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DEPARTMENT OF SUPPLY CHAIN AND INFORMATION SYSTEMS

SUPPLY CHAIN INTEGRATION: E-business Transformation of supply chains

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Abstract

A combination of economic, technological and market forces have compelled companies to examine and reinvent their supply chain strategies. Remaining competitive in the face of the increasing globalization of businesses, the proliferation of product variety, the increasing complexity of supply networks, and the shortening of the product life cycles requires greater coordination and collaboration among supply chain partners using an approach known as “supply chain integration.” (Lee)

Changes in integration of supply chains create a strategic alignment of partners so that the requirement of providing the right material, at the right price, at the right time is fully met. This integration should also reduce the amount of waste and delay across the chain.

Applying internet technologies, high performing companies consistently practice sharing forecasts and replenishment plans with customers, suppliers, and logistics providers. “Vendor/Supplier Portals” are password protected websites that provide instant access to the right information from anywhere in the world. These portals provide complete, twenty-four hours a day access to collaborative tools with just an internet connection. They allow a company’s employees, vendors and suppliers access to the most reliable, accurate, and up-to-date information. Information contained in a system allows communication to be directed at the correct audience, in the correct way. Supplier/Vendor Portals enable manufacturers to improve communication and collaboration with supply chain partners by providing both supplier and buyer a single, shared view of data.

Benefits of Supplier/Vendor Portals include: process automation, collaboration, visibility, communication, status overviews and collaborative order management. Portals enhance supplier ability to satisfy demand more effectively by streamlining shipping and materials receipts, materials management, electronic kanban signals, encouraging broader supplier enablement.

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Introduction

Over the past decade, a combination of economic, technological and market forces have compelled companies to examine and reinvent their supply chain strategies. Remaining competitive in the face of the increasing globalization of businesses, the proliferation of product variety, the increasing complexity of supply networks, and the shortening of the product life cycles requires greater coordination and collaboration among supply chain partners using an approach known as “supply chain integration (Lee).”

In the past, the relationship between suppliers, vendors, and customers involved little more than contacting each other to perform a series of simple transactions or trades with just a single point of contact between one individual on each side. All communication took place between these people, even if the customer’s or supplier’s organization contained many departments, and functional requirements (e.g., distribution, sales, quality, and finance).

Traditionally, suppliers, buyers and most supply chains prepared independent demand forecasts. Often, however, suppliers have limited knowledge of the buyer’s markets while buyers lack the supplier’s broad view of product categories and market insights or its requirements for production and capacity planning.

Today the supply chains of global corporations consist of multiple enterprises located around the world. These enterprises perform a wide variety of supply chain activities including order fulfillment, international procurement, and acquisition of new information technology and customer service. Relationships have become complex. Multiple suppliers serve multiple customers. A supplier may be a customer at one level in the chain and even a competitor at another level. This complexity explains why supply chains are sometimes referred to as “supply networks.” Because of the network complexity, communication between entities and the accurate and timely transfer of information can be extremely difficult. In particular, the multiple layers in

a supply chain can distort demand information. This distortion leads to excessive inventory, idle capacity, high manufacturing and transportation costs and increasingly dissatisfied customers.

The strategic importance of a company's supply chain cannot be overemphasized. From suppliers' suppliers to customers' customers, the ultimate objective is to satisfy the needs of the customer, whether people, systems, or processes and retain them over a long period of time. In order to do so, companies must integrate upwards and downwards in their supply chains and relationships must become deeper and wider than the traditional "arms length" supplier-customer relationship.

A supplier typically has very deep and detailed information regarding its products and markets. This information often includes valuable information on customer best practices across a range of non-competing customers. In good times, when demand is strong, customers can achieve satisfactory levels of sales using routine product and market information traditionally provided by suppliers. In difficult times, however, customers need more and better information and efficiency if they are to stay ahead of their competition.

The problem is two-fold. First, customer-supplier relationships are often adverse, and second customers may not know what helpful information the supplier has within its organization. Even within the supplier's own organization information may be "buried" and not readily available to its sales and marketing managers who normally interface with customers. There is great value for a supplier to approach its good customers with the proposition that both have a lot to gain if they collaborate. Often it quickly becomes apparent to the customer that the supplier has detailed information that can fundamentally change and improve the customer's business practices. For example, a supplier can work with its customer to create special catalogs and customer intranet websites which focus on helping the customer's customers select the right products for particular applications. This collaboration offers tremendous value for the ultimate consumers, and can result in large sales increases through the whole channel (Byrnes).

The latest economic crisis has caused the failure of thousands of suppliers, and cast doubt on the financial viability of the survivors. Companies are now scrambling to identify alternative sources of supply, while spending significant amounts of time and money in order to get a better handle on supplier stability. One clear lesson learned by one supply-chain manager in recent months is as follows: "I've got to get better real-time visibility into my supply chain in order to manage the risk that is there" (Bowman). The optimum level of supply chain integration can be

best achieved by adopting an e-business approach particularly with the use of Supplier/Vendor portals to supply chain management.

Chapter 1

Supply Chain Integration

1.1 A Lack of Integration in the Supply Chain

Many supply chains do not perform as expected because manufacturers and their suppliers are disconnected. Changes in supply and demand are often slow to filter among all partners in the supply chain. This forces manufacturers to expedite supply orders and carry excess inventory, while suppliers struggle constantly to adjust production to changing demands from the manufacturers, causing costs to skyrocket. The integration of the supply chain creates a strategic alignment of partners so that the requirement of providing the right material, at the right price, at the right time is fully met. This integration should also reduce the amount of waste and delay across the chain.

1.2 Elements of an Integrated Supply Chain

There are four key dimensions to an integrated supply chain:

1. Information integration
2. Planning synchronization
3. Workflow coordination
4. New Business Models

Figure 1. Supply Chain Integration Dimensions (Lee)

<i>Dimension</i>	<i>Elements</i>	<i>Benefits</i>
Information Integration	<ul style="list-style-type: none"> ▪ Information sharing & transparency ▪ Direct & real-time accessibility 	<ul style="list-style-type: none"> ▪ Reduced bullwhip effect ▪ Early problem detection ▪ Faster response ▪ Trust building
Synchronized Planning	<ul style="list-style-type: none"> ▪ Collaborative planning, forecasting & replenishment ▪ Joint design 	<ul style="list-style-type: none"> ▪ Reduced bullwhip effect ▪ Lower cost ▪ Optimized capacity utilization ▪ Improved service
Workflow Coordination	<ul style="list-style-type: none"> ▪ Coordinated production planning & operations, procurement, order processing, engineering change & design ▪ Integrated, automated business processes 	<ul style="list-style-type: none"> ▪ Efficiency & accuracy gains ▪ Fast response ▪ Improved service ▪ Earlier time to market ▪ Expanded network
New Business Models	<ul style="list-style-type: none"> ▪ Virtual resources ▪ Logistics restructuring ▪ Mass customization ▪ New services ▪ Click-and-mortar models 	<ul style="list-style-type: none"> ▪ Better asset utilization ▪ Higher efficiency ▪ Penetrate new markets ▪ Create new products

Figure 1 displays elements and benefits of the four key supply chain integration dimensions.

1.2.1 Information Integration or “Linkage”

Information integration is the foundation of supply chain integration. Information integration or “linkage” refers to the communication and sharing of information needed for planning and decision-making, and the interaction of people involved in planning and decision-making. Some examples include: demand data, inventory status, capacity plans, production schedules, promotion plans, and shipment schedules. Ideally, such information can be accessible by the appropriate parties on a real-time, on-line basis without significant effort.

Linkage ensures that the information necessary for decision-making is available, that different functions and entities in the supply chain are working with the same data as decisions are made and that decisions are consistent and focused on meeting customer expectations. For companies across a supply chain to coordinate their products, financial and information flows, each must have access to accurate and timely information reflecting the status of their supply chain.

1.2.1.1 Information Integration: Countering the Bullwhip Effect

Information sharing is the most effective way to counter the problem of demand distortion in a supply chain known as the “bullwhip effect.” Refer to Figure 1 for an illustration

of the bullwhip effect. In an ideal situation, a downstream site could share the sales information of its customers or its customers' customers with an upstream site. The greater the extent of information sharing, the less potential for the harmful bullwhip effect.

Information distortion often arises when partners make use of local information to make demand forecasts and pass them to upstream partners; partners making ordering decisions based on local economic factors, local constraints or performance measures; and gaming behaviors to exaggerate orders when there are perceived uncertainties in supply conditions. These distortions are amplified from one level to another in a supply chain, and are considered to be one of the biggest causes of inefficiencies in a supply chain.

Figure 2. Information Distortion and The Bullwhip Effect (Lee)

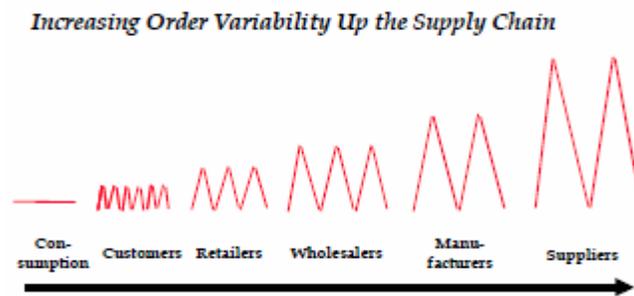


Figure 2 demonstrates the progression of the bullwhip effect throughout the supply chain.

One way to counter the bullwhip effect is to have transparency of demand information. In the grocery industry, for example, such transparency is considered to be the cornerstone of supply chain integration, and is a key ingredient of “Efficient Consumer Response,” a movement towards total supply chain integration in that industry. If each organization involved in the chain looks only at its own operations, the boundaries do exist and the result is an inefficient movement of materials at a higher cost. If everybody in a company can rapidly grasp what they have to do, they are more likely to get the job done. The capability for all appropriate parties in a supply chain to have access to shared information, such as demand information, inventory status, capacity plans, production schedules, promotion plans, demand forecasts, and shipment schedules on a real-time basis without significant effort is key to improving supply chain performance.

1.2.2 Planning Synchronization

Planning synchronization refers to the joint design and execution of plans for product introduction, forecasting and replenishment. Once supply chain members agree to share information, the next logical step is to agree on what to do with it. Planning synchronization defines what is to be done with the information that is shared. It is the mutual agreement among members as to specific actions based on that information. Members in a supply chain may coordinate their order fulfillment plans so that all replenishments are made to meet the ultimate customer demands. This synchronization has a significant effect on profitability as shown in Figure 3.

Figure 3. Company Profitability vs. Joint Planning (Lee)

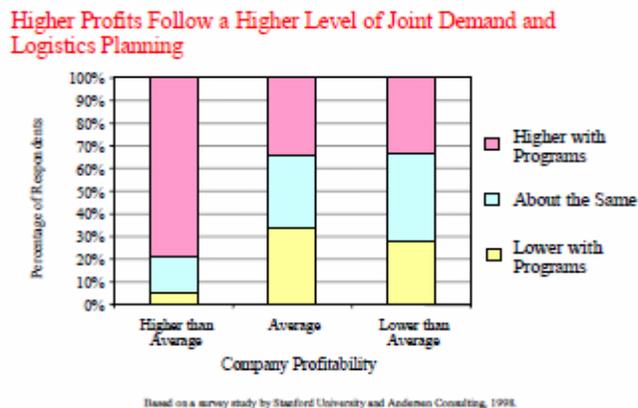


Figure 3 shows the positive relationship between profitability and collaboration between supply chain partners. Higher levels of collaboration lead to higher profits.

1.2.3 Workflow Coordination

Workflow coordination refers to the streamlining and automation of workflow activities among supply chain partners. In this part of the process the parties specify how to use the information gathered to change the manufacturing process. For example, procurement activities from a manufacturer to a supplier can be tightly integrated so that efficiencies in terms of accuracy, time, and cost, can be achieved. Product development activities involving multiple companies can also be integrated to achieve similar efficiencies. In the best-case situation,

supply chain partners would rely on technology solutions to automate many or all of the internal and cross-company workflow steps.

1.3 New Business Process Automation

Portals enable a new group of business processes, such as strategic sourcing collaborative design and demand planning, to be automated. Historically, these processes occurred over the phone, via e-mail correspondence or in face-to-face meetings. Due to their complex nature these supply chain practices were too sophisticated to automate through machine-to-machine transactions. By moving these processes on-line, portals reduced not only the cost of these transactions, but the latency of information sharing and the barriers to adoption.

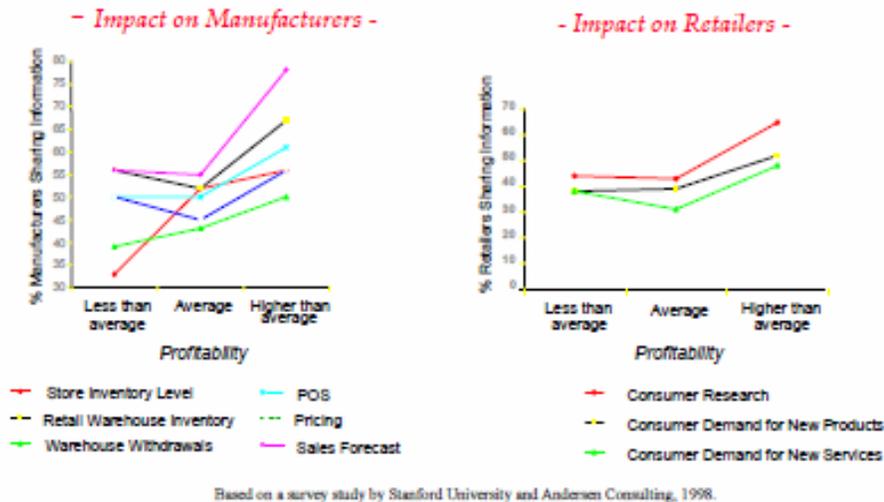
Adopting e-business approaches to supply chain integration promises more than just incremental improvements in efficiency. Many companies are discovering whole new approaches to conducting business, and even new business opportunities not previously possible.

1.4 Benefits of an Integrated Supply Chain

A truly integrated supply chain does more than reduce costs. It also creates value for the company, its supply chain partners, and its shareholders. Supply chain integration creates profits, increases market share, strengthens competitive position, and enhances the value of the company. Large, global corporations such as Dell, Inc., Lucent, Wal-Mart, Procter & Gamble, and Sun Microsystems have demonstrated that significant value can be created through supply chain integration (Fugate). Small and medium-size companies can achieve such value, too. Integration affects both manufacturers, suppliers, and retailers significantly as depicted in Figure 4.

According to AMR Research, companies that forecast demand accurately have 15% less inventory and 17% better perfect order ratings (Hofman). Companies with a higher perfect order tend to have higher earnings per share, better ROA and larger profit margins. A 10% increase in perfect order rating correlates with a 50% increase in earnings per share (Hofman). A 5% increase in perfect order rating point's correlates with a 2.5% increase in ROA. Even a 3% increase results in a 35% shorter cash to cash cycle versus peers (Hofman).

Figure 4. The Effects of Information Sharing on Manufactures and Retailers
Higher Profits Linked with Higher Level of Information Sharing



1.4 Integration Leaders

Dell, Inc. leverages partners by linking supplier planning and execution activities with Dells's systems. (Fugate) They use information technology to gather and share a constant stream of data on supply and demand trends. On the supply side, Dell gathers real time information about inventory levels of suppliers at various positions in the supply chain. Suppliers share information such as capacity outlooks and new technology drivers. In return, Dell provides signals to suppliers of customer demand and shares current and projected market shifts and sourcing strategies. Visibility up and down supply chain allows Dell to manage demand in real time and has resulted in a return on assets that is six times the level of Dell's competitors. (2004)

Sport Obermeyer worked to tightly integrate its overseas manufacturing bases with its customers and retailers. The effort resulted in a 60% increase in profits and a top ranking in customer satisfaction surveys for several consecutive years (Fugate).

National Bicycle, a Japanese bicycle manufacturer, applied innovative supply chain integration strategies to create a new product and penetrate market segments that no one else in

its market was able to do. The result was a doubling of its market share in a matter of years.
(Fugate)

Chapter 2

Technology to Support Integration

2.1 The Role of the Internet in Supply Chain Integration

Information technology, and in particular the internet, plays a key role in furthering the goals of supply chain integration. The terms “Supply Chain Integration” and “E-Business” can be used to describe the adoption of the internet to accelerate the goal of supply chain integration. In this context, e-business specifically refers to the planning and execution of the front-end and back-end operations in a supply chain using the internet. The internet has proven to be an ideal platform for information sharing because it is open, standards-based, widely available, and low cost. Businesses can use the internet to gain global visibility across their extended network of trading partners. In addition, it helps companies respond quickly to changing business conditions such as customer demand and resource availability. Internet integration solutions enable companies to reduce operational costs and increase efficiency by automating the entire indirect goods and services supply chain (Fugate).

To synchronize supply with demand, companies must pass forecast and order information on to suppliers, strengthen and automate business processes, and coordinate the complex flow of materials from suppliers to facilities. Using internet technologies high performing companies consistently practice sharing forecasts and replenishment plans with customers, suppliers, and logistics providers. Top performers increase the flow of information through a network of trading partners. All parties have visibility into demand signals as early as possible.

A research study done in 2008 by Aberdeen, a Harte-Hanks Company (NYSE: HHS), of 349 companies showed that visibility into inventory, supplier and order events, and trade documents, among other milestones, helps companies make their supply chain execution processes more flexible and responsive (Visibility):

Visibility-empowered supply chain managers can be more flexible in performing the necessary “agility actions” -- such as shipment re-routing due to demand changes or infrastructure disruptions, expedited shipping of late shipments, cross-docking and distribution center by-pass strategies, vendor-managed inventory programs and more. Aberdeen (Visibility)

It essentially becomes a team effort, instead of disjointed pieces trying to connect.

Managers concentrating on getting real-time visibility of inventory are using supporting technologies to provide their underlying systems with constant updates, and relying on those systems to integrate and manage the data to improve operational flow in directing fulfillment activities (Pezza, Scott. Warehouse Management: Success). While the most visible effect of the internet has been in the emergence of electronic commerce as a new retail channel, it is likely that the internet will have an even more profound impact on business-to-business interaction, especially in the area of supply chain integration (Pezza, Scott. Warehouse Management: Success). Refer to Figure 5 below for the impacts on integration.

Figure 5 E-Business Impacts on Integration

Examples of E-Business Impacts on Supply Chain Integration and Business Processes

<i>Dimensions of SC Integration</i>	<i>Business Processes</i>			
	<i>Procurement</i>	<i>Order Fulfillment</i>	<i>Product Design</i>	<i>Post-Sales Support</i>
<i>Information Integration</i>	Supplier information sharing	Information sharing across the supply chain	Design data sharing, product change plan sharing	Customer usage data linkages
<i>Planning Synchronization</i>	Coordinated replenishment	Collaborative planning and coordination, demand and supply management	Synchronized new product introduction and rollover plans	Service supply chain planning coordination
<i>Workflow Coordination</i>	Paperless procurement, auctions, auto-replenishment, auto-payment	Workflow automation with contract manufacturers or logistics providers, replenishment services.	Product change management automation, collaborative design	Auto-replenishment of consumables
<i>New Business Models</i>	Market exchanges, auctions, secondary markets	Click-and-mortar models, supply chain restructuring, market intelligence & demand management	Mass customization, new service offerings	Remote sensing & diagnosis, auto-test, downloadable upgrades
<i>Monitoring and Measurement</i>	Contract agreement compliance monitoring	Logistics tracking, order monitoring	Project monitoring	Performance measurement and tracking

Figure 5 lists the dimensions of supply chain integration and how e-business affects them.

The internet can redefine how back-end operations, such as product design and development, procurement, production, inventory, distribution, after-sales service support, and even marketing, are conducted, and in the process alter the roles and relationships of various parties, leading to new supply networks, services and business models.

2.2 Supplier/Vendor Portals

Technology is an obvious choice for companies looking to get closer to their suppliers and to integrate supply chains in the process. There is easier, more efficient place to conduct buyer-supplier relationships than on the internet. “Vendor/Supplier Portals” are password protected websites that provide instant access to information from anywhere in the world. These portals provide complete twenty-four hours a day access to collaborative tools with just an internet connection. They allow a company’s employees, vendors and suppliers access to the most reliable, accurate, and up-to-date information. A portal is primarily used to publish information for businesses working together, to display and capture forms information, to replace processing of paper forms, and to automate business-to-business transactions between partners. Information contained in a system allows communication to be directed at the correct audience, in the correct way. The portal serves as a central trade and logistics hub, collecting information from the time that purchase orders are cut, through delivery and final payment. All supply chain partners use the same system to manage multiple consumer orders, print compliant packing labels and gain access to new finance mechanisms. The resulting visibility enables the two parties to collaborate on corrective actions to improve overall supply chain performance.

Portals can accept various electronic files, in multiple formats. This streamlines vendor relation activities, and reduces supplier calls, as it promotes vendor self-service. In addition, a portal allows vendors to access a "real-time" view of their invoice and payment related activities, and enables vendors to track invoices through the entire approval and payment cycle. All of this leads to reduced costs and a more efficient transaction processing operation (Gifford).

2.3 Benefits of Using Supplier/Vendor Portals to Further Supply Chain Integration

Supplier/Vendor Portal enables manufacturers to improve communication and collaboration with supply chain partners by providing several capabilities. Portals provide both supplier and buyer a single, shared view of data. Historically, personnel from buyer and the supplier each viewed data in their own business applications which were more often than not out of sync. Supplier/Vendor Portals can usually support all classic requirement processes. These include delivery instructions (where customers inform their suppliers of planned net requirements based on a general agreement), called deliveries (where customers can order a specific quantity of goods to be delivered at a specific time based on a delivery instruction) and individual orders (where customers can efficiently deal with all non-standard requirements). Manufacturers can view order confirmations, the latest status of any shipment and add and view notes. Suppliers can search for shipments, accept or cancel orders, order cancel notices, confirm order for delivery to manufacturer, split deliveries, create pack slips, confirm ship, update and maintain user profiles and add and view notes. These abilities reduce transaction costs as all order data are automatically transferred from a company's internal systems to their suppliers. The fact that the data are transferred electronically makes the process even more reliable.

Portals create a central data pool for managing all supplier master data on a centralized basis. This data can then be accessed by all members of staff throughout the world. All data for an entire company can be stored at a central point, can be called up using an automated process and can be updated by suppliers themselves. As a result, suppliers and customers save a great deal of time when searching for and maintaining master data. There is also a benefit from having up-to-the-minute data, and avoiding doing the same work twice. Supplier/vendor portals enable manufacturers to collaborate with suppliers to ensure they receive materials needed to fulfill customer demand. The portal is populated with information from a manufacturer's production plans, which provides suppliers with visibility into required items and dates.

Portals offer access to a buyer's Enterprise Resource Planning ("ERP") system. Inquiries that would have been conducted by phone tag can instead be performed with just a few mouse clicks. For example, a high percentage of the call volume to accounts payable organizations comes from collections personnel in the supplier organization attempting to determine when an invoice will be paid. Portals offer the ability for suppliers to perform self-service inquiries online whenever they need to know the status of an expected payment. The benefits of self-

service are--as the name implies--that customer service agents do not have to be involved, resulting in a 97% savings per customer interaction, according to a widely cited Forrester report. (53) Studies have shown that accounts payable staff can spend up to 30% of their time dealing with basic supplier inquiries such as payment status (Keifer). Suppliers can inquire online in real time regarding invoice status, purchase order and payment details. This eliminates the need for suppliers to wait for someone to respond to an email or phone call, saving a lot of cycle times to get basic status information.

As a project for the Smeal College Center for Supply Chain Research, I researched multiple portal vendors to examine their features, pros and cons. Refer to the Appendix to review the research on Ariba Supplier Network, Direct Commerce, E2Open, Hubwoo, ICG Commerce, J.P. Morgan/Xign, SAP, and Vinimaya.

2.3.1 Process Automation

The use of portals automates and optimizes buyer-supplier interaction, thus reducing the burden on both the supplier and the buyer. Both benefit from easy and enhanced access, increased visibility into the payment process and better communication. Portals support the seamless integration of financial processes and eliminate the risk of errors which occur when collecting data manually.

2.3.1.1 Reduce AP Process Costs of Invoice Capture/Entry and Supplier Interaction

An efficient Accounts Payable (AP) process minimizes the clerical work associated with invoice capture and entry. Buyer-supplier communication enhanced by the use of portals improves invoice flow and reduces cycle times. Thus, customers can avoid late payment penalties, capture more early payment discounts, and manage cash more efficiently. Companies receive invoices immediately and accurately, eliminating paper transmission delays and errors. This real time collaboration means disputes and discrepancies are resolved quickly.

Accounts Payable service levels and costs are also impacted by supplier inquiries regarding invoice receipt, expected payment date, changes to account information, and more. A self-service AP portal for suppliers increases Finance productivity and supplier satisfaction. Reducing invoice capture and entry costs, further decreases costs by automating routine

inquiries, facilitating communication, and providing self-service maintenance of supplier account information.

2.3.1.2 Automate Invoice Submission

Invoices submitted through a portal significantly reduce costs for suppliers and buyers. Suppliers eliminate the costs, labor and delays associated with invoice printing and mailing. Suppliers also eliminate the risk of payment delays due to lags in invoice receipt. And suppliers can be sure that their primary objective has been achieved: immediate, confirmed receipt of their invoices by the buyer. Buyers eliminate mailroom costs of invoice receipt, handling, sorting and scanning. As an added benefit, both supplier and buyer achieve increased invoice accuracy while reducing their impact on the environment.

2.3.1.3 Purchase Order Flip

Suppliers can transform Purchase Orders (POs) into invoices by using data drawn directly from buyers' PO's. It eliminates the need for AP to key invoices manually and lets suppliers generate more accurate invoices, saving time and money for buyers.

2.3.1.4 Alert Management

Portals can automatically inform users of any imminent critical situations and identify where the problem lies, for example if stock falls below a minimum level or a delivery is subject to a delay. The alert monitor also shows when new information is received. The quantity and type of information to be shown can be configured to suit needs of the user. Users can be sure that they are kept informed of important developments. For example, a supplier or customer can arrange to be notified automatically whenever a bottleneck is imminent, giving them the ability to adjust and concentrate on value-adding activities. A performance dashboard indicates the status of critical activities on open orders, including overdue shipments and allows users to access details and determine the proper action needed.

2.3.1.5 Change Management

Change Management via portals automates the exchange of standards, technical drawings or specifications. Exchanging documents in a structured, automated fashion, reduces administrative outlay and lowers process costs. Links to documents can easily be set up when dealing with requests for quotations. If changes are made to a document, automatically notifies all suppliers to whom this document is relevant. This saves the labor intensive task of repeatedly exchanging documents. A special workflow ensures that your suppliers then confirm receipt, ensuring a higher level of security.

2.3.2 Streamline Shipping and Material Management

Manufacturers can control supplier shipments and material receipts more effectively with centrally managed pack slips. The solution allows suppliers to create pack slips and upload them into the portal. Suppliers then access, download and print the pack slips. To confirm an order line item has shipped, suppliers update the portal with actual shipment date, expected arrival date, carrier and Bill of Lading number. Manufacturers can also use the portal to execute spot buys for critical orders.

Supplier Portals help manufacturers and their suppliers streamline shipping and materials receipts in a number of ways:

1. Eliminate discrepancies between ordered and received items
2. Prevent early shipments from suppliers
3. Reduce excess inventory levels
4. Eliminate unexpected receipts, such as late, partial and unknown shipments
5. Accelerate material receipt processes
6. Eliminate material receipt data entry errors

2.3.2.1 Satisfy Demand More Effectively

Suppliers can split an order to satisfy demand by delivering a partial order immediately and then providing the balance at a later date. Manufacturers instantly see this and are able to incorporate it into production plans.

2.3.2.2 Kanban Signals

A Kanban system allows a business to call up goods from suppliers according to actual consumption. A Kanban signal is automatically triggered as soon as a container is empty and immediately informs the supplier that the next delivery is due. As goods are replenished according to actual consumption, fluctuations in production on hand no longer lead to excess or insufficient stock levels. The fact that call-ups via Kanban are triggered as a result of actual consumption allows a reduction in stock levels, the amount of capital tied up in stock and overall capital costs.

2.3.2.3 Transportation Management

A portal is the ideal way to integrate logistics service providers into the information flow. On-time delivery of goods is often critical. On-time delivery is more likely to occur where the trucking company is fully integrated into the ordering and delivery process. Using a portal, it can be set up that so that logistics service providers automatically receive all the important, detailed information they need when handling a consignment. By providing details of the order size/weight or the requested delivery date, the system ensures that all goods are delivered on time. If, however, delays should still occur, it informs the trucking company in advance so that alternative plans can be made.

2.3.2.4 Advance Shipping Notifications (ASN) / Dispatch Notifications

Two factors help to make merchandise management easier - knowing exactly what goods a supplier will deliver when and where, and having the certainty that all goods will be delivered in the requested packaging and with the appropriate labels and barcodes. Deliveries with incorrect labels, barcodes or packaging which cannot be used or can only be used with considerable additional resources are avoided. This in turn leads to a significant reduction in overall costs. Advanced shipping notifications provided via a supplier portal allow greater planning and supply security.

2.3.3 Broader Supplier Enablement/ Easy adoption.

Electronic Data Interchange (“EDI”) had gained a critical mass of usage amongst larger companies but smaller businesses often struggle to find the resources, budget and in-house expertise to implement EDI. However, anyone with a PC and an internet connection can connect to a portal with minimal training and investment (Keifer). As a result, the barrier to entry for portals is lower, enabling small suppliers to interact with customers electronically. Portals are easy to buy, implement and use (for both buyers and suppliers). Figure 7 shows the benefits of using web based enablers for small and mid-sized trading partners. There are huge increasing cost savings as time goes on between partners. As opposed to ERP systems, or even EDI, portals eliminate the up-front implementation and lengthy update projects of ERP systems, the up-front capital expenditure for hardware and software and the ongoing costs of support, maintenance, and administration (Keifer). Supplier/vendor portals offer an improved service to the supplier community.

Figure 7. Portals and Supply Chain Partner Participation

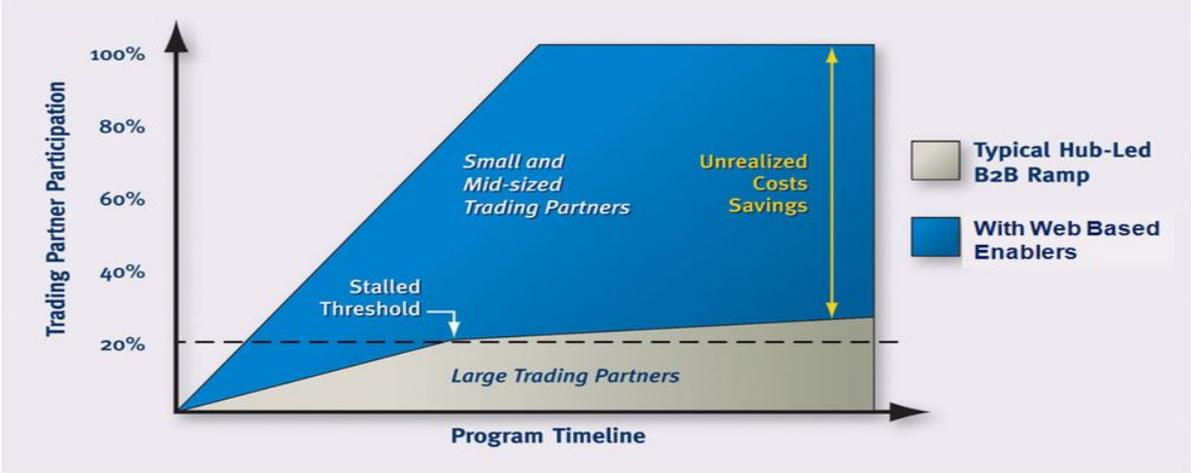


Figure 7 illustrates the positive effects of web based portals on supply chain partner participation.

The fact that suppliers, regardless of size and order volume, can be linked in electronically means that customers can eliminate duplicate processes and reduce process costs. Smaller manufacturers want to acquire this capability without having to bear the upfront costs of hardware, software, configuration, implementation, and maintenance (Keifer).

2.4 Business Examples

2.4.1 Covisint

Covisint was one of the most ambitious attempts to create a platform that would involve multiple suppliers and buyers within a particular industry. It was launched in 1999 by six of the world's biggest automakers: General Motors, Ford, DaimlerChrysler, Nissan, Renault and Peugeot. They were seeking a central place for dealing with their armies of parts and component suppliers, representing billions of dollars' worth of spending (Bowman). The effort didn't pan out as expected. Many suppliers, especially those beyond the major Tier 1 players, declined to participate. The entity's auction services were eventually spun off to FreeMarkets, which later became part of Ariba Inc., a vendor of spend-management software. The remaining technology went to Compuware Corp., which has turned Covisint into a collaboration hub that can be applied to multiple industries.(Bowman)

One big advantage of Covisint, says Minelli, is its "single sign-on" design. A supplier can log on to the portal once, then access the individual portals of its various customers in one session. However, sensitive information never moves between competing companies.(Bowman) Suppliers, once suspicious of the portal concept, have embraced the new version of Covisint, Minelli says (Bowman). The portal currently hosts some 45,000 trading partners and supports around 2 million linkups, or "federations," per month. They include smaller suppliers with access to nothing more than a telephone or dial-up internet connection.(Bowman)

Participants use the network for exchanging information related to inventory management, ordering, invoicing, production and other key supply chain activities. A global logistics application lets carriers, freight forwarders and logistics service providers feed in data about the status of shipments. Manufacturers can obtain real-time information about delays in the chain, while ensuring that critical documents are conveyed to customs in a timely manner.(Bowman)

2.4.2 Boeing

Herndon, Virginia based Exostar LLC specializes in software and collaboration hubs for the aerospace and defense sector. It is owned by The Boeing Co., BAE Systems, Lockheed

Martin Corp., Raytheon Co. and Rolls-Royce. More than 34,000 trading partners communicate on the system.(Bowman)

Most significantly, Exostar acts as the hub for communications between Boeing and its suppliers on the 787 “Dreamliner” project. The project is a radical step for Boeing, which is relying on suppliers to build large sections of the new aircraft, which are then assembled at Boeing’s facility in Everett, Wash. The expanded role for suppliers puts additional responsibility on the shoulders of Exostar, which ensures that thousands of partners involved in construction of the 787 are tightly linked each step of the way (Bowman).

Recently, however, that plan hit a snag, when Boeing announced that delivery of the aircraft would be delayed due to problems in coordinating global suppliers. Originally scheduled to debut in the summer of 2008, the Dreamliner has been pushed back to the middle of 2009 at the earliest (Bowman).

Peter Scott, vice president of marketing and corporate development with Exostar, says the principals realized that they needed even more visibility into the supply chain than they had envisioned. “We need to deploy deeper and faster,” he says. Boeing and its suppliers on multiple tiers require quick information so that they can react to schedule changes without disrupting the entire chain. The manufacturer had found itself coping with parts shortages and out-of-sequence deliveries, which can play havoc with a system that is designed with little margin of error.

Meanwhile, technology advanced to the point where portals could support a “network-centric business model” involving the two-way transfer of information among a universe of partners. In a sense, Scott says, the exchanges became a business-oriented precursor to the social networking sites that exploded in popularity shortly thereafter (Bowman).

E2open, based in Redwood City, California, provides the software that underlies the Exostar platform. Created in 2000, E2open originally offered auction capability, but that turned out to be less popular than elements of the “procure-to-pay” lifecycle: collaborative forecasting, inventory replenishment, vendor-managed inventory and logistics.

From the start, many businesses underestimated the technology that would be required to create true supplier-buyer collaboration. They assumed their enterprise resource planning systems could handle the job. That’s fine for managing internal processes, Martinelli says, but it’s insufficient for communicating with a wide range of partners outside the organization. (Bowman)

The advent of software as a service, whereby applications are hosted by vendors from an outside location, has helped to promote the development of portals. The technology avoids the need to invest in elaborate in-house systems, while making it easier for companies to adjust to changes in the market, and install updates.

2.5 Coordination

Coordination refers to the redeployment of decision rights, work, and resources to the best-positioned supply chain member. (Fugate) To illustrate: a company that historically has developed its own replenishment plans may opt to give up its decision rights and let the supplier replenish on its behalf. (Fugate) The supplier may be in a better position to do the replenishment because of its superior knowledge of the product, the overall market, and forecasting techniques. (Fugate) This is the basis of programs like VMI (Vendor Managed Inventory) and CRP (Continuous Replenishment Programs) (Fugate).

Chapter 3

Supply Chain Integration Tools: Increased Accuracy using Portals' Real Time Information

Integration tools such as Vendor Managed Inventory, Collaborative Planning, Forecasting, and Replenishment, and Continuous replenishment all enable greater visibility throughout a supply chain. Partners collaborate in order to reduce inventory and costs. Each process can achieve benefits without using Supplier/Vendor portals. However, portals allow the tools to be further utilized by providing real-time information and enablement without having to adopt expensive software into supply chain in order participate.

3.1 Collaborative Planning, Forecasting, and Replenishment

Collaborative Planning, Forecasting, and Replenishment (CPFR), a way of collaborating electronically, allows far greater collaborative planning between customers and suppliers. The point is to have customers and suppliers working off of the same consumer demand forecasts. Again, the internet plays a key role. One such example is the Collaborative Planning, Forecasting and Replenishment (CPFR) initiative. In CPFR, both the buyer and the seller make use of the internet to share forecasts, detect major variances, exchange ideas and collaborate to reconcile differences, to arrive at a common forecast and replenishment plan.

In the business-to-business world, Adaptec, a semiconductor company, and Cisco Systems, the leading networking equipment vendor, are undertaking similar initiatives. The case of Adaptec illustrates the value of internet-based collaboration to a company faced with evolving supply processes, innovative products, and a geographically dispersed supply chain. Using a

software application called Alliance the company communicates in real time with its design center in California, its foundry in Taiwan, and assembly plants in Japan, Hong Kong and Singapore, exchanging detailed and complex design drawings, prototype plans, test results, and production and shipment schedules. This greatly facilitates their ability to check demand and supply levels, and respond quickly to potential mismatch problems. It also helps shorten their new product development times. With the use of Alliance, Adaptec's cycle time was cut by more than half (Stenger). Cisco has invested over many years in the technology needed to generate such data.

Cisco's Frank Calderoni, Executive Vice president and Chief Financial Officer, says that every day its senior executives can track exactly what orders are coming in from sales teams around the world, and identify emerging trends in each region and market segment. And at the end of each month, the firm can get reliable financial results within four hours of closing its books. Most firms have to wait days or even weeks for such certainty.

Both consumer and business-to-business companies can achieve the benefits of internet-driven collaboration. Cookie and snack product company Nabisco successfully conducted a promising CPFR pilot with grocery chain Wegmans. Due to smart promotions, Wegmans had seen an 11% growth of snack nut sales versus a 9% decline at other retailers. By strategically sharing demand data and collaborating closely on promotions and replenishment, Nabisco saw its Planters sales jumped 40%, dramatically increasing its market share at Wegmans. Moreover, Nabisco's warehouse fill rate increased from 93% to 97%, while inventory dropped by 18%. Several other pilots are now under way at Schnuck Markets, Kmart, Circuit City, P&G, Kimberly Clark, Sara Lee, and Wal-Mart (Stenger).

Proctor and Gamble ranked near the top among firms noted for the high quality of supply chain management initiatives (Stenger). In 1995 they started the initiative to streamline supply chain by offering discounts to suppliers who use EDI for purchase orders and invoices. They created a customer-driven supply network and emphasized network. Their network operates with real-time data and all network participants working to add value for the final customer. They rely heavily on RFID and EPC, which allows for real-time data, and collaborative planning between customers and suppliers (CPFR). Both customer and supplier work off same consumer demand forecasts.

From 2002-2005 net sales increased from 40,238 to 51,407, and total assets increased from 43,706 to 57,048 (Teague). Proctor and Gamble received the Medal of Professional Excellence in 2008. Since 1995 the organization has delivered more than \$1 billion per year savings (Teague). In 2007 figure was \$2 billion and in 2008 profit growth to \$3.02 billion. According to Lisa Martin- senior vice president for worldwide procurement at Pfizer, “P&G’s approach to innovation and how it interacts with its suppliers to support innovation are best practices from my perspective” The company is sensitive to importance of relationships in ensuring long term success. If a problem occurs, they look at all data before suggesting solution. Since 2006 the company has had a reverse scorecard system in which it asks suppliers to rate itself. Companies responded that they weren’t being paid on-time, so P&G revised bill payment from 60% on-time to 90% on-time (Teague). In response to customer requests they created supplier portal on P&G website so suppliers could better access to key information on product schedules and changes in specifications.

3.1.1 Challenges

CPFR requires fundamental changes not only in the nature of the relationship with retailers, but also in the way each participant conducts business. It requires the development of new business processes.

Telecommunications giant Motorola runs a real risk that they when they lose an unhappy customer, It’s not just for the length of the next service contract, but for life. Accurate forecasting is further complicated because one phone model can have multiple SKU’s and rapid new product introduction adds complexity. Cell phones have life cycles averaging little more than a year, with some as low as six months. Industry statistics indicate that 50% of stock outs in the consumer goods industry are due to poor retail ordering and replenishment/forecasting processes, 25 percent are caused by overall demand planning and upstream shortages, and 25 percent by inadequacies of in store process such as shelving and replenishment (Benefits).

Prior to its move to CPFR, the Mobile Device division’s sales were highly variable and were not synchronized with customer demand. Motorola had visibility only to shipments into retailers’ distribution centers, but not shipments from the retailers’ distribution centers to the stores. Forecast error was very high, resulting in excessive stock outs. They recognized they

needed to improve collaboration with customers and forecast ability in order to compete. In 2001, the handset division turned to CPFR to improve sell-through performance with its retailers.

3.2 Vendor Managed Inventory (VMI)

Vendor Managed Inventory (VMI) optimizes supply chain performance by allocating responsibility for maintaining the distributor's inventory levels to the manufacturer. The manufacturer has access to the distributor's inventory data and is responsible for generating purchase orders. Under the typical business model, when a distributor needs product, they place an order against a manufacturer. The distributor is in total control of the timing and size of the order being placed. The distributor maintains the inventory plan. The manufacturer receives electronic data (usually via EDI or the internet) that tells him the distributor's sales and stock levels. The manufacturer can view every item that the distributor carries as well as true point of sale data. The manufacturer is responsible for creating and maintaining the inventory plan. Under VMI, the manufacturer generates the order, not the distributor.

Vendor Managed Inventory (VMI) gives suppliers an insight into warehouse stock levels and automatically ensures that they remain within agreed minimum and maximum limits. In critical situations, for example where there is an imminent risk of stock levels falling below the minimum threshold, a business and their supplier are automatically informed. An additional function allows a supplier to simulate deliveries and adjust production to best suit needs. The Vendor Managed Inventory principle enables a reduction in warehouse stock levels and thus release some of the capital tied up in stock. Vendor Managed Inventory also reacts more quickly to fluctuations in demand and avoids possible bottlenecks.

Supply chain partnerships can have a huge impact on customer and supplier profitability and cash flow. For a supplier's best customers, offering intercompany operations like vendor-managed inventory can greatly increase their asset productivity on their handling of supplier products. At the same time, suppliers can gain control of their order patterns and through this process significantly lower their own cost of operations. The benefits of these operating partnerships are so strong that sales often increase by 30-40% even in highly penetrated accounts (Byrnes).

3.2.1 Dual Benefits

Data entry errors are reduced due to computer to computer communications. The speed of the processing is also improved. Both parties are interested in giving better service to the end customer. Having the correct item in stock when the end customer needs it benefits all parties involved. A true partnership is formed between the manufacturer and the distributor. They work closer together and strengthen their ties. VMI stabilizes the timing of purchase orders. Using VMI, purchase orders can be generated on a predefined basis.

The goal is to have an improvement in fill rates from the manufacturer and to the end customer. Also, a decrease in stock-outs and a decrease in inventory levels. Planning and ordering cost will decrease due to the responsibility being shifted to the manufacturer. The overall service level is improved by having the right product at the right time. The manufacturer is more focused than ever on providing great service.

Visibility of the distributor's point of sale data makes forecasting easier and reduces distributor ordering errors (which in the past would probably lead to a return). Promotions can be more easily incorporated into the inventory plan. Before VMI, a manufacturer had no visibility of the quantity and the products that are ordered. With VMI, the manufacturer can see the potential need for an item before the item is ordered.

Many distributors are reluctant to give their suppliers the power to determine their inventory levels, and justifiably so. The (usually) friendly antagonism of manufacturer sales managers trying to load up distributors' shelves to boost their own sales numbers has been part of the game since distribution began. It doesn't have to be that way, though. Vendor-managed inventory (VMI) is no longer a radical concept in electrical distribution - the concept has been around since Wal-Mart and Procter & Gamble started working on it in the 1980s, and first appeared in the electrical industry in the early '90s. But it's still rare enough that getting a look at a VMI relationship that works for all involved brings some valuable insights (Chandler).

3.2.2 Company Examples

Graybar understood years ago that working with its suppliers on inventory could improve efficiencies throughout the supply chain. Since 1992, the company has been using several planning tools to engage in VMI with suppliers. About four years ago, it added VMI services provider Datalliance.

Datalliance has been providing VMI services since 1991, and has been working in the electrical industry for the past 10 or so years, says Bob Jennings, Vice President of Sales and Marketing. Datalliance is working with about 18 electrical manufacturers and about 75 electrical distributors, and has similar market share in automotive and truck parts, Jennings says.

The VMI services Datalliance provides are handled through “software as a service” (SaaS) format, where all the software is managed on Datalliance web servers and suppliers and distributors send and receive data and reports over the internet. Fees for the service are paid by the manufacturers. “The payback for the suppliers is to increase sales. Suppliers have reported to us that that is a more lasting payback for them than asking the distributor to share in paying for the cost of the program,” Jennings says.

Graybar had established VMI relationships with several large suppliers when it approached Berk-Tek in 2005. Berk-Tek, part of the Paris-based global cable manufacturer Nexans Co., was very interested. Berk-Tek manufactures fiber-optic and copper structured cabling products for LAN, SAN and data center installations. The company produces over 20,000 SKUs in three manufacturing plants in Pennsylvania and North Carolina, and Graybar is one of its largest distributors.

One of the realities of Berk-Tek's business is that demand is often project-driven, such as for construction of a new office building, which creates demand spikes that can be difficult to manage. When the company ran the business case for VMI, the results were promising.

“The ROI was certainly compelling, but our decision to proceed was also based on strategic advantages we could get from VMI,” says Paul Trunk, senior vice president of sales and marketing for Berk-Tek. “Among these were additional benefits in improved trading partner relations with Graybar and, potentially, Berk-Tek's other large distributors.”

“We were looking for a way to improve our process to eliminate human error, reduce time and effort for both our distributors and Berk-Tek, and gain better visibility of demand,” says Trunk. “When the distributor initiates its own replenishment orders, the process is labor-intensive, prone to error, and generally not ideal for a large distributor,” Trunk says. “Data-entry errors can be costly for both us and our distributors. It makes a difference if an order for 600,000 feet of cable is mistakenly placed as 6,000,000 feet.” (Chandler).

In addition to streamlining the replenishment process, addressing these matters would improve Berk-Tek's ability to forecast production requirements. Better information would allow them to smooth out the demand spikes and improve production efficiency.

Forging the agreement to govern the VMI relationship is a critical part of the process. It can also be one of the most challenging parts, because the distributor and supplier must be absolutely clear about what they want from the relationship and very open about inventory levels, investments and how discrepancies will be handled. This lays the groundwork for a relationship of mutual trust.

For example, to ensure that Graybar's branches wouldn't suddenly be bursting with more Berk-Tek cable than they needed, the agreement spells out how overstocks are to be handled. “We agreed that if they get into an overstock situation, we'll buy the inventory back - no harm, no foul,” says Lisa Taranto, S&OP business analyst for Berk-Tek, and the point person in working with Graybar under the VMI program (Chandler).

Both parties must agree on certain targets: typically an inventory turns target and some measurement of customer service, such as out-of-stock percentage, says Tom Hoar, Director of Sales, Electrical and Datacomm, for Datalliance. “Those (targets) can be created corporately, by product type, by groups of locations like districts or regions. Most commonly it's a corporate initiative. Then you create a benchmark — ‘Here's where performance is today, and here's where we'd like to see it get to’ — then you set up a regularly scheduled way to evaluate whether you're moving toward those goals or not. If so, great. If not, we've got to understand what we can change to get there.” (Chandler).

The Datalliance system includes very flexible functionality for generating reports. The system automatically sends out performance review statements that alert both supplier and distributor to how the system is working and highlight any discrepancies that need to be addressed. These can be set up monthly, quarterly, or however often the parties want updates.

Once the agreement is in place, implementation begins with setting up the distributor ERP system to deliver all inventory data on the supplier's products into the Datalliance system, including historical data on which initial forecasts can be built. Most current distributor ERP systems used in the electrical industry have all the necessary capabilities to provide this data. “The distributor needs to be able to send daily sales and inventory information,” says Hoar. “This tends not to be a challenge for the average to large electrical distributor. All the major

business systems have that capability. Second, the distributor has to be able to receive an electronic copy of a purchase order — EDI 855 — and the business systems in electrical industry have that capability, too. Since we're sitting in the middle, we don't care when or how the information comes to us, we just need to know the distributor will be able to reliably create this information, then we'll figure out the rest (Chandler).”

To implement the program with Berk-Tek, Graybar started in one of its Chicago District branches. “We validated that everything was working properly before we rolled it out to the entire district and then company-wide, including our zone warehouses,” says Mike Dumas, Graybar vice president, Comma/Data products. “Since then, we've reverse-engineered our process, and now we start with our zones and move out to the branches. That allows us to initially get the SKU investment-level data for that zone - what's there, how fast is it moving - all the metrics for forecasting.” (Chandler)

It generally takes four to six months to get a location, such as a zone warehouse, up and running with VMI for a supplier and then generally an additional three-to-six months for full implementation, says Graybar National Inventory Manager Rick Turner. Once the system is up and running, the changes in the relationship between supplier and distributor show up immediately. “What was most compelling was that we would have control, the ability to see real-time snapshots from as high a level or as low a level as we wanted, which allows us to be not so reactive, more proactive,” says Taranto of Berk-Tek. “The difference is that I'm aware of a lot more. If we have ten locations from Graybar ordering the same product, we can expedite and prioritize. For example, when I launch an order, I can look at any location that's out of stock and prioritize accordingly (Chandler).”

Berk-Tek's inside sales people now spend the majority of their time dealing with strategic issues such as new product introductions and helping with inventory transfers rather than reacting to expedite requests and fixing order errors. When Graybar has a large project on the boards, they submit a project feedback form that tells Berk-Tek to make adjustments in the VMI system so the replenishment levels shift to accommodate that increased demand.

Because Datalliance's services are based on the SaaS concept, implementation was pretty effortless, says Taranto, with a couple of days of on-site training and answering questions, she was up and running. “One of the biggest things we agreed on with Graybar from the beginning

was, 'Let's trust the system.' Datalliance does this, they're good at it, let's let it work," Taranto says (Chandler).

The results have been positive for all involved. Berk-Tek saw an immediate increase in sales through Graybar, which it attributes to fewer stock-outs and better visibility of its product line, as well as making it easier to conduct business with confidence. "At the same time that we were increasing sales, we also enhanced our market share within Graybar by increasing the number of active SKUs over 18 percent," Trunk says. "Inventory turns improved nearly 30 percent and stock-outs were reduced to an all-time low of 3.1 percent, which tells us that VMI is helping us run our business more effectively." (Chandler).

The benefits for Graybar start with a closer relationship with an important supplier, says Dumas. "They (Berk-Tek) now have a stake in the game for the accuracy of our inventory. We get better turns, lower total inventory investment and less obsolescence and slow-moving product. This translates into better utilization of our cash and resources — in other words, profitability." (Chandler)

Distributors thinking about getting into VMI should be aware of a few things, says Datalliance's Jennings. "Strategically, the distributor should think about, 'Who are my suppliers who are important to me for the long run?' Those are the people you should think about doing this with." (Chandler)

Graybar now has more than a dozen supplier relationships either already doing VMI or in the implementation process. "Certainly we want to do it with our largest, most significant suppliers," says Dumas. "We have seen significant service, performance and financial benefits in every case with the large suppliers. If we have significant inventory or high transactions with a supplier, we'll sit down with that manufacturer and go through the Q&A session to make sure it's a good match. It has to be a joint, mutual opportunity before we will press forward (Chandler)."

Distributors in the electrical market have some built-in advantages when considering VMI, says Hoar. "The electrical marketplace tends to be progressive, tends to look for ways to take costs out of the system, tends to have large players and mid-sized players willing to try new things. That's not the case in every industry. There's a level of trust in this industry that makes it easier. That's not often found, and that's a key ingredient to making this work well." When it does work well, VMI benefits both distributor and supplier, adds Dumas. "We want to be the

lowest-cost, highest-value channel partner to our manufacturers and customers, and this is one way we can do that. It delivers benefits to all participants (Chandler).”

P&G uses VMI in its supply chain, starting with its supplier, 3M, and its customer, Wal-Mart. Even the high-technology sector; companies such as Texas Instruments, HP, Motorola, and Apple use VMI with some of their suppliers and customers (Lee).

Costco and Kimberly-Clark Corp. began using VMI in 2000. Under the deal, responsibility for replenishing stock falls on the manufacturer, not Costco. In return, the big retailer shares detailed information about individual stores’ sales. “When they were doing their own ordering, they didn’t have as good a grasp of inventory,” says the Kimberly Clark data analyst, Michel Fafnis (Nelson). Now, a special computer link with Costco allows Mr. Fafnis to make snap decisions about where to ship more Huggies and other Kimberly Clark products. Just a few years ago, the sharing of information would be unthinkable. But the arrangement between Costco Wholesale Corp. and Kimberly-Clark underscores a significant change in American retailing. Across the country, powerful retailers from Wal-Mart to Target to JC Penny Co. are pressuring their suppliers to take a more active role in shepherding products from the factory to store shelves (Nelson).

Kimberly Clark oversees and pays for everything involved with managing Costco’s inventory except the actual shelf-stockers in store aisles. The assumption is that suppliers themselves are in the best position to spot inefficiencies and fix them. For consumers, it all translates to lower prices at the cash register. To a great extent, better cooperation between retailers and suppliers has been made possible by improved technology - such as the computer link Kimberly Clark uses. Many economists say that closer retail-supplier coordinating on the supply chain is the model of the future and will ultimately determine which companies succeed in the new millennium (Nelson). By several accounts, the close collaboration between Costco and Kimberly-Clark serves as a model for other merchandisers, and also helps explain strong recent sales gains by the two companies. Kimberly Clark says it cut out \$200 million in costs from its supply chain in 2000 (Nelson)..

“This is what the information age has brought to this industry,” says Wayne Sanders, chairman and CEO of Kimberly Clark. “It gives us a competitive advantage (Nelson)”. After implementing the program in 2000, the company posted a 51% rise in net income to \$1.67 billion on \$13 billion in sales (Nelson).

For Costco, the benefits of such close cooperation with a major supplier are equally clear; Costco saves money on not staffing in its inventory department, but also on storage. Before VMI, Costco would keep an average of a month's supply of Kimberly Clark products in its warehouses. Now because of VMI, Costco needs to keep only a two week supply (Nelson).

3.2.3 Continuous Replenishment

Companies such as Campbell Soup, Mars, Nestle, Quaker Oats, Nabisco, P&G and Scott Paper use CRP with some of their customers. Inventory reductions of up to 25% are most common in these alliances (Lee).

Campbell started continuous improvement process in 1991 in order to achieve physical efficiency and it achieved that goal. The inventory turns of participating retailers doubled (Fisher). They establish EDI links with retailers. Every morning retailers electronically inform the company of their demand for all Campbell products and the level of inventories in their distribution centers. Campbell's uses that information to forecast future demand and to determine which products require replenishment based on upper and lower inventory limits previously established with each retailer (Fisher). Trucks leave the Campbell's shipping plant that afternoon and arrive at the retailers distribution centers with the required replenishment the same day. The program cut the inventories of four participating retailers from about four to two weeks of supply (Fisher). The company achieved this improvement because it slashed the delivery lead time and because it knows the inventory of all retailers and hence can deploy supplies of each product where they are needed most (Fisher). Most retailers figure that the cost of carrying the inventory of a given product for a year equals at least 25% of what they paid for the product. A two week inventory reduction represents a cost savings equal to nearly 1% of sales (Fisher). Since the average retailer's profits equal about 2% of sales, this savings is enough to increase profits by 50% (Fisher). Because the retailer makes more money on Campbell products delivered through continuous replenishment, it has an incentive to carry a broader line of them and give them more shelf space (Fisher). For that reason, Campbell found that after it had introduced the program, sales of its products grew twice as fast through participating retailers as they did through other retailers (Fisher).

Conclusion

Remaining competitive in the face of the increasing globalization of businesses, the proliferation of product variety, the increasing complexity of supply networks, and the shortening of the product life cycles requires greater coordination and collaboration among supply chain partners using an approach known as “supply chain integration.”

The strategic importance of a company’s supply chain cannot be over emphasized. From suppliers’ suppliers to customers’ customers, the ultimate objective is to satisfy the needs of the customer, whether people, systems, or processes and retain them over a long period of time. In order to do so, companies must integrate upwards and downwards in their supply chains and relationships must become deeper and wider than the traditional “arms length” supplier-customer relationship.

The integration of the supply chain creates a strategic alignment of partners so that the requirement of providing the right material, at the right price, at the right time is fully met. This integration should also reduce the amount of waste and delay across the chain. Using Supplier/Vendor Portals to further Supply Chain Integration allows the use of real-time information available to all partners to foster process automation, collaboration, visibility, and communication, status overviews, and collaborative order management. Supplier/Vendor Portals enable manufacturers to satisfy demand more effectively while providing additional capabilities for both suppliers and manufacturers, such as streamline shipping and materials receipts, materials management, electronic Kanban signals and broader supplier enablement. Because they

provide instant up to date information, portals allow participants to collaborate with the most accurate information, making integration much more beneficial to everyone. They will assist companies in better positioning inventories and better allocating their warehouse resources to respond to upcoming changes. By taking these steps, companies are not only helping partners improve their operations, they are strengthening relationships that will pay dividends in better times.

By adopting Supplier/Vendor Portals for supply chain integration, companies can realize dramatic returns through efficiency improvements, better asset utilization, faster time to market, reduction in total order fulfillment times, enhanced customer service and responsiveness, penetrating new markets, higher return on assets, and ultimately, higher shareholder value. Many companies are discovering whole new approaches to conducting business, and even new business opportunities not previously possible. Portals allow partners to redefine logistics flows so that the roles and responsibilities of members may change to improve overall supply chain efficiency. A supply chain network may jointly create new products, pursue mass customization, and penetrate new markets and customer segments.

Portals allow users to reduce costs by enhancing collaborations, visibility and communication with suppliers. Portals provide a synchronized, real-time view of order and material management activities that ensures entire supply chain is working with most current information. The low cost and ease of implementation makes it ideal for small and medium companies to collaborate with their partners as well. For suppliers, the same partnership benefits are available. A firm can invite key suppliers to suggest ways that they could improve your company's profitability. Most suppliers implicitly assume that their customers are not open to serious operational innovations, and the most capable suppliers will jump at the chance to work closely with a customer that is open to innovative arrangements. In addition, customers can proactively analyze their own order pattern relative to their suppliers, and the lead times and delivery frequency that results. It is relatively easy to figure out ways to reduce both the suppliers' costs and a customer's own costs at the same time.

Appendix A



Ariba Supplier Network

Brief Overview

Ariba helps companies analyze, understand, and manage their corporate spending to achieve increased cost savings and business process efficiency. Ariba delivers sourcing, procurement, and commodity expertise that enables organizations to optimize their Spend Management processes and supplier relationships. They help companies get the critical buy-in and support required at all levels of their organization, then work with them to plan, build, and integrate a customized, effective spend management solution. Ariba applications currently operate on nearly four million desktops around the world (Ariba.com). ABN AMRO, BMW, Chevron, Cisco Systems, Hewlett-Packard, and Unilever are among the Fortune 100 companies that put their trust in Ariba solutions.

Capabilities

The following graph is found on the company website and features a brief overview of the company's supplier network information:

Ariba Supplier Network at a Glance

- \$100 billion in annual transactions
- 1.8 million monthly PO's
- Transactions in 80 currencies
- 80 million catalog items

Source:

Ariba.com

Ariba Supplier

Management supports the

complete

supplier management

lifecycle - from initial supplier registration and assessment to ongoing performance measurement and monitoring to corrective action and improvement plan management. The supplier network has the following capabilities:

- **Supplier portal and profile management** - empower suppliers to self-register and manage their own profiles, certifications, and other documentation that are critical to giving you a holistic view of your suppliers' capabilities
- **Approval and Onboarding** - Automatically route supplier information to key stakeholders for review and approval, with escalations, notifications, and full auditability
- **Integrated supplier Network Discovery and assessments** - augment your internal analysis with access to more than 250,000 supplier profiles, ratings, and assessment information from the Ariba Supplier Network

- **Vendor master integration and enrichment** - simplify integration with existing vendor masters and auto-enrich supplier data with diversity, parent-child, risk, and other business information
- **Supplier information management** - Systematically track key information, certifications, insurance documentations, and other milestones to proactively mitigate risks and ensure the most holistic and up-to-date view of your suppliers
- **Performance measurement, analytics, and reporting** - track and analyze qualitative and quantitative supplier performance data in a comprehensive scorecard. Set alerts for early detection of lagging performance or issues that require quick resolution or improvement
- **Corrective action and improvement plan management** - establish and monitor progress of collaborative corrective action and improvement plans to ensure optimal supplier performance. Leverage best-practice templates and formulas for supplier performance, risk, sustainability, and corrective action plan management
- **Supplier management services** - access Ariba's unique portfolio of services to streamline and manage supplier on-boarding, performance, and risk management. And leverage Ariba's global services for supplier site assessment, qualification, and on-boarding

Source: Ariba.com

Ariba solutions are available in flexible On Demand or CD versions, support integration with all major ERP and business systems, and support multi-language, currency, and regulatory requirements. In addition, Ariba's global services and category experts can assist with implementation, training, and supplier performance management program design and deliver best-practice templates for sustainability, risk, or category specific assessments. Ariba also offers services to rapidly on board suppliers and assist with catalog and transaction management.

Benefits

Ariba Sourcing solutions delivers rapid and sustainable results. Hundreds of companies around the globe use Ariba sourcing technology, expertise, and global supplier network to drive bottom-line benefits:

- More than \$350 billion is sourced through Ariba Sourcing Solutions each year - resulting in over \$30 billion in savings for our customers
- Ariba sourcing and category experts source more than \$74 billion on behalf of their customers
- Ariba Network Discovery provides access and assessments of 250,000 global suppliers

Source: Ariba.com

Companies using Ariba Sourcing solutions have reported the following additional benefits:

- Negotiate best-value supply agreements
- Standardize and enforce disciplined sourcing best-practices across the enterprise
- Elevate sourcing skills and knowledge across the organization
- Accelerate sourcing cycles and throughput
- Extend strategic sourcing to all spend categories

- Capitalize on low-cost-country opportunities
- Minimize supply risks
- Optimize and align sourcing decisions with strategic business objectives

Ariba's total solution approach, global reach, and flexible delivery model make Ariba Sourcing solutions accessible to companies of any size, industry, and geography.

Benefits to Suppliers

- **Accelerate the order-to-cash cycle**
 - Automatically reduce order problems that slow the order-to-cash cycle
 - Minimize disputes from invoice errors
 - Eliminate delays in sending and receiving critical documents
- **Lower cost of service**
 - Reduce costs of paper, stationery, postage, filing and storage
 - Reduce calls to customer service and customer A/P through increased order status visibility
 - Reduce lost orders through centralized routing
- **Increase sales opportunities with new and existing customers**
 - Gain exposure to leading buying organizations through a searchable profile
 - Respond to sourcing opportunities on the Ariba Supplier Network
 - Enjoy market share gains in existing customers through increased contract compliance, extended contract duration and deeper account penetration

Source:Ariba.com

Further information can be found on the company's website



Brief Overview

Direct Commerce (DCI) provides leading procure-to-pay solutions, including electronic invoicing, invoice imaging, and workflow, to Global 2000 corporations and their trading partners. DCI was the first company to develop and implement a web-based e-invoice application. DCI was incorporated in March of 2000 and has continued to be the leader in accounts payable automation and procure-to-pay solutions. DCI currently supports thousands of suppliers submitting hundreds of thousands of electronic invoices adding up to billions of dollars per year in transaction volume.

Network Capabilities

The Direct Commerce platform offers our customers the following features:

- **ASP Model** - DCI-hosted applications offer state-of-the-art business solutions using the latest technology, without investment in additional IT resources, allowing you to focus on core competencies.
- **Security** - We assure secure operation through the use of secure end-to-end network encryption; Hardened security gateways; Active threat detection; Authorization required for all system requests. Optionally, customers may choose to implement the use of Client Certificates, SecurID or Biometrics for enhanced security.
- **Controlled environment** - Continuous logging and auditing of all business and system events are performed to track system activity. We use a common error handling methodology across all applications so that errors are reported and handled consistently.
- **Performance**- DCI ensures speed and capability through the optimal integration of powerful, high-end platform components. The system is modeled to handle maximum users at peak operating times through the use of distributable technologies at every platform tier.

- **Reliability** - All platform components are designed with redundancy and failover in mind. Systems and applications are designed to eliminate single points of failure.
- **High Availability**- The DCI System is available 7x24 with advance notice given for scheduled maintenance windows. DCI provides around the clock network monitoring, failure notification and escalation.
- **Scalability** - The DCI platform design supports the addition of capacity in advance of demand. All components are designed to support the expansion of the customer base and increased workloads.
- **Extensibility**- The DCI architecture supports the integration of additional DCI products and features as well as third party products.
- **Configurability** - Dynamic configuration of applications is possible without modification of the code base. We have built our system knowing that while general problems in automating AP/AR processes are similar in many companies, many details such as company workflow, look and feel, and document structures need to be configurable to accommodate specific company needs.
- **Standards support**- We support and encourage the use of industry-standard technologies. We actively contribute to standards-setting bodies such as Sandia Labs and the ANSI X.12 Committees, and we publish detailed specifications for interfaces into our systems so customers can choose the access methods that match them best.

Source: Direct Commerce.com

Benefits

7. Implementation Services

Direct Commerce, Inc. has a four-step approach to ensure a smooth and successful implementation of the electronic invoicing solution. This process requires minimal time (4-6 man hours) from the customer during the Discovery Phase and also requires minimal IT involvement for implementation into the user's ERP system.

- **Discovery Phase / Needs Assessment** - DCI identifies company business rules, ERP system interface requirements, document format, validation rules, reporting requirements, etc. Implementation engineers will interface with key customer personnel to guarantee accurate application requirements definition.
- **System Configuration** - DCI will configure the system to meet requirements identified during the Needs Assessment phase. This will be an iterative process involving several meetings to review process and discuss specific details to ensure compliance.
- **Testing** - DCI will conduct functional testing with the larger buyer and several vendor users as well as integration testing to ensure that all aspects of the solution are operational prior to vendor certification and roll-out.
- **Training/ Vendor Rollout** - DCI will provide training to the designated personnel within the large buyer as well as vendor users. Training will consist of a 30-45 minute instructor led training conducted via the web. This DCI vendor team is responsible for pro-active vendor training, on-going training, and vendor support.

Direct Commerce will perform all of these tasks in conjunction with the customer to ensure a successful implementation.

Application Support

Application support is enabled through the Direct Commerce support line. This support is offered during normal business hours and accessible by both buyers and vendors. This support is

targeted to handle questions regarding product functionality, accessibility, and product enhancements.

Technical Support

Technical support is provided through a series of escalation alerts received by either internal DCI personnel or designated customer contacts. Alerts can be received by phone, electronic, or paging system, depending on severity. This support is targeted to handle problems involving systems integration, hardware, connectivity, and infrastructure.

Appendix C



Brief Overview

E2open Drives Business Performance Improvement. E2open is the supply chain performance management leader, delivering visibility, control and bottom-line performance across your global extended supply chain. The following corporations that rely on SAP use the E2open Multi-Enterprise Platform to maximize value from their SAP investment:

- IBM
- Hitachi
- Applied Materials
- Celestica
- Tyco Electronics
- LSI
- Vodafone

Source: Hoover.com

Capabilities

- **Software:**

Event management, document collaboration, analytics and decision support, process management, integration infrastructure and operations management capabilities enabling supplier collaboration.

- **Deployment:**

A proven deployment methodology, tools and resources that include business case

templates, detailed solution design and implementation, internal back-end system on-boarding, trading partner integration and project management for rapid deployment.

- **Operations:**

Hosting, all required hardware and software, and application management, including software change management, integrated support plans, a performance-backed service level agreement, and system performance reports and metrics for lower IT investment.

- **Standard Configurations Templates:**

Get immediate value from the E2open Multi-Enterprise Platform by utilizing a configured, tested and documented standard global practices templates.

Benefits

E2open delivers configured business processes that operate between internal Oracle systems and external suppliers, customers and trading partners. E2open Solutions combine software, deployment and operations delivered on-demand.

B. Oracle customers chose E2open for the following benefits:

- **Faster time to value** with payback occurring as rapidly as within one year and two to three times higher return on investment.
- **Reduced total cost of ownership** with savings in excess of 50% over alternative implementation models.
- **Flexible integration capabilities** allowing rapid on-boarding of all trading partners.
- **Faster, simpler** technical change management.
- **Reduced burden on internal resources** and lower up-front start-up costs.

- **Reduced program risks** due to E2open's proven experience and performance guarantees.

Source:e2open.com

Appendix D



Brief Overview

Hubwoo is a company based in many countries such as France, Germany, Belgium, Denmark, USA, India, Ireland, The Netherlands, UK and Sweden. According to the company website the manage over 4.5 million transactions a year and have a total value of over 9 billion dollars.



Source: (Hubwoo At A Glance)

“Companies all over the world use Hubwoo Software as a Service (SaaS) e-purchasing technologies and services. With a customer base that includes over 100 of the world’s leading companies (50 of them in the Fortune 1000) and over 13,000 suppliers online in 44 countries, Hubwoo manages the largest Business-to-Business e-purchasing community in the world.”(Hubwoo At A Glance)

Hubwoo considers themselves to be the “complete solution” and covers the entire purchasing process, from sourcing to payment. They divide their solutions into three different

sections, procurement, invoicing, and sourcing. Hubwoo really covers all aspects of supplier management, and fills all the requirements that BD is looking for. The Hubwoo eProcurement system enables thousands of users to engage in online requisitioning and procurement. “This solution covers eProcurement processes from “Source-to-Pay” and is highly adaptable to customer requirements: fully customizable Approval Workflows, capabilities to reflect numerous roles and status levels, with a wide range of optional features.” It fulfills BD’s preference of having an automated supplier self service enrollment feature as well as an ACH method of payment. With the largest SAP platform in the world, it is possible to share remittance information with suppliers as well. The following is the main benefits of having Hubwoo services as listed in the company website.

Capabilities/Benefits

- No client-side infrastructure required
- Rapid deployment and ROI in comparison to in-house implementations
- Customized functionalities
- Back-end integration
- Automated, flexible processes increase employee productivity
- Significant reductions in process times and costs
- Increased visibility of all procurement costs
- Largest SAP SRM platform in the world (60,000 users)
- 100% tracking and monitoring of transactions and performance

Source: (Hubwoo e-Procurement)

Alex F, Kleiner VP of UK Operation of Hubwoo has detailed presentation highlighting Hubwoo's performance measurements. In partnership with Aberdeen Group the eProcurement benchmark Report stated that the procurement cycle time on average for a company can be 12.4 days and with SaaS implementation the procurement cycle time is reduced to 3.28 days.(Kleiner 2007).

Hubwoo has all of the tools to be a complete solution and help a company succeed. One of the aspects that came up was the fact that many of their customers are globally based. This may be an issue when dealing with domestic issues which BD is mostly concerned with. Also its supplier network of ~13,000 is relatively small compared to other suppliers. Although this may not be a negative because of special attention its network is relatively smaller. Also, Hubwoo main focus and competitive advantage has been eProcurement, however they have entered the market of eSourcing as well. This has left investors very conscious of the company. Within eSourcing, they have added SAP eSourcing which has added 15 new SaaS contracts and has helped the continuum (Gilgenmann 2008). 2008 featured 41 new technology contracts with buyers, of which 18 were new customers. By the end of 2008, the total number of Buyers customers amounted to 88, an increase of 40% during the year which has been the strongest point of acquisition of new customers since the early days of the company (Gilgenmann 2008).

	2007	2008
Consolidated Revenue	€ 32.6 million	€ 31.8 million
SaaS	€ 24.6 million	€ 24.2 million
Services	€ 8 million	€ 7.6 million
New Contracts - Full SaaS Value	€ 6.0 million	€ 16.1 million
New Contracts - First Year SaaS Value	€ 1.6 million	€ 5.7 million
SaaS - Backlog as from 01/01/09 (Rolling 4 quarters Contracted revenue)	€ 21.0 million	€ 27.4 million

Source: (Gilgenmann 2008).

Downfalls

However, these purchases have shown in the companies confirmed In 2008 results released March of 2009. , The company's operating cashflow was -€3.0 M (against -€1.1M in 2007). "Total investments amounted to €7M for the acquisition of the company AchatPro and other technology investments. With the capital increase of €5.5M, Hubwoo finished the year with net cash of €1.3M (against €6.6M in 2007)." Another issue could be CEO and customer uncertainty of the company. As of April 7th 2009, Mark Williams has left Hubwoo to fill in the CFO position at IBS (Ahlberg 2009). With its reliance in SAP growing over the past couple of years, there is concern that Hubwoo basically follows the success path that SAP does, which brings the question why not just go with SAP.

Appendix E



Brief Overview

ICG Commerce was founded in 1992 and is a procurement services provider committed to reducing procurement costs for their customers. They are a smaller company located in King of Prussia Pennsylvania. Some of their customers include Cameron, Avaya, Vought, and Nordstrom. The company considers itself a specialist in more than 300 sourcing categories including logistics, IT, packaging, and facilities management. ICG Commerce had helped its clients track down items from airplanes to food flavorings to xenon gas.

Capabilities

ICG breaks their possible solutions into two main categories. The two separate categories are the following solutions that ICG can help a company accomplish. The first is leaned toward sourcing; the second is toward transaction processing.

1. Sourcing Databases and Technologies: In order to help you identify more savings in less time, ICG Commerce experts leverage the following:

Sourcing Information Databases

- Category specific RFI templates
- Category specific data gathering templates
- Supplier database
- Supplier cost models

Sourcing Technologies

- Spend analysis tools
 - eSourcing tools (eRFx, eAuction, and Decision Optimization tools)
 - Quick quoting tool
2. Transaction Processing Infrastructure: To support compliance and capture the detailed spending and transaction information needed for ongoing management and improvement, ICG Commerce customers benefit from the following elements of our comprehensive transaction-processing infrastructure:
- Supplier network
 - eProcurement platform for goods and services
 - Content management tools
 - Customer service tools for call and issue management
 - Documented best-practice based transaction processes
 - Detailed transaction, spend and savings reporting capabilities

Source: (ICG 2009)

Benefits

ICG participates in a purchase-to-pay transformation and automation technique to help their customers. They use six sigma techniques to make the most efficient use of their technologies. In their sourcing solution they focus on narrowing down infrequent purchases. They provide tactical sourcing support-transaction-level supplier identification, competitive bid gathering and analysis-to help you not only maximize spend under management.

Downfalls

There are many positive cases associated with ICG however; it is not something that is not seen within the other companies. Compared to the other companies analyzed there is not much info on ICG. There are success stories but no real statistics based upon the company. There is no

information on third party vendors or monthly volumes available. Also ICG specializes in indirect and direct buy for clients. They do procurement outsourcing which is something I think BD is not as interested in. Procurement outsourcing is the complete or partial transfer of the business processes, infrastructure, and resources associated with purchasing materials, the use of RFQ and RFP is present. Procurement outsourcing would make a strong distraction in management and their procurement competencies are usually for direct raw materials or a system which is something that does not really help BD.

Appendix F

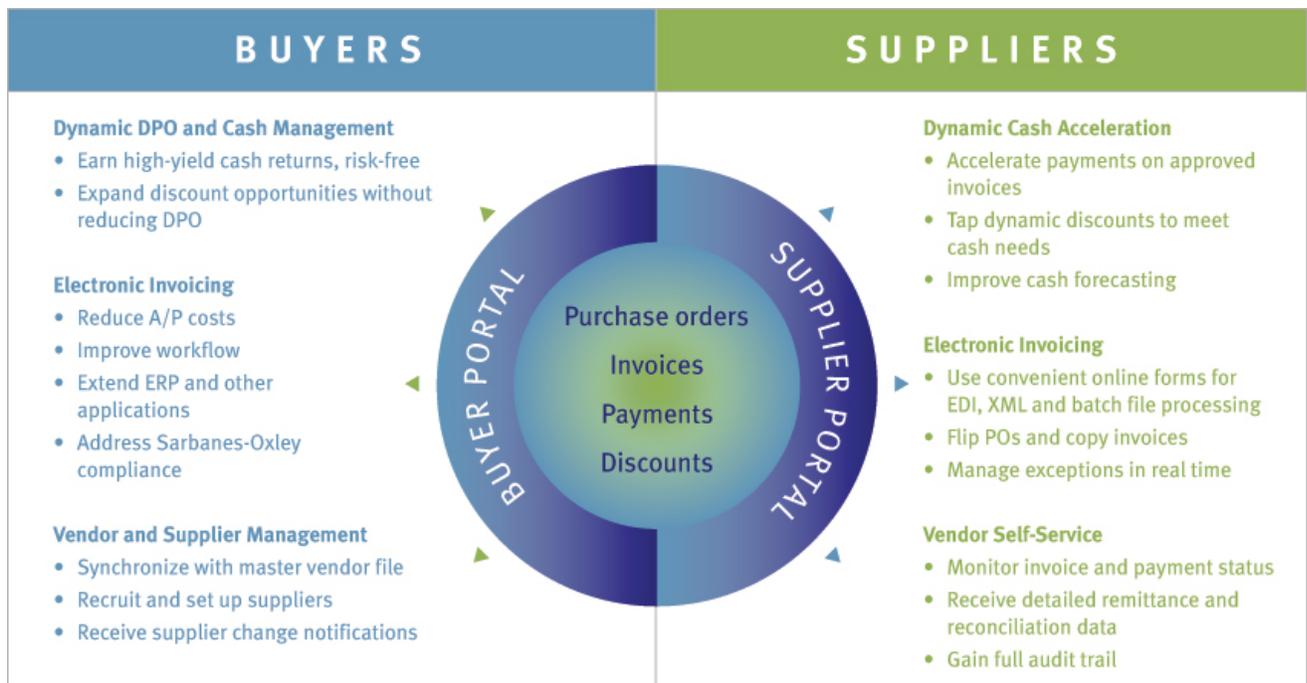
J.P. Morgan Business Settlement Network: Formerly known as Xign

Brief Overview

J.P. Morgan Business is a global settlement network. Formerly known as Xign, they were officially bought out in June of 07, the details of the terms of the deal were not disclosed but as of now they are known as J.P. Morgan Xign Corporation.

Capabilities

The following graph is found on the company website and features a brief overview of the benefits to buyers and supplier using JP Morgan Xign.



Source: JP Morgan Solutions

JP Morgan Xign breaks down valuable processes into five major areas. Each of which encompasses a unique part of a supply chain system.

Process Automation System	Process automation spans order management/delivery to invoice management and payment processing .
Working Capital Optimization	Establishing terms policy, managing Days Payable Outstanding (DPO) and Day Sales Outstanding (DSO), setting required rate of cash return—improving cash flow management.
Supplier Management	Effective and efficient supplier management , recruitment, on boarding and support services for a global supply chain.
Compliance and Control	Improved visibility, fraud prevention and audit ability of entire Order-to-Pay (OTP) process.
Benchmarking and Performance Measurement	Network benchmarks and key performance indicators to track results and maximize the return on investment.

Source: JP Morgan Solutions

Benefits

There are about 60,000 companies in JP Morgan Xign’s shared suppliers’ directory (Feig 2007). In the department of payments and discounts JP Morgan Xign is more than qualified; its use of electronic invoicing clears up any communication issues and eliminates paper waste. Xign originally was an electronic payment company so they are well equipped with knowledge in that area. They also feature a shared Supplier Network, you can gain real-time access into supply chain data such as payment status and settlement dates to improve cash flow forecasting

There is also dynamic discounting capability in JP Morgan Xign, which allows buyers and suppliers to negotiate discounts for early payment of invoices which is something BD is interested in. With JP Morgan Xign, a buyer has a greater opportunity to capture supplier discounts and the platform to negotiate more flexible terms. JP Morgan Xign supports the prorating of trade discounts based on when the payment is actually made. There is flexibility so

that for example, the standard 2/10 net 30 could be adjusted to 1/5 net 45, this lucrative opportunity allows to reduce corporate spend and increase cash earnings. In discussions with more than two hundred Fortune 2000 companies, J.P. Morgan found that only 5% of suppliers on average offer discount terms. According to recent J.P. Morgan KPIs, the average Order-to-Pay client is receiving early payment discounts from approximately 30% of participating suppliers, while top performing clients have penetrated close to 40% of Order-to-Pay suppliers for discounts. ([JP Morgan Oct 2008](#))

JP Morgan Xign also uses ACH payment via CCD. CCD is a Cash Concentration or Disbursement, a credit or debit entry initiated by an organization to fund another account. This is a preferred method of BD which JP Morgan Xign qualifies in. Currently, there are more than 60 customers using J.P. Morgan Xign services including companies such as MetLife, United Rentals, T-Mobile, Sprint, Kaiser Permanente Southern Company, and Verizon Wireless.

([Simmons IBS publishing 2007](#))

The average J.P. Morgan Order-to-Pay client realizes a 1.8% discount on 16% of network spends or about \$2.9 million for every billion dollars of spend. Top performing clients are realizing more than \$4 million in discounts for every billion dollars of network spend ([JP Morgan Oct 2008](#)).

JPMorgan Xign was named a leading vendor of accounts payable electronic invoice presentment and payment (AP-EIPP) by independent research firm Forrester Research. According to the June 2008 report *The Forrester Wave™: AP-EIPP, Q2 2008*, JPMorgan was named a leader in the market for solutions that streamline the invoice-to-pay process for its Order-to-Pay service. (JP Morgan July 2008). According to the report, JPMorgan had the top scores in the categories of invoice management, value delivery and invoice-driven financial

optimization. JPMorgan also received the highest possible scores in the categories of value delivery and 'financial resources to pursue strategy.

JPMorgan's Order-to-Pay clients achieve a range of bottom-line improvements, including reductions in settlement-related operating costs of 50 percent or more. Top performers are achieving on-time payment performance of up to 98 percent and capturing discounts on 36 percent of spend ([JP Morgan July 2008](#)).

The United Rentals case is a good example of the benefits and savings for implementing a JP Morgan Xign application, United Rentals United Rentals suppliers submit 50,000 to 100,000 invoices a year. Robert Simon director of shared services of United Rentals pointed out that the savings in postage alone represent a substantial amount of money ([Sailors 2006](#)).

Overall, JP Morgan Xign is a very qualified supplier that offers substantial savings, a high emphasis is spent on Order-to-Pay applications which JP Morgan Xign seems to excel at. They have an excellent following of customers and have flexibility within their system to allow for negotiations that help the company and the suppliers.

Appendix G



SAP Business Suite

Brief Overview

SAP has methodically transitioned toward incorporating Web-based capabilities into its product lines. While the company's huge installed base of customers provides a steady stream of recurring licensing and service revenue, SAP has come under pressure from investors to pursue new areas of growth.

SAP has also introduced its NetWeaver technology and application platform, which is designed to increase the interoperability between enterprise data and SAP's software products.

SAP's acquisition of Business Objects expanded its product line and bolstered its business intelligence offerings, but was also a response in part to competitive pressure from Oracle, Microsoft, Hewlett-Packard, and IBM (Hoover.com).

Benefits

The SAP Supplier Relationship Management (SAP SRM) application is built on the SAP NetWeaver technology platform, enabling multiple levels of suppliers, partners, and manufacturers to work together on a fully integrated source-to-pay process.

SAP SRM enables key business processes, including:

- **Procure to pay** – Execute the operational activities of procurement, including self-service, plan-driven, and services procurement. With SAP SRM, you can integrate catalog-based requisitioning with your traditional procure-to-pay process and gain the benefits of e-procurement without losing your back-end enterprise resource planning processes.
- **Catalog management** – Manage catalog data as master data in a repository that is deeply integrated with the core application processes.
- **Centralized sourcing** – Gain visibility into the demand for goods and services from multiple back-end systems, aggregate spend and streamline bidding processes, and collaborate with suppliers for faster and more efficient savings capture. SAP SRM can help you tap into new value through better business planning, improved supplier qualification, and more efficient supplier negotiation.
- **Centralized contract management** – Consolidate contract information across multiple systems and regions, distribute contract usage, ensure optimal contract selection and pricing, and track compliance and savings realization.
- **Supplier collaboration** – Link suppliers to your purchasing processes through the supplier portal. With SAP SRM, you can choose the optimal interaction channel for numerous business processes and documents and collaborate more effectively with suppliers in supplier-facing processes.
- **Supplier evaluation** – Manage your suppliers and reduce risk through supplier scorecarding.

SAP SRM provides companies with the tools to drive superior results through an end-to-end procurement process. Activities such as spend analysis, category management, requisitioning,

sourcing, contract life-cycle management, invoicing, and supplier management, are part of an integrated platform.

SAP SRM enables your organization to achieve the following business benefits:

- **Sustainable cost savings** – SAP SRM enables tight process integration. As a result, companies are able to achieve a closed loop from source-to-pay. Aggregating spend in a single platform leads to optimized spend and supplier relationship management.
- **Contract compliance** – SAP SRM provides visibility into enterprise expenditures and enables the procurement organization to effectively demonstrate that spending activities, contracts, and supplier interactions adhere to corporate guidelines.
- **Competitive advantage** – SAP SRM gives you the tools to partner with key suppliers to differentiate in your market, define your supplier management approach, and determine the key metrics that are used to determine supplier success.

Appendix H



Brief Overview

Vinimaya is a private company founded in 2000 located in Shelton Connecticut. Vinimaya's product - the SmartSearch Catalog Integration System works with any e-procurement system, most notably market leaders Ariba (Buyer), Oracle (I-Procure), SAP (Enterprise Professional Buyer) and Peoplesoft (eProcure). It is used by leading global enterprises like Sunoco, 3M, Alcoa, EDS, Cooper Industries, UPMC, Agilent, and Corning. In total there is around 200 suppliers that work with Vinimaya. Vinimaya uses a catalog system for indirect procurement, depending on the industry, the company's indirect spend can be anywhere from 30-70% (Vinimaya FAQ 2008).

Capabilities

Vinimaya basically breaks down companies problems into five main categories. The following list is from the website.

1. LIMITED USER ADOPTION, caused by
2. COMPLEX AND INCONSISTANT USER INTERFACES, exacerbated by
3. MISSING CATALOGS (OR SKUs), a problem whose resolution is inhibited by
4. LACK OF SUPPLIER CAPABILITY AND/OR COOPERATION, which in turn
5. INHIBITS TRANSACTION VOLUME through the e-procurement system!

Vinimaya's SmartSearch program is basically a program where all suppliers can be integrated. Most companies use multiple XML punchout programs and SmartSearch is basically a way to integrate all of these together. SmartSearch Catalog is based on Vinimaya's patent-pending SmartSearch Agent(TM) technology platform, and allows users to search and shop directly from suppliers' web sites, industry marketplaces, catalog aggregators and supplier networks; as well as their internal catalog database, all from a single user interface, without ever leaving their e-procurement system. SmartSearch Catalog also provides built-in compliance support, giving the buying organization the ability to manage or audit pricing, create sub-catalogs and control user views from all their the catalog sources, including punchout sites, a capability currently unique in the market (Lee 2009).

Benefits

One of the main benefits of Vinimaya is their capability with other eProcurement systems. So it is not an issue of a supplier having to change their system completely if they wanted to work alongside BD.

Vinimaya's SmartSearch Catalog solutions are 100% compatible with leading eProcurement systems:

- Oracle iProcurement
- PeopleSoft E-Procurement
- Ariba Buyer
- SAP SRM/EBP
- Ketera Procurement
- SciQuest eProcurement
- PerfectCommerce PerfectProcure

Source: (Vinimaya e-Procurement Benefits 2008)

Another benefit of Vinimaya is that their delivery on demand program is very real time and has many capabilities that are not common in other programs. Although it is an online catalog system, you can search across and aggregate results from all catalogs. You can also enable suppliers advance ship notices, invoices and payments into days format even if the suppliers did not support punchout or roundtrip. Another possible benefit or downfall depending on how BD looks at the situation is that it is extremely simple and easy to become a supplier to Vinimaya. This may or may not be a positive, if BD is looking for volume of suppliers more than quality of suppliers this is a positive.

Lastly and maybe the most impressive is the fact that Vinimaya has not posted a loss since 2005, and expects 2008 to be its most profitable year ever. Although it is a private company it seems to be growing exponentially as the times go by. Since its birth in 2000, every customer that has been up for renewal has extended their contract which makes it a 100% rate. This shows that in terms of customer happiness of the program it seems to do what companies want the SmartSearch program to do (Lee 2009).

Downfalls

There do not seem to me many downfalls of choosing Vinimaya and a program such as SmartSearch. The program has received much acclaim and seems to meet all of the specifications that BD requires in their suppliers including sharing information with suppliers, and automated service, and a strong supplier base.

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EDUCATION: Bachelor of Science with Honors in Supply Chain and Information Systems
Minor in Information Systems Management
The Pennsylvania State University, University Park, PA 16802
Enrolled, August 2006
Graduation, May 2010

Schreyer Honors College, The Pennsylvania State University

THESIS TITLE: TBD

HONORS ADVISOR: Dr. John Spsychalski

THESIS SUPERVISOR: Evelyn Thomchick

WORK EXPERIENCE:

Bayer

Bayer Material Science Supply Chain Center of Experts Intern

May 2009-December 2009

Pittsburgh, PA

- Participated in the launch of a brand new information system
 - Trained to use all SAP Programs
- Attended meetings with upper management and consultants from the United States and Germany to strategize and initiate a companywide change from EBITDA focus to a Working Capital focus to free up a billion dollars by 2010
 - Worked with team on Inventory initiative which requires the ability to run analyses brought to Bayer BMS by Bayer Business Consulting
 - Performed for all PCS and PUR products
 - Participated in Export Process Improvement as a member of the committee
 - Strategized with cross functional groups to reduce lead times
 - Organized, participated, and recorded meetings with PCS leaders to improve all processes and work out problems with new SAP system.
- Became one of 5 members of the Change Council formed to manage internal issues that come with large company shifts. Used the ADKAR model. Helped inform all Bayer Material Science employees of the new initiatives, what they are, why they are happening, and what it means to them
 - Planned and attended Change Management Leadership Training Day with upper management
 - Assembled outlines for BMS Communications to create a BMS Bulletin Article on an introduction to Bayer's Working Capital Initiative
 - Created BMS Working Capital Initiative Update 1 power point which has been cascaded horizontally and vertically throughout BMS
 - Collaborated with other change council members to create a communication plan
 - Outlined content and worked with Bayer print shop to create informative posters to be displayed in all Bayer BMS buildings in Pittsburgh, and plants throughout the United States
- Worked with SAP system to pull data to perform analysis of forecasting biases. Ran various analysis with the Business Warehouse System, Excel, and Access to analyze current excess stock
- Created numerous power point presentations on Working Capital, Summit Conference with Germany, Change Management ect.
- Worked to assist Customer Service
 - Trained as a Call Coordinator
 - Created Emergency After hours Contact Card
 - Conducted my own meetings

- Trained to create Customer Service Program One Programs for service reps and export team

PROFESSIONAL AFFILIATIONS: APICS

Awards, Scholarships and Honors:

- Penn State University Dean's List
- U.S. Steel Trustee Scholarship 2008-2009
- John J. Coyle Scholarship 2008-2009
- Academic Competitiveness Grant 2006-2007, 2007-2008
- Schreyer Honors College Graduate

SKILLS AND QUALIFICATIONS:

Languages: Conversational Spanish

Computer: Proficient in the use of Microsoft Project, Visual Basic, Microsoft Access, Microsoft Excel, Power Point, , Adobe Photoshop

Other: Trained for 15 weeks on Project Management and Programming
Took 15 week course on SAP R/3

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