PROBLEMS MANUFACTURERS AND MARKETERS FACE WHEN USING THE INTERNET TO MANAGE THE GLOBAL VALUE CHAIN

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ABSTRACT

The major problems that manufacturers and marketers face when using the Internet to manage the global value chain are (1) cannibalization of normal traditional channels sales by Internet based sales; (2) overselling supply, production, and distribution capacities due to the lack of salesperson involvement to apply knowledge about these capacities; (3) misinterpretation of the permanency of the demand from customers who may return to their original suppliers once those suppliers are on-line; (4) doing business 'in the blind' and not fully understanding the customers' needs, desires, and future plans; (5) forecasting volatile demand with very short lead-times; and (6) synchronization and optimization of the value chain when everyone in the chain has open access, and extra-value chain servers and networks are necessarily being used to manage the value chain on the Internet. This paper examines these problems and offers strategies for overcoming them.

Keywords: Internet, value chain, manufacturing, marketing, management, cannibalization, IT.

INTRODUCTION

"Business is entering its next step of evolution: a new conception of time in which simultaneity rules (5)." Customers' desires for immediate fulfillment of orders for customized or personalized products are changing the way manufacturers operate. The Just-In-Time (JIT) system of manufacturing reintroduced to United States manufacturers in the 1980s was the harbinger of a multitude of philosophical and information technology (IT) enabled systems aimed at meeting the customers' desires for variety and speed and answering threats from global competitors. The maturing of the Internet has raised the promises of being competitive globally and taking orders instantaneously twenty-four hours a day 7 days a week. The literature - popular, practitioner, and academic - is replete with anecdotes of the successes of retailers, service businesses, and electronics manufacturers using the Internet for managing the global value chain. Many of these articles extol the virtues of Internet based, real-time, global value chain management systems. Indeed, when these near-perfect, hypothetical situations actually come to fruition (the general consensus of most prognosticators seems to expect sometime between 2005 - 2010), the surviving companies/networks will be more efficient, more profitable and more responsive to true end-consumer demand.

Some manufacturers of light goods have already had success on the Internet. Dell Computers' method of Internet based global value chain management has been held up as the model to be emulated. Microage, Cisco, Gateway, and other digital product manufacturers have all adapted the Dell model with mixed success. Now manufacturers of more durable goods such as automobiles, Ford, General Motors, and Toyota (16) in particular, are moving toward using the Internet for value chain management. However it is not easy for these heavy manufacturers to

move to the Internet. Their processes are not just composed of 'brick and mortar' but also concrete and steel and sometimes hard physical links to suppliers and customers. These traditional behemoths aren't likely to move as fast as the digital products companies. For example, it took Ford 18 months to reposition its IT operations just to begin to harness the Internet (7). Digital products have to be interoperable. As a result the products are composed of a high percentage of interchangeable parts that can be purchased from several suppliers. This availability of interchangeable parts combined with the relative simplicity of the products and processes enables these light manufacturers to operate with very short manufacturing lead-times and reap tremendous benefits from using the Internet to manage the global value chain. Heavy manufacturers' products, on the other hand, are primarily composed of brand specific custom parts. Their products and processes are complex and often the processes are literally embedded in concrete. Their expectations of benefits and measures of actual performance from using the Internet should not be derived from nor judged by the experience of light manufacturers. Very little research has been focused on the problems faced by manufacturers in general, and particularly manufacturers of more durable goods, for managing the global value chain using the Internet. The purpose of this paper is to examine potential problems the durable goods manufacturers will face and suggest strategies for dealing with them. In many cases, the experience of the retailers, service companies, and electronics manufacturers will be used as a 'jumping off place' for discussion and comparison.

MAJOR PROBLEMS

The major problems that manufacturers and marketers face when using the Internet to manage the global value chain are presented and discussed below. Strategies are suggested for overcoming or managing each of the problems.

Cannibalization of Normal Traditional Channels Sales By Internet Based Sales.

Cannibalization occurs when a business begins to offer Internet based sales and service and the customers of the traditional 'brick and mortar' channel simply switch to the Internet based channel. This is not a problem if the business' intention was to move the customers to this channel to reduce cost or enhance service. However, if the business intended to open and expand an Internet channel market and simultaneously use the Internet to influence, maintain and even grow the traditional channel market then the resources allocated to develop the Internet channel may have been misspent. Even further losses may be incurred via the costs of downsizing the traditional business and of unrest and attrition among the traditional channel distributors, sales force, and employees. Manufacturers should make thorough analyses before establishing an Internet channel to insure that after all of the cannibalization the benefits from the Internet channel are greater than the costs associated with downsizing the traditional channel.

Many businesses today thrive on customers' lack of information. For example, local buyers may pay more for goods than they would if suppliers were numerous because they lack the ability to comparison shop. As access to the Internet levels the information playing field, sales in many product categories will shift to the channel, either online or traditional, offering the lowest price. Companies offering both options must prepare by either insuring that their cost to sell via the

Internet channel is lower, or that they offer value added services through the traditional channel to justify the higher prices.

Manufacturers might consider the lesson from Charles Schwab, the discount brokerage firm. As Internet stock trading at very low prices began to encroach on their markets, Schwab discounted its Internet-only trading prices to $29.95 compared to about $65 per trade for those made through a broker. They subsequently found that many customers maintained a small brokerage account for the advice, but did most trades through their Internet account to save on transaction costs. Schwab's solution was to significantly reduce the price for broker assisted trades while establishing a customer interface that made Internet trading much easier and more convenient. Initially, this reduced revenue by $125 million. However, over the next 18 months, the new pricing structure succeeded in attracting additional accounts worth over $51 billion, most of which used the lower cost Internet trading option. This strategy raised Schwab's market share of online trading to 28% (1). Manufacturers choosing to do business traditionally and online should tailor their online product package offerings (customizations, price, delivery, online support, etc.) to attract nontraditional customers and also augment the value of product packages offered through the traditional channel with appropriate ambiance, personal consultation, and service.

An extreme method is to convert entirely to the Internet based channel as exemplified by Egghead Software, especially if it appears the lower Internet pricing will significantly expand the market for the firm's products (15). Similarly, manufacturers may choose to convert entirely to the Internet based channel to expand their market and/or reduce costs. Manufacturers taking this approach should be careful to verify that all of the costs of operating the web channel (such as 24/7 operations and customer support) have been considered.

Manufacturers attempting to avoid the lowest price wins mentality can propose novel value-oriented pricing mechanisms. American Airlines, for example, pays its tire vendors on a 'per landing' basis. This rewards suppliers for focusing on improving the product value rather than merely lowering the cost to produce (9).

Overselling Supply, Production, And Distribution Capacities Due To The Lack Of Salesperson Involvement To Apply Knowledge About These Capacities.

Salespeople, in the best companies, stay apprised of what they can promise a customer in terms of delivery date and quantity and not exceed the production capacity of the firm. In the customer driven rush to implement web-based value chain solutions, many companies fail to first integrate internal information flows. Organizations that operate like separate silos of information may not anticipate the resulting problems. Without the intervention of the sales force to check with warehouse or production contacts, their new systems accept orders that exceed their inventory and production capacity. The solution usually requires rethinking not only the process and organization, but also integration across customer-facing groups (10).

The salesperson in the Internet based channel is a virtual salesperson embodied in the web page and online ordering system. This system must automatically sell excess capacity and discount backordering in real time much like airline tickets are sold on the Internet. These decisions must be made in advance of the online transaction. Hard capacity constraints or intelligence for

determining the constraints must be loaded or linked to the web page. Hard price bands or yield programming, similar to that used in the airline industry, must also be loaded or linked to the web page. Continuing close collaboration between the marketing, manufacturing, finance, and IT staffs is absolutely essential to put the capacity and pricing constraints intelligence in place.

Misinterpretation Of The Permanency Of The Demand From Customers Who May Return To Their Original Suppliers Once Those Suppliers Are On-line.

Another risk manufacturers face is establishing a 'one size fits all' Internet based value chain, where all customers are offered similar products and services at similar prices, delivery times, and service levels. This may attract significant levels of new business from smaller customers of competitors. The company reacts quickly to the increased volume, perhaps even adding capacity. Inevitably, the new customers' original suppliers respond with comparable deals and the incremental demand evaporates. Achieving lock-in is the key to turning new customers into permanent customers. Some ways manufacturers can achieve lock-in are extended warranties, maintenance agreements, accepting trade-in of products, always on online technical support, and so forth. Manufacturers must be intimate enough with their customers to know how to lock them in. Paradoxically, what locks in a customer today may be viewed as entrapment by the customer in the future.

One solution to this dilemma lies in the 'digital loyalty network' approach to managing customer relationships. By combining automated customer relationship (CRM) management with supply chain management, companies can differentiate in real time the response to individual customers and/or segments according to their loyalty, profit potential, service requirements, and cost to serve (12).

Doing Business 'In The Blind' And Not Fully Understanding The Customers' Needs, Desires, And Future Plans.

Another development worth noting, the e-marketplace or vertical consortium, may be independently run, organized by individual large buyers, or owned jointly by a consortia of buyers within an industry. Those that are well run may benefit all participants via standardization of designs, elimination of excess SKUs, sharing of information and streamlining of transaction costs. However, many operate primarily to the benefit of the buyers, with some requiring suppliers to pay transaction fees in addition to lowering prices through auction-style bidding (3).

Manufacturers can use the Internet to learn about their customers by having product and service expos on-line that ask questions of customers as they peruse the products and services modeled or described. 'Playgrounds' can be provided on-line for customers 'to design their own products' in order to gather data about their desires. Additionally, customer preferences and profiles can be solicited online by giving the customer something of value in return. And finally, the customer click stream data can be tracked to determine what product or product attributes interest the customer.

Forecasting Volatile Demand with Very Short Lead-Times.

Even if orders are taken instantaneously via the Internet, fulfillment is constrained by the physicality of the manufacturing operations. Only by minimizing the manufacturing lead-time of operations or anticipating the customer demand and fulfilling the order from finished goods inventory or staged partially completed products can delivery fulfillment time be minimized. Minimizing manufacturing lead-time will be discussed below. The anticipation of demand or forecasting is addressed here.

To realize many of the extraordinary benefits attributed to deployment of an Internet based value chain management approach, manufacturers need to pinpoint significant differences in supply and demand quickly and accurately. By obtaining customer demand data as far upstream as possible and by collaborating with all suppliers, companies can recalculate demand on a daily basis. Honeywell provides an excellent example. They have developed sophisticated algorithms to analyze customer demand based on four types of data: Honeywell's actual shipments, Honeywell's forecast of customers' sales, customers' forecast of their own sales, and actual consumption. Honeywell has found that the quality of the demand data improves as they move from actual shipments to actual consumption, but the data also becomes more difficult to obtain. Honeywell's forecasters believe that the effort is warranted despite the difficulties, because waiting until customers push purchase orders and forecasts to them will not allow their system to react in time (14).

The problem with forecasting is that it introduces error into the manufacturing processes. Traditional methods of model selection, error measurement, and parameter adjustment will reduce forecasting error when the market is in steady state. Firms striving to deliver mass customization and personalization are seldom in steady state. The emphasis must be on preventing error in the forecast. The first requirement to prevent error is to shorten the manufacturing lead-time as much as possible. This shortens the forecasting horizon and reduces error. Business Process Reengineering (BPR), Total Quality Management (TQM) and JIT tools and strategies can be focused on reducing lead-time. The use of JIT tools for reducing set-up times, linearizing production flow, and shortening supplier lead-times is crucial. The second requirement is to retool the forecasting process to concentrate more on qualitative issues since there will be scant longitudinal data for mathematical modeling in the mass customization and/or personalization environment. IT powered market research, focus groups, technological forecasting, and geopolitical forecasting should be emphasized. The services of a company similar to Internet Securities, Inc. should be contracted to provide global information. The third requirement is the establishment of a CRM system that is constructed from order data, application data, logon data, certification data, and click stream data. Finally manufacturers should segment their suppliers and customers into strategic and 'arms length' groups (4) and engage the strategic suppliers, and customers in strategic partnerships through collaborative planning, forecasting, and replenishment (CPFR) to provide deterministic forecasts (8). Of course, a manufacturer's ability to obtain access to the necessary information requires a level of partnership and trust that probably has not previously existed. Therefore, it may take quite some time before excellent forecasting accuracy results. Even after the initial level of information access is obtained, manufacturers may be uncomfortable having to rely on data outside their control to drive significant aspects of their business. But as John A. White, vice president-

strategic consulting services, of Manugistics explains, "I may rely on my customers' forecast to drive production. If they don't forecast well, I may lose opportunity. However, the magnitude of lost sales or too much inventory will be greater if trading partners don't collaborate." (11) The 'arms length' suppliers and customers would simply be managed on a competitive basis.

Synchronization and Optimization Of The Value Chain When Everyone In The Chain Has Open Access, And Extra-Value Chain Servers And Networks Are Necessarily Being Used To Manage The Value Chain On The Internet.

A plethora of literature has been written about the two major problems of any network, security and privacy, and certainly the value chain networks are not immune to these. However the focus here is on synchronization and optimization of the value chain. The keys to value chain synchronization and optimization are collaboration, a common Internet value chain protocol among all the members of the value chain, and an effective value chain management methodology. Collaboration and IT are the keys to speed in the value chain. Value chain teams connected globally via Group Decision Support Systems (GDSS), interactive video, chat rooms, and Email are essential for collaboration. CPFR requires more interaction between value chain members than vendor managed inventory (VMI) and should be used if only because it enhances collaboration (6). A common value chain standard protocol such as RosettaNet is essential to managing the value chain in an integrated manner. RossetaNet will operate using Partner Interface Processes (PIP) to provide the technical specifications for exchanging information and will include modules for supply and demand management, partner integration, collaborative forecasting, order management, design management, ship from stock and debit, and manufacturing work in process tracking (13). There are off the shelf IT applications, such as enterprise resources planning (ERP) systems, whose designers claim that they can optimize the value chain and operate in pull, push, or mixed materials flow modes. Manufacturers should begin by analyzing their competitive situation, formulating an appropriate value chain structure and discipline, and then select or design value chain optimization IT applications. The three primary materials flow problems with a value chain are long lead-times, the 'bottleneck' effect, and the 'bullwhip' or 'whiplash' effect (2). Theory of Constraints (TOC) and JIT both offer concepts and methodologies for minimizing these effects when applied to all the partners of the value chain in concert rather than just internally to each manufacturer. Application of TOC and JIT philosophies facilitates integrating, operating, and continuously improving the value chain.

CONCLUSIONS

Six major issues facing manufacturers managing the global value chain using the Internet have been addressed and strategies for each issue have been suggested. The dominant theme laced throughout the strategies is the need to tightly integrate the value chain. The principal tools are identified as collaboration and information. The chief enablers are management philosophies and IT systems. However, creativity, ingenuity, and problem solving skills must be brought to bear on developing a complete rationalization of the value chain; on identifying, collecting, and analyzing pertinent data; and on designing and managing the value chain.

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