



UNIVAR

Univar USA Business to Business Integration

1 Introduction

This document presents a summary of the research conducted by Univar USA into Business to Business integration over an 18-month period.

1.1 eBusiness Vs. eCommerce

For the purposes of this discussion, we shall define eCommerce as the process of placing an order electronically and eBusiness as the broader set of interactions that are involved when two companies conduct business electronically. In our view, “eBusiness” implies a tighter and more timely electronic coupling of the systems of two trading partners than “eCommerce.”

1.1.1 Interfaces Vs. Integration

Previous efforts to provide links between dissimilar systems have typically relied on interfaces. Often these took the form of a file of data exchanged periodically, that provided details of orders placed, invoices issued, or otherwise conveyed electronically what might previously have been a faxed or mailed document.

EDI provides a standardized format for these interface files, and has been successfully used for many years. There are three main issues with EDI as it currently exists:

- EDI is usually implemented as a batch interface, meaning that a given system may only create or consume interfaces once a day.
- EDI is a rigidly fixed format, with little scope for change to suit the particular needs of a given pair of trading partners.
- EDI typically requires the use of a third party Value Added Network (VAN) to transport the documents, a service for which a charge is incurred.

The approach taken by most integration initiatives is to expose the internal processes of a business, electronically. The key is that rather than transmitting a file containing transactions, the systems of two trading partners directly interrogate each other, as part of a regular business process.

As an example, consider the placing of a purchase order by Company A with Company B. Using a file-based interface, the systems of Company A might batch together all purchase orders for Company B as part of a nightly process. This file is then sent to Company B using any of a number of means. During its nightly process, Company B retrieves the file of purchase orders and attempts to process it. Errors are either flagged for manual attention or are returned to Company A.

An integrated approach might have many more contact points between Company A and Company B. Upon receiving an order from one of its customers, or due to some other triggering event such as low inventory levels, the procurement system of Company A might interrogate Company B and other suppliers to determine availability and price. Orders would then be placed as appropriate, with assigned sales order numbers recorded immediately. All of this could take place in real time as part of Company A's order entry process.

2 Background

2.1 EDI at Univar USA

UNIVAR USA has been conducting eCommerce using EDI since 1988. During this time, we have encountered, and resolved, most of the issues involved with inter-system communications.

2.2 Web based commerce

On line order entry has been a feature of www.vwr-inc.com since early 1999, and is responsible for thousands of orders per year. In providing web-based access to our order entry systems, UNIVAR USA has learned a great deal about the functionality and infrastructure required to conduct business over the Internet. Providing web-based order entry has given flexibility to customers who desired after hours order management, or for whom the cost of an integrated approach was not justified.

2.3 Acquisition and assimilation

Just as UNIVAR USA has grown through mergers and acquisitions, it too was acquired by Royal Pakhoed in 1997. In 1999 Royal Pakhoed merged with Royal Van Ommeren to become Royal Vopak, and in 2001 we became Univar to become the North American presence of the largest chemicals logistics organization in the world. These mergers have given UNIVAR USA first hand experience of the work required to integrate the diverse systems of companies around the world.

3 Linking Businesses

3.1 Enterprise Application Integration - the foundation.

Early in our research, it became apparent that in order to proceed with meaningful integration with our trading partners, we had first to ensure that our internal systems were accessible from a unified platform. Our work here centered on the development of programmatic interfaces to our mainframe and AS/400 applications, enabled through the use of an integration broker. We have chosen, and installed, IBM's MQSeries messaging components together with MQSeries Integrator.

This infrastructure allows us to reliably co-ordinate transactions across our disparate internal systems, and provides a single integration hub for our external efforts. Future changes to our internal transaction processing systems are isolated from dependent applications by the use of an integration broker as intermediary.

3.2 The Three Elements of B2B Integration

3.2.1 Document format

The emerging reality suggests that there will be many competing "standards" for the composition of documents exchanged by trading partners. There are two fundamental aspects to a document standard: syntax and semantics. Syntax, the appearance or construction of the document, is relatively easy to establish. Initially at least, the work involved in integrating a new trading partner will be little different from what was traditionally done in EDI, and will center around the semantics - mapping of data elements from the partners standards to your own. This typically includes product code conversions, unit of measure/dimension conversions, account number conversions, and so on.

There seems to be a fundamental contradiction present between the extensible goals of XML and the establishment of standards. The rigid standards of EDI lead many implementers to "alias" data elements for other than their intended purpose, a problem for which the self-describing, extensible nature of XML was heralded as a cure.

It seems likely that one of two things will happen with XML standards: either there will be so many standards that effectively there are none, or there will be a set of relatively dominant standards that will require creative interpretation by individual implementers. Either way it seems clear that B2B adopters should assume that they will have a need to translate between a wide range of document formats.

3.2.2 Delivery

After determining what is to be exchanged, the next question is how? Probably the most generic approach is one that uses HTTPS to post a document from one system to another over the Internet. To ensure security and non-repudiation (guaranteeing who the sender of the document was) trading partners should obtain and exchange digital security certificates.

A number of alternatives exist depending on the environments and needs of trading partners. A Virtual Private Network (VPN) could be established between the networks of two companies, a leased line could be provisioned, or encrypted form of internal messaging (MQSeries for example) could be used. Sensitivity to the reliability and latency of the public Internet could well be a deciding factor.

It is our view that the method chosen to exchange documents is entirely unrelated to the format and content of the document itself. As an example, UNIVAR USA intends to continue conducting EDI business with trading partners, but will exchange EDI X12 formatted transactions over the Internet rather than a VAN, saving VAN charges.

3.2.3 Process

This is perhaps the most significant departure from the e-Commerce, EDI approach. If the full benefit of integration is to be achieved, partners will need to exchange not only a transaction, but also the details of the process that surrounds it.

As a first step, implementers must decide how much of their private process to make public to their trading partners. Historically concerns surrounding electronic commerce have stemmed from a lack of knowledge of the state of a transaction. Many buyers, for example, preferred to speak to a live representative when placing an order, as they would receive instant confirmation of the suppliers' ability to meet their needs. In batched EDI implementations it could take 24 hours, or more, before a confirmation of terms was received.

If the interaction between trading partners is to be streamlined, we must assume that less human intervention is planned, not more. This in turn suggests that communication, and management, of the state of a transaction must happen more directly than is currently the case.

As an example: if, in a traditional EDI context, an order is placed which specifies a delivery schedule which cannot be met, either manual intervention is required or a notification message must be sent. The originating party must now handle the exception and determine whether to use an alternative supplier or to accept a delayed shipment. Ideally the originator's process requirements would be sent along with the transaction document, and would detail the type and frequency of acknowledgements, along with the path to follow when a condition of the transaction cannot be met.

The full implementation of these types of shared processes is the key to realizing significant efficiency gains from B2B integration.

4 Emerging Business Models

4.1 e-Procurement Systems

Many companies are realizing significant efficiency and cost improvements for their MRO (Management Repair and Operation) expenses through the use of an e-Procurement system. These systems typically provide mechanisms to store custom catalogs from suppliers, and implement the appropriate approval and routing rules for employee purchase requisitions.

For those companies without a nationally negotiated purchasing scheme for such things as office products, car rentals, air fares, or who rely on less sophisticated approval systems – such as e-mail or paper – there is understandable appeal to these solutions. Products purchased through these packages are typically those items that corporate procurement is not involved with, and where an in-house ERP Purchase Order Processing system is not used.

Having seen some success with MRO implementations, and fearful of the perceived cost and complexity of B2B integration, many companies have started to look to these same e-Procurement systems (such as offerings from Ariba and Commerce One) to provide integration for their core industrial purchases. Often this involves their corporate purchasing agents in entering purchase orders twice, once into an ERP system, and again into an e-Procurement system. There are frequently transaction fees associated with this approach, and a strict adherence to the document standards of the solution provider is required. Integration functionality is limited to whatever the solution provider has developed within their application. It is worth noting that the cost savings and improvements in efficiency that are touted as goals for MRO purchases fall short of the standards already achieved for most industrial chemical purchases.

4.2 Markets and Exchanges

There are two primary motivations for markets and exchanges: either to facilitate the trading of goods or as an enabler of integration. Open marketplaces seem most suited to commodity products, especially those that present few logistical challenges, or where a lack of certainty about future price is not an issue.

In their role as integration enablers, marketplaces and exchanges are not very different conceptually from the Value Added Networks of EDI days. Rather than integrate with a large number of different partners, a participant need only integrate once with the marketplace or exchange, who is then responsible for securely routing transactions.

We see a couple of conflicting forces in this situation: the universe of available business transactions is relatively small, yet it is unlikely that users will bear a very high per transaction fee. This is likely to strain the ability of many fledgling marketplaces to survive, given the high capital cost of entry. Our expectation is that significant consolidation is inevitable, likely with Elemica as the sole surviving chemical marketplace, co-existing with a small number of niche market offerings.

Transaction hubs or exchanges face the same reliance on rigidly defined standards as the EDI VANs did in the past, and presumably the same challenges when the needs of participants are not met by the standards. We are already seeing Industry specific standards emerge, but that still leaves most companies dealing with a different standard for each industry that they trade with.

It is worth noting that many marketplaces include in their contracts language which grants them a transaction fee on any business generated as a result of the marketplace. It will be interesting to see how this is interpreted with regards to transactions between participants of a marketplace that are conducted via phone or fax.

4.3 Direct Trading Partner Integration

With the proliferation of competing marketplaces, and lack of widely accepted document standards, there is often no reason not to consider direct integration with a trading partner. The large number of competing marketplace initiatives means that many companies will see at best only a handful of their partners covered by any one marketplace, or exchange. As a result you may end up maintaining as many distinct marketplace connections as you have trading partners. Given the membership and transaction fees associated with these marketplaces the incentives to pursue direct integration increase.

A direct integration initiative with a trading partner also opens the door to tailoring the solution to suit the particular business needs of the relationship, something not possible when an intermediary defines document conventions.