White Paper

# FROM PAPER-INTENSIVE COMMERCE TO E-BUSINESS

## *LINKING BUSINESS ACROSS THE INFORMATION VALUE CHAIN*

OPTIO SOFTWARE
OPTIMIZING INFORMATION

# From Paper-Intensive Commerce to E-Business: Linking Business Across the Information Value Chain

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**Introduction**

The massive acceptance of the Internet as the medium of choice for global information access, electronic business transactions and delivery of e-goods and services has been a wake-up call for every business seeking to enhance their operations. Essentially, the business world and the people that staff those businesses want the best information, custom-tailored to their needs and those of their customers and trading partners, and they want it now.

The numbers speak for themselves. International Data Corporation (IDC) calculates spending on "web-enablement" at $305 billion dollars in 1999, growing to $1.5 trillion dollars by 2003. Forrester Research anticipates that business to business (B2B) e-commerce will reach $1 trillion dollars by 2003.

## The Evolving Business Continuum

The latest revolution envisions that elusive goal of a paperless world where all information, transactions, reconciliations and communications travel the ether to their ultimate goal without conforming to mundane considerations like the difference between 8.5 X 11 and A4 page formats, Postscript vs PCL, HTML vs XML, and so on. In reality, the world behaves a lot differently. Most businesses tend to be evolutionary, rather than revolutionary in nature. Business models that have been proven to work are enhanced to take advantage of new technologies, improved core processes and marketplace direction. This evolutionary approach, or Evolving Business Continuum (Figure 1) is affecting organizations on a global scale and is moving them from a world of Paper-Intensive Commerce towards a goal of e-business enablement, but balancing the need to maintain on-going commerce while extending their online reach.

As the reach of the enterprise extends towards its customers and trading partners it begins to blur the boundary between organizations. A cooperative environment is formed where each member's business rules are taken into account and information shared along the value chain is customized, optimized and shared to improve the quality of the relationship, rather than the singular benefit it might provide to an individual entity. Information may be in printed or electronic form, it may be delivered in the form of documents, labels, bar codes, fax, checks, or EDI transactions, or it could be a stream of bits representing an XML encoded purchase order destined for an e-commerce system.

To handle the complexities of information generated by the natural flow of business, specialized technologies are required. These technologies can "tap" into the information flow created by business critical documents, evaluate its content in real-time, and then custom tailor its look, feel, format and destination based on the specific needs of the recipient. Technologies such as


**Figure 1 - The Evolving Business Continuum**

data-warehousing, data-mining and reporting solutions that sift through volumes of row-column data, meet a specific but radically different business need.

In the end, E-business is still business. The most successful enterprises will seek to embrace e-business by implementing solutions that support their in-place systems and processes and naturally extend them to the growing number of best practices that have begun to emerge as they link with customers and partners across the Information Value Chain.

## Value Chains

In "Competitive Advantage – Creating and Sustaining Superior Performance" Michael Porter describes The Generic Value Chain as being comprised of primary and support activities.[1] Primary activities include:

- Inbound Logistics
- Operations
- Outbound Logistics
- Marketing & Sales
- Service

Support activities are described as:

- Firm Infrastructure
- Human Resource Management
- Technology Development
- Procurement

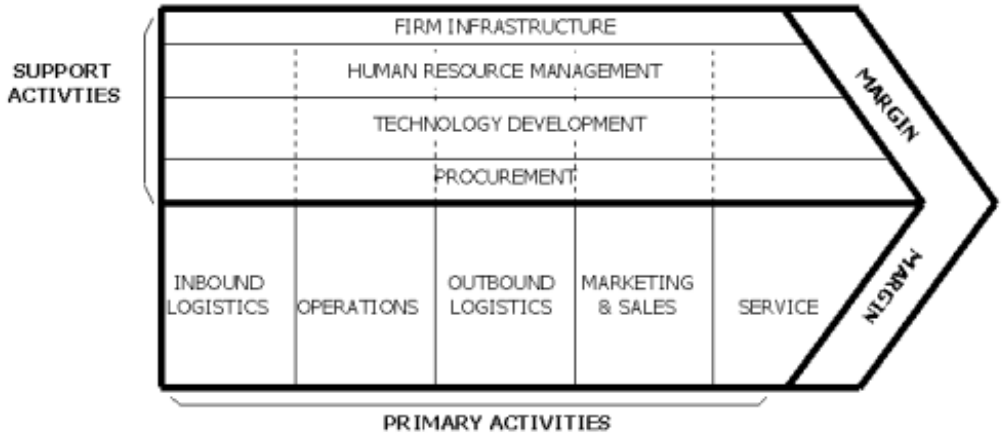


**Figure 2 - Generic Value Chain**

All of these activities can be broken down into sub-activities, projects and tasks that serve to lay out the entire operations of an organization with a focused goal on producing a product or service that provides a unique competitive advantage and a sustainable, profitable business. Each of the discrete components is charged with adding value and overall value is aggregated throughout the lifecycle of the product or service.

## The Emergence of the Extended Enterprise

In the past, application software was initially designed to meet very specific business needs. Accounting applications handled the financial needs of a company while a separate set of applications controlled the manufacturing process. Procurement and purchasing might have been a module within the accounting package, the manufacturing system or could have been a third separate application. Information was isolated within these applications and was not easily shared among systems. Raw data that referred to the same piece of information might have

been defined inconsistently. A large enterprise could easily have ten or more discrete systems running that were incapable of communicating with each other. So, while the enterprise might have been focused on designing a compelling product, producing it in sufficient quantity and then distributing it efficiently to a well serviced consumer base, the IT systems they utilized to automate operations were actually counterproductive to any attempt in establishing a "value chain".

The emergence of Enterprise Resource Planning (ERP) systems promised to deliver broad-based applications that unified all business functions extending from the Front Office through Manufacturing to the Back Office. Data had integrity throughout the system. A Customer Master Record meant the same thing to sales as it did to manufacturing as it did to accounting. This high level of consistency and end-to-end integration came at a high price in terms of implementation but for large, multinational entities was often worth the expense when based on a multi-year ROI. Vertical market applications offered varying degrees of end-to-end integration but added modules and levels of functionality that included subject matter expertise that was tuned to the specific industry served.

Since 1997, the widespread acceptance of the Internet has placed a new set of demands on the enterprise. Originally conceived as a virtualized community for information exchange and access, it has emerged as a medium for global commerce and a backbone for instantaneous communications. Business models that only support the concept of standalone entities with fixed boundaries are being challenged and the ERP market is being pushed towards a second wave. The Gartner Group refers to this second wave as "C-Commerce" (Collaborative Commerce) and AMR has designated it as "Business Community Integration". These terms refer to the intersection of ERP, CRM, Supply Chain and an Internet-enabled transactional backbone that promotes seamless interaction between trading partners. The mid-90's concept of the Enterprise is being altered significantly and the new "Extended Enterprise" is emerging.

## The Information Value Chain

The goal of any value chain initiative is to link together a series of inputs from both inside and outside of an organization and apply those inputs to increase margins and competitive advantage. These inputs can be used to improve a product offering or to improve the core processes of a company resulting in an overall increase in operating efficiency.

The Information Value Chain (IVC) extends the generic value chain by introducing several concepts:

1. Unlike Data-Mining that focuses on retrieving "after the fact" information from structured datastores, IVC inputs are derived by monitoring the core processes and events of an organization and using them as trigger points to obtain business critical information.
2. Information received and processed in this way is more dynamic and can contain data that will not be found in a database. For example, a Y2K solution that depends on application logic to correct date information will appear correctly in the information stream but not in the datastore.
3. Business rules are applied to the information in real-time, highly customizing it to serve specific needs.
4. Customized information is securely routed to any one of a number of digital destinations within the enterprise or to any number of customers or trading partners.
5. Information must be presented in a format that is determined by the specific type of destination served (printer, fax, e-mail, web browser, external system) with complete fidelity.
6. The originating party in the IVC can recognize a business benefit (enhanced value) from the process as can the downstream recipients of the customized information.

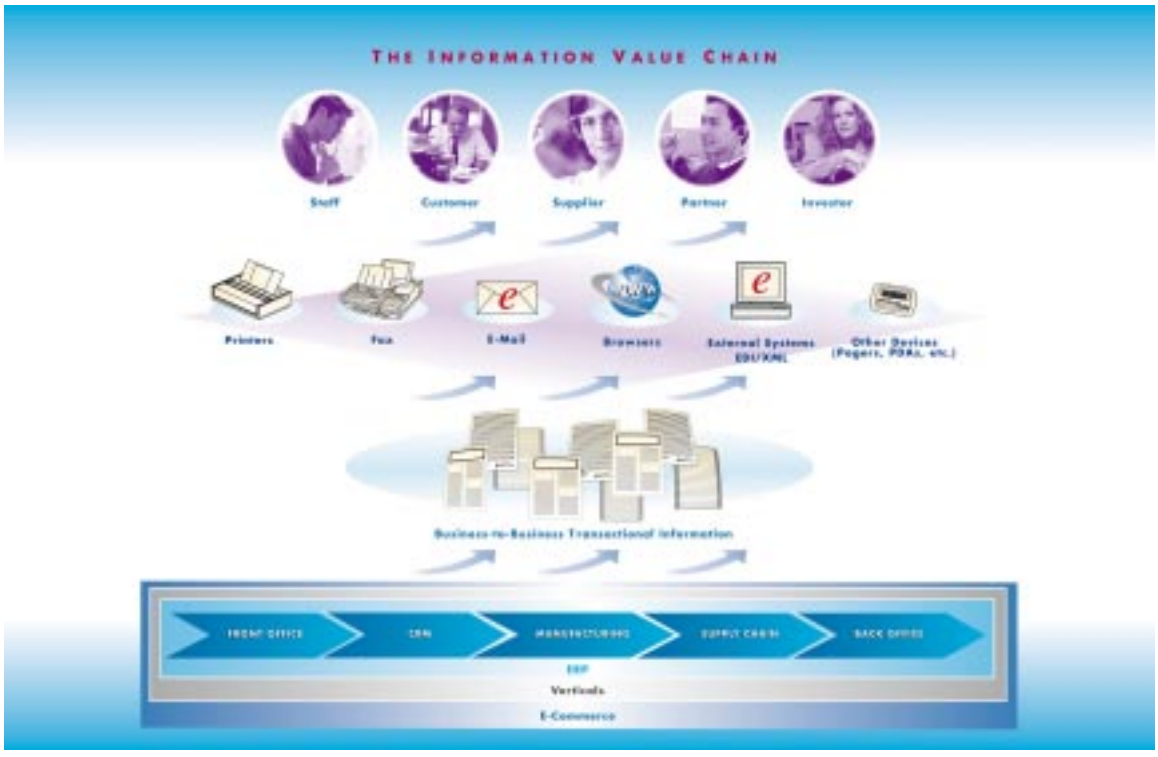


**Figure 3 - The Information Value Chain**

In the Information Value Chain diagram (Figure 3) information moves through an enterprise based on what core processes are being performed. These core processes (Sales, Procurement, Distribution, etc.) culminate in activities that produce a significant amount of information contained in standard business critical documents like invoices, purchases orders, statements, checks and the like. In most enterprise applications, these documents are simply routed to an output device and generated as printed output with little thought given as to how the content can be optimized and used more productively.

> *"Enterprises have discovered that the capability of their ERP system to create and manage output effectively is often limited and will not meet the needs of the enterprise. Issues arise when enterprises realize that the output an ERP system can generate is often limited to simple, fixed-font text documents that often are unappealing. While this is acceptable for standard reports, other output (e.g., purchase orders, shipping labels) require unique fonts and formatting."* [2]

This observation just scratches the surface of the business problem. The information generated by the buyside / sellside activity of an organization has much broader applicability than simply producing a series of invoices or purchase orders.

### Producing Highly Customized Information to Link Trading Partners

In a trading partner relationship, the buyer and seller exchange information relative to product requirements, credit worthiness and payment terms, technical specifications, shipping information, etc. (Figure 4) In Paper-Intensive Commerce, a request for proposal (RFP) is answered with a formal proposal, that is used as a basis for negotiations and finally accepted. The procurement process continues with the buyer issuing a purchase order which is received by the seller who then ships the ordered goods and issues an invoice, and so on. B2B E-Commerce seeks to automate this process by opening up the bid / offer process to large communities of interest, managing repositories of trading partner rules and providing "best available" pricing due to open competition. In either case, optimized information exchange among the parties is key.

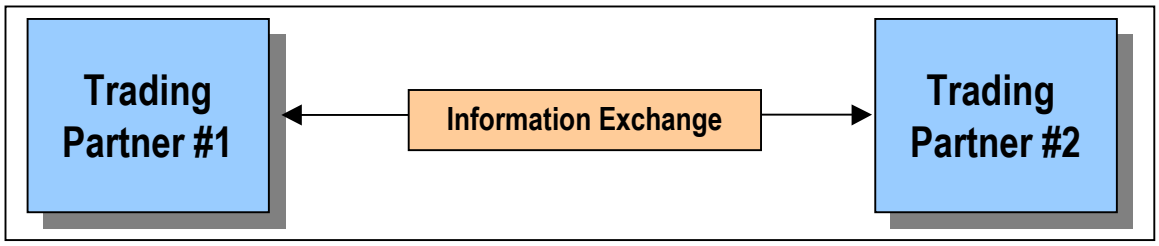


**Figure 4**

In some cases a manufacturer may deal with tens of thousands of distributors or buyers who have unique requirements in each of these areas. To achieve economies of scale and make the overall process manageable, it is essential that trading partner information can be highly customized according to business rules and then routed to the trading partner in the proper format and to the correct location. In addition, any solution or technology needs to be implemented with minimal disruption to existing business processes.

## Tap Into the Information Flow

To meet the business requirements detailed above requires an application server that:

- Appears as a "virtual" trading partner or digital entity,
- Taps directly into the information flow generated by B2B transactions,
- Recognizes the nature and rules of the trading partner relationship,
- Customizes the information based on these rules,
- If necessary, acquires supplementary information from additional sources,
- Selects the proper format for the information and transforms it correctly, and
- Routes it to the appropriate digital destination within the enterprise or to a trading partner's domain.

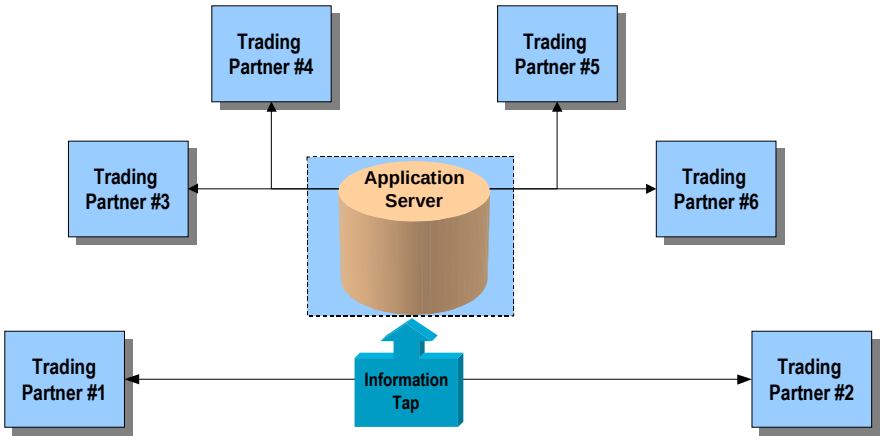


**Figure 5 – Tapping into the Information Flow**

The application server also must be able to provide high levels of accurate throughput (documents / pages / information sets per hour), scale to meet the needs of the largest extended enterprise and manage hundreds or thousands of unique trading partner requirements in real-time.

In Figure 5, the application server is tapped into the information flow created by B2B transactions. Its presence is entirely transparent to the information flow and non-disruptive to the business process. To the information flow, it appears as a virtual device or trading partner. With this minimally invasive approach, the application server can evaluate the B2B information based on business rules and provide connectivity to a network of trading partners without having to re-engineer the application generating the information or the business process that produced it.

## Reaching A Global Network of Digital Destinations

Once in place the application server "listens" for information that meets predetermined criteria. For example, a single information flow can trigger the application server to evaluate the information in a purchase requisition and then customize it for delivery to multiple trading partners all in the correct format and tuned to the particular digital destination (Internet, XML document, printer, fax, etc.).

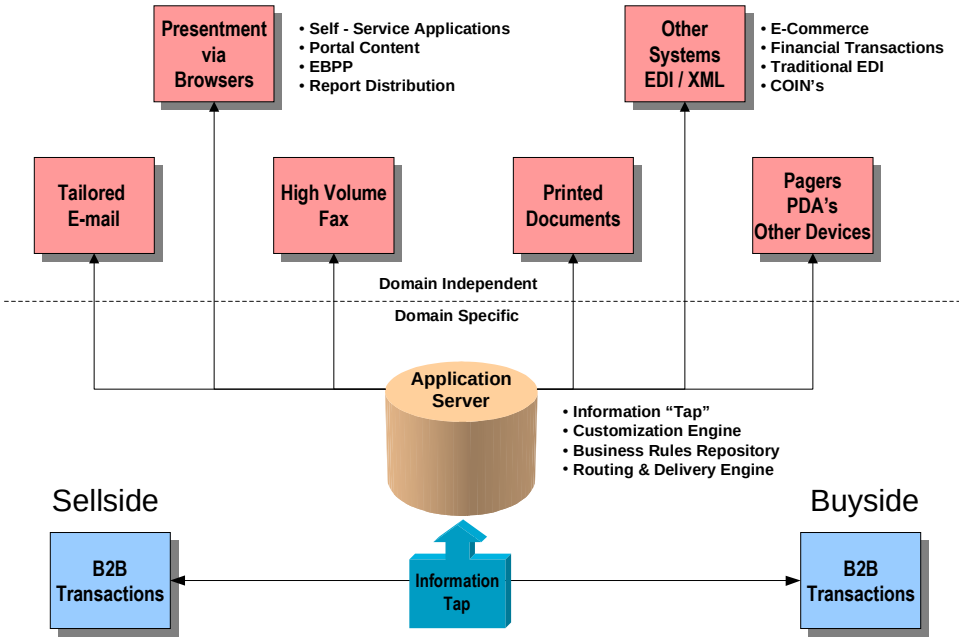


**Figure 6 – Serving a Network of Digital Destinations**

In traditional business models most transactions are singular in scope, point-to-point in nature and highly domain specific. A vendor creates an invoice, produces hard copy and then mails the invoice (as a record of the transaction) to the buyer. The information leaves the domain of the vendor and arrives at the buyer's domain with the help of the US Post Office, an alternative delivery service or, perhaps, a fax machine. This process is repeated for every transaction recorded and the result of the transaction is stored in an application database for processing and analysis at a later date.

On any given day, an organization involved in B2B commerce might buy (or sell) a high volume of goods or services. Without the assistance of the appropriate technology, individually tailoring information to meet the requirements of any one trading partner, as well as, reprocess the recorded data is extremely time consuming and inefficient. Figure 6 illustrates the practical application of technology to highly customize and deliver information across the domains of trading partners.

Let's assume that the sellside vendor is producing a series of invoices. From this one flow of information all of the following activities can take place:

1) Traditional invoices can be formatted and routed to printers for hard copy output.
2) External databases can be referenced and if a valid fax number is available the invoice can be electronically faxed to the sellside trading partner.
3) All of the day's sales activities can be summarized and then e-mailed to sales management who are away from the office but accessing their email server from their hotel rooms.
4) Large volume purchases or key account commitments can be flagged and account executives or managers can receive alerts via pager or wireless PDA.
5) Invoices can be routed to a secure web server, email alerts can be sent to the buyside partner who can then securely access the server and view their invoices and statements via their web browser. This forms the basis for an Electronic Bill Presentment system and facilitates customer self-service.
6) Report distribution can be automated by publishing to a web server and then alerting internal staff via email.
7) Information can be transformed into XML documents or EDI streams and then presented to external systems to fully automate process between partners.

Of particular note is that all of this customization, routing and notification is accomplished from the information flow that naturally occurs as a part of the procurement process between trading partners. The partners core processes have not been significantly altered and business process

disruption is kept to a minimum. The high degree of transparency this approach delivers also keeps employee retraining to a minimum.

## Conclusion

Companies seeking to optimize the information flow within their own organization and use it to extend their reach to embrace their trading partners' e-business models would be well served to set their sights on using this approach to Link Business Across the Information Value Chain.

[1] Pg 37 Competitive Advantage – Creating and Sustaining Competitive Advantage – Michael Porter © 1985
[2] DOM Solves ERP's Dirty Little Secret: Poor Output - J. Lundy – Gartner Group © 1999