

# Electronic Commerce and Electronic Data Interchange in the Public Sector

The State Government in California has recognized the value of Electronic Commerce (EC) and Electronic Data Interchange (EDI) technologies in reducing the cost and improving the efficiency and effectiveness of purchasing and contracting transactions, as well as furthering its other social and economic goals [5]. The State was also encouraged by the successful implementations of EC by the State of Oregon (VIP Program) [2], by the Federal Government (The GATEC Project) [1], the developments in Singapore [3], and elsewhere in the public sector in North America.

There is a fundamental difference between the public and private sector use of EC/EDI technology; private corporations are generally relying upon fewer high

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quality and compatible suppliers in each area; the public sector has the social responsibility of increasing its outreach for suppliers and especially targeting small business and other disadvantaged emerging business (eg. women/minority/disabled/veteran-owned business enterprises). This basic distinction leads to a substantially different approach to planning and implementing EC/EDI in the public sector. The normal corporate practice of coopting one's suppliers to become EDI ready takes a different dimension. For example, the State of California has in excess of 70,000 suppliers for goods and services. While in all likelihood, 90% of the goods and services are provided by 10% of the suppliers, the EC/EDI readiness of the remaining 90% of the suppliers remains a critical issue, as the State has to deal with many objectives other than those of fiscal and operational efficiency. From an EC/EDI viewpoint, the public sector procurement process can be divided into six distinct segments; bid advertising and dissemination, bid response, bid award, purchase order issuance, invoicing, and payment.

## Pilot Programs

The State of California decided to conduct three pilot programs and reported the results in a business assessment of EC/EDI technology. These pilots were as follows:

### □ Bid advertisement

In this pilot program, an electronic version of the California State Contracts Register is created from the data being collected for the paper publication of this register. This electronic data file is transmitted to a Value Added Network, which in turn makes it available to its clients as well as performs bid matching. Currently, the process of collecting advertisements remains on paper. A department wishing

to advertise sends a paper or FAX containing the advertisement to the office responsible for publishing the CSCR. The important lesson of this pilot is that a reengineered advertising process that collects advertisement data on line at the point of origin, and updates data bases nightly, could easily eliminate four to six weeks from the contracting cycle. Eventually, the paper version of CSCR could disappear or be customized for its readers (no need to browse 60 pages when all you care to see are a few advertisements) and use FAX to transmit advertisements to those who still wish for a paper medium. Recently, the State has also made the CSCR available on Internet using Mosaic. Also, an association serving the disabled veterans has started to provide this electronic contract register to its customers via a BBS; many others are exploring this option. It is evident that this offers government a significant strategy for reaching out to its target groups.

### □ Bid solicitation (RFQ) and response

This pilot program involved the transmission of requests for quotations (RFQ) from the State's purchasing system through a VAN to an Electronic Bidding System (EBS). The EBS broadcasts the request for quotations to vendors who are registered to participate in the pilot project. Vendors only receive those RFQs that match their business profile. The vendors review the RFQ and submit responses electronically. Finally, the EBS transmits the vendors' responses to the buyers via FAX modems. This pilot identified areas that need further investigation before a large-scale implementation can be undertaken. Some of these issues include the integration of EDI with the purchasing system software, the training of the trading partners, and the user-friendliness of the EBS software. Overall, the use of EDI in requests for quotation and bid responses promises significant effectiveness and efficiency for the State Government.

### □ Invoice handling

In this pilot program, the utility company converts its invoices to ANSI X12 format and transmits it to a state agency. The agency receives the data electronically on a PC, performs pre-programmed elec-

tronic edits and audits, and approves payment. Subsequently, the approved invoices are transmitted electronically to the State's accounting system for payment scheduling. The cost of processing these invoices in a manual system ranges between \$75.00 and \$100.00. The time required to process these invoices in the manual system ranges from 30 to 80 days. It is expected that the invoice processing costs in the EDI system would drop to \$25.00; processing time would drop from an average of 61 to 6 days. This is a very limited size pilot and statewide implementation poses a significant reengineering and organizational challenge.

These three pilots have been successfully implemented and have provided the State with valuable information to successfully implement EC/EDI over the years to come.

## Lessons Learned

### □ More experience in private sector

While over 40,000 American companies conduct business using EDI, there are only a handful of successful public sector implementations. None of these implementations have successfully demonstrated end-to-end electronic purchasing or contracting.

### □ Large scale preferable

Generally successful EDI implementations involve trading partnerships among large companies and their product-oriented suppliers. Small and medium size companies and service providers have yet to embrace EDI in a significant way.

### □ Integrated electronic environment

EC/EDI technologies succeed when they become part of a pervasive integrated electronic environment. Governments are faced with the challenge of having multiple purchasing and accounting systems, manual as well as electronic. The 'islands of automation' and considerable diversity of standards and vendors add complexity to EC/EDI implementation.

### □ Leadership commitment

Early EC implementations appeared simple, but experience with the pilot project shows the need for strong leadership, adequate resources and sufficient time for planning. In addition, the value of EC/EDI will only be achieved through considerable reengineering of paper-based systems. The absence of a profit motive in the public sector makes such reengineering a considerable challenge.

### □ Early costs, later benefits

Public-sector decision makers, particularly in these difficult financial times, have to face the challenge of making investments for long-term benefits. Also, these investments often compete with other funding priorities, such as social programs

and those dealing with crime reduction and law enforcement.

### Return on Investment

As a planning baseline, it is reasonable to assume that successful EC/EDI implementation in the public sector can yield a benefit in the range of 8% to 12% of the purchasing/contracting volume. Therefore, if a public entity spends \$1 billion on purchasing and contracting, it stands to gain some \$100 million in value. This value will come from two areas; first, the reduction in cost of goods or services due to the availability of an on-line history of prior awards (this has been successfully documented and audited).

Second, the reduction in personnel and operating costs resulting from effective use of technology. Current public sector administrative cost for each dollar of acquisition is approximately five and a half cents (State of Texas study) [4]. Successful EDI implementation should bring this closer to one cent for each dollar of acquisition. In addition, there is enormous potential for the State to leverage EC/EDI to help achieve its goal for participation of small and other emerging enterprises in the State market, as well as reduce the acquisition cycle time. Finally, it is the author's contention that public

sector planners need to pay a great deal of attention to this technology if for no other reason but to position its jurisdiction for success in the global economy. We are witnessing a dramatic reduction in the cost of matching the products with the buyer due to availability of information technology tools. This reduction coupled with the emergence of the global information infrastructure will lead to a great increase in the number of international transactions while lowering the average size of the each transaction. Early electronic commerce implementations on Internet clearly indicate the potential of this new market in the emerging global economy. The societies that adapt early to EC/EDI and use it as a strategy for economic growth will have a competitive advantage over the laggard. The societies that successfully develop their information and commercial (EDI) infrastructure will be more successful in bringing in service/information jobs for their constituents and also be able to market their own products and services better, and act as brokers for other producers in the global marketplace.

For a thousand years there was a 'silk road' from Europe to China. Societies along the 'silk road' prospered. There is a 'new silk road' being formed. Those will-

ing to venture out early are likely to be rewarded with prosperity for generations to come. ■

### References

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- [5] This article is based on EDI pilots documented in 'Conducting Electronic Commerce in California', published by the Department of General Services, State of California, 1994.

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## The Role of Government in Electronic Commerce

**The role of government in electronic commerce (EC) is partially dependent on the role that each government perceives it has in commerce itself. Governments adopt differing degrees of intervention within the commercial world, and this directly affects their participation in this world. Even amongst the Federal and State governments in Australia, there are sufficient differences in views on the role of government that their approaches to EC also differ.**

The Federal and Western Australian Governments have chosen to implement and operate a corporate gateway through which all agency transactions will be fun-

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nished and processed. The New South Wales Government has established a partnership with a local Australian network service provider (NEIS) to develop and operate the Government's system and the Queensland Government has determined a preference for a totally outsourced solution or strategic partnership with a service provider [1].

The approaches also vary from a stance of expecting suppliers to use the network of its choice, through to establishing connections to all networks in order not to disadvantage any particular supplier on the basis of their choice of network. Further, some Governments have considered specific strategies for

addressing the needs of small and medium businesses that might be disadvantaged by the entry costs involved in adopting EC techniques. Governments' role in EC needs to be considered from three perspectives, being their role as a purchaser of goods and services, a provider of services, and a regulator of commercial activities.

### Purchasing Role

Governments are significant purchasers of goods and services. In particular markets, they can represent up to 100% of a company's customer base. Therefore, the way in which governments participate in the marketplace has an impact on that marketplace. This means that governments can be a significant catalyst for adoption of EC techniques by their suppliers of goods and services. Adoption of EC techniques which lead to lower supplier costs and lower government costs makes a direct contribution to the

improved competitiveness of the suppliers, the government and the other industries serviced by the supplier community. However, to achieve the catalytic effects, governments need to take a coordinated approach to the adoption of EC techniques. It is clear that the business case for adopting EC techniques is not so compelling that a supplier will adopt it as soon as one customer requires this mode of operation. Otherwise, it would be far more widely adopted than is presently the case. Rather, there must be the volume of business to generate sufficient benefits to offset the costs of implementation and operation. Ideally, a supplier would like all customers to trade electronically, enabling avoidance of the more expensive manual processes, or a mixed mode of operation which may be more expensive than either manual or fully EC enabled processes.

For government to really encourage suppliers to adopt EC techniques, it is important that the full volume of government business is transacted electronically. Typically, different agencies in governments operate sufficiently autonomously that the timing of their implementation of EC techniques will vary significantly, due to differing internal priorities, resource availability, and relative benefits. Therefore, specific effort or decisions must be made to ensure that adoption by