
White Paper

The E-Commerce Imperative: Empowering Efficiency in the Healthcare Supply Chain

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I. *Executive Summary*

According to a recent study by Computer Science Corporation, the domestic healthcare supply chain is estimated to have an annual value of \$83 billion dollars. Of that number, \$23 billion is estimated to be the cost associated with moving and managing products through the supply chain. The study indicated that \$11 billion of the \$23 billion could be eliminated through the use of technology and supply chain management.

After years of cost-cutting initiatives following on the heels of repeated cuts in reimbursement, ever increasing regulation, and critical staffing shortages (most noticeable in key clinical areas such as nursing), hospitals and healthcare systems are once again at a crossroads. This latest crossroad differs from all of the ones that have come before in one significant way. In the past, hospitals could count on some measure of profit margin relief coming from reductions in the prices they pay for the medical products they consume. Unfortunately, the chilling effects of reductions in government reimbursement and cost-cutting efforts by managed care organizations have finally filtered all the way to the companies who manufacture and distribute those very same medical products. That combined with the demands of buying groups and other larger purchasers of medical products have contributed to substantial reductions in the bottom lines of some of the nation's largest suppliers.

Up until the last few years, almost all of a hospital materials management department's effort to reduce cost centered squarely on the line item acquisition cost of medical products. With those opportunities almost exhausted, business savvy materials managers are beginning to turn their attention to the costs associated with the processes in managing the internal life cycle of the products that move through their institutions. It is clear that technology can and must play a significant role in removing costs from the entire healthcare supply chain. The power of the Internet to move and manage information combined with improvements in technological functionality are the catalyst that the healthcare supply chain has long needed to maximize its potential and minimize the total cost of moving products from their manufacture and into the hands of clinicians. Ecommerce is the vehicle that will make many of the above a reality. Furthermore, e-commerce is likely to serve as the template for how healthcare costs can be removed well beyond the supply chain.

II. Understanding the Healthcare Economic Model

In order to fully understand the potential impact of e-commerce on the healthcare supply chain, one must take a few steps back and gain an appreciation of the Healthcare Economic Model that exists in the United States. At first glance, the notion of an economic model in healthcare, which could somehow be different than that of other, in fact, all other, industries in the United States, might seem a bit absurd. However, stopping at the first glance would be a significant oversight. Consider that outside of the healthcare marketplace prices for goods and services are set largely through competition. Manufacturers and distributors are free to adjust their prices as

they see fit based upon changing costs of labor and/or raw materials. Significant shortages of either one can produce sharp increases in prices. The laws of supply and demand hold steady. The current situation with the increase in gasoline prices points to an example where as supply falls, even if the fall is artificially produced, prices go up and no one is exempt from the effects. Clearly, non-healthcare manufacturers and distributors have the ability to raise prices as their costs increase. The free market is truly dynamic and prices are elastic. Non-healthcare purchasers are able to operate on the long held assumption that a dollar saved on the acquisition cost of a product is a dollar that goes directly to the company's bottom line.

Now consider the situation in healthcare. For a large segment of the population, the government is the ultimate purchaser of healthcare services. A rapidly expanding senior population combined with shrinking payments into the government healthcare system has created a crisis. In its efforts to "stretch" the Medicare Trust Fund for as long as possible, the government has become extremely aggressive in reducing its healthcare expenditures over the last few years. Prior to the Balanced Budget Amendment of 1997 (BBA), many U.S. hospitals were hard pressed to achieve their financial objectives. Now, nearly three years after the passing of the BBA, the deep financial impact of that act is being calculated and reported. A quick check of the daily healthcare headlines almost always yields information on another healthcare institution meeting its financial Waterloo. As a whole, hospital costs are on the increase. New technology, lower reimbursement not just from the government but also from managed care as well and the need to provide at least modest cost of living increases for their employees are forcing more hospitals into the red. Under the old reimbursement laws, the cost of new equipment could be handled as

a capital pass through. Today, options for getting a break from the government on the costs of new technology are all but a distant memory. Not only can the hospital not pass on its cost increases to its customers in the form of price increases, in many cases, hospitals are being expected to accept reimbursement that is lower than previous years. With limited leverage on the supplier side and almost no leverage on the payer side, hospitals are caught squarely between a rock and a hard place.

There is one more aspect of the healthcare economic model that will bring this discussion back to the healthcare supply chain. When manufacturers develop new products, they invest enormous amounts of capital into that development. Once a product is produced, clinically tested and approved by the Food and Drug Administration, a process that can cost in the millions of dollars even for the simplest of products, the manufacturer must now depend upon a reasonably high price and patent protection to provide an opportunity to recoup their development investment dollars. The amount of money that manufacturers have to invest in development is reduced every time they concede to sell their products at lower prices. The existence of Group Purchasing Organizations (GPOs) and their practice of using “most favored nations clauses” in their supplier contracts essentially means that if a manufacturer offers a customer a price that represents a new market low price for that item, the manufacturer can expect that in a relatively short time that price will become the price for virtually all of their customers.

Historically, hospital materials managers have focused on reducing the line item cost of the products they purchase. For years they have held to the notion that a dollar saved on the acquisition cost of the product purchased is a dollar that goes directly to the institution's bottom line. However, this long held belief may not be universally valid in the healthcare industry. In fact, in certain healthcare industry segments, it is possible to make an argument that reductions in product acquisition costs may in fact contribute to specific reductions in reimbursement by payers. This argument is based upon the fact that payers in several industry segments require providers to present proof of their cost of the products used in providing the healthcare services to their insured. But beyond that hypothesis, there is another reason why hospital materials managers need to shift their focus. By and large the substantial product cost savings opportunities that may have at one time provided significant career boosts to many materials managers are no longer there in the numbers and sizes they once were. That is not to say that there are no longer any opportunities to lower product acquisition costs. Clearly, every hospital can and will find that there are product groups where they have not purchased well and some prices will come down. But in the long run, lower product costs are not the factor that will drive e-commerce. That will be left to the area known as process costs.

III. Separating Product Costs From Process Costs

The most expensive component of cost for most hospitals is labor. This applies to every department. But in just looking at labor statistics or staffing reports, it is difficult for anyone to figure out exactly what employees are actually doing. Yet it is vital for hospitals to have that

information. The management method known as Activity Based Management is ideal for discovering what work gets done, what it costs to get it done and what work can be reduced or eliminated. One of the most important results of implementing Activity Based Costing (the cost accounting component of Activity Based Management) is in determining what value is produced in the work that is done. Work that has no value can be targeted for elimination thus providing an opportunity to reduce the total cost of doing business.

All hospital departments consume products to one degree or another. Yet because their purchasing activities are handled by materials management, their cost savings focus is more related to labor savings and, while they may not employ Activity Based Management, they do understand some relationship between the number of procedures they do and the level of staffing required to perform those procedures. Striking the right balance between staffing and productivity is critical. Yet it is also significantly more difficult to manage and quantify the results of doing so without the use of Activity Based Management.

Over in materials management, the same rules apply except that reductions in line item acquisition costs are much easier to calculate and report than improvements in productivity or reductions in process costs. Even hospital management recognizes this situation and often establishes goals for the materials management department that completely revolve around reducing the cost of materials purchased. This can only be accomplished in two ways. First, material costs can be lowered by reducing the price paid for the products purchased. Historically, this has been the role of materials management and the goal of GPOs. Second,

material costs can be lowered by reducing the consumption of the products purchased. Reducing consumption can occur naturally if census numbers go down or if fewer procedures are performed. It can also be reduced through efforts to decrease clinical staff access to products or by changing procedures or procedural trays to include fewer products. Products such as Omnicell or Pyxis units create cost savings in part because they reduce access to products, which contributes to reduced consumption.

The typical hospital materials management function encompasses several departments including purchasing, distribution and sterile processing. Each of these departments performs a wide variety of time consuming activities. The accounts payable department is heavily involved in the back end of supply chain transactions. Clearly then, a great deal of resources are consumed in materials management-related functions. By streamlining or eliminating many of these processes, hospitals can significantly reduce their overall cost of doing business and improve their ability to remain fiscally solvent and able to continue to provide high-quality care to their patients.

IV. Current Hospital Purchasing Practices

In order to fully appreciate the potential of e-commerce it is essential that current hospital purchasing practices be understood. In general, the term “medical product” can refer to either disposable products or expensive medical equipment. The first type is disposable supplies that are purchased, used and discarded. The second type, medical equipment, may also be referred

to as assets. Assets may be defined as items that have a useful life well beyond a one-time use. Assets may include everything from carts to MRI units.

Disposable products are either kept in inventory at the hospital and are replenished periodically according to their rate of usage or they are requested and ordered specifically for use on a single patient. The hospital purchasing department generally performs the ordering function for these products. In the case of inventory products, replenishment orders are placed with a contracted supplier. Unless usage of a product was higher than expected and a rush order is required, replenishment ordering is a reasonably predictable task. Some hospitals already use Electronic Data Interchange (EDI) to transmit these replenishment orders. Special orders are another issue entirely. The universe of products that could be potentially used in a hospital number in the hundreds of thousands. It would be neither prudent nor possible for a hospital to stock everything. Yet every day new patients with unique needs create the impetus for hospital purchasers to scour the world to source products that will meet that patient's needs. Product sourcing is a tedious and time-consuming process. Purchasing departments historically are filled with catalogs and price lists of every imaginable shape and size. And even with that, much of the sourcing that takes place occurs with purchasers making countless phone calls to suppliers looking for a source for the product they are seeking. Once they find a source however, they must hope that the source actually has the product or can get it quickly. Pricing and delivery terms must be negotiated. Purchasers can literally spend hours trying to track down a single product. Product sourcing is easily one of the most inefficient processes that exist in the entire healthcare industry.

Once an order is placed, the product is received and the invoice arrives, there is another situation that occurs all too often and adds enormous costs to the purchasing process: the pricing on the invoice is wrong. If the purchaser followed good practice guidelines, resolving the price discrepancy is quite doable. However, doing so is likely to create reams of extra paperwork and countless phone calls between the purchaser and the supplier and between the purchaser and the purchaser's accounts payable department. Still worse is the situation where the purchaser failed to use good purchasing practice and the pricing discrepancy is never caught, resulting more often than not in overpayment by the hospital to the supplier.

The purchase of capital equipment also presents inefficiencies in the areas of sourcing and pricing discrepancies. However, the most time-consuming aspect of medical equipment is the disposition of the equipment once it has outlived its usefulness. Not all hospitals migrate to new technology at the same rate, so a piece of equipment that has been removed from service in one hospital may have value in another. Finding another hospital that is interested in purchasing a piece of used equipment can be like looking for the proverbial needle in the haystack. For purchasing departments with reduced staffing levels, often the only workable solution is selling to an equipment broker for far less than the value that might be placed on the equipment by another hospital.

V. The Role of E-Commerce in Reducing Supply Chain Costs

Technology will play an important role in reducing process costs in the healthcare supply chain. This concept was postulated as a result of the now famous and often cited study conducted by Computer Sciences Corporation. At the time of the study, the healthcare supply chain was valued at 83 billion dollars and 11 billion dollars of that was determined to be a direct result of costly and wasteful processes. While large consumers of healthcare products such as hospitals stand the most to gain from process cost reduction, some level of benefit will accrue to every healthcare provider. The right e-commerce technology delivered in the simplest, most customer friendly way can have an enormous impact on reducing costs associated with areas such as sourcing and pricing discrepancies.

- **An E-Commerce Solution to Product Sourcing Inefficiencies**

Current product sourcing practices consist of time-consuming searches of hard copy product catalogs, countless phone calls to potential suppliers, solicitation of price and delivery information and finally the creation of a purchase order. In the e-commerce world, purchasers can choose to search online catalogs and/or send an electronic bid solicitation called an electronic request for proposal (eRFP) to every supplier who carries the product and is connected through the e-commerce company. In a very short amount of time, without the need for a single phone call, the purchaser receives bids and a decision to purchase can be made.

- **An E-Commerce Solution to Pricing Discrepancy Inefficiencies**

Pricing discrepancies, both the kind that are caught and the kind that are not, can be virtually eliminated through e-commerce. For items with contract pricing, that pricing is verified against

the contract-pricing file, which is loaded for the customer. For non-contract items, pricing is confirmed at the time the order is placed.

· **An E-Commerce Solution to Equipment Disposition Inefficiencies**

By using an electronic auction rather than spend countless hours searching for a purchaser for a used piece of equipment or “give it away” to a broker, hospitals with excess equipment can post it on the Web site where other hospitals can see it and bid on it. The result is a fairer price paid to the seller and a higher value obtained by the buyer in simple efficient process.

As hospitals become more efficient, some of those efficiencies will translate into additional efficiencies for their supply chain partners. For example, if a hospital’s purchasing department places multiple orders based on requisitions originating in several different departments, processed by several different buyers and with the same supplier each day, that supplier has a certain amount of cost associated with processing all of those separate orders. However, if those orders are consolidated electronically and placed as a single order via the Internet, the supplier is likely to have a lower cost of doing business for delivering the same number of supplies to the same hospital or to that hospital’s same departments.

In order to fully appreciate this effect, one must understand that the supply chain can only be as efficient as its most inefficient link. Over the past 10 years, manufacturers and distributors have invested heavily in automation and cost measurement and management initiatives such as

Activity Based Management. The result is that many manufacturers and distributors have developed world-class operations. Yet in spite of their own efforts and successes, they are still largely limited by their customers' inefficiencies. Clearly, the most inefficient link in the healthcare supply chain is the healthcare provider. Ecommerce will help to change this situation. As healthcare providers begin to enjoy newly discovered efficiencies in using e-commerce, their supply chain partners, manufacturers and distributors will finally be able to take full advantage of their own cost-reduction efforts.

VI. *The E-Commerce Marketplace*

The availability of investment dollars and the enormous potential of the e-commerce marketplace have fueled and continues to fuel the emergence of new players on an almost daily basis. Although the size of the total market is consistently estimated to be very large, not every entrant will survive. As has been sufficiently demonstrated up to this point, the primary beneficiary of the benefits of e-commerce will be the healthcare provider. Only those companies that can demonstrate quantifiable long-term benefits to providers will, in fact, survive.

As each new entrant seeks to carve out their own territory, they create their own unique offering. Each of these offerings fit into one or more of several identifiable models. These models are critically important because they define the level of importance of the end user, the hospital provider. These models also define what levels of functionality will be available to the user and

how large the universe of products available might be. Each of the clearly defined models along with a few hybrids will be presented and examined.

- **The Closed Marketplace Model**

The closed marketplace model creates an Internet marketplace in which the customer has access only to the domain of products carried or permitted by the site host. In the closed marketplace, the site host may be one or more manufacturers or distributors. The host may also be an Internet business-to-business e-commerce provider who has intentionally chosen to limit the domain of products available to the offerings of a supplier(s) with whom they have established an exclusive trading partner relationship.

The primary benefit of the closed marketplace for providers is that before signing up, they can decide if they want to do business with the trading partners who own the site or with the trading partner selected by the site host. There are several disadvantages to this model. First and foremost, a closed marketplace limits the purchaser's access to products made by certain manufacturers or distributed by certain distributors. Second, the limitations of a closed marketplace may actually increase the provider's cost of sourcing by forcing them to go offline or to resort to traditional sourcing methods to locate the product that meets their needs. It may even force the provider to be a member of multiple online trading communities, which would result in a significant give back of the process cost savings they may have projected for the relationship. Logging on and off multiple Web sites to purchase a variety of products would be

very inefficient. Third, even though the primary strategic benefit of e-commerce is in removing process costs and not in reducing line item product acquisition costs, the closed model is likely to have a negative effect on any market price leveling that might occur with certain items. Fourth, the closed marketplace model severely limits the ability of smaller players to participate in the marketplace as a whole. Smaller companies lack the resources to compete with the larger players and both the smaller companies and their customers will be hurt in this arrangement.

Although e-commerce is generally viewed as providing most of the benefit for the healthcare provider organization, the closed marketplace exists more to serve the site owner than the healthcare provider. In some cases, it appears to be nothing more than a veiled attempt to control the customer's purchasing habits, limit competition that might drive down prices and minimize the risk of losing a sale to a competitor. This is not to say that the closed marketplace model offers no process cost savings opportunities because it certainly does. However, most if not all of those opportunities are taken away when the customer must go offline and/or revert to old inefficient practices to locate a product not accessible to them through the closed marketplace.

- **The Open Marketplace Model**

As the name implies, the open marketplace is almost the exact opposite of the closed marketplace. In the open marketplace, the buyer is the center of the universe and, as such, has equal and unfettered access to the product portfolios of every manufacturer and distributor who has chosen to affiliate with the site host. All players regardless of size are eligible to become

suppliers in the open marketplace. The only potential barrier to entry would be reluctance on their part regarding paying the transaction fees charged by the host. The open marketplace provides tremendous flexibility to the buyer in as much as that they should be able to access the entire universe of product through a single e-commerce portal. This factor along with corollary factors will produce the most dramatic process cost savings potential of any marketplace model.

Inefficiencies related to sourcing, pricing management and asset disposition will be largely erased in this model. The open marketplace model creates what is essentially a free trade zone on the Internet where buyers and suppliers can find each other and create the best win-win opportunity available to either player. It is expected that the open marketplace will have a more profound effect on price leveling since size or individual organizational clout will have little effect on who gets the best deal. Volume levels and commitment capabilities will continue to drive pricing, and smaller customers who offer better abilities to affect supply chain costs will have an advantage over larger organizations that cannot. Not every supplier or every product is necessarily priced with the same methodology. This means that the supplier's margins on individual products may be quite different even though pricing on the entire portfolio might be very similar across customers. It is quite likely that certain product areas will experience more rapid pricing deterioration. In time, however, the leveling effect of an open market will bring pricing equilibrium. While this is occurring, participants in e-commerce should be beginning to reap significant process cost savings, which will result from the inherent efficiencies in e-commerce. This should galvanize users who will finally truly understand the real value of e-commerce. At this point in time, total cost will become more important than product cost and all

players will recognize what makes sense in e-commerce and what does not. One of the things that does not make sense is the purchase of commodities from distributors outside of the buyer's own geographic region. While the buyer may receive some price benefit, the cost through the chain will be higher than if the products were purchased locally in the first place. However, spot purchases of special products or products in short supply in a particular region seem destined to grow significantly.

The open marketplace will permit the buyer to use his own pre-existing GPO contracts, pre-existing hospital contracts or neither. The cost of sourcing will be greatly reduced in the open marketplace because the buyer will need only one e-commerce platform from which to access the entire online marketplace. In addition to medical products, this model will allow the buyer to purchase a wide range of non-medical maintenance, repair and operating supplies (MRO) as well as computers and virtually anything used by the healthcare provider organization.

- **Low-Price Focus Models**

A low-price focus model is one that focuses on obtaining the lowest price for its participants much like a buying group would do. One such example is medpool.com. It is essentially a cross between a GPO and an e-commerce provider. Medpool.com acts like a GPO in the sense that it aggregates or pools (as the name implies), the volume of its members and acts like an e-commerce provider in that it uses its e-commerce platform to solicit bids from suppliers through its eRFP from suppliers linked to the site. The winning bidder will then receive purchase orders for a predetermined amount of product from the individual holders of the aggregated volume.

The buy is a one-time purchase and the format is to take volume out to the market more frequently to take advantage of any downward pricing trends in the marketplace. This in a sense is a closed marketplace because medpool.com acts its customers' (members') agent in matching up the winning bids.

Another recently arrived player makes no pretense about its goals. QuoteMED.com states that its goal is to provide its members with the best possible product pricing. While it purports to plan to address process cost issues, its real focus is pricing. Unfortunately, the logic behind the model is flawed because the pricing that has been available to larger hospital organizations has been available partly because there were other smaller players who would pay more for the products they purchase to, in essence, offset some of the pricing concessions made to the larger players. Unfortunately, if all players become affiliated and become large-volume players, something will have to give. And what is most likely to give is lower prices. Two large e-commerce consortiums Global HealthExchange (manufacturer), and New HealthExchange (distributor) came into being largely to stem the tide of pricing concessions from dot.coms focused purely on price. In general, suppliers are limited financially regarding how much more they can give in price concessions. Additional pricing concessions are likely to come right out of research and development budgets. If this happens on a wide scale, the flow of innovation in healthcare products will slow to a trickle. In evaluating the low price focus model, one must recognize that there is a limit to how low pricing can go. Although it is correct to believe that increased volumes should translate into lower product costs, there is a stopping point. Surely no one believes that an infinite increase in volume would result in an infinite decrease in price. As

soon as pricing equilibrium is established (probably at higher levels than would be expected), price-focus-only e-commerce companies will lose their drawing card while the e-commerce companies focused on process cost savings will be just hitting their stride.

- **Supplier-Controlled Models**

A supplier-controlled model is an e-commerce marketplace established by a supplier or group of suppliers. Notable among this group is the recently introduced Global HealthExchange, which is comprised of a growing number of manufacturers including Johnson and Johnson, Abbott Laboratories and Baxter Healthcare. The New HealthExchange is another such offering. This organization is made up of a number of distributors including AmeriSource, McKesson and Cardinal Health. What is striking about both organizations is that they are an assemblage of organizations who have historically battled each other for every dime of revenue in their respective markets. What threat could possibly be so strong that it would pull these often bitter rivals into a collaborative effort? Although there are actually a number of significant factors involved, one would not be wrong if the pricing issue was the first reason they listed. Clearly, manufacturers and distributors, whose margins in many cases are already significantly lower than that of their customers, are concerned about the Internet's potential power to reduce their margins. Their unstated fear is that unsophisticated buyers will race to the Internet for what they perceive to be a land rush of reduced pricing opportunities. If this happens on a large scale, the results to the entire healthcare supply chain will be catastrophic. The low pricing model clearly is an empty promise to an industry that desperately needs to change how it does business, not what it pays for product.

Supplier-controlled models may be the most formidable foe for the independent e-commerce company. They may have more financial staying power in that they have substantial revenues and are funded through the retained earnings of the member organizations. Ultimately though, if these organizations do not adopt the open marketplace model, they will be placing limits on their own ability to meet the needs of their customers.

VII. The Impact of E-Commerce on the Links in the Supply Chain

Every new approach to doing business must endure its own learning and growth curves. E-commerce in the healthcare industry will not deviate from that maxim. This section will consider the impact of e-commerce on manufacturers, distributors, GPOs and customers.

- **E-Commerce vs. Traditional EDI for Manufacturers and Distributors**

EDI has been used extensively by both manufacturers and distributors. Although EDI has been a good intermediate step, it pales when compared to e-commerce.

The following is a comparison of traditional EDI with e-commerce.

Traditional EDI	E-Commerce
Minimally interactive	Dynamic
Receiver centric	Equicentric
Single source	Multisource
Transaction focused	Process focused
Transactionally efficient	Process efficient
Reduced order entry costs	Reduced error rate
Data transmission	Data warehousing
Local sourcing	Global sourcing
Difficult to learn	Easy to learn

- **Benefits to Manufacturers**

E-commerce should provide the following significant benefits to manufacturers. However, most of these benefits will not occur until the later stages of e-commerce development.

1. More timely and accurate information will permit more efficient production schedules. This is the same benefit that non-healthcare manufacturers are enjoying in demand management in relationships with major retailers such as Kmart and Wal-Mart.
2. Demand science based on access to data will minimize product in the supply channel pipeline reducing operating costs and product obsolescence.
3. Optimization of distribution channel management initiatives will be possible.
4. The supply chain will be in a position to migrate from upstream cost shifting to value-based cost sharing among supply chain partners. No partner will be forced to absorb more than his or her fair share of supply chain costs.

- **Benefits to Distributors**

E-commerce will provide many significant benefits to distributors. The following list is representative but is likely not to be comprehensive.

1. Allows smaller distributors an economical way to compete with larger ones.
2. Online catalogs are less costly than printed versions and are easier to maintain and update.
3. Online catalogs allow potential customers to aware of the distributor's entire product offering, not just what is in a two-year old printed version.
4. Pricing and contract files can be updated quickly and easily, shortening the cycle time historically required to load contract pricing to initiate customer access to new contracts.
5. Pricing can be confirmed and validated at the time of order eliminating backend processing of pricing errors.
6. E-commerce will expand market size for equipment and capital goods.
7. Commodities, which usually carry lower margins, can remain local purchases at an increased level of efficiency.
8. Provides an opportunity for distributors to redefine their value with customers as a supply chain partner.
9. Provides greater quantities of useful, accurate and timely data, which will improve decision making for customers and their distributors.
10. Distributors will be able to expand their online capabilities without having to incur the cost of building it all themselves.
11. Cycle time for equipment sales will be shortened due to the use of eRFPs.
12. Assists distributor sales people in making a transition from sales to service.

13. Allows a smaller sales force to handle a larger customer base.
14. Allows more distributor resources to go into creation of value-added services.
15. Reduces the numbers of returns and exchanges resulting from ordering errors by customers.
16. Streamlines the returns process in cases of unavoidable errors.
17. E-commerce connectivity will likely play an important role in implementing distributor-based e-autoreplenishment.
18. Distributors will reap efficiency benefits heretofore unavailable due to customer process inefficiencies.

- **The Impact Potential on Group Purchasing Organizations**

GPOs in healthcare have been historically focused on reducing the cost of products for their members. They accomplish this goal by aggregating annual volume product purchase commitments on behalf of their members and then aggressively shopping (bidding) these product portfolios among the supplier community to receive the lowest possible price for each line in the product portfolio. Winning bidders for each portfolio enter into a contract with the GPO to sell their products to members at the agreed-upon price for a specified period of time. GPOs create revenue for themselves by collecting membership fees, collecting administrative rebates from participating suppliers or both. These administrative rebates serve as compensation to the GPO for performing the contract administration activities, which produce the supplier contracts.

Early in their history, GPOs created enormous purchase volume leverage with their suppliers and used this leverage to systematically drive down product costs. Hospitals and other consumers of medical products have benefited greatly from the lower product costs achieved by GPOs. Suppliers have traditionally been willing to reduce their prices in exchange for “guaranteed” revenues. The larger GPOs had higher volumes and were able to demand the best prices. In order to ensure that they had the best prices, most GPOs instituted most favored nations clauses in their contracts essentially forcing the supplier to ensure that the price to the GPO was in fact the lowest price in the marketplace for like products as like volumes. These clauses at first worked mainly to the benefit of the GPOs and their members. Over time however, suppliers found these clauses to be solid justification for creating their own marketplace pricing floors. As a result, there has been relatively little downward movement in prices of long standing commodity items although each year there are breakthroughs in lower volume product areas. By the time these “artificial” pricing floors started to go into effect though, something else was happening in the healthcare industry. Medicare, Medicaid and managed care were placing ever increasing demands on healthcare providers to provide more services for less reimbursement. Hospitals who had already benefited from GPO-created product cost reductions were hungry for more, so the GPOs were driven back to suppliers for still more pricing concessions. The result of all of this is greatly reduced margins for suppliers who have almost no place left to go to create the desired pricing concessions. In fact, it is commonplace for some of the largest wholesalers and distributors to operate on pricing that is calculated at product cost minus two percent or more. Only sheer volume and finely honed operating efficiencies allow these companies to operate profitably on such low margins.

Savvy GPOs have come to the realization that the product cost reduction portion of their value to their members is on the wane. Those organizations have developed additional services for their members such as consulting and product management programs. They understand that process inefficiencies in their customers represent their next significant area of opportunity. The largest of these organizations, Premier and Novation, have already moved to secure relationships with business-to-business e-commerce firms. Clearly they view the ability of e-commerce to significantly reduce their members cost of doing business and in so doing provide both themselves and their customers with a strong value proposition.

VIII. The medibuy E-Commerce-based Supply Chain Solution

The preceding pages have created a clear cut imperative for a business solution that will harness the power of technology and the pervasiveness of the Internet to eliminate many of the inherent and profound inefficiencies, which currently exist in the healthcare supply chain. This solution must address the critical needs of customers, suppliers and GPOs. It must be powerful, yet user friendly. It must be comprehensive, yet flexible. It must ultimately be able to transcend the mishmash of unfriendly incommunicative technology, which has played a large role in keeping the management of healthcare in functional silos effectively preventing efficiencies and synergies.

The service offering of medibuy exceeds the established requirements and will in time, far surpass requirements that currently do not even exist. It is uniquely focused on the customer, yet

its' model takes into the account the needs of suppliers and GPOs. Its inclusive yet selective approach to the healthcare supply chain provides a true win-win for partners in every link. The power of medibuy's technology and vision are likely to create new paradigms for other aspects of healthcare management far removed from the supply chain.

medibuy is a provider of business-to-business Internet marketplace services for the healthcare community. It provides a robust yet easy to learn and use array of services designed to enable the efficient use of the Internet to acquire medical supplies and equipment, maintenance, repair and operating supplies, and almost any other product required by the healthcare provider organization. medibuy is customer focused and supplier neutral. medibuy operates an open marketplace, which was shown earlier in this paper, to be the superior model for the long-term benefit of the entire healthcare supply chain. Surely, there will be some product-price reductions resulting from this model but they will not be as severe or as likely to significantly damage the viability of the supply chain. The most significant and most promising benefit of medibuy's service platform will be the ability to eradicate many of the pervasive and insidious inefficiencies in the healthcare supply chain, most of which reside within healthcare provider organizations. medibuy's substantial initial service offerings will be but a foreshadow of its paradigm shifting capabilities, which will take a little longer to bring online. This longer time element is more the result of the technological limitations of healthcare provider organizations. The time spent developing these more advanced applications will provide a window of opportunity to prepare potential customers through targeted educational programs. The significance of education cannot be underestimated. Millions of American households have videocassette recorders, yet the

number of users who can actually use all the VCR's features is quite limited. Clearly, an instruction book is not an education. Understanding the goal is an important part of achieving it. There is much education to be done in the healthcare industry and medibuy may be the first, if not the only, e-commerce company to recognize the paramount nature of customer education and to develop initiatives in that area.

As further proof of its commitment to reduce process costs and promote efficiencies, medibuy is developing technological capabilities that will allow it to create seamless interfaces with hospital Materials Management Information Systems (MMIS) and Enterprise Resource Planning (ERP) systems. medibuy's service offering also provides for secured transactions for its users. One of the significant outputs of using medibuy, which applies equally to buyers and suppliers, is that all transactions are captured using sophisticated data warehousing and report-generating capabilities. By using medibuy as their only e-commerce portal, users are assured of capturing all of their purchasing data on a single platform. This capability, previously thought to be almost impossible to achieve, will become a part of medibuy's comprehensive service offering.

medibuy's initial service offerings include the following components:

- **eCatalog** - medibuy has developed a "click and buy" online catalog to procure medical supplies at established contract- or seller-determined prices. Buyers can purchase from multiple suppliers with a single transaction. A wide array of product information makes product searches and product comparisons simple and efficient for users. medibuy receives

payment at the time of purchase or extends credit. The fact that this information is tied to seller databases means that it can be updated quickly and easily providing the buyer with the most up-to-date and accurate content available.

- **eRFP** - eRFP is a highly efficient and secure way of soliciting bid pricing from potential suppliers for all equipment and supplies used in the healthcare environment. Buyers can create and send out an eRFP to qualified vendors in just a few moments and receive responses back quickly. Buyers can quickly browse all bids to find the best value. If this were medibuy's only offering, it would be enough to create significant reductions in the cost of supply management for hospitals and healthcare organizations.
- **eAuction** - eAuction offers the healthcare community two options. The first is a section entitled *medibuy preferred*, where buyers can purchase pre-owned capital equipment from the manufacturer with a minimum of a 90-day warranty, service manuals and a return policy. This sets the standard and positions medibuy to offer the healthcare community the benefits of purchasing like-new equipment at reduced prices. All *medibuy preferred* pricing is fixed and requires no bidding, allowing both the buyer and seller minimal site monitoring and hassle-free transactions. In turn, this adds value to the manufacturer as they now have a way to list their remanufactured items without being viewed as a used equipment dealer. This is a quantum leap forward in the second-hand equipment market and it revolutionizes this industry. The second option is a standard auction for "as-is" products. Hospitals, physicians and dealers and brokers can list their used equipment for all to shop at incredible prices. All transactions are secured by an independent escrow account, which protects both the buyer and seller. Other services provided by eAuction include product

assessment, market evaluation of retired assets, liquidation, charity disposal, service contracts, life cycle planning and facility closing assistance.

- **eSpecials** - This service affords suppliers the opportunity to provide discounted pricing on medical/surgical consumables and disposables with a place for special product “Promotions,” which are either in an overstock situation or which are being replaced by more advanced designs. eSpecials allows customers the opportunity to save money while reducing on-hand inventory for suppliers. For manufacturers and distributors, this is a much more efficient outlet that reaches thousands of healthcare buyers with inventory that they are motivated to move quickly and less costly than creating flyers and mailings, which are too slow and are usually not updated. Buyers love the great deals and vendors have a brand new sales channel.

These services are already impacting both buyers and suppliers. For example, Buffalo Hospital Supply, a medical products distributor in Buffalo, New York, was an early adopter of the medibuy offering. So far, they are pleased with both the progress of the development of services and the number of new customers they have come in contact with. They are committed users of e-commerce and find it to be less expensive and easier to use than EDI.

Hospitals are benefiting as well. Kevin Morrissey, Acting Director of Hospital Information Services for Children’s Hospital in Oakland, California, has already experienced the power of medibuy’s brand of e-commerce for himself. He has been using eRFP and other services to acquire computer equipment and peripherals for the hospital. He has taken procurement

processes that used to take 6 hours and condensed them into 20 minutes thanks to medibuy. E-procurement is now part of an overall strategy being implemented at Children's Hospital of Oakland to "digitize" how business is done.

Jim Gleich is Director of Supply Chain Management at BJC Health System, a large IDN in St. Louis, Missouri. BJC's sixteen buyers process 11,000 purchase orders each month, so they are prime candidates for e-commerce. So far, they have achieved some significant cost reductions using medibuy's eRFP. Mr. Gleich believes that process cost savings will follow down the road but it is too soon to analyze the results. He does say that he is encouraged by the work that companies such as Cisco and IBM have done and sees the types of savings that hospitals can expect to achieve.

E-commerce in healthcare is still in its infancy but one thing is certain, medibuy has an e-commerce offering that appears at this time to be the best in its class. That leadership position will not be easy to maintain. It will require continued commitment to the needs of its trading partners and continued investment in developing the technologies and services, which set it apart. There are many e-commerce companies, with more joining the ranks daily. Clearly, not all of them, in fact, not many of them, will survive. However, if the two-above conditions are met, medibuy can expect to be one of the few companies that breaks through and delivers on its vast potential.