should be expanded to identify logistics interoperability issues and evaluate capabilities. Finally, where appropriate, DoD should expand the use of joint program offices to increase inter-service coordination.

## **Public-Private Interaction**

Participants recognized that managing the public-private interface is critical to a successful transformation of government logistics. The private sector develops major systems, which the government acquires; supplies spare parts and consumables; integrates automated systems; and increasingly provides managed services—to include logistics services. This underscores the government's change from the "doer" to the "manager of the doer." The participants acknowledged, however, that there is an ingrained mistrust between the private sector and government. Government middle managers don't trust industry to perform consistently. Government employees fear that job losses are likely when partnering, especially in the realm of managed services. Businesses worry about the many issues with performing on government contracts to include the lack of government leadership to implement the tools and integrate the services they provide. These create a resistance to expanding the role of the private sector in logistics processes, even though it is frequently more efficient. Issues such as security, which are a real concern but have available technical solutions, become excuses for inaction.

The Forum discussions about how to achieve the right public-private mix were lively and identified several strategies. First, the government must clearly define what is realistic to achieve during the initial phase of the partnership—"what is the expectation." Then, the government must develop consistent ways to evaluate the value of the partnership. To hasten the level of private sector participation, formal goals for the number of new partnerships may be useful.

There was also general agreement that the government should make maximum use of commercial off-the-shelf (COTS) systems for logistics and supply chain functions. This would leverage the private sector's cutting-edge technology and, at the same time, reduce the problems involved with the public-private interface.

There was also a discussion of the appropriate roles for government, original equipment manufacturers (OEMs), and third-party logistics providers. Government should focus on being the manager of the overall services, providing configuration control and oversight, and establishing interoperability

portals. Then, through training and experience, government should choose among all the available strategies, such as outsourcing and competitive sourcing, to provide the most effective logistics support based on “buying capability vs. buying parts.” The OEMs, which are sometimes reluctant to push for a greater role because they are reluctant to offend their government sponsors, should have prime responsibility for logistics support and management of the supply chain for the major systems they manufacture. Based on performance measurement contracts, the OEMs should make continuous improvements in reliability, availability, and affordability. Finally, the third-party logistics providers should be relied on to provide warehousing and distribution, transportation, and interoperable information systems.

#### **OMB in conjunction with department and agency heads should:**

##### ***9. Use pilot programs to build trust and demonstrate value.***

Although the commercial sector has demonstrated the value of outsourcing and partnering, there is still reluctance within government agencies to “trust” contractors to perform under all conditions. For example, there is concern that private sector providers won’t meet a customer’s needs to meet surge requirements. Yet many companies excel at doing just that—usually more efficiently and effectively than government. There is a lack of concrete examples that demonstrate the value of public-private partnerships. Agencies and departments must develop pilot projects to demonstrate this value, and to build the trust and understanding that many contractors can perform as required. Periods of performance from 12 to 18 months are required before these projects instill adequate confidence. Agencies should leverage existing developments, such as the U.S. Air Force (USAF) demonstration logistics portal to provide cross-government visibility, information, and access. Finally, agencies should expand those government/industry partnering initiatives that have proven their value.

##### ***10. Use COTS and the web.***

When automating and integrating logistics systems, agency heads should adopt proven commercial products and systems, and resist the temptation to

develop their own unique systems. Generally when organizations use COTS, they shorten the development cycle, minimize development risk, reduce “scope creep,” and leverage the rapid commercial development cycle. Modifying agency business processes to adapt to an existing COTS system must be preferred to the development of a unique system in-house. Agencies can, in this way, buy proven products and focus on process reengineering, not product development. If legacy systems must be maintained, then middleware should be developed to manage the interface. Additionally, COTS systems will also provide known privacy and security performance.

##### ***11. Ensure information security and privacy.***

The increased use of information technology has increased the vulnerability of federal agency systems to worms, viruses, hacker attacks, web-page defacing, and disgruntled employees. Information security has received much emphasis of late, but weaknesses persist. Since automated and integrated logistics management systems will contain sensitive agency and proprietary contractor data, these real or perceived security weaknesses will dampen the enthusiasm for and acceptance of them. When acquiring or developing these systems, agencies must make security and privacy a system-level requirement from the beginning. They must be coupled with an active training program for all users and regular security audits (“Red Team” testing) after system implementation.

## **Overcoming Barriers**

The Forum participants concluded that there are no technological barriers to transforming government logistics systems. However, the participants did identify several significant barriers that are the result of the size and complexity of the federal government, and the general nature of large organizations (public or private). These include the culture and resistance to change, lack of consistent senior leadership, lack of trust, stovepipes, and turf battles. These are addressed in other sections of this report.

Legislative and regulatory barriers were also identified. The law that causes some of the most frustrations is Section 2466, Title 10, “Limitations on the performance of depot-level maintenance of

materiel,” commonly known as the “50/50 rule.” Under this law, “not more than 50 percent of the funds made available in a fiscal year to a military department or defense agency for depot-level maintenance and repair workload may be used to contract for the performance by non-federal government personnel....”

The “50/50 rule” is important to federal military depot advocates.<sup>12</sup> They believe it is required to guarantee government access to a government controlled, organic source of repair for military equipment, which would be available to manage surges during wartime. Participants agreed that these rigid restrictions sometimes artificially distort the economics of providing logistics support and result in poorer performance and higher program costs. For example, the Army may have an opportunity to outsource Apache logistics support, producing improved performance and significant program savings. Yet, because those remaining in the “working capital pools” have to absorb all the overhead, the cost of maintaining M1A1 tanks at government depots would have to increase, without improved performance. Forum participants concluded that the private sector’s ability to react to surge requirements is underrated, and greater flexibility contracting for logistics is desirable so that the most effective support can be provided to military systems. Several alternatives were discussed, from changing the law to changing how the law is interpreted and implemented—for example, looking only at touch labor,<sup>13</sup> or having the DoD comptroller redefine the base used in the calculation (such as changing the way public-private partnerships are treated).

Another issue discussed at the Forum was the federal acquisition environment. The regulations, or in some cases the way they are interpreted, can work at cross purposes with logistics “best practices.” Emphasizing frequent competitions does not reinforce the proven key factor in successful public-private and private sector efforts: building long-term relationships. Instead of *requiring* frequent competitions, the government should maintain the *option* of introducing competition whenever the supplier allows performance to degrade or costs to rise. Also, restricting the sharing of information precludes suppliers from effective demand planning. And, requiring the development of detailed plans

and business cases based on critical data for pilot project approval, when that data is incomplete and inadequate because government does not sufficiently track such information, is incompatible with the spirit of spiral development. (Spiral development is a cyclical, iterative build-test-fix-test-deploy process that yields continuous improvements in systems. Each iteration draws upon the experience and lessons of previous versions.)

#### **OMB in conjunction with department and agency heads should:**

##### ***12. Review and modify acquisition guidance.***

Acquisition guidance must be reviewed and modified to eliminate real and perceived barriers to logistics transformation. Regulations on information sharing should be clarified to make it clear that agencies can and should share demand information with suppliers to allow them to optimize their services. Done correctly, this need not result in providing a competitive advantage. The requirements for business cases must not require so much detail that they discourage the use of spiral development and rapid implementation (especially when the government’s “baseline” cost data are not well known). Finally, acquisition regulations should continue to encourage competition (to provide a broad supplier base), yet agencies should also promote the use of multiyear contracts with performance guarantees to develop strategic partnerships, while maintaining the option of introducing competition should performance fall off or costs rise.

##### ***13. Implement activity-based costing (ABC).***

If cost is not understood, the impact of proposed changes cannot be demonstrated effectively. Adopting activity-based costing throughout the government would allow better analysis of organizational functions and better identification of costs—especially the indirect costs—and would allocate them to the appropriate cost object. ABC is a consistent, disciplined process that would improve strategic decision making by enabling the collection of true costs for government operations. With ABC, valid comparisons can be made between different options such as when analyzing organizational requirements or comparing costs between government and private sector alternatives.

**14. Provide the required resources.**

To ensure a dedicated and consistent effort, OMB must maintain an emphasis on transforming agency logistics systems and supporting adequate funding (and/or require the agencies to provide it). Without the required funding, full transformation will be impossible, and the great promise of improved government performance will not be realized. Since trying to do too much will dilute resources, OMB should also assist in prioritizing projects and should specify key strategic projects and infrastructure actions. Agencies should resist the temptation to develop the perfect logistics management system and, where appropriate, implement the “B” or “80 percent” solution quickly.

Agencies also should empower program managers to develop the “best value” system life cycle solutions, and should provide them with the required funding authority to execute these plans. Multiyear funding should be considered to improve individual program stability.

**OMB in conjunction with the secretary of defense should:****15. Address the “50/50” rule.**

In order to make available the full range of options, and to get the best value for the government, OMB, together with the secretary of defense, should work to get relief from the “50/50” rule, then commercialize and/or privatize the military depots. If that is not possible, then DoD should advocate a logistics base realignment and closing commission to evaluate depot capacity and realign it with service requirements.

Short of these major fixes, it may be possible to work with the comptroller to reinterpret the “50/50” rule to focus on touch labor, and/or to redefine the base used in the calculations, such as with regard to public-private partnerships.

**Human Resources**

Recent technological changes and downward budgetary pressure have driven government organizations to search for greater efficiencies and ways to create greater value. As a result, the nature of government work is evolving from being “the doers” to becoming “the manager of the doers.” Consequently,

the strategies needed to recruit, train, develop, and sustain the new generation of employees is changing.

The human capital landscape in which these changes are occurring has also dramatically shifted. During the last decade, there were major reductions in the total number of government employees. However, these reductions were made without focusing on the makeup of the workforce, and now the government is faced with more than 25 percent of its employees being eligible to retire within the next five years.

Forum participants discussed the need to transform this aging workforce to adapt to the new, more complex logistics roles. They recognized that this will not be a quick or easy process, but a necessary one to transform the logistics systems. Agencies will have to review the relationship between their employees and technology, and redefine the skill base they need. This must involve the evaluation and development of new job descriptions and career paths. The participants also discussed bringing talented mid-level and senior personnel into government service from industry. Although they recognized that individuals brought in from the private sector are challenged in their first exposure to government service (employees give them little credibility when they lack prior government experience), agencies should begin to develop a program to rotate these individuals into and out of government service on special assignments. Such programs do exist and should be expanded or improved as necessary.

**Department and agency heads should:****16. Redesign logistics jobs.**

Government logisticians face a challenging environment. To take full advantage of the ever changing systems and technology, the government will need a logistics workforce with a different skill set. Future logisticians need to be “knowledge workers” with much more in the way of IT and management skills. Departments and agencies must create a career path and develop a comprehensive professional development and career management program for logistics professionals. This program should include the maximum use of rotational assignments, both inter-agency and into and out of industry.



**17. Greatly expand education and training.**

With the recognition that many manual and clerical functions will be eliminated, employees will have to learn higher order management skills to manage and partner with the private sector contractors. Agencies must aggressively develop and provide that training to reshape and sustain the logistics workforce. Maximum use should be made of web-based training. Agencies must also develop executive training programs for senior managers and leaders to keep them abreast of technological changes, to train them to select the best acquisition approach, to develop valuable performance measures, to manage performance contracts, and to expose them to improvement possibilities using benchmarks and case studies.

# Endnotes

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10. In the realm of the dead, Sisyphus is forced to roll a block of stone up a steep hill, which tumbles back down when he reaches the top. Then the whole process starts again, lasting all eternity.
11. Center for Public Policy and Private Enterprise report, *Moving Toward an Effective Public-Private Partnership for the DoD Supply Chain*, June 2002.
12. Military services maintain in-house depots that repair and produce spare parts for weapons systems ranging from F-16 fighter aircraft to M1A1 tanks to Nimitz class aircraft carriers. These depots employ more than 64,500 employees and spend almost \$16 billion annually.
13. Touch labor is direct labor performed on hardware or documentation. This work can involve fabrication, assembly, test and evaluation, and repair.

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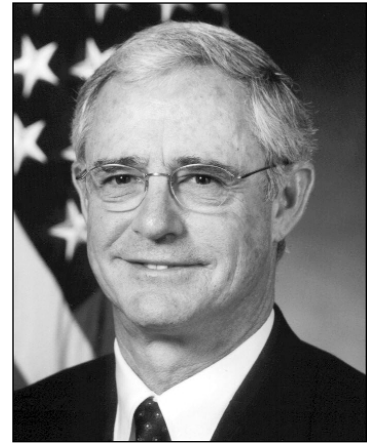
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Throughout his career, Dr. Gansler has written, published, and taught on subjects related to his work. He is the author of *Defense Conversion: Transforming the Arsenal of Democracy*, MIT Press, 1995; *Affording Defense*, MIT Press, 1989; and *The Defense Industry*, MIT Press, 1980. He has published numerous articles in *Foreign Affairs*, *Harvard Business Review*, *International Security*, *Public Affairs*, and other journals, as well as newspapers and frequently testifies before Congress. He is a Member of the National Academy of Engineering and a Fellow of the National Academy of Public Administration.



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