

Online Auctions in Procurement: The Cost/Goodwill Tradeoff

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Submitted to the Engineering Systems Division
in partial fulfillment of the requirements for the degree of

Master of Engineering in Logistics

at the

Massachusetts Institute of Technology

June 2000

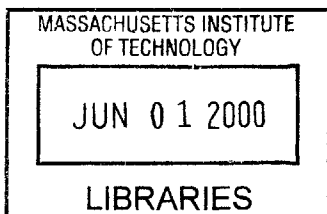
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Submitted to the Engineering Systems Division May 5, 2000
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Abstract

Industry is rapidly adopting online auctions. Many of these auctions are occurring in the procurement of component supplies. While there are tremendous expectations for this technology, there is little data or study looking at the implications of the technology. This thesis aims to provide some insight into this topic. Primarily using data collected in a study of auctions in the procurement of automotive components, this thesis looks at the costs and benefits of using online auctions in procurement. The thesis specifically addresses the cost vs. supplier goodwill tradeoff present in procurement auctions. After quantifying these variables and answering associated questions, the thesis provides a framework for evaluating the use of online auctions in industry in general. The thesis concludes with a list of suggested further research into this important subject.

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Introduction

Many corporations are currently evaluating online auctions as a means to reduce procurement costs in the supply chain. This trend runs counter to the established supply chain theory of integrating more tightly with suppliers in order to drive inefficiencies out of the supply process. Whether these online auctions are beneficial is an understudied and unclear topic. This thesis will attempt to clarify some of this ambiguity by identifying the central issues of using auctions in procurement as well as attempting to convey some of the risks and rewards of using this tool.

While reverse auctions in procurement have a long history, the online auction is a new phenomenon. The ubiquity of the Internet has enabled the use of this technique in purchasing. The typical online procurement auction is a reverse auction. In a traditional auction the buyer bids for the item for sale. The winning bidder is the buyer that bids the highest price. In a reverse auction, the sellers are doing the bidding. Sellers bid against one another for the right to sell or supply a product. The winning bidder is the supplier with the lowest bid. These auctions can take many different variations. The main variations concern the number of rounds and the visibility of bids.

While online auctions in procurement are being espoused as a tool to drive down procurement costs, the notion of moving to a spot market for production goods runs counter to traditional supply chain thinking. Over the past decade, theorists have espoused the benefits of reducing the supplier base and integrating more tightly with a few select suppliers. The logic of this movement has been to decrease procurement costs while increasing the flow of information. Procurement costs are decreased due to less time and labor-intensive bidding. The flow of information is beneficial because it reduces the level of safety stock that a supplier must hold to buffer uncertainty in demand. Theoretically, this saving is shared between buyer and supplier. Additionally, many purchasers have developed partnerships that both create and share value created across firm boundaries.

Structure of the thesis

The use of online auctions in procurement raises several new issues for the management of the supply chain. There has been little discussion in the academic literature regarding these issues. This thesis will attempt to address some of these issues. The structure of this thesis is outlined in the following sections.

Section one of the thesis will evaluate the current industry environment in order to provide the framework needed to understand the instance at which this technology is emerging. The environment is evaluated through a review of current and present procurement philosophy. Specifically the thesis reviews two theories of procurement technology. The first theory is that of creating competition between suppliers. The second theory is that of cooperation with suppliers to optimize inter-company efficiency. In addition to reviewing competition and cooperation the thesis evaluates different types of auctions in order to provide a reference mode for understanding online auctions.

Section two of the thesis is an analysis of the motivations driving the use of Internet auctions in procurement. This section surveys the perceived costs and benefits from auction technology. The benefits surveyed include lower material costs and procurement process cost savings. The risks or costs surveyed include deterioration of quality as well as the loss of supplier goodwill.

Section three of this thesis seeks to identify important questions surrounding the use of online auctions in procurement. These questions include:

- Are there cost savings from Internet auctions?
- What is the effect of auctions on supplier goodwill?
- Is the use of online auctions limited to commodities?
- Why are there gains from online auctions?
- What are the implications of online auctions to managers?

The fourth section of the thesis looks at the data gathered in the research performed for this thesis. The fruits of this research consists of data compiled from in Internet auctions performed at the Visteon subsidiary of the Ford Motor Company.

The fifth and final section of this thesis revisits the questions asked in section three. In revisiting these questions and seeking to clarify them in the context of the data developed in section four, I hope to provide insight to the management community regarding the costs and benefits of using this technology.

Due to the early stage of research on this topic combined with the limited data gathered in this study many of the conclusions gathered are conjectures. Nevertheless, I hope to provoke further research on this topic through the revelation of these conjectures in section six of this thesis.

A review of the industrial environment

An understanding of the industrial environment provides important context to managers considering the use of Internet auctions in procurement. An understanding of this environment allows the manager to understand both the historical precedents and the present necessities driving the use of Internet auctions. The historical precedents involves the evolution of supply chain theory over the past several decades. The present necessities provide a context for understanding the motivations driving management. This thesis will attempt to provide this context by exploring the evolution of procurement theory and then briefly looking at the industrial landscape present in business today.

Chapter 1: Supply chain theory

Supply chain theory is the theory of management of the flow of goods from procurement to end customer. Our particular research shall focus on the procurement aspect of supply chain theory. Specifically we will compare and contrast the two competing views of supply chain theory, competition and cooperation.

1.1 Competition

In the early to mid eighties, supply chain theory focused on the balance of power between buyers and suppliers. Following Porter's (Porter,1980) analysis of industries, it was posited that the greater leverage a buyer held over its suppliers, the better positioned competitively a firm was. By wielding this leverage, a firm could extract saving and thus margin from suppliers. This strategy was pursued aggressively by many firms. The most notable example was General Motors. Wielding huge market share and consequently huge purchasing power, General Motors squeezed its suppliers for large price concessions. This strategy had predictable effects on both the supplier's and buyer's financial performance. This situation is a zero sum game where the margin is transferred from the supplier to the buyer.

Competition between suppliers in this model of supply chain theory is accomplished by creating competition between many different suppliers. Uncertainty is high. Contracts tend to be short term and auctions frequent. Researchers (Dowlatshahi,1999) have identified characteristics of industries engaged in one buyer many supplier competition. These characteristics include:

1. Low investment: Uncertainty and risk concerning future volume create a disincentive to invest in the relationship. Investment consists of buyer/supplier capital as well as process improvements.
2. Lack of Uniqueness: Uniqueness provides leverage to the supplier and hence is little seen in adversarial buyer/supplier relationships.
3. Short term commitment: Short term, arms-length transactions lead to short term commitment on the part of the supplier.

4. Threat of in house production/new supplier: to maintain leverage over suppliers, buyers must have a credible threat of substitution. This threat is often obtained through the perceived threat of utilizing in house production or an alternative supplier.

By receiving merchandise from many suppliers, a buyer in an adversarial relationship aims to eliminate any pricing from the supplier. While the gains in this type of relationship can be significant, the overall margin pie remains the same (Jap,1999). Surplus is shifted from buyer to supplier.

Online auctions in the adversarial buyer supplier relationship increase the buyers leverage. By facilitating and encouraging competitive bidding, the buyer increases its leverage over suppliers. Historically, the frequency of bidding was limited by the costs incurred by the buyer of organizing a competitive bidding event.

1.2 Cooperation

In the mid Eighties and into the Nineties supply chain theorists espoused the development of win-win cooperative buyer supplier relationships. This school of thought recommended the development of partnerships with a limited number of suppliers. By creating these partnerships, firms could capture the benefits of vertical integration without the risks of ownership. Several highly successful partnerships attested to the soundness of this theory. Bose integrated closely with suppliers, allowing suppliers to work in its manufacturing facilities. These suppliers assumed responsibility for inventory levels and other tasks historically held by Bose employees. Lower costs and greater efficiencies accrued to both Bose (Isaacson,1994) and the suppliers. Likewise, a slew of progressive companies experienced success with buyer supplier partnerships. These companies included such titans as Baxter healthcare (Stanley,1995) and Chrysler.

Characteristics of single sourcing partnerships are also widely studied in the literature (Dowlatshahi,1999). They include:

1. Large investments: Suppliers have typically made large investments in equipment to achieve cost reductions and improved quality.

2. R&D investments: a significant amount of Research and Development expenditures has been shifted to suppliers.
3. Sharing of information: There is typically a large exchange of proprietary information between buyer and supplier.
4. Personal relationships: These relationships typically occur between buyer and supplier as a result of long term interaction

The preceding characteristics of buyer supplier partnerships serve to facilitate and perpetuate the partnership. Large investments in equipment, know how and personnel are potentially lost if a partnership is terminated. While there are certainly large investments necessary in a cooperative agreement between buyers and suppliers, there is likewise tremendous literature to support large gains from tight integration between suppliers. Reports of improvements of 150-250% in profits and 30-70% in order cycle time have been reported (Ansari, 1999).

1.3 Competition vs. Cooperation

The debate between competitive or cooperative supply chain theories rages on today. While each has its merits, cooperation has evolved as a progressive methodology to increase the overall size of the pie (Carr, 1999). Moreover, many researchers have suggested that to obtain a lasting competitive position, we will see more and more partnerships forming (Brennan, 1999). By increasing the overall size of the margin pie, either through product or process improvement, lower component cost savings can be more than offset by increased margins from quality and other unquantifiable measures. While companies pursuing the competitive approach are ensured a vicious battle over slimmer and slimmer margins, they increasingly face a threat from competing cooperative firms who are improving their product and processes. Moreover, suppliers caught in a competitive environment face increased uncertainty, which in the long run leads to higher costs due to less investment.

Economic research has shown that the use of auctions is an efficient mechanism to arrive at the market price for an item (Englebrecht-Wiggans, 1980). Thus, we know that using auctions in procurement is a method of obtaining the market price. However, the argument is not for the existence of gains, but for *the existence of gains of sufficient magnitude to justify widespread adoption of the technology.*

Whether the Internet will simply reduce the cost of conducting an auction or increase the level of competition to a magnitude that will create true savings is not a question. Several Free Markets auctions conducted to date document dramatic reductions from historic price levels. Free markets reports an average savings of 15% from historic levels (Tully, 2000). While the actual level of reduction will certainly vary from industry to industry, it is important to identify the general trend.

While there are certain to be benefits from using this new technology, there will likely be costs as well. Supplier goodwill has proven to be an immensely valuable to companies like Chrysler. Chrysler has reduced the total costs and time to market for new models by involving suppliers in the design process. The loss of this kind of collaboration would be a significant cost to these companies. Research has shown that price is not the first component of value when buyers select a supplier. Quality actually exceeds price in importance in several studies (Ansari, 1999). The difficulty arises in weighing price versus other unquantifiable benefits, such as potential development of new products or supplies.

1.4 The Industrial Landscape: Ripe for Internet Auctions?

Industry in general and the auto industry in particular has followed two general philosophies in procurement over the past several decades. These two philosophies have been characterized by the users of the systems. Chrysler has followed a strategy of developing "keiretsus", Japanese type supplier networks. This strategy involves parrying the supplier base and more tightly integrating with suppliers. Theoretically, and as has been shown through financial results, costs are driven out of the system lowering costs and improving profits for the entire network. General Motors has taken the opposite tack. The company has increased its size and thereby increased its leverage over suppliers. The company is quick to point out, it is the Fortune 1 company. The company utilizes its huge buying power to orchestrate increased competition between its suppliers.

The benefits of the Keiretsu type approach are threefold. First, relationships with suppliers are strengthened. These strengthened relationships lead to stronger ties that ultimately help the buyer by gaining most favored nation status with the supplier. In times of shortage, it is expected that the supplier will deliver to its partner company before other less integrated

companies. Second, the tighter integration allows for global rather than local optimization of operations. Ideas are shared between the companies reducing overall costs. Finally, procurement costs are reduced due to less bidding of procurement work.

The benefits of the General Motors type approach are fairly obvious. By exerting large leverage over suppliers, the company is able to use the markets to drive efficiencies into the supply chain. The resulting costs savings are captured by the manufacturer. Historically, this method of procurement has had large procurement costs associated with it due to the repetitive bidding that occurs. The use of the Internet has the potential to reduce these costs.

With the advent of Internet auctions it arises that the costs of using the General Motors method of procurement has become cheaper. We can expect, and the popular press has reported, that the advocates of the competitive method of procurement will adopt this technology. General Motors and Ford reported within hours of each other large online initiatives towards this end. Several months later they announced a joint venture with Daimler Chrysler to create a combined exchange.

Reverse auctions in procurement are not new. Companies throughout industry have been bidding business out for years. The real question in reverse auctions on the Internet is whether this is an incremental change in existing business methods or whether there will be a fundamental shift to this technology.

Chapter 2: Auction Models

Auctions can be defined as games with incomplete information (Englebrecht-Wiggans,1980). In this description of the auction model, players have independent values for the goods being auctioned. Players identify these values through analysis of private information. Whether this information is their costs of production or their assessments of future market conditions, it is assumed that all players act rationally and bid the price implied by their private information. Each player formulates his or her strategy based upon his or her formulation of strategies that other players will implement for bid quantities.

Auctions are typically one-dimensional games decided upon by highest or lowest price. However, it is possible to conduct an auction with multi-component bid functions. Auctions in which this occurs involve submitting bids with price as well as variables such as delivery date or quality also specified. An example of multi component bids (Englebrecht-wiggans,1980) is in civil engineering contracts. In this format, a bid is submitted with a unit cost for each item calculated. The seller then determines quantity.

In a typical Internet auction, the contract is awarded to the lowest cost producer at a given quality level. This award is usually under the caveat of at least meeting the buyer's reservation price, which is the minimum price necessary for the buyer to move the business to a new supplier. In addition to the reservation price, the buyer or seller must also determine the order in which to auction the desired items. Research has shown that the order in which items are auctioned is an important determinant of the amount of revenue received (Manelli,1995). A horse auction was used in the Schotter study. The conclusion was that selling horses with the highest reservation prices first results in the greatest number of horses sold . The reverse order results in fewer horses sold but a larger profit to the sellers. Thus, the importance of reservation price and selling/purchasing order is clear. However, the exact methodology of applying auction theory to online auctions appears to be in its infancy. It is issues such as the optimal order to auction components and the optimal format to submit bids that industry does not appear to have settled on.

2.1 Are auctions an efficient procurement device?

The conceptual ease and history of use makes auctions a logical choice for use in procurement. The question as to whether they are an optimal solution depends upon the product being offered. Some (Anon, 1996) have argued that auctions are not always the most efficient method of procurement. Specifically, in environments where there is incomplete information, auctions are generally efficient and profit maximizing. However, in situations where there is no good test of quality either pre or post transaction, auctions can be an inefficient method of procurement.

The crux of the argument for inefficient outcomes revolves around the issue that when the quality of a good is unverifiable, all that an auction ensures is that the poorest types of goods are provided. This is a frightful observation, given that over thirty percent of the US governments procurement is through sealed bid auction (Manelli, 1995).

The inability to determine the quality of production is an issue present in using Internet auctions in procurement. The presence of many anonymous bidders increases the risk of adverse selection in Internet auctions. If quality cannot be verified pre or post purchase, or if contract enforcement is costly, adverse selection will be present in Internet auctions. However, if users of auctions are forced to pre-register before entering an event, and must meet certain requirements, such as ISO 9000, this may deter adverse selection to a certain extent. Whether limiting events to certified vendors limits the effectiveness of auctions remains to be studied. However, from the concept of supply chain strategy, this moves the focus from entirely competitive towards cooperative. While this complication is not relevant to all industries, managers must be aware of the limitations of auctions in the procurement of some supplies.

2.2 The Motivations

Napoleon Bonaparte once said that there are two levers which move men, fear and greed. These are also the levers that are moving corporations to consider the use of online auctions in procurement. Fear of their firm being left behind in the digital revolution. Fear that their firm will not be viewed as technologically savvy. Greed in the form of visions of large savings in component costs and procurement costs. The following section analyses the motivations driving the consideration of online auctions in greater detail.

2.3 Perceived Advantages of Internet auctions

The primary driver of Internet auction adoption is perceived cost savings both from reduced component costs and reduced costs of procurement. A secondary driver of this technology is increased speed to market due to reduced bidding lead times.

2.3.1 Lower Prices

A primary driver of reverse auctions in procurement is the assumed cost savings from using this technology. These cost savings can be identified as coming from two different sources. These sources are a decrease in administrative costs and an increase in competition.

The decrease in administrative costs emanates from the difficulties of conducting an auction in the physical world. To conduct a bidding event historically, buyers needed to contact numerous suppliers, distribute specifications and bid packages, conduct the bidding event, evaluate the bids, and select a supplier. From the suppliers end, the bid must be calculated, submitted and then clarifications must be made. The use of reverse auctions does not eliminate most of these steps. What the use of reverse auctions theoretically does is provide digital lubrication to the process. This digital lubrication allows the efficient and timely flow of information between buyer and supplier.

The increase in competition is where most of the gains from reverse auctions are expected. By decreasing the costs of distributing specifications, a greater supplier pool is gathered. The greater this supplier pool, the greater the potential gains from bid events. In addition to a larger bid pool, reverse auctions also increase competition by providing a format where there is interaction between bidders. Historically, reverse auctions were sealed bid affairs that consisted of a one shot opportunity to submit a fixed bid. With electronic reverse auctions, the dynamic of an English auction increases the rivalry between firms, driving prices lower.

The potential cost savings from online auctions is little understood and somewhat perplexing. Given that most goods that qualify for online auctions are easily specifiable and produced by many suppliers, they can be described as commodities. For an item to be a true commodity, all suppliers must be price takers and price is determined solely by the marketplace. Therefore, it seems reasonable to suspect that the savings from auctioning these commodities best reflect

changes in the marketplace rather than savings from a more competitive market, since (theoretically) the market for commodity type goods is already extremely competitive.

The above argument leads to the logical conclusion that the largest gains in cost savings from online auctions can be expected by those companies who have historically partnered with commodity suppliers. By partnering with these suppliers, these companies have eliminated some of the competitive pressures of the marketplace. The use of online auctions has the potential to bring these costs more in line with the marketplace. However, the potential to reduce these prices existed before the introduction of Internet auctions, yet these companies were not tempted into “squeezing” their suppliers. Two possibilities for this situation present themselves. First, the companies have a firm understanding of the benefits they gain from not squeezing their suppliers and these benefits outweigh the additional savings. Second, these companies do not have a grasp of the cost/benefit equation and are being taken advantage of by their suppliers.

2.3.2 Lower procurement costs

Lower procurement costs are a potential benefit of reverse auctions. By using the Internet, a supplier is able to gather a large group of competitive suppliers at a low cost. To perform such an auction historically has been impossible due to large costs. Therefore, the next best solution was used. This solution was a sealed bid single or multi round auction. This process is expensive due to large manpower and time costs. Additionally, it does not lead to the competitive interactions seen in many online auctions.

A reverse auction lowers the cost of conducting an auction. While the overall cost of conducting these auctions may approach the costs historically incurred by the company, this cost is for an auction with greater effectiveness. Stated differently, a larger auction can be held for the same cost. A logical extension of this reasoning leads to the question of optimal auction size.

The optimal auction size for a reverse auction in procurement is a question that must be explored. While the cost of enlisting multiple suppliers is lower than in a traditional auction, there are costs. It can be expected that there will be increasing and then decreasing returns to adding new suppliers to an auction. The first few suppliers added are extremely important and add much to the cost savings of the auction. These suppliers supply the competition. However, as we add more suppliers to an auction, we can expect the returns from adding the additional

supplier to diminish as the amount of competition supplied is proportionally smaller. However, we must also account for the stochastic probability of adding suppliers who will compete at the price level necessary to drive the procurement price down. Thus, there exists an optimal quantity at which the costs of finding and recruiting a new supplier just offset the probabilistic benefit of adding that supplier. Theoretically, this is the optimal number of suppliers for the auction.

2.3.3 Increased speed to market

By enabling rapid bidding of necessary component, adopters of Internet auctions hope to increase time to market. By eliminating many rounds of bidding pre production times are expected to be reduced. In an economy characterized by shrinking product life cycles and lean production techniques, this feature of online auctions is very attractive. Historically, speed was attained at a cost. Speed meant eliminating numerous rounds of bidding and extensive supplier search. Online auctions allow quick competitive auctions at a reduced bidding cycle time.

2.4 Perceived Disadvantages of Internet Auctions

The perceived disadvantages from the use of Internet auctions in procurement are a loss of supplier goodwill and a reduction in product quality.

2.4.1 Loss of supplier goodwill

A loss of supplier goodwill is a legitimate concern for adopters of Internet auctions. In an era of streamlined supply chains, loss of supplier goodwill and cooperation can have a dramatic effect on a company's fortunes. In industries characterized by cooperative partnerships formed between suppliers and buyers, the advent of Internet auctions is a scary proposition. In these partnerships, companies have made dedicated investments in the success of the partnership. These partnerships have been both financial and relational. Frequently these investments have been made with no inherent guarantee of future business and are specific to the relationship. The adoption of Internet auctions in the procurement of these goods threatens the extensive investments these suppliers have made.

More than just threatening sunk investments in partnerships, Internet auctions threaten the development of partnerships in general. The development of existing partnerships has evolved over many years. Both suppliers and buyers must overcome the risk of "hold up". Trust must

be established that, once specific investments are made to support the partnership, the other partner will not exploit the leverage afforded by this arrangement. In situations where a supplier supplies more than one good to a buyer, and one of the goods begins to be procured through an auction, we can expect that the supplier would be less willing to make future dedicated investments with the buyer. Moreover, it seems reasonable to expect that other suppliers will observe the dynamics of this relationship and hence be unwilling to make dedicated investments.

The inability to entice suppliers to make dedicated investments has potentially detrimental implications for a business. Taken to its extreme, a company's product becomes a commodity due to its inability to differentiate from competitors. These competitors can create the exact same product from suppliers. A company could potentially integrate to accomplish differentiation but this leads back to the initial question of cost savings. A vertically integrated firm that produces its own supplies does not gain economies of scale and is faced with larger costs than one that outsources supplies.

2.4.2 Reduction in Product Quality

The use of Internet auctions in procurement self selects suppliers of the lowest quality. These suppliers are able to provide the given good at a lower cost than competing suppliers, all else equal. Therefore, a major concern of potential adopters of this technology is how to retain product quality while reducing component costs. This is a difficult question because the nature of the auction encourages reductions in quality.

A potential solution to this dilemma is to certify suppliers before an auction as to the quality of their product. However, this has two distinct costs. The first cost is the physical costs of travelling to plants and examining products to ensure quality. This must be an ongoing process to ensure standards continue to be met. The second cost is the reduction in competition that such a certification process creates. The ideal auction from a buyers perspective is one with many competitors which is held at a moments notice over the web. However, a company moves further from this ideal the more layers of certification and qualification it adds. In order to create the largest most competitive auction environment, goods must be commodities. The reason that the commodity and stock markets are so efficient is the fact that the products are easily specifiable. A barrel of oil or a share of ATT is easily quantifiable and interchangeable. Supplies used in the production of many products are not so interchangeable.

Chapter 3: Online Auction Questions

The thesis so far has provided both context and motivations driving the adoption of Internet auctions. However, there has been limited research as to the effectiveness and appropriateness of this technology in procurement. Therefore, there is limited understanding of both the short and long term effects of this technology on a firm's competitiveness. In order to address this situation, I have developed several questions that, if answered, would provide insight into this issue. These questions are presented in the following sections. After evaluating the research conducted for this thesis, I will return to these questions in an attempt to answer them and in the process provide insight into the use of auctions in procurement.

3.1 Are there savings from auctions?

Whether or not there are savings from auctions is an important question that needs to be answered. If there are savings, then where are these savings coming from. Theoretically, auctions can only be held with commoditized or semi-commoditized goods. In a perfectly competitive market, there could be no additional gains from the adoption of auction technology. Even assuming a partially competitive landscape, the gains would be assumed to be small. If the gains indeed turn out to be small, what is the benefit of utilizing Internet auctions in procurement. Are there true gains or are the purported gains a figment of the Internet hype that currently grasps society? And if the gains turn out to be more significant than expected, are these gains from the technology or from underlying movements in the markets for these supplies?

3.2 What is the effect on supplier goodwill?

Perhaps more important than the question of savings from auctions is the question as to what the effect will be on buyer supplier relationships. It is obvious that there are certain procurement activities that depend little on buyer supplier partnerships. The procurement of pencils and paperclips obviously needs little in the way of partnership. However, in many businesses, partnerships are indeed integral to success. Frequently it is these partnerships that create the differentiation between a firm and its competitors. The development of these partnerships is a difficult and tenuous process. While a company may be able to use auctions in procurement for

some items, at what cost is this benefit gained. If using auctions with some suppliers deters other suppliers from making dedicated investments in the business partnership are the cost savings justified. This of course is an issue that must be determined on a case by case basis, but it must certainly be considered by firms investing in this technology.

3.3 Are auctions a zero sum game?

The answer to this question seems obvious. If we extrapolate the physical model to the Internet, we see that the auction process causes a shift in the value chain. Buyers capture margin from suppliers. Deeper into this question though is the question of sustainability. What will happen in the supplier market? Will we see consolidation in the market? What is the limiting feedback loop stopping the entire margin being shifted from suppliers to buyers? It is presumable that we could see the rate of return reach some mean value at which firms begin to exit the business. This exit of the business would allow remaining firms to consolidate supplier power and raise prices. The issue here is what effect this equilibrium seeking will have on a company's business. Moreover, if reentry into the business is difficult, what effect will the consolidation have on the long run equilibrium market price.

3.4 Are auctions limited to commodities?

Nirvana for Internet auction proponents is the auction of all supplies used in the production process. However, it is unclear whether or not this will be feasible. In practice, for a good to be auctioned successfully it must be easily specified and produced by many suppliers. This however is not the case with most of the goods used in industrial production today. Therefore, the more a company moves towards online auctions, the more a company moves towards the commoditization of its products components. However, the more commoditized a products components the more commoditized is the finished product. Therefore, there is a trade off between differentiation and the use of online auctions. Thus the question is whether auctions will be limited to commodities in order for a company to retain a competitive edge. And if this is the case will suppliers who are grouped into the commoditized product category further differentiate themselves to escape from this categorization?

3.5 What are the implications of online auctions for management and industry in general?

The popular press has consistently touted the potential of the Internet to revolutionize our lives. More recently the popular and financial press has been particularly enamored with Business to Business e-commerce. The savings being attributed to this "revolution" are being calculated in the billions of dollars per year. However, most of these articles are built upon forecasts created by technology consulting companies such as Forrester and the Gartner group. While much research goes in to developing these forecasts, it must be realized that in such a highly dynamic industry the accuracy of these forecasts cannot be assumed to be great.

In preparing this thesis it is my goal to identify the fundamental structure and feedback loops driving the auction segment of the "B2B revolution". Specifically, I question where the gains from Internet auctions come from. If auctions are indeed a zero sum game, someone must lose in order for someone to win. Who are these someones?

Chapter 4: Sources of data

The main source of data comes from Internet auctions conducted for the Visteon unit of the Ford Motor Company. This data was collected over several months and several bidding events conducted with MIT involvement. The data consists of user feedback to the auction process. Through this feedback we hope to gain a better understanding of the suppliers position in the auction process. In addition to user data we utilized a control group that did not undergo the auction process. A portion of this data is user supplied and the remainder was conducted through phone interviews with the suppliers.

4.1 The Visteon Study

In the preparation for the writing of this thesis, I participated in a study of online auctions in procurement. This study was conducted with the Ford Motor Company's Visteon division. The Visteon division of Ford is tasked with manufacturing and procuring components for the manufacture of automobiles. Visteon is a wholly owned subsidiary of the Ford Motor Company. The study conducted was in conjunction with the Sloan School of Management at the Massachusetts Institute of Technology.

The purpose of the study was to follow and document the use of online auctions in procurement. Ford had recently announced a supply chain initiative to bring all of its suppliers online and create savings. Online auctions were being studied by Ford in order to understand the process and determine what role if any this technology should play in Ford's future. On the spectrum of supply chain thinking, with Toyota representing the cooperation end and General Motors representing the competition end, Ford has historically been more towards General Motors thinking. Following this overall strategy, online auctions are a natural progression. Interestingly, both Ford and General Motors announced these online initiatives within days of each other. As mentioned previously, these initiatives were combined along with the addition of a new partner. This new partner was Daimler-Chrysler illustrating the shift in this company's supply chain strategy since Chrysler merged with Daimler Benz.

In exploring the implications of online auctions in procurement, Ford wanted to gain a deep understanding of the issues and methods available. Towards this end, the company hired three

different consulting companies to implement online auctions in different areas of the business. These three vendors were A.T. Kearney, IBM, and Free Markets.

A.T. Kearney implemented a proprietary system for Ford that consisted of multiple round English type auctions. In an English auction, all bids are visible to all bidders. The name of bidders is not necessarily visible to other bidders. In fact it usually is not. AT Kearney implemented this system in support of auctions in several commodity groups. A commodity group is a commodity typically purchased by Visteon in bulk for numerous different vehicles. The commodity groups that Kearney auctioned included Semiconductors and Stampings.

IBM implemented auctions to support Visteon in the Tooling and Transportation commodity areas. IBM's bid process was a single event either multiple or single round. All bids were sealed and not visible to other suppliers. This method of submission changed the dynamic of the competition from an auction to electronic submission of bids. This methodology can be thought of as a hybrid of the old and new methods of conducting auctions.

Free Markets implemented auctions using its proprietary software for online bidding events. Free Market events consisted of a single event with multiple rounds of bidding in an English format. Free Market software was utilized in the auctioning of coolant hoses, Bus Bars and Stampings.

By experimenting with different software vendors, Visteon hoped to get a feel for what methods worked best in online auctions. In order to measure the results, Visteon enlisted MIT to perform a study of the process. This study was performed using online surveys and person to person phone surveys. In order to create a relevant survey, MIT developed a control group and an experimental group. The experimental group went through the auction process. The control group did not.

The questions asked by MIT focused on identifying changes in suppliers' perceptions of Visteon as a result of the auction process. MIT researchers believed that this data was important in order to measure the effects that shifting to an online auction based system of procurement would have on the supplier base.

4.2 The results

The studies conducted by Visteon and its technology partners fell into several different categories. The commodities and their respective auction types are listed in the following table.

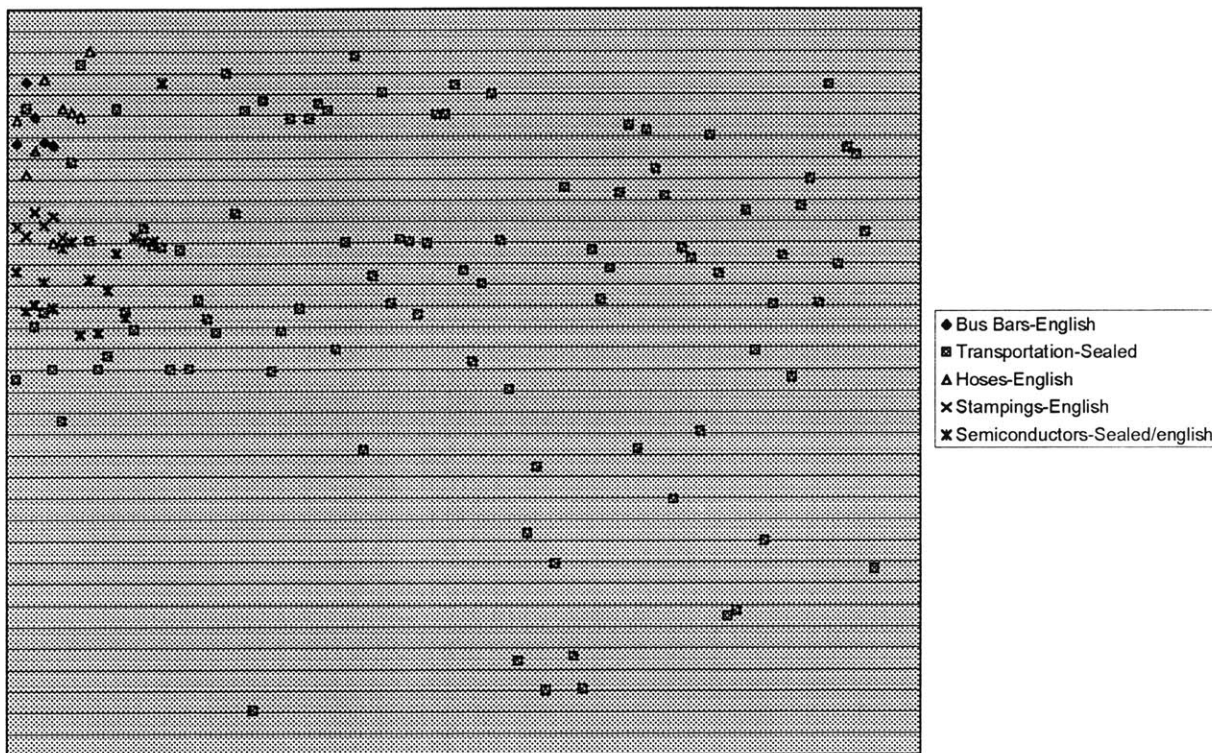
	Auction Type	Number of rounds	Software vendor
Hoses	English	Single	FreeMarkets
Semiconductors	Sealed/English	Multiple	AT Kearney
Stampings	English	Single	FreeMarkets
Busbars	English	Single	FreeMarkets
Tooling	Sealed	Single	FreeMarkets
Transportation	Sealed bid	Single	IBM

The cost savings results for the individual commodities are presented in the following chart. Due to the competitively sensitive nature of this information, the savings are presented in relative terms.

	Savings	Variance
Hoses	Large	Small
Semiconductors	Small	Large
Stampings	Small	Small
Busbars	Large	Small
Tooling	Large	Small
Transportation	Small	Very Large

A more graphical interpretation of this data is presented in the following chart. This graph is a dimensionless graph illustrating the variation witnessed in the different bidding events.

Returns from Sealed VS. English auctions



Variability on this graph is illustrated by the degree of dispersion along the Y axis.

The following section outlines commodity descriptions and general results from the study by commodity type.

4.2.1 BusBars

Bus bars are electronics components that allow the interconnection of the electrical systems in cars and other industrial devices. The industry is characterized by many small manufacturers. The results of the Visteon event are summarized in the preceding table.

A review of the preceding numbers are surprising. In an industry characterized by many small players competing for business, we see significant cost reductions through the use of Internet

Auctions. Theoretically, most of this margin should have been competed away through the competitive interaction of firms. However, here we see large price reductions in a mature industry. Lest the reader thinks that unrealistically low bids are distorting the savings, I have calculated the average bid and average savings. A review of these figures illustrates that the average savings in the procurement of BusBars with a competitive Internet auction are considerably less than historic levels. Moreover, selecting the winning bidder in each of these auctions would have resulted in savings that were drastically lower than historic prices.

4.2.2 Hoses

The summary table summarizes the results of a competitive bidding auction for hoses at Visteon. This event was a real time interactive competition between suppliers for the Hose business at Visteon. Again the Hose industry can be characterized as a highly competitive commodity type business. Visteon spends approximately 150 million dollars per year on tubes and hoses. Of this amount, reinforced hoses make up 25.3 million and within this category radiator/heater hoses are a 16 million dollar expenditure. This is the type of Hose auctioned in our Visteon study. The company put approximately 12 million dollars of business on the line representing 75-80% of the company's total expenditure. In the radiator Hose category of the market there are over 50 suppliers. The product and industry are mature.

Visteon believed that the Hose suppliers were willing to compete in a bidding event for several reasons. These reasons included the product being easily specified, a comparatively low spend, few parts bid and a reduction in the amount of time spent on bidding. The company expected significant savings. The company also intended to pare the supplier base. This reduction in the supplier base would allow the company to wield greater volume leverage in future purchases.

Again, we are also seeing large reductions in cost due to this technology. The average savings in this event exceeded Visteon's expectations. If Visteon were to select the lowest bidder in each category, its savings would have been large.

4.2.3 Stampings

Stampings are a large component of the manufacturing industry. Stampings is a generic term that refers to pressed metal components. Examples of stampings in automobile manufacture include radiator grills, brackets and bumpers. Before utilizing auction technology, Visteon used approximately 91 suppliers to fulfill their stamping needs. The company's goal was to reduce this number by one third. The stampings industry in general is extremely competitive with over one thousand suppliers to choose from. Visteon purchases over 1300 stampings per year representing over \$300 million dollars in business. Of the 1300 stampings purchased every year 232 represent over 80% of the purchased volume.

A review of the table listing the relative savings from the different auctions will illustrate the common theme that we have seen in interactive auctions. However, savings in this commodity group were significantly smaller than in Hoses and Busbars. Again, we are seeing savings in a presumably mature industry.

4.2.4 Transportation

The result for the transportation auction was similar to the preceding auctions in that significant savings were achieved. However, this auction was different than the others in that it consisted of a sealed bid single round auction conducted electronically. This methodology can be thought of as a hybrid approach. Historically reverse auctions have been conducted as a single round sealed bid event. This type of event has also historically been handled through traditional communications mediums, i.e. the postal service. By conducting the auction online the company creates a digital auction with a familiar feel.

The transportation auction event consisted of seventy five suppliers of different sizes competing for 90 lanes of business. The goal of the auction was to do a survey of the competitive environment in order to identify areas to target for later cost reductions. In this auction no business was to be awarded. This is an important fact that should be kept in mind when evaluating the results of the event. This particular segment of Ford's procurement had never been through a similar market test. The company expected proposals from 25 of the 75 suppliers in the auction. A large concern of Visteon was the validity of responses submitted given that they were not binding and no business was to be awarded. In general, the attitude to the specific IBM tool used in this survey was negative. IBM made few adjustment to cater to the transportation industry. Hence, there was much confusion among the supplier base.

4.2.5 Semiconductors

A review of the preceding bid material should reveal to the reader the results of conducting a physical sealed bid event followed by a online auction. In this case, in many of the situations the average bid is a loss to the company. This event consisted of a sealed bid followed by a live English auction several weeks later. The overall success of combining these two types of events does not appear to have been extremely effective from a cost reductions standpoint.

Chapter 5: Answering the questions

5.1 Are there cost savings from auctions?

The analysis of the different bidding patterns both between and within auctions is important in providing the manager with an accurate view of the strengths and weaknesses of different auction formats. Our data primarily views the differences between the sealed and English auctions and also the differences between English auction price savings.

Higher bids between sealed and English auctions

While the sealed bid auction is perhaps more familiar to bidders, a review of the average bid prices reveals an intriguing insight. The English auctions typically had average bids which were uniformly savings. However, the Transportation bids 61 out of the 95 auctions resulted in average bids that were higher than historical cost. In these situations the outlying responses are the drivers of cost savings. Without these outlying bidders, the auction would not have been successful. This is an extremely salient point to users of this technology. In 64% of the cases, using traditional sealed bid technology leads to a loss on the auction investment.

The reasons for the higher average bid could be many and interrelated.

First, trucking is a highly competitive business. It is also a virtual commodity. As long as the item gets where it is going in one piece and on time, the buyer has no preference. Thus, it could be argued that these higher average bids are a result of shifts in the commodity market and do not reflect the gains of the technology. While this explanation is indeed logical, why would we not have seen similar dynamics using English auction technology?

Second, perhaps this higher average bid reflects the dynamics of the trucking industry.

Trucking firms that can optimize lanes to fill backhauls are able to bid considerably lower prices than competitors due to lower costs. In this situation, companies who are able to fit the offered lanes into their network optimally would be the outliers offering the lowest price. Other trucking company's would not be able to match these savings due to a different network configuration. Thus, the average bid would be higher.

Third, because no business was being awarded, the bidding companies may have had no incentive to bid aggressively. Although this seems plausible, bidders also had no reason not to bid aggressively and indicate their willingness to take on more business.

Lastly, the competitive dynamic present in the English auction reveals to participants the price being offered by competitors. In the sealed bid there is no such price discovery and hence bids are submitted blindly. No reserve price was set so we could expect probability to give us 50% of the bids at a higher price than the current bid and 50% at a lower price. Additionally, in an English auction, bidders would not commit to bidding unless they were at a lower price than the reserve or the lowest current bid. Thus, we could expect all such bids to be savings. Bidders who could not provide savings would decline to bid.

Differences within the English auctions

In addition to the differences between sealed and English type auctions, another interesting pattern that developed in the data was the differences in savings between the three English auctions. It does not appear that the savings can be contributed to different levels of competition within the auctions. The average number of bidders in the stampings auction was 9.5 while the average was 7.4 for hoses and 10.8 for bus bars. It is some senior management's position that the results of the auction reflect the fact that suppliers have long been gouging Visteon. Visteon has historically attempted to pare the supplier base in an effort to develop closer relationships with suppliers. Prices rising to these levels was seen as a symptom of the level to which suppliers had risen in their opportunism.

There is certainly something wrong when a manager finds that they have been paying significantly more than the market price for a commodity. Whether this is a result of opportunism by suppliers is not known. We do not know the historical context of the relationship between Visteon and its suppliers. Moreover, we do not know the different specifications for the products bid in the auctions. We can only assume that they are comparable to the historical price basket.

Large decreases in average costs in English auctions

The large decreases in average costs present in the hoses and Busbars events is perplexing. Busbars and hoses are almost pure commodities. There is significant production capacity and numerous competitors in the industry. Nonetheless, it appears that Visteon has historically paid

well over the market rate for these commodities. In order to evaluate possible reasons for this overpayment, we must evaluate several possibilities.

As mentioned previously, Visteon has historically attempted to partner with fewer suppliers in order to increase service and reduce bidding costs. This process may have had two effects. The first effect may have been a reduction in Visteon's awareness of the marketplace. Because Visteon was focussed on paring the supplier base and building tighter bonds, it may have lost touch with the market for these items. This combined with opportunism on the part of the supplier led to higher prices. The second effect could have been an increase in the service requirements placed on the supplier by Visteon. These service requirements may have evolved over the relationship and become a significant component of supplying parts to Visteon. New suppliers bidding on the business may be unaware of or not required to fulfill these requirements.

An additional cause of higher prices in the English auctions could be the length of time from the last auction. If it has been several years since Visteon has bid these items, there could have been fundamental shifts in the marketplace. Specifically, there could be significant over-capacity in the marketplace during this bidding process. Both Busbars and Hose production use capital intensive production techniques in their manufacture. Excess capacity could lead to lower costs relative to a period characterized by under capacity. Although this seems to be a reasonable explanation, an interview of managers revealed that four of the hoses had been bid only four months before the auction, transportation approximately two years, and stampings two months. Other than in transportation, over-capacity could not reasonably be achieved in these short time frames. In transportation, over capacity is not a significant driver of large cost reductions.

The preceding paragraph underscores an important point in considering the cost saving results of the Visteon survey. That is, whether the cost savings are a result of the auction technology or shifts in the marketplace. For a commodity type product, we would expect excess profits to be bid away by the marketplace. We could also expect to see cobweb type cycles in the marketplace. This fact may help to explain both the differences in costs between the English auctions and the large reductions in costs seen in two of the auctions.

5.2 What is the effect on supplier goodwill?

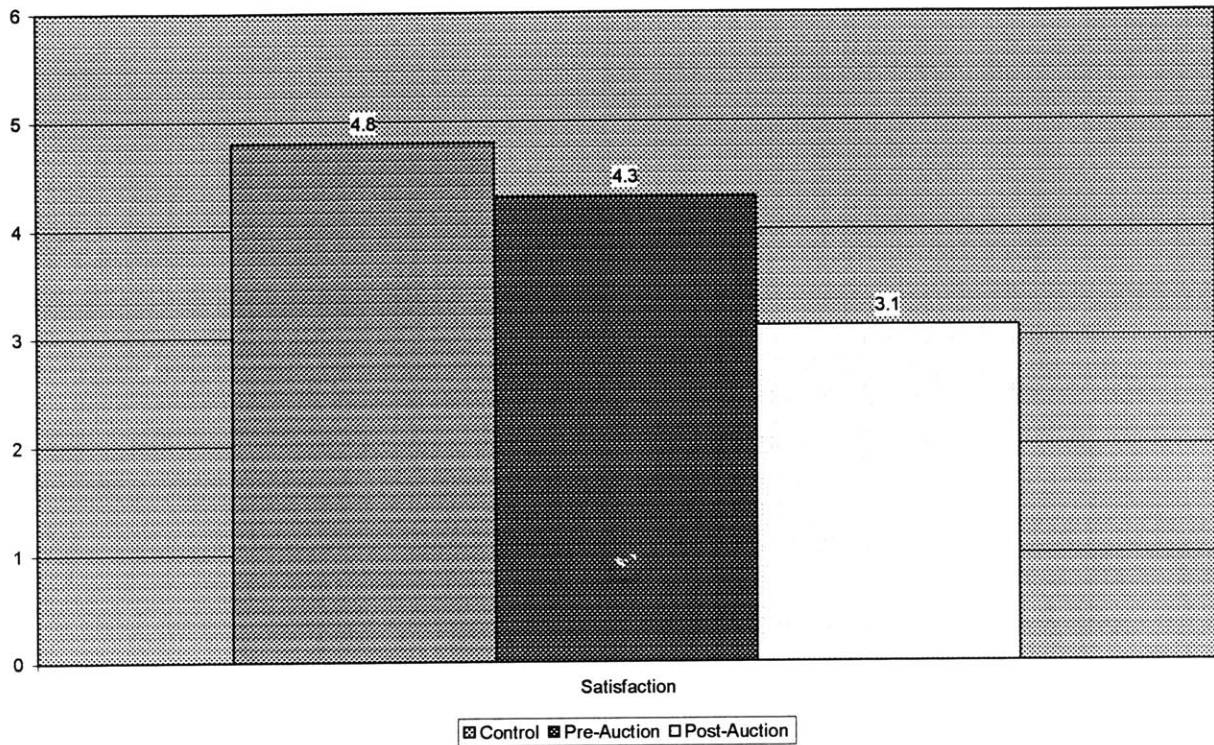
The effect on supplier goodwill is an important variable to evaluate when considering the use of auction technology. As discussed previously, supplier goodwill is an important component of many companies' competitive advantage. Deterioration of this goodwill could have significant adverse effects on these companies' competitiveness.

To evaluate supplier relations, our study consisted of a web based survey that evaluated suppliers' perceptions of buyers across the following 13 dynamics:

1. **Collaboration:** The supplier's willingness to collaborate with the buyer on such things as new product development and supply chain initiatives.
2. **Responsiveness:** The supplier's responsiveness to the buyer's needs.
3. **Information Sharing:** The supplier's willingness to share information with the buyer
4. **Flexibility:** The supplier's flexibility to demands made by the buyer.
5. **Preferential treatment:** The supplier's willingness to give preferential treatment to the buyer.
6. **Solidarity:** The supplier's perception of whether the buyer is "we" oriented; concerned about mutual interests
7. **Trust:** The supplier's perception of the; level of trust present in the relationship
8. **Opportunism:** The supplier's propensity to exhibit opportunism in the relationship
9. **Investment:** The supplier's willingness to make dedicated investments to support the relationship.
10. **Munificence:** The extent to which the supplier's environment holds an abundance of opportunity.
11. **Dynamism:** The supplier's perception of the rate of change within their industry
12. **Competitiveness:** The supplier's perception of the competitive environment for their industry
13. **Knowledge:** The respondent's knowledge of the preceding variables

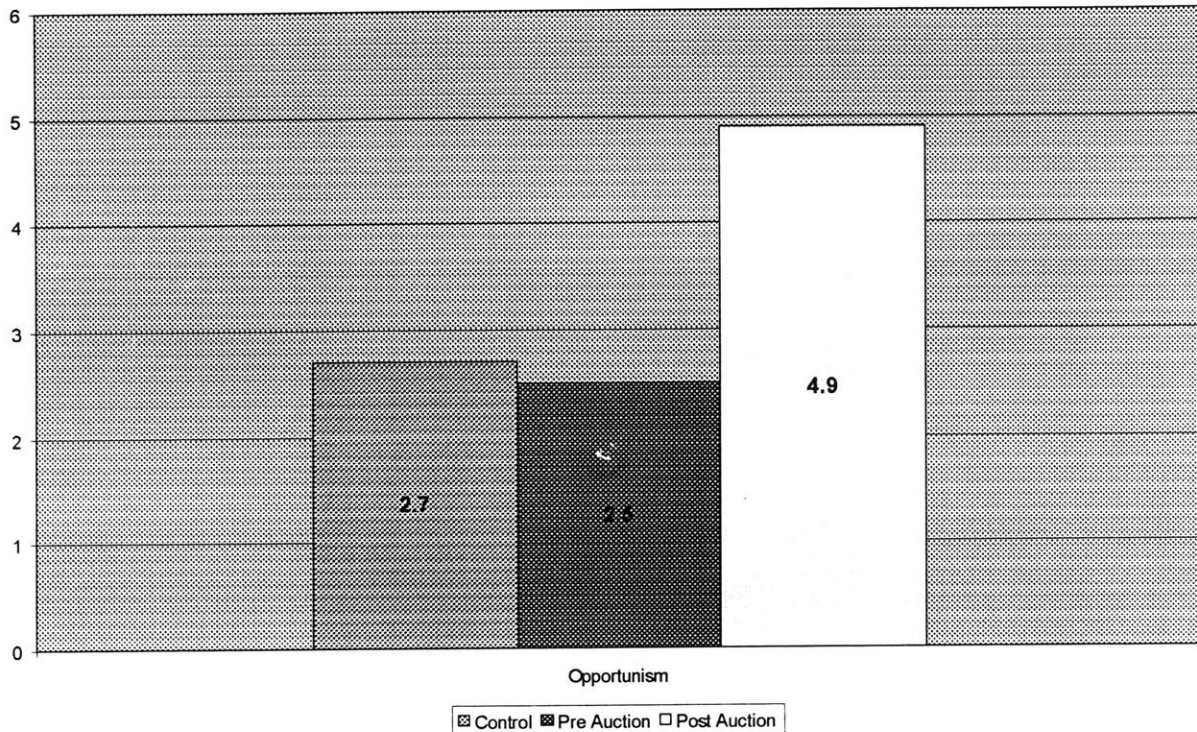
The web surveys consisted of a control group and a pre and post survey. These surveys evaluated the preceding dimensions through a series of questions ranked on a numeric scale. A significant result of these surveys is the measurable effects that online auctions had on buyer supplier relationships. The following graphs illustrate the theme illuminated by the web surveys.

Satisfaction with Relationship



The preceding chart illustrates the profound shift in the satisfaction with the relationship that suppliers who participated in the auction underwent. While the difference between the control and the pre auction groups is not statistically significant, the difference between the pre and post auction is significant. The sample size for these observations is 21 in the control, 29 in the pretest, and 18 in the posttest. The decline in satisfaction shown here does not portend well for users of this technology.

Effects of auction on opportunism



This chart illustrates the effect of the auction experience on supplier's likelihood to engage in opportunism. Once again, the differences between the control and pre auction groups is not significant while the difference between the pre and post auction is significant. This rise in the likelihood of behaving opportunistically is disturbing in that several studies have shown that this type of behavior can be a death knell for cooperative arrangements.

Transportation

Suppliers who underwent the transportation event responded well to the experience. This event was a sealed bid single round RFP. The event was essentially a Request For Proposal submitted electronically. Analysis of the data reveals that suppliers are willing to make greater investments with Visteon due to the auction experience. Additionally we see that those suppliers who participated in the event were more willing to engage in collaboration, information exchange and investments with Visteon than those suppliers who did not engage in the event. Satisfaction with the relationship were also higher in this group.

Analyzing the underlying supplier reaction we see that the reaction to an RFP submitted online increases the suppliers goodwill. This is intuitive in that a closer relationship is being formed in a non competitive arena. Relationship satisfaction would logically improve due to more interaction. Investment willingness may increase in order to establish a relationship with Visteon to forestall further competitive auction events.

Semiconductors

In the semiconductor auction there was little change between the pre and post group. This result may have been a result of the outcome of the auction. In the auction, a supplier entered a bid of zero dollars for items it was not interested in bidding on. However, the software was unable to handle this situation and disallowed any bids over this price. Panicked, suppliers called the war room to complain. Eventually suppliers were able to submit bids but only on a paper basis. Additionally many of the suppliers had been through a paper based auction shortly before the web based auction and had therefore reached their minimum price.

Stampings

Our analysis of the stamping event consists of data gathered at all levels of the bidding process. Statistically significant results of this analysis are presented in this section in order to draw conclusions about the supplier base and the effect of the auction on goodwill.

In the pre bidding survey with the new suppliers compared to the the control group we identified the following relationships:

	Control Mean	New Mean	T statistic	Prob>T
Preferential	3.6	5.3	2.12	0.10
Trust	3.5	5.2	2.3	0.08
Opport	3.5	1.9	-2.9	0.06
Munif	4.0	5.8	2.5	0.06

This table illustrates that Visteon evidently chose the most positive suppliers to participate in the auction. Perhaps these suppliers “chose themselves” by being generally positive in relations with Visteon and being less opportunistic. Interestingly, this difference between those suppliers chosen to participate in the process and the control disappears after the auction event.

While the self selection of suppliers is interesting from a human relations point of view, we are more interested in discovering the suppliers reaction to the bidding event. The following table outlines the post test new suppliers versus the control group who did not undergo the event.

	Control Mean	New Mean	T statistic	Prob>T
Prefer	3.7	5.1	4.1	0.05
Opport	3.5	5	15	0.004

Similar to the pretest table, we see here that the suppliers willingness to give preferential treatment to Visteon is still high. However, we see an increase in the level of opportunism in buyers that now exceeds that of the control group who was not invited to the event initially!

BusBars

The following table illustrates that for new suppliers versus the control group we are seeing self-selection again. Those suppliers with the best attitudes toward Visteon are being selected to take part in the survey. Those that have poor attitudes are not being selected. Other than this result we could not determine any significant changes as a result of the Busbars auction.

	Control Mean	New Mean	T statistic	Prob>T
Prefer	3.7	5.5	2.2	0.05
Munif	4.0	6.0	3.1	0.01

Hoses

Our statistical analysis of the Hose event first focuses on the differences between the control group and the incumbent groups in the pre test. Here again we are seeing closer relationships between Visteon and those suppliers invited to participate in the bidding event and those not invited. The following table illustrates the two different groups of suppliers perceptions of the relationship directions of their relationships with Visteon.

	Control Mean	Incum. Mean	T statistic	Prob>T
RelTrend	1.5	5	4.7	0.02

After analyzing the initial differences between suppliers, we turn our focus towards the effect of the auction on suppliers. While there was no significant difference between the new and control groups with respect to opportunism and preferential treatment, we see here that the auction elicited a significant change in these variables. Specifically, the following chart illustrates that the new suppliers were more willing to give Visteon preferential treatment while at the same time they were disposed to act more opportunistically as a result of the auction.

	Control Mean	New Mean	T statistic	Prob>T
PreferT	5.1	6.25	2.8	0.04
Opport	3.7	5.3	2.6	0.05

The preceding chart illustrates an interesting paradox. On the one hand suppliers are willing to give Visteon preferential treatment but on the other hand they are more likely to act opportunistically. The following chart reinforces this paradox by revealing more of the same. In this chart we see suppliers acting more opportunistically but also willing to invest more in the partnership and having greater trust in the partnership. This is a confusing result.

	Control Mean	New & Incumbent Mean	T statistic	Prob>T
Opport	2.9	4.9	3.0	0.01
Invest	5.1	6.4	2.5	0.04
Trust	5.2	5.6	4.0	0.01

Perhaps a reasonable explanation for the curious result we see is that suppliers are confused. Suppliers may feel threatened by the auction technology and are therefore less secure in their future with Visteon. This could prompt them to act opportunistically in order to gain the most from an insecure relationship. In the long run, this threatened feeling could also provoke a willingness to form tighter relationships in order to increase differentiation and avoid future auctions.

Qualitative reactions to online auctions

As part of the study performed with Visteon, our research involved obtaining qualitative reactions from supplies after undergoing an online bidding event. The responses between groups varied according to the format of the auction. Generally the transportation group believed that the online auctions were a large improvement over standard methods of bidding

while the English type auction participants took the opposite view. The following section illustrates some of the feedback obtained from these two groups.

Semiconductors

The semiconductor auction was a two round auction, a single sealed bid followed by an open English auction. The software vendor for this event was IBM. The results of the auction were disappointing in that little savings were achieved due to little bidding by participants. The mood from the supplier base was generally negative. Suppliers noted that the reserve price was set too low. This may have been the result of the fact that Visteon had recently bid out the semiconductor business in a traditional paper based auction. Therefore, prices were near market levels. Some suppliers also noted that the technology allowed them to gauge their competitiveness relative to the market place. The general mood from the semiconductor suppliers was that the technology was being used as a tool to leverage the buyer's power. The technology was seen as a threat to the success of the suppliers' businesses.

Transportation

In contrast to the reaction from the semiconductor suppliers, the reaction of the transportation suppliers to this technology was much more positive. This is no doubt due to the different nature of the two formats. Specifically, the transportation auction was a sealed bidding event where the bids were delivered electronically rather than through the postal service or by hand. Suppliers gave a generally positive spin to this format because it allowed them to save time in the preparation and delivery of bids. This format therefore delivered the benefits of electronic interaction without changing the dynamics of the relationships between suppliers and buyers. Additionally, this event was likely less stressful to the suppliers because no contracts were being awarded.

5.3 Are auctions a zero sum game?

Auctions are a zero sum game in the truest sense of the phrase. Margin is being shifted from suppliers to buyers. This in itself is not bad. This is the epic struggle between buyers and suppliers. What needs to be considered are the alternatives to leverage. If there are no advantages to integrating with suppliers then Internet auctions may be the ideal procurement tool. If there are advantages to integrating more closely with suppliers *anywhere within the enterprise*, a buyer needs to consider the use of this technology carefully.

5.4 Are auctions limited to commodities?

If an item can be easily specified, quality can be verified either pre auction or post auction, and there are many suppliers, then the item is a candidate for procurement using an Internet auction. A large number industrial products fit this description. It is logical to assume that many firms will attempt to differentiate their products in order to avoid being considered for Internet auction procurement. One method of differentiating a product is to integrate more closely with buyers. A concept known as virtual integration. However, it is unclear whether supplier firms will be willing to make this investment if they face the threat of online procurement. On one hand they must differentiate, on the other they face the risk of holdup by buyer firms. The outcome of this struggle is not clear. An alternative strategy for suppliers is the development of low cost leadership. In an industry marked by price competition, this is one of few profitable strategies.

5.5 What are the implications of online auctions for management and industry in general?

The use of online auctions in procurement is new. This technology is being embraced rapidly by some of the most progressive firms in industry. The technology has received lavish praise from the popular and technical press. However, behind the hype and the publicity, it is not clear that anyone has seriously thought about the implications of this technology on the future of business relationships. Many progressive firms are accepting this technology because it is in fact new. However, a question remains; is it better?

Of course, the question of whether or not this technology is indeed better depends upon your perspective. Is the technology better than holding a live auction. A resounding yes. Are there cost savings from this technology. Again, yes. Can a competitive advantage be gained from this technology? Here it gets cloudy.

As the data gathered in the Visteon study shows, auctions can be an effective method to lower procurement costs. Whether auctions are the correct procurement tool in any situation is a different story. The data also shows that auctions cause a decrease in supplier goodwill. Previous research has shown that, in situations where buyer-supplier partnerships are important to the success of the enterprise, increases in opportunism can be deadly to a business. Thus, the question arises as to when it is correct to use Internet auctions in procurement and when it is not. Several potential situations need to be evaluated.

It would seem from the data that a commodity type product, like stamping or transportation would be an ideal candidate for Internet auction procurement. These items are not pure commodities, but are items in which there are many suppliers competing for the revenue pie. This competition is what can be exploited well in an Internet auction. However, a company must consider what signal auctioning semi commodity type products sends to other suppliers. Auctioning semi commodity type products could send a signal to more specialized suppliers that would inhibit them from making dedicated investments in the relationship. Thus, it could be argued that deciding to use Internet auctions is a binary decision. Once the decision is made, all suppliers are aware of the consequences to their respective businesses. The binary nature of using auctions is an important attribute to consider.

If auctions are binary, this makes the choice of Internet auctions difficult. A buyer cannot have his cake and eat it too. The buyer cannot choose suppliers with which to use auction technology without sending a signal to all suppliers. It is this signal that may in fact cause opportunism in all suppliers to rise, regardless of whether or not the technology is being used on their company specifically.

There is some evidence from our research that the use of auctions may increase the likelihood of a supplier's willingness to collaborate. It may be the case that this willingness to collaborate and make dedicated investments is an effort to decommo-ditize the suppliers business. However, the consequences of this willingness are not clear. If the supplier is willing to make these investments to optimize the relationship, the supplier will indeed be differentiated from its competitors. Consequently, the supplier will not be comparable to competitors and will not be in a position to be cast into an auction against these competitors. Then the issue returns to whether the gains from the auction out weigh the gains from collaboration.

The preceding scenario raises the question of evaluating gains from collaboration versus gains from Internet auction. Indeed, it is these gains which must be evaluated in the evaluation of Internet auctions as a whole. Without having a firm grasp of the benefits of both of these technologies, a firm will not be able to choose the correct procurement methodology. I believe the data presented so far illustrates this fundamental point. Auctions offer significant potential for cost savings. This much is obvious. However, auctions also create dissention within the supplier base. This dissention can have detrimental effects on the competitiveness of a

company. Thus if the gains from auctions are greater than the sum of the negative goodwill and reduced ability to collaborate across the firm then a manager should use this technology.

In addition to the effects on supplier buyer relationships, industry practitioners should also consider the effects that auctions may have on the supplier base. The cost savings present in Internet auctions are not ephemeral. The savings come directly from the supplier's profit. The use of Internet auctions is a zero sum game. Moreover, commodity type businesses do not have large margins to begin with. Consequently, if Internet auctions are indeed successful in cutting the price of industrial commodities, we can expect to see a decline in the profitability of the supplier base. Predictably, this decline in profitability will cause firms to exit the industry. We can also expect to see significant consolidation as firms seek to gain economies of scale. The effect of these two phenomena will be a decrease in the rivalry of firms and an increase in supplier power. A decrease in firm rivalry combined with a consolidation of the supplier base will lead to less competition in the supplier market and thus higher prices. This appears to be the fundamental feedback loop not considered by many advocates of Internet auctions. Reducing procurement prices by 30-40% will quickly drive many players out of business. There simply is not enough margin in many of these products to support this type of cost reduction, unless supplier firms obtain large economies of scale. Once supplier consolidation occurs it could be the case that it will be the buyers buying from the suppliers in a auction!

Auctions technology is best suited for commodity and semi commodity type products. These products are easily specifiable and there are many suppliers. However, as previously discussed, it may be difficult to use auction technology for some suppliers and not others. This is especially true if bilateral investments are needed with the non-commodity supply base. It would appear then that the ideal situation in which to use auction technology is when all supplies are a commodity or semi commodity. This situation when combined with an environment where there is no significant advantage to buyer supplier integration leads to the perfect situation for Internet auctions. However, the unfortunate consequence of this is that if a product can be built entirely from commodity supplies, imitation is simple and rampant. Profits are competed away, the end product is a commodity and thus subject to auctions.

Chapter 6: Recommendations

The adoption of new technologies is an important skill for any business. However, new technologies should only be adopted if they optimize or improve existing business practices. It is with this caveat in mind that managers should evaluate online auctions in the procurement portion of their supply chain. What follows is a blueprint for thinking about the adoption of online auctions in procurement. This blueprint is by no means definitive. Indeed the recommendations made in this blueprint are based upon the data presented in this thesis. Certainly additional research is needed to answer questions not addressed in this paper. I will address these additional research questions after outlining what I believe is a reasonable thought blueprint based on data so far collected.

The fundamental revelation of the research performed for Visteon is that there are costs and benefits to using Internet auctions in procurement. The costs include increased opportunism from suppliers and decreased satisfaction with the relationship. The benefits include decreased procurement costs. The data on these facts is clear. However what a manager evaluating this technology needs to consider are the values for his particular industry and company. In some industries, it may be more valuable to partner with suppliers to drive costs out of the supply chain or to collaborate in the production of new products. In other industries, it may be more profitable to utilize online English type auctions to capture margin from suppliers. In still other industries it may be best to use a middle ground technology such as sealed bidding submitted over the Internet.

Some companies will choose to collaborate with suppliers in order to create a competitive advantage. Other companies will choose to use auction technology to gain a competitive advantage. Individual managers will need to make these determinations for themselves by carefully weighing the pros and cons of each decision. The following section outlines talking points for this determination.

6.1 Adopting Internet auction technology

Pros:

Reduced procurement costs: Our data shows that the use of Internet auction technology can significantly reduce the cost of procuring commodity type component parts. The savings from the English type auctions used in our study always led to savings in the price of the product.

Ease of use: The ease of conducting an online auction relative to a physical procurement auction is significant. A larger more effective auction can be produced for a fraction of the cost of conducting a conference type bidding event. Moreover, there are numerous consulting and technology firms that can be hired to develop or hold these auctions for companies.

Cons:

Reduced supplier goodwill: Our data has shown that the use of competitive English type auctions in procurement causes an increase in opportunism and a decrease in satisfaction from suppliers. For many firms this type of behavior can be a death knell.

Long run implications on the supplier base: Nothing declines forever. A decrease in procurement costs comes directly from suppliers' profitability. While in the short run these gains are sustainable, in the long run supplier consolidation may occur to drive prices back up.

Origination of savings: Where savings from auction technology are coming from is an open question. While it is clear that auctions increase the level of competition between suppliers, is this increase in competition driving lower costs or are lower costs coming from other sources.

Chapter 7: Further Research

Additional research on several aspects of Internet based auctions is certainly needed to answer several of the questions raised in this thesis. The following is a short list of the questions that further research may seek to address;

1. **The location and size of gains from Internet auctions:** Our research consists of a limited study of a few auctions held at one company in a particular industry. Future research may want to conduct a larger study and seek to control for variables such as production capacity and time since last auction in order to determine the locus of cost savings. Because it is commodities being bid, are the gains coming from shifts in the underlying marketplace or from the increased competition instilled by Internet auction?
2. **The binary nature of Internet auctions:** Future research may want to address the binary nature hypothesis raised in this thesis. That is whether the use of auctions does indeed send a collaboration inhibiting signal to all suppliers or if auctions can be used surgically. If it is concluded that auctions can be used surgically, does this use inhibit or promote collaboration with other suppliers. These are important questions that need to be addressed by future research.
3. **The long run implications for the supply chain:** Further research may also want to explore more deeply the long run implications of auction technology to the supply chain. Supplier firms will not continue for long periods of time earning a risk adjusted negative return. Consolidation in the industry is sure to occur if supplier's fail to earn market rates of return. The implications to auction technology in this situation are unclear.

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