



**STRATEGY  
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**DOD E-BUSINESS:  
A REVOLUTION WITHIN A REVOLUTION**

**BY**

**COMMANDER EDWARD J. SWEENEY  
United States Navy**

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USAWC STRATEGY RESEARCH PROJECT

**DOD E-Business: A Revolution Within A Revolution**

by

Commander Edward J. Sweeney  
Supply Corps, United States Navy

Lieutenant Colonel Woodrow Bradley, Jr.  
Project Advisor

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U.S. Army War College  
CARLISLE BARRACKS, PENNSYLVANIA 17013

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## ABSTRACT

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In most of the literature associated with the Revolution in Business Affairs, most activity has focused on becoming paperless as a method of saving money and improving efficiency. To that end, the initiatives begun by the Joint Electronic Commerce Program Office (JECPO) and the Standard Procurement System (SPS) Program Office have taken great strides in developing a business framework for business as it was envisioned in the late 1990s. The incorporation of new technologies and languages in the business world since the charter of these two institutions has provided opportunities and challenges for DOD in order to remain among the institutions employing best business practices. This paper addresses the history of the initiatives under the JECPO, the SPS program and some new technologies and challenges at the dawn of the 21<sup>st</sup> century. The paper concludes with some recommendations for DOD on Business communication.



TABLE OF CONTENTS

ABSTRACT ..... III

LIST OF TABLES ..... VII

DOD E-BUSINESS: A REVOLUTION WITHIN A REVOLUTION..... 1

    JOINT ELECTRONIC COMMERCE PROGRAM OFFICE (JECPO) .....2

    STANDARD PROCUREMENT SYSTEM.....4

        SPS INTERFACES .....5

        EDI .....6

        ELECTRONIC PROCUREMENT FOLDERS/ARCHIVE .....6

        INTERNET MARKET RESEARCH TO CONTRACTS ONLINE/E-MALL .....6

        ACQUILINE.....7

        AMS LOOKING TO THE FUTURE .....7

    RATE OF CHANGE.....8

        A SEA OF CHANGE IN BUSINESS TO BUSINESS COMMUNICATIONS .....8

        DIGITAL SIGNATURE .....8

        EXTENSIBLE MARKUP LANGUAGE (XML) .....9

        XML STANDARDS.....9

        SOFTWARE MAINTENANCE.....10

        ONLINE MARKETPLACE .....10

        VENDOR ONLINE MARKETPLACES .....11

        PURCHASING MARKETPLACES .....12

        COMBINATION MARKETPLACE .....12

        CONVERGING CONSUMER CONSORTIUMS .....13

        EVOLVING WIRELESS AND INTERNET TECHNOLOGIES.....13

        CONCLUSIONS AND RECOMMENDATIONS .....14

ENDNOTES.....17

BIBLIOGRAPHY.....23



## LIST OF TABLES

TABLE 1: SPS INTERFACES .....	5
-------------------------------	---



## DOD E-BUSINESS: A REVOLUTION WITHIN A REVOLUTION

The recent growth of the information technology sector is an indicator that the business sector will undergo profound change. Until recently, individuals primarily used the Internet for communication, research and shopping. Within the last few years, the Internet has become an uncharted territory with the growth in business to business technologies. The enabling technologies are on the doorstep and given the advance experienced over the last few years, the business climate will continue to change. Peter Drucker described the ongoing change as not limited to technology. He said, "It is not a revolution in technology, machinery, techniques, software or speed. It is a revolution in CONCEPTS."<sup>1</sup> The one thing for sure is that our business climate is changing.

Secretary Cohen suggested that "All of us are living in this Tofflerian age of Future Shock, where time is speeded up by events and everything is being shaken by the winds of change."<sup>2</sup> The DOD has to eliminate archaic barriers in the business process and tap "the full potential of private industry" to keep pace with the evolving change and develop "novel solutions" to the challenges.<sup>3</sup> The changes will require the commitment of people within DOD and those outside it.<sup>4</sup> The same is true in the world of business. Every activity needs to innovate to succeed incorporating "deep knowledge of new markets".<sup>5</sup>

In the Defense Reform Initiative, the defense leadership indicated that "the Department of Defense (DOD) must adopt and adapt the lessons of the private sector if America's Armed Forces are to maintain their competitive edge in the rapidly changing global security arena."<sup>6</sup> The primary emphasis was on the reduction of paper in the workplace to achieve efficiency and economies of scale. As a result of that initiative, DOD began projects to reduce paper in several ways. These projects included: Paper-free contracting, use of purchase cards; electronic catalogs and e-mails; paper-free systems for weapons support and logistics, publishing on the internet and CD; use of prime vendor contracts; reengineering travel procedures; replacing "just-in-case" with "just-in-time" inventory practices; and reengineering the movement of household goods.<sup>7</sup>

When the initiative began in the late 1990s to make the acquisition process a paperless one, the objective was to take advantage of the Internet. Since that time, technology has enabled a much greater step. With the advance of the wireless technology, an individual can collect and send email and other information from portable devices such as a mobile phone or a PALM Pilot digital assistant. The enabling technologies will allow for greater portability of information and reduced turn around time in decision making. DOD should continue the march with business and advancing technologies, not simply bringing legacy systems online, but exploiting technology to improve DOD business processes and communications. Building to a specification developed years ago, when technology marches on at a rapid pace, will place DOD in the same position it was in the mid-1990s, far behind the business sector in best practices.

## **JOINT ELECTRONIC COMMERCE PROGRAM OFFICE (JECPO)**

As part of the Defense Reform Initiative outlined above, the DOD was tasked with becoming more efficient through better business practices using Electronic Business (EB) and Electronic Commerce (EC). Dr. John Hamre, Deputy Secretary of Defense, established a Joint Electronic Commerce Program and Office (JECPO) and designated the JECPO as the executive agent for "supporting, facilitating, and accelerating the application of EB/EC practices." JECPO developed an overview and summary of common capabilities that define current and future EB/EC capabilities.<sup>8</sup> The purpose was to establish an architecture to focus DOD's effort in engineering change to the best business practices. The goals of the program are noted below.

- Identify top level business operations that support business and non-business related operations
- Identify data flows and assets necessary to conduct DOD EB/EC operations
- Define a common DOD EB/EC business environment
- Provide a mechanism for optimizing DOD business operations and opportunities
- Compatibility of business operations
- Commonality of business solutions
- Inter-operability of business systems
- Prioritization of resources<sup>9</sup>

The architecture that was completed in draft form includes a look at these from the Command, Control, Communications, Computers, Intelligence, and Reconnaissance (C4ISR) framework. The views that were provided include All Views (AV) definitions and environment; Operational View (OV) tasks, elements and information flows; and System View (SV) description, systems and interconnections; as well as a Technical View (TV).<sup>10</sup> The systems were employed so that differing services would operate on the same assumptions to guarantee future inter-operability. The JECPO developed an overall business process that incorporated their findings as an Overview of Business Process, End-to-End. As a part of the process, the JECPO sponsored a collection of individuals from each of the Services and Agencies within DOD to conduct an end-to-End review of the procurement process. The intent is to use the information in connection with the architecture above to maintain an overall framework and methodology for the procurement process.<sup>11</sup> A summary of the JECPO office initiatives follows.

- DOD Electronic Mall (E-Mall)
- Paperless Contracting Prototype – Wide Area Workflow
- DOD Business Opportunities
- Technical Data Package Material Information System
- Central Contractor Registration
- DOD Medium Assurance Public Key Infrastructure
- Government Purchase Card

- "Smart Cards"
- DOD EC Navigator<sup>12</sup>

The DOD E-mall will serve as a single point of entry or "Portal" for all online DOD electronic catalogs for services or supplies. It will consist of a commodities corridor, an information technology corridor and a services/construction corridor. Each Service can establish "stores" to advertise their catalogs in the E-mall.<sup>13</sup>

The paperless Contracting Prototype – Wide Area Workflow is a project that provides an open environment for data formerly restricted by legacy systems that were not connected. The program will use tools such as Electronic Document Management (EDM), Electronic Document Workflow (EDW), Electronic Document Access (EDA) and Electronic Document Interchange (EDI) Standards. The Wide Area Workflow prototype will use shared data and electronic documents to reduce unmatched expenditures.<sup>14</sup>

DOD Business Opportunities will link the business world to DOD solicitations. The Service participants in this endeavor include: DLA Procurement Gateway; Navy Electronic Commerce On-Line; Army Single Face to Industry; Air Force Electronic Posting System and DISA Business Opportunities Site. The initial phase was to link all of these sites until a consensus for business rules was established.<sup>15</sup>

Technical Data Package Material Information System (TDPMIS) provides a common DOD repository of unclassified technical drawings and data packages referenced by any contract online. These data include unrestricted drawings, military specifications, Federal specifications and common industry standards.<sup>16</sup>

Database innovations that are being looked at today include some of the following. Central Contractor Registration is a database of all contractors working with DOD. This database standardized the contractor information required for procurement and financial systems. In the past data were often duplicated and a company may have been listed in several different ways on various databases. The time lost in de-conflicting the data to pay or locate a vendor was substantial.

The Purchase Card is now mandatory for all purchases under \$2500. The other uses of the card vary with the Service. The card is just like an individual Visa or MasterCard. The only major difference is the accounting procedures. These vary between the Services as well. Unfortunately, every line of accounting that is used in traditional procurement and the financial system is still required with the purchase card. Reconciliation of the purchases for payment with the monthly invoice is a delicate balancing task and often results in delinquencies. These delinquencies are often resolved with optional bulk funding of the card.<sup>17</sup>

The next project dealing with Public Key Infrastructure (PKI) involves protecting the data from unauthorized modification and disclosure. Since offers from vendors are often sensitive and could hurt the company's overall business if disclosed, it is very important to protect the data. Two of the programs

that use the PKI methodology today are Electronic Document Access (EDA) and Wide Area Workflow (receipt documentation/DD Forms 250).<sup>18</sup>

Smart Cards are still another use of EB/EC principles for an integrated approach across service programs. This card is envisioned to bridge the fleet, travel and purchase cards. The ease of use and elimination of multiple single purpose cards are the main advantages.<sup>19</sup>

The DOD EC Navigator is an online tool to the location and purpose of EC tools. The long-term vision is a single entry workspace for all Federal customers and suppliers to electronically conduct their transactions.<sup>20</sup> This endeavor appears to be like very wishful thinking. In many of the other programs listed above, the consensus among the DOD participants was less than unanimous. A more realistic option for DOD will be discussed later in this paper.

Finally, DOD has begun to monitor past performance of suppliers. The Past Performance Automated Information System is a collection of data submitted by the Services' report card systems: the Army Past Performance Management Information System (PPMIS), the Navy Contractor Performance Appraisal Reporting System (CPARS) and the Air Force CPARS operated on a Lotus Notes database. DOD contracting personnel can login and evaluate a contractor's overall past performance when reviewing a contractor's proposal.<sup>21</sup>

## **STANDARD PROCUREMENT SYSTEM**

At the beginning of the business process review, a major effort was already underway in the area of making the contracting process paperless. In 1990, DOD began studying a method to automate the files and contracts that are required for Defense procurement. By the end of 1992, a formal search had begun. In 1995, a contract was solicited for the development of a standard procurement system that could be used throughout the Department. The award was made to both American Management Systems and DynCorp in 1996. Both companies demonstrated their proposed standard systems in the following year. In April 1997, DOD awarded a ten year contract to AMS for software known as "Procurement Desktop 2" (PD2). The contract included follow-on development, fielding and support of the DOD Standard Procurement System (SPS), commercially known as PD2.<sup>22</sup>

Before this, each of the Services had their own unique procurement systems. Each Service developed unique applications based on the business practices employed. The Navy was the first to develop key automated interfaces. The early Navy programs targeted for replacement by SPS were Automated Procurement and Accounting Data Entry (APADE) and Inventory Technical Item Management and Procurement System (ITIMP). The APADE System included several interfaces to accounting systems, inventory management systems and requirements tracking systems. The interfaces with Defense Accounting and Finance System (DFAS), Inventory management demand history tracking function by sending local purchase demand history transactions to the Naval Inventory Control Point; requisition entry and status for the Uniform Automated Data Processing System (UAPDS) and Material Accounting System (MAT 01) and Afloat Requisitioning System. These interfaces provide an exchange

of data between SPS and the logistics and financial systems. In some cases, the interfaced system still feeds data to further systems; i.e. the data sent to DFAS is also forwarded to the fraud monitoring program known as Operation Mongoose.<sup>23</sup>

#### SPS INTERFACES

Following the demonstration and testing of the software, the Navy was the first Service to begin use of the SPS Interface (SPS-I). SPS-I is a utility to exchange (import and export) data between SPS and DOD logistics and finance legacy systems. Other systems that will interface with SPS are listed in Table 1. The program facilitates the monitoring of the data and data flow by maintaining logs. This feature improves the ability of the contracting operation to maintain data integrity.<sup>24</sup> Currently, SPS supports the smaller procurements; i.e. smaller than a weapons system (F/A-18 aircraft). Future functionality will incorporate the other requirements of more complex procurements such as a major weapons system.<sup>25</sup>

AIR FORCE	<ol style="list-style-type: none"> <li>1. Air Force Contract Reporting System (J001)</li> <li>2. Automated Business Services System (ABSS)</li> <li>3. Civil Engineering Material Acquisition System (CEMAS)</li> <li>4. Fraud Detection System (MONGOOSE)</li> <li>5. Integrated Accounts Payable System (IAPS)</li> <li>6. Medical Material Management System (MMMS)</li> <li>7. Standard Base Supply System (SBSS)</li> <li>8. Wholesale and Retail Receiving/Shipping System (WARRS)</li> </ol>
Army	<ol style="list-style-type: none"> <li>1. Automated Integrated Requisition System (AIRS)</li> <li>2. Army Material Command Installation Supply System (AMCISS)</li> <li>3. Computerized Accounts Payable System (CAPS)</li> <li>4. Corps of Engineers Financial Management System (CEFMS)</li> <li>5. Federal Procurement Reporting System (FPDS)</li> <li>6. Integrated Facilities System Mini/Micro (IFSM)</li> <li>7. Integrated Requirements Purchase Request System (IRPRS)</li> <li>8. Theater Army Medical Management Information System (TAMMIS)</li> </ol>
Navy	<ol style="list-style-type: none"> <li>1. Automated Non-Standard Requisition System (ANSRS)</li> <li>2. Standard Accounting and Reporting System (STARS)</li> <li>3. Shipyards Management Information System (SYMIS), also Known as MAT01 (see text).</li> <li>4. Uniform Automated Data Processing System (UADPS)</li> <li>5. Uniform Inventory Control Point (UICP)</li> </ol>
USMC	Standard Accounting, Budgeting and Reporting System (SABRS)

TABLE 1: SPS INTERFACES<sup>26</sup>

A key factor in the revolution in Business Affairs is the accomplishment of changes in business practices to improve service and reduce cost. In the course of evaluating the data required for SPS, the Navy conducted a thorough review of the data. The resulting data dictionary was then mapped to the SPS database tables by AMS. In cases where the business rules for certain actions required a differing

format, these business rules were mapped as well. The review of the complex business rules allowed managers to streamline the process. The results of this review and the ease of use of the Purchase Card for micro-purchases (Under \$2,500) by customers has driven many contracting management organizations to review the nature of the business of procurement. The review drove the DOD to adopt SPS as the standard. DOD precludes any acquisition, development or deployment of any system or tool that duplicates SPS functionality.<sup>27</sup> One procurement operation defined SPS as the solution that "will enable purchasing specialists to focus on value-added activities, and improve customer service by forging closer ties between purchasing and the requisitioning community."<sup>28</sup>

#### EDI

A typical flow for the data mirrors the flow of data previously accomplished manually or via some other automated fashion. The requesting personnel submit the requisition via a data entry method or via Electronic Data Interchange (EDI) from an existing legacy system. The procedure will then send the EDI transaction electronically to the SPS program by the Internet using File Transfer Protocol (FTP) or some other delivery method such as IBM Message Queuing (MQ) Software. Contracting management personnel categorize the requisition data for completeness and accuracy. Management then assigns the requisition to a buyer or contract specialist. The contract specialist then conducts the procurement via established procedures. A large number of vendors rely on EDI to share data, but the inherent problems with EDI include: "large investment, high operating costs, complexity and rigid formats."<sup>29</sup>

#### ELECTRONIC PROCUREMENT FOLDERS/ARCHIVE

The SPS program retains an electronic record of all pertinent information related to the contract or purchase to maintain an audit trail and reduce the requirement for paper files. The program will print the completed documents along the way for any required hardcopies. In the future, the program will also transmit the solicitations, modifications, awards or cancellations electronically employing the ANSI X12 3050 EDI Implementation Convention<sup>30</sup>. The closed-loop nature of the system was the reason DOD selected the AMS developed program as the standard.

#### INTERNET MARKET RESEARCH TO CONTRACTS ONLINE/E-MALL

One of the additional factors in today's new technology climate is the Government's ability to use the Internet much like the business community. Contracting organizations must negotiate favorable contract terms and prices and provide for these in contracting vehicles. These contracts will serve as the foundation of an online requisitioner to supplier forum. The contracting agencies must then post them in a user-friendly way to enable online shopping in accordance with the terms and conditions of the contract. The individual will shop online via electronic catalogs or e-malls. This online shopping will be protected from other forms of online shopping by the pre-arranged terms and conditions mentioned above. The payment as currently envisioned will be conducted with a Government purchase card.<sup>31</sup> As Dr. Hamre has said, "We're using an Internet-based technology in a very simple way to get an enterprise-wide

solution so that we can go paper-free."<sup>32</sup> The growth of the business element of the Internet is striking. "A recent study by the Internet Research Group and SRI Consulting estimates that U.S. companies spent \$153 million on e-business infrastructure last year and projected that the total will rise to \$348 billion by 2003."<sup>33</sup>

The scenario mentioned above will also provide some of the reengineering of the logistics and weapons systems support that is currently heavily managed by various organizations. The system or systems of systems that evolve will reduce the need to stockpile inventory for the just-in-case crisis. By having a wealth of information online, the shopper can have a variety of options from which to choose.<sup>34</sup>

#### ACQUILINE

Although not included in the requirement for SPS, a web-based solution is possible as an off-the-shelf procurement. In addition to the SPS-I being developed under the auspices of the DOD SPS Program Management Office, AMS has also developed a tool for requisition data entry and status. This program is known as Aquiline. This software tool also facilitates legal review, catalogs, e-mail, and solicitation postings. The key selling feature is the integration of the web based Aquiline with the network based SPS. The system includes the web as a data port to move data between the customer and vender via the locally installed dedicated Aquiline server using any Internet Service Provider (ISP). The Aquiline server posts and receives data to/from the network installed SPS server. The system is based on modules that can be run as standalone or with other modules<sup>35</sup>. These later features are not included in the DOD solution because other applications currently exist to accomplish the same functions.

DOD enhanced procurement functionality includes several independently developed programs that include functions not originally included in the SPS program solicitation/competition. Navy Electronic Commerce Online (NECO) addresses the Government-vendor EDI communication regime for solicitations, modifications, awards and cancellations using SPS data. An image of the orders, purchases and contracts is maintained on the web as part of the Electronic Data Access (EDA) program used to facilitate invoice reconciliation at DFAS.

#### AMS LOOKING TO THE FUTURE

The AMS organization is also looking into technologies not envisioned during the initial solicitation. In order to improve the utility of the software, AMS is exploring "web-based acquisition solutions that go beyond integrating and streamlining the purchase process."<sup>36</sup> They envision "incorporating knowledge management and business intelligence components that analyze historical data and other information to forecast the future service, material, and knowledge needs associated with each acquisition."<sup>37</sup> This is the type of system that could enable the revolution in business affairs being sought by the US Army.

"We want to leverage the capabilities of the Internet and rapidly expanding web-based technology. Right now, the Material Management Center of 1<sup>st</sup> Corps Support Command from Fort Bragg can operate split-based depending on the mission. They can send a team into theater, with the remainder operating from Bragg. They have the capability, if need be, to split their organization and still be effective." (Lt Col (P) Ray Mason) A goal

for the future is a web-based system where users drop requisitions onto a web page and the provider pulls down requests and processes them, all in real time.<sup>38</sup>

The SPS Program Management Office (PMO) has initiated seven different technical proofs of concept that will be included in the effort to improve the ability of SPS to “handle large and complex documents” to “support intermittently connected field operations.”<sup>39</sup> These include tighter integration with the functions mentioned above such as EDA, EDI, other applications and AMS programs such as Acquiline and SPS-I. This “enterprise-wide” solution will replace the complex system of servers and clients required SPS operations throughout the DOD.<sup>40</sup> AMS and Ariba just paired up to provide Government buyers with access to online vendors.<sup>41</sup>

## **RATE OF CHANGE**

Where does DOD go in the future? The DOD will have to monitor the changes that occur in business practices, building on the tools of Acquisition Reform and the mechanisms employed to collect them. The acquisition community must also remain closely linked with the information technology experts to exploit the newest technologies that can provide greater opportunity for better value in goods and services, reduced prices and greater availability of information. The Services have made great strides in moving from paper to automation. The DOD has improved the process by introducing one standard method of employing the process of contracting and micro purchasing (purchase card). In the late 1990s, AMS improved the availability of contracting information on the Internet. The Navy even made the requisition information available in the “One Touch Support” website.

## **A SEA OF CHANGE IN BUSINESS TO BUSINESS COMMUNICATIONS**

Just as the Government legacy systems need to be replaced by new code or developed in new languages, existing business to business models will have to undergo similar change in order to maintain interoperability in the new media. In the few years since the DRI, there has been a dramatic change in direction for business to business, therefore business to Government methodologies. In the 1997 DRI, the emphasis was on the web as the medium. Within just the last few months, technology enabling greater flexibility and visibility of data transfer has occurred. The next few paragraphs will address changes in technology and market conditions that may cause DOD to rethink the strategic goal of the DRI. At its essence, DRI intended to exploit the best business practices. Some may interpret this strategy as following business technology. Given the current flux in business to business (B2B) technology and communications, DOD may not have to follow, but could lead the transition by maintaining a flexible approach to acquisition and modeling new business processes.

## **DIGITAL SIGNATURE**

The key to B2B activity is authenticity between businesses. This is established by PKI and is known as a digital signature. But, as in most business transactions, a legal basis must be established. The American Bar Association has established guidelines along with the software industry.<sup>42</sup> The

cornerstone of security for the online marketplace community is comprised of the public and private keys within the PKI. This consists of a public key or encrypted message and a private key with a matching code to decrypt the message. This two key method establishes a digital signature.<sup>43</sup>

#### EXTENSIBLE MARKUP LANGUAGE (XML)

One of the striking things about all of the technologies mentioned above is that the differing codes have required an extensive data-mapping effort just to establish the transfer of data between systems. One tool known as XML has provided a medium in which this re-coding would not necessarily be required for each interface. For example, if an office data output were receipt date, the XML data/file that the office generates would be posted to an online repository. Any of the approved interested parties could draw from that data. If the data were to be posted into a shared data warehouse, the business rule for mapping certain data from the XML stream or file could send the data to the correct directory of the database without losing the relationship of the data to each other. If the office shared data with 17 other sources, they could simply map one XML file format vice 16 other systems. The Worldwide Web Council recommended the XML standard in April 1998.<sup>44</sup> XML offers greater flexibility when sharing data than does the current web standard Hypertext Markup Language (HTML).

#### XML STANDARDS

XML will be used by businesses to help categorize the data being shared and identify or "tag" the type of information so it may be sorted and used in a receiving business process. Businesses will still be required to define the data dictionaries used between businesses. The World Wide Web Consortium expects to finish an XML scheme specification this year that will standardize the way documents and data elements are defined – and force the industry groups that have already developed data definitions to convert to the new format." Other groups that expect to assist in defining the standards of the new language include Members from the United Nations Centre for the Facilitation of Procedures and Practices for Administration, Commerce and Transport and the Organization for the Advancement of Structured Information Standards. As with every generation of software, all the details will probably not be completely sorted out for five to ten years.<sup>45</sup> Bandwidth is a key consideration in the employment of a new standard. Two compression techniques exist that will greatly reduce expected bandwidth.<sup>46</sup>

Other companies are deciding to adopt XML for future code. Recently PeopleSoft added XML as a tool in moving its applications to the web. Katherine Jones, Research Director, Enterprise Business Applications, Aberdeen Group stated that "XML will become the unifying standard for supply chains".<sup>47</sup> Other key companies that have employed XML include but are not limited to Adobe Systems, Commerce One, FourThought LLC, IBM, Microsoft, Oracle and Sun Microsystems. Some examples of how companies have begun to employ or exploit XML follow.

Even Microsoft developed XML tool in BizTalk Developer's Jumpstart Kit and a fist spec for BizTalk Framework. According to Charles Fitzgerald, Director of Business Development, Microsoft Developer Group, Microsoft was dedicated to not just supporting the platform, but also " to build the tools that make

those technologies successful to the broadest range of developers regardless of their background, their skill set, or their choice of programming languages".<sup>48</sup>

Microsoft developed a data sharing protocol to the Internet Engineering Data Task Force. The protocol is called Simplified Object Access Protocol (SOAP). SOAP will allow for greater sharing of business to business data by using XML for code and capitalizing on the HTTP Internet architecture.<sup>49</sup> Recently, two additional new technologies that help companies present data were recommended by the Worldwide Web Consortium. They include "Extensible Stylesheet Language Transformation (XSLT) to transform an XML document back to a restructured format and XPath to let users address pieces of an XML document." The XSLT tool could be used to tailor presentation to different browser users; i.e. translating the XML content to HTML for other browsers.<sup>50</sup>

#### SOFTWARE MAINTENANCE

The Government should decide whether it should continue its legacy systems effort or shift to commercially developed and maintained applications. Paul Scarpa of the Yankee Group in Boston stated that "Even today, you're seeing many of the largest companies reconsidering their internally developed software because it's not just an issue of how much it costs to deliver. Eighty percent of the cost of software is in the maintenance."<sup>51</sup> Even if organic design is desired, a full review of requirements must be conducted. The number of options available is substantial. "Although packaged e-commerce suites may need to improve, many analysts recommend that companies check them out – particularly those that are just getting started. They also caution firms to do a careful needs assessment before making a commitment."<sup>52</sup> One approach might be to limit expectations based on budget. For activities with restricted budgets and limited expectations, an off the shelf application might be enough.<sup>53</sup>

#### ONLINE MARKETPLACE

A recent alliance among the Big Three automakers for online purchasing and auctioning will see over 50 billion transactions a year online. The companies expect to see the new online marketplace by the end of 2000. The basis will be a business to business online catalog. This effort brought together several competing technologies. The challenges include mastering the processes and corporate cultures.<sup>54</sup>

Moving DOD business to the Internet will still lag behind the business world. In the purchasing community, using the web has increased. As of November 1997, a study by the National Association of Purchasing Managers indicated 93 percent of purchasing managers were on the Internet and an additional five percent more planned access soon. The study showed 34% used it five to ten times a week and 19 percent used it over 20 times a week. There is a chance for growth in this area. The value of this electronic business is that "Online marketplaces allow buyers and sellers to conduct electronic transactions, hold online auctions to dispose of surplus goods and stage "reverse auctions" for buying supplies with nothing more than a computer and an Internet connection"<sup>55</sup>

The online marketplace was termed a purchasing guide by one purchasing manager. For corporations, these tools increase the size of a "visible" marketplace. For Government buyers, the tools greatly reduce the time spent in market research when trying to fulfill requisitions.<sup>56</sup> The changes experienced by business offer opportunities that add value. An associate at one marketplace indicated, "With technology speeding up development cycles and opening the market for many more companies to be recognized by purchasers, manufacturers have been forced to be more aggressive in offering more product information, competitive prices, and faster delivery times."<sup>57</sup> The way the Government has traditionally conducted the telephone or formal requests for quotes may be obsolete, given the new technology. With potential access to hundreds of suppliers with the click of a mouse, the Government buyer should be able to close the buy in record time.

The future looks very busy and very hopeful for E-business. By 2004, businesses will conduct 56 percent of all the B2B transactions in online markets. Additionally, by 2004, online business volume will be \$2.2 trillion and of this, 87 percent will come from E-Business.<sup>58</sup> There are three evolving marketplaces: sellers, buyers and independents. The buyers are coming together to provide a common marketplace for disparate locations, pooling resources and leveraging their buying power. Some companies see this move as a method to reduce the number of suppliers, "cut transaction costs, reduce inventories and speed the entire process."<sup>59</sup> Some companies foresee savings of 10 to 20 percent in their business to business transactions. John Deer alone forecasted a reduction of five percent savings over five years. United Technologies has saved \$800 million.<sup>60</sup> In addition to what may have been considered the norm for online business, a company called Tet2.Com sells business intelligence online between large company research and development activities.

#### VENDOR ONLINE MARKETPLACES

Purchasing professionals are quite familiar with the Thomas Register for its wealth of information on products and supplies. The Register represents one of several online catalogs or marketplaces. The several volume catalogs with 155,000 vendors is now online.<sup>61</sup> In addition, the register has over 135,000 brand names and 750,000 CAD drawings.<sup>62</sup> Users can conduct a search by product type or brand name. As of April 1998, Thomas was reporting over 70K searches a day. For a small business, this venue might be helpful in gaining visibility in the purchasing arena. It also allows for established Thomas companies to target customers by advertising in several categories, thereby building on established reputations. For the technically challenged, the Register still is printed and is available on CD.<sup>63</sup>

Another online catalog is Marshall Industries. The company specializes in electronic components. The Marshall catalog consists of over 500,000 items. The catalog can be searched by part number, manufacturer or product description. For a business that is concerned with being shut out of a converging technology marketplace one of these locations may be the place to go; to be where buyers shop.<sup>64</sup> Access to these sources will prove invaluable to the buyer and potentially the micro-purchaser, a maintainer for example, who needs a part right now.

Cargill, a worldwide supply chain manager decided to take its suppliers online recently by joining up with J.D. Edwards. Ariba will provide the data services and JD Edwards will provide its E-procurement Software.<sup>65</sup> The new operation will be called Novopoint.com. Crosspoint Ventures will operate the site that will remain independent of Cargill.<sup>66</sup> The open marketplace will include both buyers and sellers of food industry related suppliers and services.<sup>67</sup>

Dell partnered with Ariba to update its online marketplace. Dell hopes to increase its customer base while retaining customer loyalty. American Express will provide the finance system.<sup>68</sup> One of the key features of this partnership is a tremendous merging of customer bases. Dell brings 40,000 customers to the Ariba network. AMEX brings its 50,000 suppliers.<sup>69</sup>

#### PURCHASING MARKETPLACES

Ariba and Electronic Data Systems (EDS) partnered to provide electronic procurement and online auctions for corporations. The features that will be combined include business to business transactions (Ariba) and purchasing software (EDS). The combined venture expects annual purchases to exceed over \$17 Billion.<sup>70</sup> The portion of EDS that supplies the purchasing solution is called CoNEXT. This brings with it a sourcing network of over 400 companies. It is anticipated that the competitive environment created by CoNext will lower prices.<sup>71</sup>

In a similar venture, Chevron and Ariba joined forces to form a web market for energy sector services such as drilling, engineering and construction. They termed the venture the Petrocosm Marketplace. Chevron is committed to a substantial share of its \$10B spending to the venture. In 1999, CommerceOne and Shell decided to do the same thing.<sup>72</sup> Petrocosm is expected to save \$1 billion a year.<sup>73</sup>

AMS, the developer of SPS recently announced a new partner "FreeMarkets Inc. FreeMarkets Inc. is located in Pittsburgh, PA. FreeMarkets, Inc. run "online auctions for companies seeking industrial parts, raw materials, commodities and services". Suppliers are able to bid on government requirements, creating a "reverse auction". The source of the bid will not be revealed, but the bid will be open for display to any potential bidder, similar to E-Bay.<sup>74</sup> The Government has not yet indicated how it will employ the new features.<sup>75</sup>

#### COMBINATION MARKETPLACE

I2 Technologies, Inc. (I2) has developed the "high-tech" marketplace called HightechMatrix to provide a series of services that include "a catalog, a request for proposal, request for quotation, auction, and bidding" and other "collaborative features enabling companies to deal with their suppliers online." I2 currently serves 72 percent of "electronics firms including nine of the 10 largest computer makers in the world using its production scheduling and supply-chain management software".<sup>76</sup>

The data drawn from the use of the B2B online marketplace will most likely tell business and DOD more about themselves. In most cases, this data has not been available before. By using the XML tools,

data will become related that had not been before.<sup>77</sup> Some proponents have said that "e-commerce will drive contract compliance and provide a wealth of "mine-able" data that could help purchasing organizations negotiate their contracts better."<sup>78</sup>

#### CONVERGING CONSUMER CONSORTIUMS

The trend recently to establish online buying consortiums is aimed at getting a better value for members by leveraging the collective buying power of the members. One executive at a recent conference sponsored by the Industry Standard said, "I believe we will see the revenge of the seller.com."<sup>79</sup> This could be true, in contingency contracting when several buyers were attempting to obtain limited resources, the prices increased rather than decreased. By closing these markets off vice having them open, the consortiums could be hurting themselves.

In February 2000, the Big Three automakers announced an online purchasing and auctioning website. The operation will be supported by I2's TradeMatrix marketplace Software, Ariba's B2B E-Commerce Software, and IBM WebShere Commerce Suite and other technologies.<sup>80</sup> The business venture will be over \$250 billion in transactions with over 60,000 suppliers.<sup>81</sup>

#### EVOLVING WIRELESS AND INTERNET TECHNOLOGIES

A replacement may exist for the complicated issue of receipt control that was addressed in the planning for the JECPO sponsored Wide Area Workflow. Within 18 months, a company will be capable of providing an online electronic receipt whether a customer buys from a store or online. Today, a paper copy of the receipt for either transaction is required for proof of purchase or warranty enforcement. This online receipt would preclude the need for a customer tracking paper receipts. It may also address logistics concerns of tracking warranties by having a warranty record available online. The Government could also better track purchase card purchases. The Digital Receipt Alliance includes Visa, Office Depot, AOL, Microsoft and HP VeriFone division. The operation will employ XML formatted receipts with a hypertext link to the manufacturer. The retailer may even identify targeted discounts. Retailers could also track any rebates, recalls or advisories for each customer. This would also greatly enhance point of sale tracking. Data could be combined to provide greater insight into customer preferences hopefully improving customer satisfaction.<sup>82</sup>

IBM also recently developed a Web based cash register. This system is really a closed loop that could combine the operations online with a typical in store purchase. The machines called SurePOS would even have access to a customer picture online for greater security.<sup>83</sup>

After the business rush to get into the web, technology has continued to march on. The latest technological trend is to get on the wireless web. Going wireless must be considered because more people are using wireless devices as a method of managing data and communications. The standard was developed in a Wireless Application Protocol (WAP). The WAP forum, Phone.com, Ericsson, Motorola and Nokia adopted the WAP in 1997. WAP is both a communications platform and an

application environment. WAP is also compatible with a variety of operating systems.<sup>84</sup> Several companies have decided to begin code in WAP. The chiefs among these are major online portals such as AOL, Microsoft and Yahoo.<sup>85</sup>

In order to begin thinking of developing the software necessary for this new medium, a company must focus on data access, business logic and presentation. In the recent past, most companies had used three tiers for code development: legacy, Internet, and WAP. To avoid this in the future, these companies needed a "trans-coder to translate and restructure data from the Internet programming language HTML to the Wireless Markup Language (WML) for display in handheld devices." With XML a company can use trans-coder to write code only once.

IBM plans to deliver a product by the end of 2000 that will greatly reduce the effort needed to provide B2B over the wireless web. The WebSphere Everyplace Suite, will "transform and compress data, serve as the Wireless Application Protocol gateway, synchronizing data between the device and the database, and managing devices and subscribers." This coding is a very big concern for business and by inference to Government. One Businessman suggested, the he was "going to need tools that help me design wireless web interfaces faster" in order to compete in a fast changing electronic environment.<sup>86</sup>

## **CONCLUSIONS AND RECOMMENDATIONS**

Today, as the Services move to provide servicemembers with hand held automation tools such as the Palm Pilot, the DOD needs to move beyond the Internet to the wireless web. Business is showing the path to get there. That path lay in the evolving new methodology of exchanging business information via XML. Using XML and a middleware solution that can present the data on a hand-held device, a maintainer would not even need to logon to the desktop and surf the web for the information needed. The data would be automatically posted to the mobile phone or Palm Pilot. The contracts that support the development of these solutions must be flexible enough to exploit emerging technologies that may carry the responsiveness of DOD contracting operations. Ideally, a maintainer or support person should be able to identify the service or supply using their mobile phone, digital assistant or desktop computer and the Internet. The customer could constantly monitor the status of their order through to receipt. Then, the receiver could acknowledge receipt with a click of a button, vice all of the lengthy receipt processes we employ today.

DOD should pursue open online markets that enable broad searches across the spectrum of suppliers to search for the best value. DOD buyers could locate time critical supplies with a dynamic search engine that would tap into multiple online markets and could stratify the options by price, lead-time and value. With the employment of a digital signature, the DOD would no longer need personnel to re-key their credit card. The digital signature could be cross referenced to an individual's customer profile and all resulting financial transactions could be seamlessly employed (a "backroom" operation).

The DOD should continue the revolution in business affairs by moving along with business to the wireless web. Such a move would address the need to provide communications with a greatly disbursed

field and reach people at the work site. By using digital assistants and other wireless devices, managers and maintainers could be freed from the need to conduct all business at the desk. An individual could use commute time or other non-value added time to continue working on projects or communicating with staff. Additionally, data could be sent with the speed of thought vice being queued by the individual until the person is available to return to the workstation because that work would follow the individual. This reduction in queuing time will reduce the lead-time between thought and action, hopefully reducing turn around time for repairs and other critical DOD tasks. The continued use of PKI and the digital signature for Internet and wireless web security must be maintained or even expanded if found to be inadequate. Current publications and instructions referring to putting DOD business on the Internet should be expanded to include any evolving technologies so that as DOD undergoes transformation, the organization will understand that this revolution is an evolving one and DOD must keep pace with the business world.

WORD COUNT = 6,818



## ENDNOTES

<sup>1</sup> Peter F. Drucker, Management Challenges For the 21st Century, Harper Business, New York 1999: p. 97.

<sup>2</sup> Cohen, William S. "Remarks Delivered at Ribbon-Cutting of the Navy Information Technology Center," New Orleans, 17 May 1999; available from <<http://www.defenselink.mil>>; Internet; accessed 11 October 1999.

<sup>3</sup> Cohen, William S. "Remarks Delivered at Acquisition and Logistics Reform Week Kick-Off," Washington, 8 June 1999; available from <<http://www.defenselink.mil>>; Internet; accessed 11 October 1999.

<sup>4</sup> Cohen, William S. "Remarks Delivered at 2nd Annual Electronic Commerce Day," Washington, 10 June 1999; available from <<http://www.defenselink.mil>>; Internet; accessed 11 October 1999.

<sup>5</sup> Kanter, Rosabeth Moss, "From Spare Change To Real Change," Harvard Business Review, May-June 1999, 123.

<sup>6</sup> Defense Reform Initiative, Chapter 1, available from <<http://www.defenselink.mil>>; Internet; accessed 11 October 1999.

<sup>7</sup> Ibid.

<sup>8</sup> "DOD EB/EC Architecture Version 3.0 Draft", November 1999, 1-1.

<sup>9</sup> Ibid., 1-3.

<sup>10</sup> Ibid., 1-3.

<sup>11</sup> Ibid., Abstract-4.

<sup>12</sup> "Joint Electronic Commerce Program Office Projects," available from <<http://www.dla.mil/ecdaynews/jecpogms.htm>>; Internet; accessed 26 March 2000.

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

<sup>16</sup> Ibid

<sup>17</sup> Ibid

<sup>18</sup> Ibid.

<sup>19</sup> Ibid.

<sup>20</sup> Ibid.

<sup>21</sup> Ibid.

<sup>22</sup> "Standard Procurement System," available from <<http://www.abm.rda.navy.mil>>; Internet; accessed 22 February 2000.

<sup>23</sup> "SPS Integration," available from <<http://spsi.amsinc.com/spsiweb.nsf>>; Internet; accessed 22 February 2000.

<sup>24</sup> Ibid.

<sup>25</sup> Bob Brewin and Colleen O'Hara "DOD Buried Under: Software snafus bog down the Pentagon's high-profile initiative to shift to paperless contracting," 24 May 1999, available from <<http://www.fcw.com>>; Internet; accessed 24 March 2000.

<sup>26</sup> Henry, Roger; Richard Sherwood and Christine Wenrich, "Interface Review," Presentation, 12 January 2000, available from <<http://www.abm.rda.hq.navy.mil/sps/IntRev.ppt>>; Internet; accessed 15 March 2000.

<sup>27</sup> Office of the Secretary of Defense Letter of 12 July 1996

<sup>28</sup> "Los Alamos National Lab Streamlines Purchasing With AMS's Procurement Desktop: Cross-Platform Web-based Solution Is One of the First Mission-Critical Systems Built Using Sybase's PowerJ," available from <<http://www.amsinc.com/ProcurementSolutions/LosAlamos.htm>>; Internet; accessed 29 February 2000.

<sup>29</sup> Michael Menduno, "Point, Click, Purchase," Hospitals & Health Networks, Chicago, October 1999.

<sup>30</sup> "Standard Procurement System," available from <[http://www.if.afrl.af.mil/IFK/afbop/sps\\_info.html](http://www.if.afrl.af.mil/IFK/afbop/sps_info.html)>; Internet; accessed 6 January 2000.

<sup>31</sup> Defense Reform Initiative, Chapter 1.

<sup>32</sup> Hamre, John J., A speech at Microsoft Corporation, 2nd Annual Leaders Conference, Washington, 15 April 1999

<sup>33</sup> Mark, Chris and Daniel Machalaba, "Manugistics Set to Expand Electronic-Commerce Role --- Software Company Plans Web Site Devoted to Moving Freight Shipments," Wall Street Journal, New York, 25 January 2000

<sup>34</sup> Defense Reform Initiative, Chapter 1.

<sup>35</sup> "AcquiLine - A Modular Approach," available from <[http://acquiine.amsinc.com/acqweb.nsf/files/info\\_features\\_modular.htm](http://acquiine.amsinc.com/acqweb.nsf/files/info_features_modular.htm)>; Internet; accessed 29 February 2000.

<sup>36</sup> "Next Generation Acquisition," available from <<http://www.amsinc.com/eCommerce/ecomNGA.htm>>; Internet; accessed 29 February 2000.

<sup>37</sup> Ibid.

<sup>38</sup> "Commonality Helps Logistics Reduce Its Tail," <armylinknews-sender@dtic.mil>; Internet; accessed 23 February 2000.

<sup>39</sup> "Keeping Up With Change," SPS Program News, Volume I, 2<sup>nd</sup> Issue, July 1999, 2.

<sup>40</sup> Ibid.

<sup>41</sup> Behr, Peter, "AMS Seeks To Handle Internet Purchases; Va. Firm Targets Government Customers," The Washington Post, 7 December 1999.

<sup>42</sup> Tozer, Chris, "ABA Section Creates First Digital Signature Guidelines To Aid In Security Of the Internet," available from <<http://www.abanet.org/media/96/dsg.html>>; Internet; accessed 30 March 2000.

<sup>43</sup> Dunn, Ashley, "The Cutting Edge: Focus on Technology; Online Exchanges Open Door Wider For Tech Firms; E-Commerce: As Business to Business Marketplaces Spring Up, The Companies involved Stand To Reap Big Rewards," The Los Angeles Times, Los Angeles, 20 March 2000.

<sup>44</sup> Coopee, Todd, "Extensibility Upgrade Takes XML Forward," InfoWorld, Framingham, 6 December 1999.

<sup>45</sup> Sliwa, Carol and Julia King, "B-to-b hard to spell with XML," Computerworld, Framingham, 28 February 2000.

<sup>46</sup> Dodds, Leigh, "Good Things Come in Small Packages," available from <<http://www.xml.com/pub/2000/03/22/deviant/index.html>>; Internet; accessed 29 March 2000.

<sup>47</sup> Grygo, Eugene, "PeopleSoft Adds XML to Business to Business Apps," InfoWorld, Framingham, 24 January 2000.

<sup>48</sup> Lattig, Michael, "XML Still Waiting for the Spotlight," InfoWorld, Framingham, 13 December 1999

<sup>49</sup> Trott, Bob, "Microsoft Submits XML Data-Sharing Protocol," InfoWorld, 6 December 1999

<sup>50</sup> Sliwa, Carol, "Key XML Standards Ready," Computerworld, Framingham, 22 November, 1999.

<sup>51</sup> Sliwa, Carol, "Web Site Upgrades: Build or Buy," Computerworld, Framingham, 17 January 2000.

<sup>52</sup> Ibid.

<sup>53</sup> Ibid.

<sup>54</sup> Sliwa, Carol, "Auto E-Market Faces Big Hurdles," Computerworld, Framingham, 6 March 2000.

<sup>55</sup> Dunn, Ashley, "The Cutting Edge: Focus on Technology; Online Exchanges Open Door Wider For Tech Firms; E-Commerce: As Business to Business Marketplaces Spring Up, The Companies involved Stand To Reap Big Rewards," The Los Angeles Times, Los Angeles, 20 March 2000.

<sup>56</sup> Mary Mihaly, "Profitable Purchasing Strategies," Industry Week, Cleveland, 16 August 1999.

<sup>57</sup> Ibid.

- <sup>58</sup> Leslie Walker, "The Next Revolution: B2B," The Washington Post, 30 March 2000.
- <sup>59</sup> John Couretas, "Dana to Move Its Purchasing System to the Web," Automotive News, Detroit, 24 January 2000.
- <sup>60</sup> Del Jones, "E-Purchasing Saves Businesses Billions," USA Today, Arlington, 7 February 2000.
- <sup>61</sup> Karen Southwick, "Found In The Crowd," Inc, Boston, 15 September 1998.
- <sup>62</sup> Mary Mihaly, "Profitable Purchasing Strategies," Industry Week, Cleveland, 16 August 1999.
- <sup>63</sup> Southwick.
- <sup>64</sup> Ibid.
- <sup>65</sup> April, Carolyn, A. "Cargill Teams with J.D. Edwards, Ariba," InfoWorld, Framingham, 14 February 2000.
- <sup>66</sup> "Cargill And Ariba In Internet Business Deal," New York Times, New York, 15 March 2000.
- <sup>67</sup> "Cargill, Ariba Announce Food and Beverage Open Intranet B2B Marketplace," available from <[http://www.ariba.com/corp/NewsEvents/press\\_releases\\_cargill2.asp](http://www.ariba.com/corp/NewsEvents/press_releases_cargill2.asp)>; Internet; accessed 25 March 2000.
- <sup>68</sup> "Dell Will Develop Online Marketplace In Venture With Ariba," Wall Street Journal, New York, 14 March 2000.
- <sup>69</sup> Sapp, Geneva, "Ariba Boosts Platform With Trioka Of Alliances," InfoWorld, Framingham, 20 March 2000.
- <sup>70</sup> McWilliams, Gary, "EDS Forms Alliance With Ariba to Run Electronic Procurements for Companies," Wall Street Journal, New York, 11 January 2000.
- <sup>71</sup> Copeland, Lee, "EDS, Ariba To Offer Procurement Sites," Computerworld, Framingham, 17 January 2000.
- <sup>72</sup> "Chevron And Ariba To Form Web Market For Energy Industry," Wall Street Journal, New York, 20 January 2000.
- <sup>73</sup> Del Jones, "E-Purchasing Saves Businesses Billions," USA Today, Arlington, 7 February 2000.
- <sup>74</sup> Schafer, Sarah, "AMS Joins E-Auction Project; Suppliers To Get Government Link," The Washington Post, Washington, 10 March 2000.
- <sup>75</sup> "FreeMarkets, AMS Establish an Alliance For Online Auctions," Wall Street Journal, New York, 10 March 2000.
- <sup>76</sup> Doug Bartholomew, "Jockeying For Position," Industry Week, 7 February 2000.
- <sup>77</sup> Walker, Leslie, "The Next Revolution: B2B," The Washington Post, 30 March 2000.

<sup>78</sup> Menduno, Michael, "Point, Click, Purchase," Hospitals & Health Networks, Chicago, October 1999.

<sup>79</sup> Walker.

<sup>80</sup> Lehman, DeWayne, "IBM, Ariba, I2 Form E-Commerce Alliance," Computerworld, Framingham, 13 March 2000.

<sup>81</sup> Ashley Dunn and John O'Dell, "Auto Makers Plan Behemoth E-Business," The Los Angeles Times, Los Angeles, 26 February 2000.

<sup>82</sup> Sliwa, Carol, "E-Receipts Next On Retail Front," Computerworld, Framingham, 24 January 2000.

<sup>83</sup> Sliwa, Carol, "IBM Cash Registers Come With Web Support," Computerworld, Framingham, 14 February 2000.

<sup>84</sup> Biggs, Maggie, "E-Business Strategists Stay Competitive By Attending to Emerging Wireless Protocols," InfoWorld, Framingham, 21 February 2000.

<sup>85</sup> Riedman, Patricia "Portals Find More Wars To Wage On Wireless Web," Advertising Age, Chicago, 6 March 2000.

<sup>86</sup> Sliwa, Carol, "Middleware emerges for wireless Web," Computerworld, Framingham, 13 March 2000.



## BIBLIOGRAPHY

- "Cargill, Ariba Announce Food and Beverage Open Intranet B2B Marketplace." Available from <[http://www.ariba.com/corp/NewsEvents/press\\_releases\\_cargill2.asp](http://www.ariba.com/corp/NewsEvents/press_releases_cargill2.asp)>. Internet. Accessed of 25 March 2000.
- "Commerce Department Seeks Funds To Improve Tracking of E-Business." Wall Street Journal, New York, 8 February 2000.
- "FreeMarkets, AMS Establish an Alliance for Online Auctions." Wall Street Journal, New York, 10 March 2000.
- "Acquiline – A Modular Approach." Available from <[http://acquiline.amsinc.com/acqweb.nsf/files/info\\_features\\_modular.htm](http://acquiline.amsinc.com/acqweb.nsf/files/info_features_modular.htm)>. Internet. Accessed on 29 February 2000.
- "Brief History of SPS." Available from <<http://www.abm.rda.hq.navy.mil/sps/basics/sld006.htm>>. Internet. Accessed on 20 November 1999.
- "Cargill and Ariba in Internet Business Deal." New York Times, New York, 15 March 2000.
- "Chevron And Ariba To Form Web Market For Energy Industry." Wall Street Journal, New York, 20 January 2000.
- "Commonality Helps Logistics Reduce Its Tail." email [armylinknews-sender@dtic.mil](mailto:armylinknews-sender@dtic.mil), Accessed 23 February 2000.
- "Dell Will Develop Online Marketplace In Venture With Ariba." Wall Street Journal, New York, 14 March 2000.
- "Los Alamos National Lab Streamlines Purchasing With AMS's Procurement Desktop: Cross-Platform Web-based Solution Is One of the First Mission-Critical Systems Built Using Sybase's PowerJ." Available from <<http://www.amsinc.com/ProcurementSolutions/LosAlamos.htm>>. Internet. Accessed on 29 February 2000.
- "Next Generation Acquisition." Available from <<http://www.amsinc.com/eCommerce/ecomNGA.htm>>. Internet. Accessed on 29 February 2000.
- "Procurement Desktop Defense." Available from <<http://pd2.amsinc.com>>. Internet. Accessed on 29 February 2000.
- "Standard Procurement System (SPS)." Available from <[http://www.if.afri.af.mil/div/IFK/afbop/sps\\_info.html](http://www.if.afri.af.mil/div/IFK/afbop/sps_info.html)>. Internet. Accessed on 6 January 2000.
- April, Carolyn, A. "Cargill Teams with J.D. Edwards, Ariba." InfoWorld, Framingham, 14 February 2000.
- Bartholomew, Doug, "Jockeying For Position." Industry Week, Cleveland, 7 February 2000.
- Behr, Peter, "AMS Seeks To Handle Internet Purchases; Va. Firm Targets Government Customers." The Washington Post, 7 December 1999.
- Biggs, Maggie, "Buying Chain 2.0 Professional Edition." InfoWorld, Framingham, 17 January 2000.
- Biggs, Maggie, "E-Business Strategists Stay Competitive By Attending to Emerging Wireless Protocols." InfoWorld, Framingham, 21 February 2000.

- Biggs, Maggie, "Enabling A Successful E-Business Strategy Requires A Detailed Business Process Map." InfoWorld, Framingham, 6 March 2000.
- Biggs, Maggie, "Successful E-Business Requires One-To-One Communications Among Staff and Customers." InfoWorld, Framingham, 20 March 2000.
- Boeri, Robert J. and Martin Hensel, "Why Bother with XML? Here's Why." Emedia, Wilton, January 2000.
- Bourquard, Jo Anne, "New Laws For The Digital Age." State Legislatures, Denver, March 2000.
- Clothier, Mark, "California Based Competitor To Buy Tradex Technologies." The Atlanta Constitution, Atlanta, GA, 17 December 1999.
- Cohen, William S. "Remarks Delivered at 2nd Annual Electronic Commerce Day." Washington, 10 June 1999. Available from <<http://www.defenselink.mil>>. Internet. Accessed 11 October 1999.
- Cohen, William S. "Remarks Delivered at Acquisition and Logistics Reform Week Kick-Off." 8 June 1999. Available from <<http://www.defenselink.mil>>. Internet. Accessed 11 October 1999.
- Cohen, William S. "Remarks Delivered at Ribbon-Cutting of the Navy Information Technology Center, New Orleans, 17 May 1999." Available from <<http://www.defenselink.mil>>. Internet. Accessed 11 October 1999.
- Cohen, William S. "Remarks To Microsoft Corporation, Washington, 18 February 1999." Available from <<http://www.defenselink.mil>>. Internet. Accessed 11 October 1999.
- Coopee, Todd, "Extensibility Upgrade Takes XML Forward." InfoWorld, Framingham, 6 December 1999.
- Copeland, Lee, "EDS, Ariba To Offer Procurement Sites." Computerworld, Framingham, 17 January 2000.
- Couretas, John, "Dana to Move Its Purchasing System to the Web." Automotive News, Detroit, 24 January 2000.
- Cummings, Tim, "Hot Topics in Commercial Contracting." Contract Management, Vienna, VA, February 2000, 29.
- Deckmyn, Dominique, "Novell Readies E-Business Software." Computerworld, Framingham, 24 January 2000.
- Dodds, Leigh, "Good Things Come in Small Packages." Available from <<http://www.xml.com/pub/2000/03/22/deviant/index.html>>. Internet. Accessed 29 March 2000.
- Doegun, Nikhil and Evan Ramstad, "I2 Agrees to Acquire Aspect Development --- Stock Deal For \$9.3 Billion Would Be Largest Ever For A Software Purchase." Wall Street Journal, New York, 13 March 2000.
- Drucker, Peter F., Management Challenges for the 21st Century, Harper Business, New York, 1999.
- Dunn, Ashley and John O'Dell, "Auto Makers Plan Behemoth E-Business." The Los Angeles Times, Los Angeles, 26 February 2000.

- Dunn, Ashley, "The Cutting Edge: Focus on Technology; Online Exchanges Open Door Wider For Tech Firms; E-Commerce: As Business to Business Marketplaces Spring Up, The Companies Involved Stand To Reap Big Rewards." The Los Angeles Times, Los Angeles, 20 March 2000.
- Dunn, Julie, "From K-Cars to E-Business, Iacocca Generates Traffic." New York Times, 13 February 2000.
- Fisher, Lawrence M., "Is Oracle On Track To Be the Engine Of E-Commerce." New York Times, New York, 19 March 2000.
- Fletcher-McDonald, Trina, Jeff Senna, Lori Mitchell, Carly Kite and Matthew Nelson, "The Buying Connection." InfoWorld, Framingham, 19 July 1999.
- Fulford Carlton W. LtGEN and Col David R. Clifton, MARFORPAC's Business Reform Initiative: The Corps Must Have A Revolution in Business Affairs To Support RMA." Marine Corps Gazette, January 1999.
- Gansler, Jacques S., "Public Sector Logistics Transforming The Way We Do Business." A Speech delivered at the Council of Logistics Management, Toronto, 18 October 1999, Available from <<http://www.defenselink.mil>>. Internet. Accessed 11 October 1999.
- Gansler, Jacques S., "The Defense Industrial Structure In the 21st Century." A Speech delivered at the AIAA Acquisition Reform Conference, 27 January 2000. Available from <<http://www.defenselink.mil>>. Internet. Accessed 15 March 2000.
- Goddard, Claude P. Jr. Esq. and Daniel J. Donahue, Esq. "Keys To Successful Teaming." Contract Management, March 2000, 47.
- Grygo, Eugene, "PeopleSoft Adds XML to Business to Business Apps." InfoWorld, Framingham, 24 January 2000.
- Hamre, John J., "R&D in the New Millennium." A speech at National Defense Industry Association's Tech Trends 2000 Conference, Philadelphia, 6 April 1999. Available from <<http://www.defenselink.mil>>. Internet. Accessed 11 October 1999.
- Hamre, John J., A speech at Microsoft Corporation, 2nd Annual Leaders Conference, Washington, 15 April 1999. Available from <<http://www.defenselink.mil>>. Internet. Accessed 11 October 1999.
- Hamre, John J., Department of Defense Reform Initiative Directive #43 – Defense-Wide Electronic Commerce, of 20 May 1998. Available from <<http://www.defenselink.mil>>. Internet. Accessed 11 October 1999.
- Haugan, Stéphanie, "Person-To-Person E-Commerce." Graphic Arts Monthly, Newton, December 1999.
- Hechinger, John, "IBM Takes Stakes in I2, Ariba In Sign of Business-To-Business Internet Market." Wall Street Journal, New York, 9 March 2000.
- Henry, Roger; Richard Sherwood and Christine Wenrich, "Interface Review." Presentation, 12 January 2000, Available from <<http://www.abm.rda.hq.navy.mil/sps/IntRev.ppt>>. Internet. Accessed 15 March 2000.
- Higgins, Chris W. "Legal Issues of Electronic Commerce: Activity Policies, Intelligent Agents and Ethical Transactions." Available from <<http://www.hytime.org/papers/higgins1.html>>. Internet. Accessed 29 March 2000.

Hoffman, Thomas, "Business-To-Business Lender Foresees Fast Growth Online." Computerworld, Framingham, 11 October 1999.

Jones, Del, "E-Purchasing Saves Businesses Billions." USA Today, Arlington, 7 February 2000.

Kanter, Rosabeth Moss, "From Spare Change To Real Change." Harvard Business Review, May-June 1999.

Kreisher, Otto, "The Revolution in Business Affairs: A Sea Change in Defense Procurement." Seapower, April 1998.

Kujubu, Laura and Stephanie Holt, "Web Procurement Picks Up Speed." InfoWorld, Framingham, 13 September 1999.

LaMonica, Martin, "Active Automates E-Commerce Integration." InfoWorld, Framingham, 28 February 2000.

LaMonica, Martin, "E-Business Turns up the Heat on the Big Five." InfoWorld, Framingham, 20 March 2000.

Lattig, Michael, "XML Drumbeat Intensifies." InfoWorld, Framingham, 6 December 1999.

Lattig, Michael, "XML Still Waiting for the Spotlight." InfoWorld, Framingham, 13 December 1999.

Lehman, DeWayne, "IBM, Ariba, I2 Form E-Commerce Alliance." Computerworld, Framingham, 13 March 2000.

Levine, Bernard, "Hurry, Hurry, Go Online." Electronic News, New York, 7 February 2000.

Levine, Rick, Christopher Locke, Doc Searls and David Weinberger, The Cluetrain Manifesto: The End of Business As Usual, Perseus Books, Cambridge, MA, 2000.

Lewis, Bob, "Don't Become An E-Head, Just Support Your Business Strategy With Technology." InfoWorld, Framingham, 21 February 2000.

Maniccia, Michael, "How Purchasers Can Hold Their Ground." Business and Health, Montvale, November 1999.

Mark, Chris and Daniel Machalaba, "Manugistics Set to Expand Electronic-Commerce Role --- Software Company Plans Web Site Devoted to Moving Freight Shipments." Wall Street Journal, New York, 25 January 2000.

Marshall, Patrick, "Build Your E-Business Now, Customize Later." InfoWorld, 7 February 2000.

McWilliams, Gary, EDS Forms Alliance With Ariba to Run Electronic Procurements for Companies." Wall Street Journal, New York, 11 January 2000.

Mendumo, Michael, "Point, Click, Purchase." Hospitals & Health Networks, Chicago, October 1999.

Oppel, Richard A., Jr. "The Higher Stakes of Business-to-Business Trade." New York Times, New York, 5 March 2000.

Orenstein, David, "Microsoft Finalizes BizTalk XML Standard." Computerworld, Framingham, 20 December, 1999.

- Peters, Katherine McIntire, "Leading the Business Revolution." Government Executive, Washington, August 1998.
- Phillips, Edward H. "Sabre, Ariba Launch Procurement Web Site." Aviation Week & Space Technology, New York, 6 March 2000.
- Pinkerton, Richard, "The Evolution of Purchasing To Supply Chain Management." Contract Management, Vienna, VA, February 2000, 19.
- Riedman, Patricia "Portals Find More Wars To Wage On Wireless Web." Advertising Age, Chicago, 6 March 2000.
- Roesler, Stacia, CPCM, "The Mobile Global Model: IBM's Contracts Organization-An Employee View." Contract Management, Vienna, VA, February 2000, 11.
- Rosencrance, Linda, "Service Set Up To Study E-Shoppers." Computerworld, Framingham, 14 February 2000.
- Sanborn, Stephanie, "Directories To Link Up Via XML." InfoWorld, Framingham, 13 December 1999.
- Sapp, Geneva, "Ariba Boosts Platform With Trioka Of Alliances." InfoWorld, Framingham, 20 March 2000.
- Schafer, Sarah, "AMS Joins E-Auction Project; Suppliers To Get Government Link." The Washington Post, Washington, 10 March 2000.
- Schwartz, Ephraim, "The Art of the New E-Deal." InfoWorld, Framingham, 5 July 1999.
- Scrupski-Miranda, Susan, "Look Before You Leap At E-Business Consultants." Computerworld, Framingham, 24 January 2000.
- Sliwa, Carol and Julia King, "B-To-B Hard To Spell With XML." Computerworld, Framingham, 28 February 2000.
- Sliwa, Carol and Stacy Collett, "Consumers Gripe About Web Shopping." Computerworld, Framingham, 10 January 2000.
- Sliwa, Carol, "Auto E-Market Faces Big Hurdles." Computerworld, Framingham, 6 March 2000.
- Sliwa, Carol, "E-Commerce Solutions: How Real?" Computerworld, Framingham, 28 February 2000.
- Sliwa, Carol, "E-Receipts Next On Retail Front." Computerworld, Framingham, 24 January 2000.
- Sliwa, Carol, "IBM Cash Registers Come With Web Support." Computerworld, Framingham, 14 February 2000.
- Sliwa, Carol, "Intranet Procurement Systems, But Require Extra Effort." Computerworld, Framingham, 30 August, 1999.
- Sliwa, Carol, "Key XML Standards Ready." Computerworld, Framingham, 22 November, 1999.
- Sliwa, Carol, "Middleware Emerges For Wireless Web." Computerworld, Framingham, 13 March 2000.
- Sliwa, Carol, "Web Site Upgrades: Build Or Buy." Computerworld, Framingham, 17 January 2000.

- Southwick, Karen, "Found In The Crowd." Inc, Boston, 15 September 1998.
- Stout, Erin, "Reinventing A Company." Sales and Marketing Management, New York, February 2000.
- Toner, Chris, "ABA Section Creates First Digital Signature Guidelines To Aid In Security Of the Internet." Available from <<http://www.abanet.org/media/96/dsg.html>>. Internet. Accessed 30 March 2000.
- Treece, James B. "Toyota Isn't Jumping At GM E.Com Invitation." Automotive News, Detroit, 24 January 2000.
- Trott, Bob, "Microsoft Submits XML Data-Sharing Protocol." InfoWorld, 6 December 1999.
- Ulrich, William M. "How Governance Leads To E-Success." Computerworld, Framingham, 21 February 2000.
- Vijayan, Jaikumar, "Manufacturers Make E-Business Leap of Faith." Computerworld, Framingham, 28 February 2000.
- Walker, Leslie, "The Next Revolution: B2B." The Washington Post, 30 March 2000.
- Welch, John K., "Ready For The 21st Century: From T Squares to Virtual Reality." Seapower, August 1997.