

# Enabling Global Steel Trading with XML

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## Abstract

Stemcor, one of the world's largest independent steel traders, has developed a new trading system using XML and web technology to allow rapid development, deployment and adoption by users in any trading location. This presentation will focus on the business drivers that led Stemcor to introduce a web-based trading system, the key role that XML plays in that system and some of the technical background of the implementation and role out to Stemcor traders worldwide. The system is implemented as a multi-tier application, using a relational database in the data tier and a high performance, pure Java application server to manage processes and sessions in the middle tiers.

## 1. Introduction

Stemcor is one of the world's largest independent steel traders, located in over 30 countries and conducting over \$1.3 billion of business each year. The business involves buying from steel mills, transporting steel internationally and selling steel to consumers. As principals in the transaction between sellers and buyers, Stemcor provides enabling services such as insurance, shipping and financial services.

Several key business requirements have driven the introduction of a new trading system at Stemcor, including the need to accelerate the flow of information between the company's offices worldwide, to improve the availability of management information and to capitalise on new business opportunities in the Internet trading space that has been created by new '.com' start-up ventures.

Stemcor's trading system has used XML and web technology to allow deployment and adoption by internal intranet users in any trading location. Stemcor traders enter details of offers to sell steel. Offers are picked up by other traders in particular market locations and refined to suit particular customers. Customers can then negotiate with

bids to buy steel until the offer and bid are united and a contract can be formed.

This presentation provides an overview of the key business and technical aspects of the new system, focussing on the role played by XML. It considers:

- business drivers that lead Stemcor to introduce a web-based trading system
- some of the technical background of the implementation
- the role out to Stemcor traders worldwide
- how XML is being adopted for steel trading
- the competitive advantage and next steps for Stemcor

## **2. Business Drivers for Stemcor.com**

Stemcor started to consider the introduction of a new web-based system following the rise of new steel trading sites such as e-steel.com, metalsite.com and isteelasia.com. Although these initiatives can be seen as a catalyst for Stemcor's development programme, the main business driver was not to create a trading site of their own, in competition with the venture capital backed start-ups. In fact the main business drivers were to:

- Drive down the costs of executing business
- Improve the level of service provided
- Broaden the supplier and customer base
- Improve Management information both in terms of accessibility and quality

These objectives were met by designing a web-based system for traders to use internally for recording offers to sell and bids to buy steel, thereby facilitating the flow of information between the two sides of the business and making it easier to conduct business with both suppliers and buyers.

Secondary to these drivers, was the need to position Stemcor to feed information to

and from Internet trading sites - an objective that was achieved through the adoption of XML.

### **3. Technical Overview**

The system is implemented as a multi-tier application, using a relational database in the data tier and a high performance, pure Java application server to manage processes and sessions in the middle tiers. XML is used in the data tier to represent offers and bids and in the presentation tiers to represent screen displays that can be manipulated using DOM and XSLT, before being delivered to a web browser as HTML.

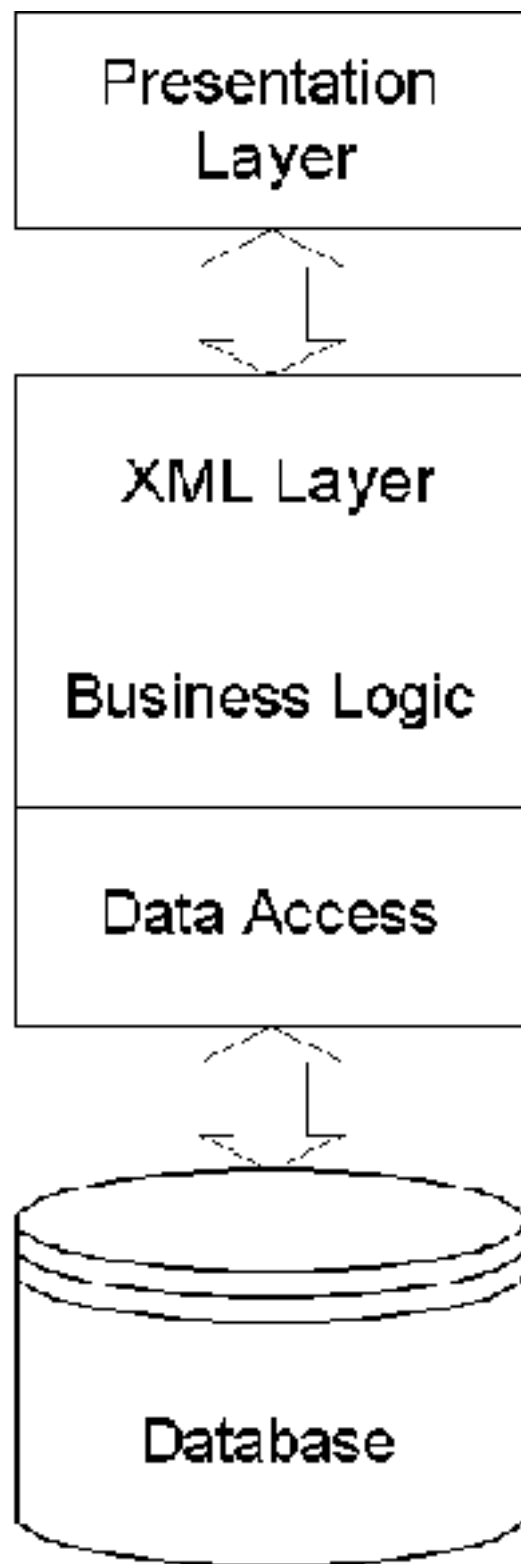


Figure 1. High-level System Architecture

### **3.1. HTML Client**

The client tier (user interface) is a thin HTML client, designed to run in IE4/Netscape 4 browsers (or better) on clients with minimum 266 MHz processors and 32Mb RAM. The client may contain a small amount of JavaScript (eg for mouseOver events) but does not contain extensive client-side processing in applets or JavaScript.

Links for user actions are to JSP or Servlets on the server-side which then call out to Java classes in the XML tier or business logic tier.

### **3.2. XML Tier**

The XML tier is used to hold the state of the user interface 'screens' with an XML representation of the HTML screen seen by the user. The XML is transformed to HTML with XSLT stylesheets using the XT processor and is delivered down to the desktop as HTML.

When the user initiates an action in the HTML client the initial link will be to a servlet or JSP which then calls either directly to the business logic or to code in the XML tier. A user action such as sorting items by field in a offer summary screen is handled by re-ordering the XML representation of the screen (using DOM or XSL), then transforming the revised XML screen representation to HTML using XSL. Other user actions (eg display details of an offer after clicking on an item in the offer summary screen) require a call to the Business Logic tier, which then accesses the database through the data tier and creates a new XML screen representation in the XML tier.

Because all information displayed to and manipulated by users passes through the XML tier, all information can also be transformed for use in other XML steel trading systems that use XML (or indeed have a published and consistent method of Electronic Data Interchange in any format). Thus by developing XML transformation processes to and from the formats used by Internet trading sites Stemcor have the capacity to intergrate quickly with those sites in the future.

### **3.3. Business Logic and Data Access**

The business logic tier is a set of Java classes that implement the underlying UML

design. These classes make calls to the database through the data access tier - a set of Java classes that encapsulate database calls that are made using JDBC. This encapsulation allows the database access to be re-implemented easily using the native database API or the database to be switched to an object-oriented database if necessary in the future, with minimal impact on the application.

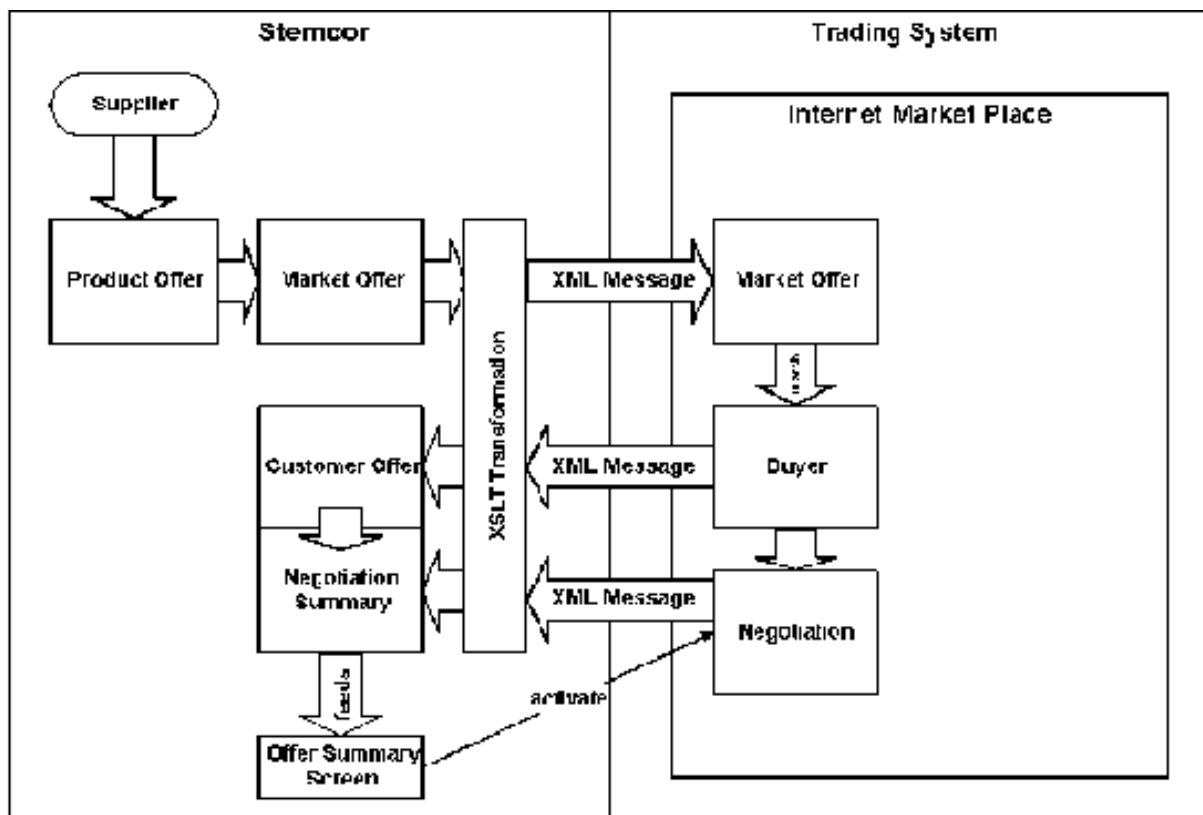
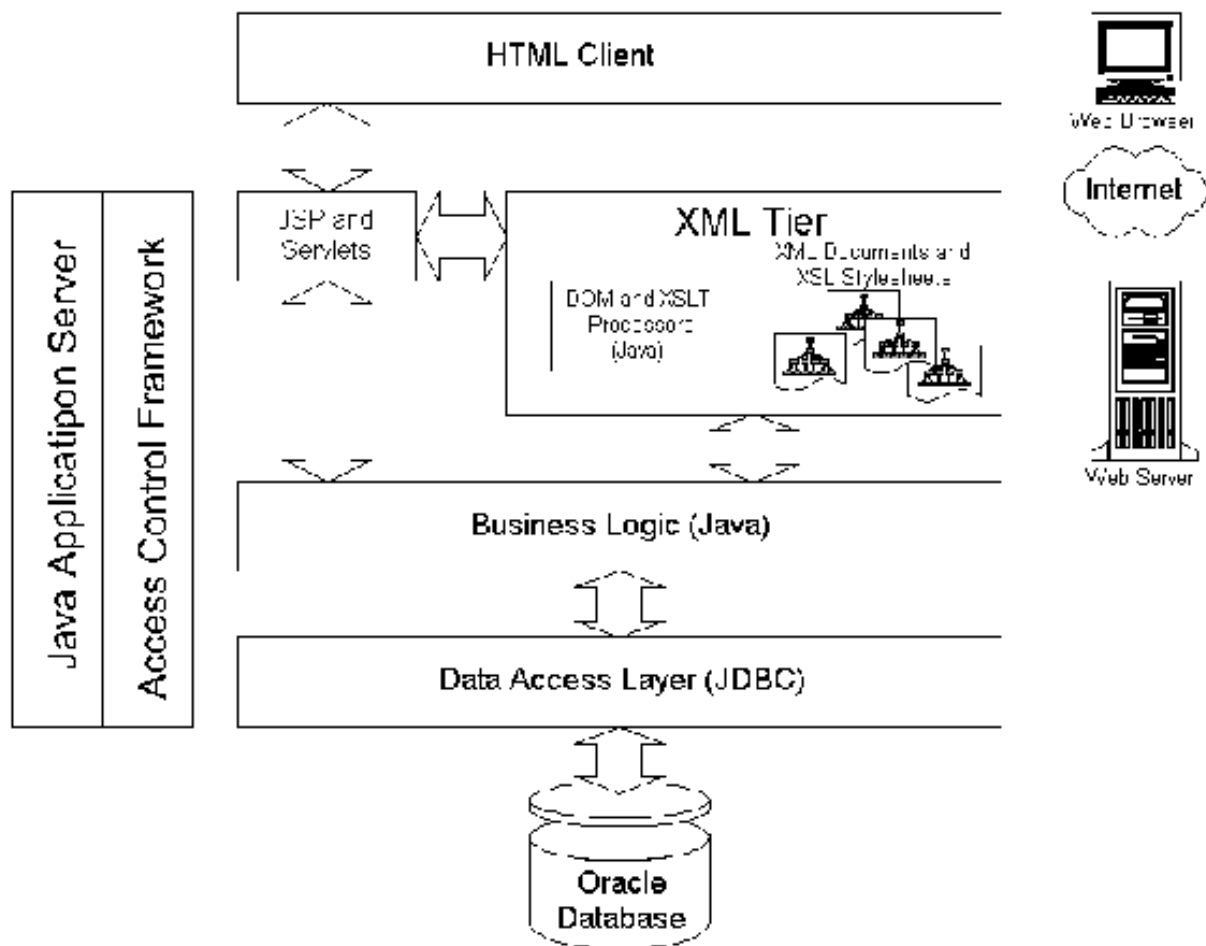


Figure 2. System Architecture - Detail

## 4. XML in Steel Trading

In common with other trading communities, steel trading has seen the rapid emergence of numerous Internet ventures in recent years. As yet there is no clear consensus on an XML vocabulary for the exchange of steel trading information and no dominant market leader. However, by developing internal systems using XML, established enterprises such as Stemcor can position themselves to engage with any outside parties necessary in the future.

The XML architecture adopted by Stemcor provides the ideal platform from which to engage in online marketplaces, by delivering XML messages describing the offers and bids within Stemcor. The negotiation within the chosen marketplace can be conducted using the interface of that market, and the results of the negotiation can be fed back for Stemcor to record, in XML, the outcome of the process.



**Figure 3. Engaging in Online Markets**

## 5. Competitive Advantage and Next Steps

The use of XML is key to the Stemcor system and provides significant competitive advantage to the organisation. It is used to represent details of offers and bids as they are entered by steel traders through a web browser interface. These details are then available immediately to other traders throughout Stemcor's global network,

considerably streamlining the existing trading process. Because XML is used to represent offers and bids, they can be piped to or from other Internet-based trading systems that also use XML.

This type of scenario is typical in many sectors of business and commerce. The position of established companies can be threatened by start-up ventures using the power of the Internet, and more recently XML, to create new marketplaces. Often the players in these new marketplaces have difficulty with the fulfillment of orders - one area in which the established players have the existing infrastructure and expertise necessary to succeed. By positioning themselves to feed into the new Internet marketplaces, established players are poised to exploit the new business opportunities offered by whichever marketplace, or aggregation of marketplaces, proves to be most successful.

## **Biography**

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*Dr John Chelsom* - Dr John Chelsom is Managing Director of CSW Informatics, a company dedicated to providing object-level information management solutions using XML, SGML and database technology. Originally trained as an electrical engineer, John worked first as an X-Ray engineer and later gained a PhD for work on the application of knowledge based systems in medicine. Since founding CSW Informatics he has been responsible for the design and development of XML and SGML information management systems for some of the world's most prestigious engineering, healthcare and publishing organisations.

John is a regular speaker at XML and SGML conferences, was a contributing author for the SGML Buyer's Guide and is a presenter of the Technology Appraisals seminar series on XML.



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*Richard Edmonds* - Richard Edmonds is head of e-commerce strategy for Stemcor Group and has both a technical and business background. He was employed by IBM UK Ltd in a systems engineering role from 1989 to 1983 and then as a steel trader for Stemcor USA Inc until 1999, ultimately with responsibility for Stemcor's trading business in South America. From the start of 2000, Richard has spearheaded a drive towards full e-commerce, with the objective to turn Stemcor into a 'bricks and click' company and enable the Group to take advantage of the new business processes enabled by the Internet.