

SUPPLYPOINT: ELECTRONIC PROCUREMENT USING VIRTUAL SUPPLY CHAINS – AN OVERVIEW

BY SUE KERRIDGE, ANDREW SLADE, SIMON KERRIDGE AND KEVIN GINTY, UNIVERSITY OF SUNDERLAND, BRITAIN*

BACKGROUND

In the area of Electronic Contracting and Virtual Company Formation within Supply-Chains there has been little research or development work. During this paper we will outline the European Union sponsored project SUPPLYPOINT (ESPRIT 27007) which addresses the issues of pan-European electronic trade links for business-to-business and business-to-public body electronic commerce. This will be achieved by using virtual supply chains and covering a life cycle from contract identification to completion, including virtual supply chain management and electronic payments. It will provide a one-stop shopping service for companies to purchase goods and services from small / medium sized enterprises (SMEs) co-operating in virtual and dynamic supply chains. The project started on July 1st 1998 and is co-funded by the European Commission to support the multi-national consortium conducting the research and development over a two year period.

OBJECTIVES

SUPPLYPOINT, a European electronic procurement system utilising virtual supply chains will:

- ◆ undertake comprehensive surveys to identify the requirements of SMEs and procuring entities and the legal framework in which these requirements must operate.
- ◆ develop a conceptual European framework for electronic procurement using virtual supply chains incorporating existing state-of-the-art public and private sector electronic procurement and supply chain systems, in particular, Tradepoint, ELPRO and SIMAP which takes explicit account of the needs of SMEs at all stages.
- ◆ build and pilot on a number of sites a demonstrator electronic procurement system using virtual supply chains in-

corporating multi-media and distributed work-flow management, document handling, supply chain and tendering procedures.

- ◆ conduct user trials, and give guidance and make recommendations on the development of virtual supply chains within electronic procurement systems meeting the needs of SMEs, and the development of effective regional support networks for SMEs with a view to the long term exploitation of the SUPPLYPOINT concept.
- ◆ SUPPLYPOINT will be an open project, collaborating with and offering demonstration facilities to other projects in this field (e.g. ELPRO, Tradepoint and SIMAP)

TECHNICAL AND BUSINESS APPROACH

The SUPPLYPOINT service is a new business opportunity which will be taken up by a number of the project partners. It will benefit the wider business audience by addressing a current gap in the Electronic Commerce market place and will:

* Sue Kerridge

(Susan.Kerridge@sunderland.ac.uk)
is the Manager of the Centre for
Electronic Commerce,

Andrew Slade

(Andrew.Slade@sunderland.ac.uk)
is the Director of the Graduate
Research School,

Simon Kerridge

(Simon.Kerridge@sunderland.ac.uk)
is the SUPPLYPOINT Project Manager

and Kevin Ginty

(Kevin.Ginty@sunderland.ac.uk) is the
Technical Manager of the Centre
for Electronic Commerce within the
University of Sunderland,
Sunderland UK.

- ◆ support the whole transaction cycle
- ◆ give fast and accurate access to information on possible contracts
- ◆ show the current state of the supply chain(s) involved in current contracts
- ◆ allow SMEs to form dynamic supply chains
- ◆ enable brokers to form virtual supply chains

EXPECTED RESULTS

WEB SERVER SYSTEM

This will allow users to search the supply chain database depending on different criteria and form a virtual supply chain. The supply chain database administration for suppliers will also be supported by WWW access.

ORDER PROCESSING

SUPPLYPOINT will contain a dedicated subsystem for order processing, which, most likely will be separate from the Web server system for reasons of security and auditable transaction processing.

EDI GATEWAY

SUPPLYPOINT will contain an integrated EDI gateway, through which orders can be transferred to the suppliers in EDI formats (EDIFACT, ANSI X.12, XML, in-house, or others) via electronic mail, file transfer, and, in a later stages, via existing VANS. The provision of EDI through a programmable gateway also allows the future integration of complete EDI Clearing Centres from different vendors.

E-MAIL

This gateway will basically be an SMTP gateway for inbound and outbound mail

BANKING GATEWAY

A banking gateway for secure electronic payment.

EXTERNAL INTERFACE API

SUPPLYPOINT will also provide an API to external sources of information (e.g. external databases, external software systems). This will allow users to integrate customs information, VAT and other tax

information, as well as the integrating tracking systems and pricing information from shipping agents and freight handlers.

All these will be combined in a single coherent system (together with existing systems, e.g. product databases, electronic catalogues) which will help to accelerate user uptake.

INDUSTRIAL DEMAND

There are literally millions of contracts awarded in the European Union (EU) each year, most of these existing in supply chains. However the vast majority of these supply chains are relatively fixed and are comprised from a high proportion of large companies. In order to enable more SMEs to bid for contracts a way of co-ordinating dynamic and virtual supply chains is required. SUPPLYPOINT meets this need and will reduce the number of disadvantages that SMEs have. Additionally, SUPPLYPOINT will give the end purchaser more control over the supply chain and hence a higher quality of service / product.

The EU Initiative Electronic Commerce estimates that 3% of the public procurement budget in the EU (12% of GDP) could be saved through the use of electronic commerce, SUPPLYPOINT will go a long way towards achieving this goal.

PROJECT OBJECTIVES AND SCOPE

Electronic procurement is one of the main issues in the Bangemann report, enabling a European wide co-operation between administrations and industry with a strong involvement of SMEs. The objective of the SUPPLYPOINT project is the development and implementation of a software and service infrastructure for the integrated deployment of electronic procurement using virtual supply chains. Special attention is paid to the integration of traditional EDI systems and new interactive World Wide Web technology together with multimedia.

SUPPLYPOINT will fill a gap in current electronic commerce support systems by providing fast and accurate access to con-

tract information for both procurers and suppliers in a supply chain context. It will provide affordable and easily packaged support for business relationships, in particular for SMEs wishing to become part of or to initiate supply chains.

In addition it will be a best practice pilot for the marketing and trading of goods and services in supply chains, thus enhancing quality, flexibility, responsiveness and productivity at a global level.

The aim of the project is to demonstrate the effectiveness of the SUPPLYPOINT approach to electronic procurement using virtual supply chains by taking a number of existing systems and providing access to them in an integrated manner.

To this end a number of tasks have been identified, namely:

- ◆ a review of the environment, which the SUPPLYPOINT system will meet, with a special focus on the legal situation and the existing work done in other projects
- ◆ a definition of the specific requirements to be included in the pilot system and the subsequent commercial products
- ◆ the interfacing of a number of existing systems
- ◆ the provision to the user of a coherent integrated system
- ◆ the utilisation of the SUPPLYPOINT demonstrator to show best practice

SUPPLYPOINT will initially be demonstrated in a construction industry context, but most aspects of electronic procurement using virtual supply chains are common for all supply chains, where SUPPLYPOINT will be exploited as well. Therefore, the whole workplan, although adapted to the construction industry application of the demonstrator, takes into account the wider perspective of electronic commerce for all strands of applications in different sectors. The construction industry has been identified by SMEs as being an area where they would see most benefits from such a system. At the moment when a large contract is adver-

tised it will almost certainly be awarded to a large company. This company then merely re-advertises the contract as sub-contracts which are accessible to SMEs, only after they have taken their 'managerial expenses' in the region of 10% from the total. SUPPLYPOINT will allow the SMEs to form virtual consortia of supply chains and to bid directly for the original contract.

BUSINESS OBJECTIVES

EC document COM (97) 157 states that public procurement accounts for 12% of EU GDP and the Swedish association of local authorities estimate that 3% of the procurement budget could be saved through electronic procurement. SUPPLYPOINT will allow SMEs to be involved as first parties not subcontractors in this procurement, benefiting them and the end purchasers.

There is also the opportunity for a new market in information services as a partner broker who would identify contracts and possible virtual supply chains to fulfil the contract.

The savings for procurers would also be seen for the SME suppliers in terms of reduced administration for the whole procurement cycle from call for tender to electronic payment.

MEASUREMENT OF OBJECTIVES

During the initial stages of the project, the user partners will organise a project user group (PUG) of interested companies. As well as being involved in the user requirements, critically, the PUG will use the demonstrator system to ascertain its usability and effectiveness. The criteria for success will be defined by the PUG at the same time as the user requirements.

STATE OF THE ART

There are a growing number of electronic commerce systems and research projects focusing on supply chains. Listed below are some of the current projects in the area, many of which involve SUPPLYPOINT partners.

GEIS and Netscape have formed ACTRA - OrderXpert (software for e-commerce) and ECXpert (secure Internet-based messaging for e-commerce) [<http://www.actracorp.com/>]

GE TradeWeb offers forms-based, entry-level EDI service via the WWW. [<http://www.getradeweb.com/>]

GEIS Trading Process Network provides a suite of Internet purchasing tools including TPN Post, for electronic RFP distribution and bid receipt. GEIS recently joined forces with the Thomas Publishing Co., to create TPN Register, which will allow end-to-end procurement of industrial materials [<http://tpn.geis.com/>]

TRADE'ex have a suite of Java-based software for various aspects of e-commerce, including RFQs. [<http://www.tradeex.com/>]

IBM World Purchasing provides end-users access to customised supplier catalogues via a Web browser. [<http://www.internet.ibm.com/commercepoint/html3/purchasing/>]

Microsoft are now turning their attention to e-commerce, with the Merchant Server now subsumed into their new Commerce Server. [<http://www.microsoft.com/>]

ELPRO - Electronic Procurement System for Europe (Telematics Project AD-1003) [<http://cec.sunderland.ac.uk/>]

Many forms of electronic on-line payment techniques have been proposed in recent years, but only a few have emerged into reality. Of these, the SET scheme devised by Visa and Mastercard for secure bankcard transactions via the Internet is probably the most important. SET uses a sophisticated combination of cryptographic means to protect the interests of all parties in a payment transaction. Nevertheless, it should not be forgotten that electronic funds transfer is well-established outside of the Internet, and tends to be a preferred means of payment in the more traditional supply chains. How-

REFERENCES

E.U. ESPRIT Project SUPPLYPOINT (27007)

E.U. TELEMATICS Project ELPRO (AD1003)

Intellectual Property Law; Paul Marett; Sweet + Maxwell ISBN 0421 554207

Introduction to Computer Law 3rd Ed; Pitman 1996; ISBN 0273 619403

[Http://www.hq.nasa.gov/](http://www.hq.nasa.gov/)

The Application of the Internet and Intranet in Business; Murray, Thompson, Kerridge, Grey, Ferguson & Slade, IFIP WG3.4, Educating Professionals for Network-centric Organisations, Saitama, Japan, Aug 23-28, 1998.

COM (97) 157 - Green Paper; Public Procurement in the E.U Exploring the way forward

ever, the emergence of more dynamic virtual chains gives rise to a need to handle payments more flexibly. Systems such as SET could provide part of the solution, when integrated with say EDI links into the banking network.

SUPPLYPOINT will incorporate and integrate the best of these systems into a single, coherent, affordable and easily managed support system.

INDUSTRIAL CONTEXT AND IMPACT ON SOCIETY

INDUSTRIAL CONTEXT

The European Commission has always viewed public procurement regime not only as means of complying with GATT but also as a lever and demonstrator to encourage the liberalisation of the private sector procurement field and complete the creation of a single European

market. The Commission has a clear need to realise this objective by encouraging increasing private sector participation in open procurement throughout Europe. Again the advantages to both SMEs and the construction industry in the ability to form effective virtual companies would facilitate this.

The SUPPLYPOINT electronic procurement system will allow SME to form virtual supply chains in order to produce more competitive and realistic bids for contracts. In effect it will provide a seamless gateway to the ELPRO, TRADEPOINT, SIMAP, TAPPE and similar systems allowing SMEs to form virtual companies in the most practical and cost effective ways which would put them at an advantage when bidding for procurement contracts.

MARKET OPPORTUNITIES

The estimated savings from using an integrated electronic commerce system for supply chains is 0.36% of EU GDP [ref. COM(97) 157] from public procurement alone.

SUPPLYPOINT will allow SMEs to be involved as first parties not subcontractors in this market to the mutual benefit of both the suppliers and procurers.

Apart from the SUPPLYPOINT system itself, there is also the opportunity for a new market in information services: SUPPLYPOINT brokers who would identify contracts and possible virtual supply chains to fulfil the contract, as a value added service.

Administrations are required to secure the economic health and welfare of their administrative area, and to provide support for the creation of employment opportunities in their regions. This political imperative is clearly stated in both the EC White Paper on "Growth, Competitiveness and Employment" and in the Bangemann Report as well as in the policies and activities of government at all levels. SUPPLYPOINT would facilitate this.

INDUSTRIAL IMPACT

Commission experts expect an increase of invitations to bid to more than 1000 per day within the next year (in the Official Journal alone). The current 150.000 awarding organisations can expect to approach the 3% saving estimated by using a comprehensive, integrated electronic supply chain management system like SUPPLYPOINT.

Conversely, the millions of SMEs in Europe who cannot directly compete for these and similar calls for tender will, with SUPPLYPOINT, be able to do so easily and affordably. The potential impact on the SME community is almost unlimited. Even assuming a 10% market penetration of the system to the 1% of SMEs that are truly viable, means that potential supply chains can be formed from over 300.000 dynamic SMEs within the European Union.

MARKET SITUATION

There are several current solutions for electronic commerce on the market, which need to be taken into account, when analysing the competitive market situation.

The classical EDI Clearing Centre approach, as for example available from Sterling, Frontec, GE Information Services is strongly application oriented with batch processing of electronic transactions, but it doesn't feature a WWW access. In the classical approach there is also no provision for interactive EDI.

In existing online ordering systems, frequently there is only one single supplier/manufacturer involved. In most cases they do not support integrated EDI, electronic payment, customs information, and cross-border tax calculation.

In the last year, several low-cost solutions (such as the integration of Oracle and Netscape) via CGI scripts evolved in the market. They allow easy integration of product information databases, but they support retrieval only and not order placement.

For more advanced electronic commerce, a number of dedicated solutions (multimedia CD-ROM, product catalogue for home shopping, etc.) have been developed. They feature advanced multimedia as well as order placement (in connection with a modem or off-line by fax). The problem with those solutions is that they are not always up-to-date. Moreover, buying of the CD and a local installation is required.

Most recently, a series of products have been announced, which can be viewed as major competitors to the SUPPLYPOINT set of integrated services. One of them is the announcement of Oracle's end-to-end solution for electronic commerce, developed under the project Apollo, which is mainly targeting the business-to-consumer end of the electronic commerce market. The other one is Microsoft's Merchant Server, which is announced as a complete "electronic shopping mall" solution.

However, those new products mainly address the business-to-consumer market, providing highly proprietary solutions (although one needs to take into account that Microsoft has always set the path to de-facto standards in the past), and do not integrate EDI systems and services already in use and well-established.

In summary, none of the above systems address the issues of supply chains and how to form, manage and monitor them in a 'just in time' manner. SUPPLYPOINT meets this need and will allow SMEs to take full advantage of the single European market.

Notably, the construction industry uses supply chains, and contracts can be very large. Currently SMEs cannot bid for these contracts as they have neither the financial backing nor track record which are perceived needs of the purchasers. SUPPLYPOINT by allowing them to form consortia and supply chains would distribute these implications to a manageable size, thus giving the SMEs access to a 'level playing field'.

CONCLUSION

The project has only recently started, and so no concrete results are yet available. The intended outcomes of the project are, however, quite clear. The SUPPLYPOINT system will allow the formation of virtual enterprises whose members can then collectively bid for large value contracts. This will build on the existing work of the Centre for Electronic Commerce. Above the threshold procurement is currently being developed in electronic format in the Elpro project. Sunderland University's Centre for Electronic Commerce is the lead partner in the Elpro project, which involves a number of organisations throughout Europe in a web-based procurement solution. Because of the close connection between SUPPLYPOINT and the Elpro project, cluster companies formed in SUPPLYPOINT will be able to use the Elpro system to locate and bid for above the threshold contracts.

The Centre for Electronic Commerce is also lead partner in another European project dealing with below the threshold purchasing for local authorities and large companies. This project, called Tradepoint, allows organisations to pool together information from various supplier catalogues into buyer side catalogues, for centralised use within the local authority or company. The Tradepoint system is also being developed and hosted on a web server at Sunderland University, and this system will also be available for interfacing with SUPPLYPOINT.

Although the project is initially being developed in the construction sector, the broad technological base of the system will allow for development into other commercial areas as demand requires it.

In summary, SUPPLYPOINT will build on and extend the successful work of the Elpro and Tradepoint projects that are now reaching maturity. Various deliverables will be publicly available (via <http://cec.sunderland.ac.uk/>) and should prove to be useful not only in the construction sector but also more widely in the whole domain of electronic contracting within virtual dynamic supply chains.