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minority enterprises

The Role of Reverse Auctions in Strategic Sourcing

by

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Executive Summary

In the mid-1990s, a new electronic sourcing tool emerged that has had, and is continuing to have, a profound impact on the way in which firms source goods and services from current and potential external suppliers. This tool, while known by other names (e.g., “online negotiation”) is the *electronic reverse auction* (e-RA). The purpose of this study is to present the initial results of a comprehensive study of e-RAs undertaken by CAPS Research during 2002.

Defining E-RAs

In its *basic* form, an e-RA is an online, real-time dynamic auction between a buying organization and a group of pre-qualified suppliers who compete against each other to win the business to supply goods or services that have clearly defined specifications for design, quantity, quality, delivery, and related terms and conditions. These suppliers compete by bidding against each other online over the Internet using specialized software by submitting successively lower priced bids during a scheduled time period. This time period is usually only about an hour, but multiple, brief extensions are usually allowed if bidders are still active at the end of the initial time period.

Overview of the Study’s Methodology

The study’s methodology consisted primarily of analyzing face-to-face and teleconference-structured interviews performed in the United States and Europe during mid-2002, with the following organizations:

- A targeted number of firms who were considered to be “power users” of e-RAs for sourcing goods and services from external suppliers
- A targeted number of suppliers who had participated in e-RA events

- Third-party providers of e-RA services (e.g., eBreviate, FreeMarkets)
- A targeted number of firms who had specifically chosen not to use e-RA tools for sourcing.

Why E-RAs?

Why the intense interest in e-RAs? The dramatic growth of the use of e-RAs over the past few years has been facilitated both directly and indirectly by a number of converging internal and external developments and forces, including:

- Widespread ability for buyers and suppliers to economically communicate in real time, worldwide, via the Internet.
- Development of robust, user-friendly Internet-based software systems to support worldwide e-RA events that are either hosted by a third party or designed to be run by the buying company with little or no outside assistance.
- Recent order-of-magnitude improvements in quality and cycle-time reductions have resulted in buying companies perceiving superior quality and service as “givens.” Thus, they have shifted their emphasis toward *low price* as a major sourcing decision variable.

E-RAs Are Controversial

The birth and acceptance of e-RA tools has not been without controversy, because, for some, its process is contradictory to the long-term benefits associated with collaborative/cooperative buyer-supplier alliances. This perceived conflict is primarily caused by the tool’s emphasis on awarding business based on aggressive price competition (the classical arm’s length coercive/competitive model) instead of long-term total cost of

ownership (TCO) considerations. However, *this research has concluded that for a growing number of buying firms, e-RAs have found an appropriate niche in their strategic sourcing toolkit, allowing them to efficiently source goods and services that are highly standardized, have sufficient spend volume, can be replicated by a reasonable number of qualified competitors, and have insignificant switching costs. In contrast, the research indicates that those suppliers of strategic items, where alliance-level supplier relationships are critical, are usually not subjected to e-RA sourcing.*

Generally, suppliers asked to participate in e-RAs, especially incumbent suppliers, do so reluctantly for fear of losing business. Overall, incumbent suppliers win about half of the e-RA events in which they participate, with the balance going to contender suppliers, sometimes at prices that are barely profitable or are even below variable costs.

In addition, there continues to be an ongoing controversy between some sourcing professionals and their top corporate managements regarding awarding business on the basis of lowest TCO versus lowest price. Sourcing professionals argue that higher prices can often result in lower total landed costs due to non-price variables such as suppliers' superior quality, service, technical ability, and long-term commitments between the two entities. Part of this controversy is caused by the difficulty of measuring the components of total cost versus the transparency of measuring reductions in price. As a result of this transparency, most top managements not only embrace the use of e-RA tools, but in some cases, seeing the impressive results of early e-RAs, set aggressive goals for e-RA use in annual sourcing requirements. This can be particularly true when top management learns that the documented return on investment from e-RA use can run as high as 10 to 1. This is not to imply that TCO criteria is not used nor accepted for awarding business through an e-RA event. To the contrary, there is a growing acceptance to use TCO criteria as more sophisticated e-RAs (and other e-sourcing tools) are developed.

Beneficial Aspects of E-RAs

The unique attributes and processes associated with e-RAs can create the following benefits for those firms that employ them.

Direct Cost Reductions: The major benefit from the use of e-RAs is the potential for measurable direct cost reductions of purchased goods and services through either price reductions or believable TCO reductions. In general, reported reductions range from 10 to 20 percent below historical prices.

Biddable Attributes: Not everything a company buys is e-RA biddable. Especially exempt are items or services that do not have clearly defined attributes that competing suppliers can translate into unambiguous specifications. Second are items that are highly differentiated strategic items. Third are instances in which switching suppliers would result in unacceptably large change costs. Fourth are items where the volume or value is so low that the potential savings do not cover the cost of holding the event. What then, are the major attributes of a biddable good or service? In general, they are:

1. Items can be clearly specified (via design, terms, and conditions) and translated into prices a supplier will commit to charge the buyer.
2. There is a strong likelihood that the current price is sufficiently higher than the market price, making the e-RA event cost effective.
3. Switching costs are acceptable.
4. A sufficient number of qualified, competitive suppliers exist in the marketplace.
5. Qualified suppliers of the item(s) are willing to participate in an e-RA.

E-RAs Can Create Markets: The development and use of e-RAs has created competitive "relatively efficient" markets for many goods and services where none previously existed. While this "market making" only hints at the efficiency of the organized stock, commodity, and currency exchanges, they are substantially more effective in determining market prices than the traditional static sealed bid or tender processes.

Cycle-Time Savings for Buyers and Suppliers: The use of traditional processes for sourcing goods and services can consume several weeks, months, or more. Much of this time is spent in managing several rounds of information sharing and negotiation with competing suppliers. On the other hand, a successful e-RA requires much greater time and preparation up front. However, the tradeoff between these extra up-front and back-end efforts versus the hour or so taken to "negotiate" an acceptable price can result in a substantial net reduction in the RFx-to-contract award cycle time. Buying firms report this cycle-time reduction to range from "no significant reduction" to as much as 40 percent over traditional sourcing processes. The majority of suppliers also believed that e-RAs resulted in decreased cycle times. Many felt that e-RAs not only decreased the negotiation phase of the sales process, but could also improve cash flow.

Increased Buyers' Reach: Because most e-RAs are hosted through standard (secure) Internet connections, the reach to include qualified suppliers worldwide is increased substantially. Some integrated e-procurement systems

include semi-automated release, receipt, and analysis of RFPs or RFQs in multiple language formats. This expanded reach results in providing an effective and speedy supplier search mechanism.

Price Visibility: E-RAs offer the unique opportunity for buyers to gain insight into price levels, market prices, price elasticity (as related to various volumes), and price rigidity (from powerful oligopolies) from suppliers that participate in the event. This knowledge of markets and prices can result, in some cases, in a “power shift” from strong suppliers to weaker buyers not previously attainable until information is revealed through an e-RA event.

Benefit/Cost Justification: E-RA users justify the set-up and operational costs with their documented hard and soft savings benefits. *Reported payback can be achieved after the first few uses of the tool.* Nonetheless, there has been some resistance to the fees charged by full-service providers of e-RAs events. These providers have listened to their customers and have responded by developing less expensive, do-it-yourself systems that are rapidly gaining acceptance.

Dysfunctional Aspects of E-RAs

Like any tool, e-RAs can be misused or, even if used appropriately, can result in a dysfunctional outcome. Here are some of the causes of poor results gleaned by the researchers from the interviews:

- Inadequate up-front event planning, unclear item specifications, and ambiguous auction rules.
- Insufficient training in the use of the e-RA system (buyers and suppliers).
- Allowing unqualified bidders to participate.
- Misreading the market and setting a reserve (maximum) price that is too far below the market price, resulting in no bidder responses.
- Awarding business to a supplier at a price so low that it cannot deliver as specified or its survival is severely threatened.
- Targeting the wrong commodity with which to apply an e-RA, creating an instance where the market will not be responsive, or even suppliers will refuse to participate.
- Holding repeated e-RA events for the sole purpose of pressuring incumbent suppliers to reduce their prices.
- Use of an e-RA that results in destroying the trust and mutual interdependence between the buying company and a key strategic alliance supplier.

Benefits to Suppliers

Most incumbent suppliers indicate they are reluctant participants in e-RA events, but rarely refuse the chance to retain their current business or increase their business if supplier consolidation is an objective of the e-RA. In contrast, contender suppliers appreciate the chance to develop new business through their e-RA participation. In addition, suppliers also gain valuable insight into their competitive environment through their own post-event analysis of the outcome. Other potential benefits to suppliers include lower marketing/sales costs, quicker award/non-award cycle times, and constructive feedback from buyers as to why they won/lost the business.

Actual vs. Potential Applications of e-RAs

Most firms indicate their current usage is in the single-digit percentage range of their annual spend. However, they say the potential is well beyond this range. Aggressive users of the tool estimate that the potential can be as high as *half of their annual spend*. Others were more conservative in their estimates, indicating that only 10 percent to 15 percent of their spend could be sourced via e-RAs. Whatever the estimate of maximum possible spend, none of the firms had yet achieved this level of usage. *This strongly suggests that there is substantial opportunity for growth in the use of e-RAs.*

E-RA Spend Dollars, Percentages, and Trends

E-RA Event Experience: The range in the number of e-RAs conducted by buying organizations participating in the structured interview study was from 21 to 1,900, with the majority of buying organizations having conducted over 100 events. Thus, most of these firms can be considered “early” or “middle” adopters of the tool rather than “late” adopters which had only experienced a small number of e-RA events.

E-RA Experience across the Global Economy:

Estimating the dollar volume of spend awarded through e-RAs across the economy, across industries, or across economic regions is not easy. However two useful sources of data on e-RA volume are CAPS Research and a survey conducted by the Institute for Supply Management (ISM) and Forrester Research. CAPS Research conducted two separate polls in 2002 with two diverse sets of large companies, concerning the volume and trends in e-RA usage.

The first poll indicated that 68 percent of the respondents were using e-RAs. For those companies

using e-RAs, the rate of usage in 2001 was about 2.6 percent of total spend and the expected growth rate was about 17.5 percent for 2002. The second poll indicated that 83 percent of the companies (N= 46) were using e-RAs. For those companies using e-RAs, the percent of total spend in 2001 was estimated to be about 5.5 percent. For all companies combined, the percent of total spend through e-RAs in 2004 was expected to be about 11.5 percent.

CAPS Research also asked companies in eight industries about their use of e-RAs. Out of 81 responding companies, 42 companies (52 percent) indicated that they were using e-RAs in 2002. The average spend through e-RAs for these companies was 3.6 percent of total spend. These data (and others detailed in this report from CAPS Research and ISM/Forrester Research) lead to several conclusions.

- The percentage of larger firms (over \$100 million in spend) using e-RAs is at least 35 percent and probably over 50 percent. The percentage is lower for smaller firms and non-manufacturing firms.
- The average percent of spend going through e-RAs is still modest (less than 5 percent), but some firms are already using e-RAs for over 25 percent of their spend.
- The growth rate in usage is strong (10 to 15 percent increase per year). While most users expect that the solid cost savings produced by e-RAs may taper off, they also expect that the efficiency of e-RAs will continue to fuel the growth in use.

Experience across Industries: The use of e-RAs is not limited to a few or selected industries. The research team was able to find “power users” in the automotive, electronics, aviation, pharmaceutical, construction engineering, machinery, chemicals, and packaged goods industries. (The four case studies presented in this report are examples of these “power users.”)

Experience across Commodity Types: Initially, many firms conclude that e-RAs will find most application in purchasing indirect materials and direct materials that are commodities or near-commodities. However, upon reflection, and after some experience with e-RAs, most firms come to the conclusion that e-RAs can be applied to many areas of their spend, including direct and indirect goods, capital goods, and services. One of the CAPS Research polls indicated that the majority of responding firms used e-RAs most often to buy direct goods, primarily because, for manufacturing firms, the greatest portion of their spend is for direct material, and second, because many indirect and commodity items

have low value-add by the suppliers and are already priced with low margins.

Sustainability of the Use and Economic Value Add of E-RAs

Sustainability of E-RAs as a Sourcing Tool: Are e-RAs here to stay or just another passing fad of the digital economy? The skeptics relish the question, the early adopters scoff at the question, and the new adopters are hopeful that they have chosen a winning tool. *All of the evidence collected in this study suggests that e-RAs are here to stay and that their use will continue to grow.* There are several facts to support this position.

- First, e-RAs have been shown to work — that is, produce cost savings across a wide number of goods, services, industries, countries, and economic regions. While there are cases of specific e-RAs failing, this research found only one firm that had tried e-RAs and later abandoned their use. (Even this firm indicated they might try e-RAs again at a future date.) Furthermore, this research found that the success of e-RAs had mostly overcome the early resistance and philosophical objections to their use. Indeed, this research did not find any firms not using e-RAs because they objected to their use. The non-using firms either had not seen an application for them or had not gotten around to using them.
- Second, e-RAs are one of the few new e-tools that can be used in a stand-alone mode (although this may not be the optimal deployment), without integration into ERP or other sourcing systems. This makes them relatively low-cost to install and use. Many of the fees charged by third-party providers go to support the expertise that the provider brings to the process, acting as a consultant in terms of supplier identification or specification writing, for example. Thus, companies can reduce many of the associated fees by using self-service auctions.
- Third, e-RAs are a very efficient method of getting to a final best price from a group of suppliers. Early uses of e-RAs may result in substantial cost savings that are not sustainable later on. However, the efficiency remains whatever the outcome. One company said that e-RAs resulted in outcomes that were as good as its best negotiations and better than most of its negotiations. Therefore, e-RAs delivered best or near-best results in an efficient manner, even if the result was not a large cost savings.

- Fourth, e-RAs are becoming a desktop tool with a commodity status. Many providers can provide the basic functionality for e-RAs and can place it on the desktop of every buyer. Buyers can arrange e-RAs with minimal effort and time.
- Fifth, although not required, many companies are integrating e-RAs into a more complex set of tools. These tools encompass more of the sourcing process, particularly the RFx process. As this integration continues, buyers will have e-RAs available as a routine choice, along with sealed bids and traditional negotiations, to complete the buying process.

As counterpoint, no one quite knows what to expect if the economy surges and tight supply markets develop. Two possibilities exist:

- The first is that suppliers might organize forward auctions and sell their capacity to the highest bidder. Many suppliers currently being coerced into e-RAs voice this as a veiled threat. But, it could prove to be an efficient means to clear markets, just as e-RAs have been in a “buyer’s market.”
- A second possibility is that both buyers and suppliers will prefer to abandon e-RAs in favor of face-to-face negotiations. However, this return to the “old” way of doing business would sacrifice many of the efficiencies gained by e-RAs. Of course, it is unlikely that all supply markets will be tight at the same time. As is true today, e-RAs are applicable only in certain circumstances. It seems unlikely that these circumstances will disappear altogether under any but the most extreme economic conditions.

Sustainability of E-RAs’ Economic Value Add: Long-term sustainability of e-RA results (i.e., substantial cost savings) is a question on the minds of most users and non-users alike. Logic alone suggests that buying companies cannot expect to save, for example 25 percent, on *repeated* buys for the same good and have the supplier, or even supply base, stay in business. The companies in this study all suggested that they did not expect to maintain the same percentage of cost savings on repeated buys. Nonetheless, several companies had experienced substantial cost savings on the second e-RA for the same good. Longer term, most firms indicated the savings will level off and become more driven by the supply-demand conditions at the time of the e-RA. Thus, future results could be price increases rather than price decreases.

Sustainability of Supplier Performance: Many suppliers interviewed indicated that, as they drop prices, they would not be able to sustain many of the “free”

services surrounding the goods they now provide to their customers. Design services, repair services, emergency deliveries, and so forth would all disappear because the new low prices would not cover the costs of providing these services. The buyer response to these statements has been three-fold:

- First, none of the buying companies in this study could identify a case where supplier service had diminished after an e-RA that resulted in a new lower price. Thus, the buyers were skeptical of the claims.
- Second and more importantly, the buyers were interested in testing the value of the un-priced services. If the services had value and were withheld, the buyers would return to the suppliers and explicitly negotiate (or use e-RA) for the services.
- Lastly, the experienced buying companies in this study were generally confident that they could include all of the services they needed in the specifications for the e-RA. This would not only allow suppliers to fairly price and bid on the complete package of goods and related services, but also allow the buying firms to better know what they were paying for.

Based on the evidence collected in this study, there is little or no evidence that e-RAs are driving suppliers into non-sustainable relationships with buyers. In fact, there is evidence to suggest the opposite. E-RAs are sharpening the relationships by removing some of the ambiguity about market prices, forcing buyers to be clearer about what they desire to buy (i.e., better specifications), and forcing suppliers to be clearer about what they are supplying. However, while it is clear that buyers are enjoying the efficiency of e-RAs in getting to a price, the efficiency gains on the supplier side are less visible. While there is scant evidence from this research that suppliers have been able to reduce sales costs or personnel because of e-RAs, some sales managers indicated that they now use their time differently. Prior to e-RAs they spent a great deal of time in negotiations talking about price or cost elements. With e-RAs, they spend less time negotiating price face-to-face; this function is “delegated” to the e-RA.

Non-User Observations and Issues

One component of this study included interviews of some buying firms that had never been involved in an e-RA, or had used them in the past but chose to discontinue their use. The following observations and issues emerged from the firms interviewed.

Reasons for Non-Use: The vast majority of the non-e-RA user organizations interviewed had firm plans to begin using e-RAs in the near future. Only one of the firms interviewed had used an e-RA tool in the past and discontinued its use because the savings were no better than the firm's traditional sourcing methods. However, even this firm indicated they planned to return to e-RA use in the near future. *Interestingly, none of the firms had any major philosophical or ethical objections to e-RA use for sourcing certain targeted (i.e., non-strategic) commodities.* When asked why they were only now planning to use e-RAs, here are the reasons the firms gave:

- First, all interviewees were aware of the general nature of e-RAs, but some had higher priorities and limited resources to devote to their use. In addition, some firms had received proposals from third-party e-RA service providers with fees they thought were too high when compared to expected benefits. However, recent publicity about e-RA value had changed their minds, and some were planning pilots.
- A small number reported that only a few of their procured items were suitable for e-RA application, primarily because they had several long-term contracts in place that would not expire for a few years, or e-RAs would not be appropriate for their key "strategic" suppliers.
- One responding firm indicated that it was so highly decentralized that it would find it difficult to get enough aggregate demand to make e-RAs cost effective.
- A few interviewees expressed concern that their suppliers may not participate, or not enough qualified competitors would join the e-RA event.
- Some minor resistance from internal clients and top management was voiced, but this was not a major deterrent to e-RA use.
- When asked if they were concerned about the fairness of e-RA processes, a few rumored anecdotal stories about phantom bidders, but generally, the respondents were not concerned. In fact, some of the non-using firms asked the interviewers to give examples of what was meant by "unethical practices" with e-RA use.
- There was some concern about the nature of the e-RA systems' range of capabilities and their ease of use. However, this was not a major issue.

Conclusions Regarding Non-Users: In summary, this component of the study did not reveal any serious

barriers to the use of e-RAs. In fact, it appears that *many firms who have taken a "wait-and-see" strategy indicated that they could be at a serious competitive disadvantage unless they add e-RA tools to their mix of sourcing strategies.*

Ethical Issues Related to E-RA Use

Observed Ethical Issues: Some of the *potential* (not necessarily observed) ethical issues surrounding e-RAs, as described by the interviewees, were as follows.

- Buyers using e-RAs can force suppliers out of business by accepting what they know to be unreasonably low prices.
- Buyer pretends to be a supplier in the e-RA event and bids low to force down price.
- Buyer includes suppliers in e-RA who are not pre-qualified and probably not viable.
- Suppliers engage in collusion.
- Supplier bids unrealistically low price.
- After winning the business based on low price, the supplier then recoups profit by charging for change orders.
- Suppliers "participate" in an auction but don't bid, with goal of gaining market intelligence.
- Supplier cannot deliver product/service as promised.
- After the e-RA event is closed, another supplier meets or beats the low bid and is awarded business, based on either buyer's or supplier's initiative.
- Low prices "force" some suppliers to cut corners in the safety arena.

Some buyer organizations, while addressing at least some of the ethical issues shown above, stated that *e-RAs are no different from traditional negotiations with regard to ethical improprieties.* Another group of buying organizations stated that *e-RAs actually improved the state of ethics and fairness* by making the sourcing process more objective (e.g., through the elimination of cronyism and supplier "wining and dining") and more transparent, as suggested by the following statements from purchasing and supply managers:

- "Now all suppliers get the same information at the same time — this increases fairness."
- "[E-RAs] change the 'old boy network' of sourcing."
- "[There is] no more hiding bad performance of the buyer, and no more lying to the supplier."
- "[E-RAs] eliminate cronyism, just as does job rotation and giving buyers new materials groups every three years. [E-RAs] eliminate cronyism

without having to put buyers through frequent learning curves.”

Several suppliers interviewed echoed sentiments similar to those of their buyer counterparts regarding a lack of distinction between ethical issues prior to and after the introduction of e-RAs. Counter to some of the recent assertions found in the trade press, some of these *suppliers also stated that e-RAs were a fairer process of awarding business, indicating that e-RAs helped to “level the playing field” through increased transparency.*

Conclusions

- For a growing number of buying firms, e-RAs have found an appropriate niche in their strategic sourcing toolkit, allowing them to efficiently source goods and services that are highly standardized, have sufficient spend volume, can be replicated by a reasonable number of qualified competitors, and have insignificant switching costs. In contrast, the research indicates that those suppliers of strategic items, where alliance-level supplier relationships are critical, are usually not subjected to e-RA sourcing.
- Reported payback usually can be achieved after the first few uses of the e-RA tool.
- There is little or no evidence that e-RAs are driving a significant number of suppliers into non-sustainable relationships with buyers.
- Firms who have taken a “wait-and-see” strategy indicated that they could be at a serious competitive disadvantage unless they add e-RA tools to their mix of sourcing strategies.
- Buyers believe that e-RAs are no different from traditional negotiations with regard to ethical improprieties, and suppliers indicate that e-RAs, in general, are a fairer process of awarding business, because they “level the playing field” through increased transparency.
- E-RAs are here to stay and that their use will continue to grow.

Executive Overview

E-RAs Capitalize on Recent Developments in the Purchasing Environment

Driving forces

- Need to reduce costs of externally sourced goods and services
- Quality and service increasingly regarded as "givens"
- Integrated ERP systems allow for company-wide demand aggregations
- Internet enables buyers and suppliers to economically communicate worldwide
- Increased emphasis on global sourcing
- Shift toward buyers' markets

e-RA

Main e-RA benefits

- Reduction of price paid for goods and services
 - about 15% on average
 - range of 5% to 90%
- Process improvements
 - error reductions range from 30% to 90%
 - cycle time decreases of up to 90%
- E-business skills development

Characteristics of E-RAs

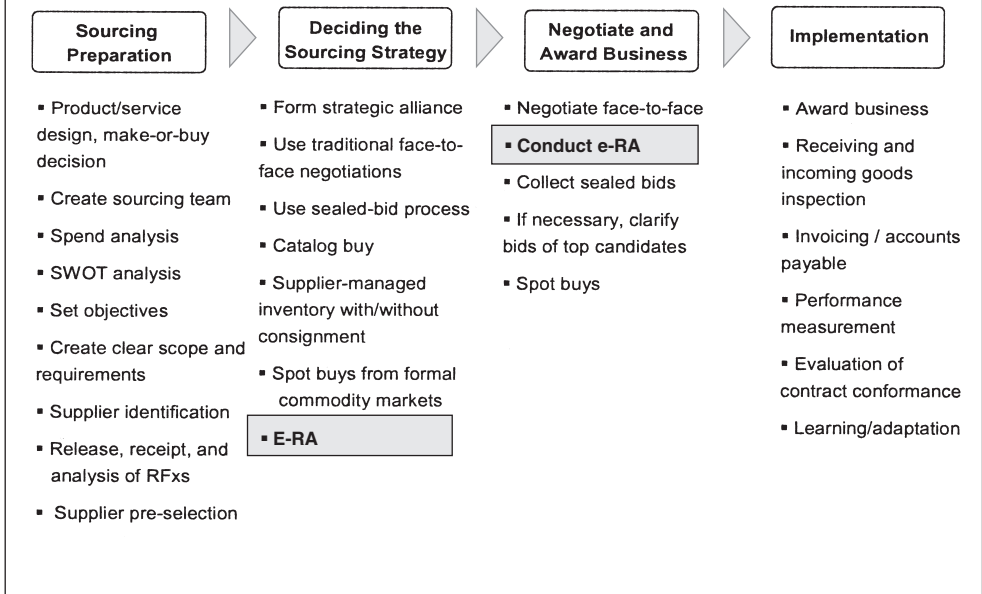
- Reverse/descending: price falls during auction
- One buyer, multiple sellers
- Bidders may submit multiple bids
- Competitors can see competing bids (actual value or rank)
- Intention of buyer is to award business

Auction Typologies

Reverse	E-RA	Dutch
Forward	"forward" Dutch	English Japanese
	One buyer, multiple sellers	One seller, multiple buyers

Multiple bids possible (dynamic competition)	E-RA English Japanese	Sealed with multiple rounds
	Dutch	Sealed - First price - Second price
One bid only	Open/ Full visibility: competitors see submitted bids	Sealed/ No visibility: competitors do not see submitted bids

E-RAs Complement a Firm's Typical Sourcing Process



Applicability of E-RAs Primarily Depends on Market and Product Characteristics

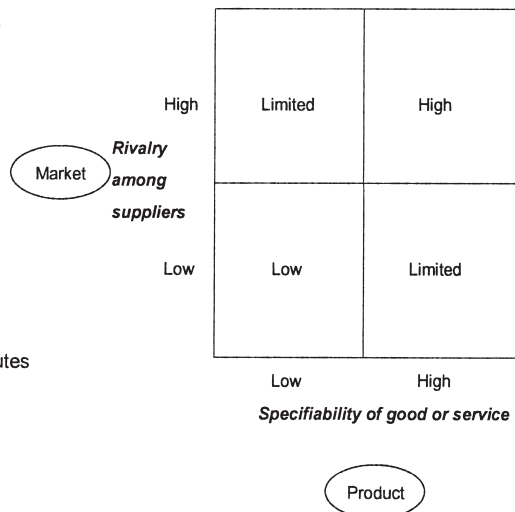
Rivalry is high when:

- there is no collusion among suppliers
- at least two suppliers are competing
- excess supplier capacity exists
- the volume is attractive for suppliers

Specifiability is high when:

- the product has clearly defined attributes that suppliers can translate into unambiguous specifications

Auction Applicability Matrix I



E-RAs Have a High Potential for Industries with Short Contract Commitments and Low Switching Costs

Auction Applicability Matrix II

- Long-term contracts are most common when suppliers are deeply involved in the product development process (e.g., the aviation industry)
- High switching costs occur in industries for which qualifying new suppliers (e.g., the biopharma industry) or changing tooling (e.g., the automotive industry) is expensive

Long-Term Contract	Limited	Low
Short-Term Contract	High	Limited
	Low Switching Costs	High Switching Costs

Almost All Commodity Types Can Be Sourced Through E-RAs

Purchasing Strategy Matrix
(from Kraljic, 1983)

High	Leverage	Strategic
Low	Commodities	Bottleneck
	Low	High
	<i>Commodity/Purchase Family Complexity</i>	

Examples found by the CAPS Research

- **Commodity:**
Packaging material in a specialty chemical company
- **Leverage:**
Plastic-molded pieces for a machinery manufacturer
- **Bottleneck:**
Made-to-order printed circuit boards for product development in an electronics company
- **Strategic:**
Propulsion and avionics systems for an aviation company; *not suitable for e-RA*
- **Services:**
Construction for cell phone transmission towers in a construction engineering company
- **Capital:**
Capital equipment for the laboratories of a pharmaceutical company

E-RAs Are Here to Stay

Firm size

- The percentage of larger firms (over \$100 million spend) using e-RAs is at least 35% and probably over 50%
- The percentage is lower for smaller firms
- The percentage is lower for non-manufacturing firms

Spend through e-RAs

- Spend still modest, less than 5%
- Some firms already using e-RAs for more than 25% of their spend

Future growth

- Strong growth, 10% to 15% per year
- Solid cost savings produced by e-RAs may taper off
- Efficiency of e-RAs will continue to drive their use

Four Case Studies Provide an In-Depth Analysis of E-RA Super Users

GlaxoSmithKline	Bechtel	Volkswagen	METRO
<ul style="list-style-type: none"> ▪ Pharmaceutical ▪ 190 auctions; volume of \$912 million through 2002 ▪ E-RAs are critical to overall purchasing strategy ▪ E-RAs are integral part of e-sourcing platform ▪ E-RFXs are integral to e-RAs ▪ E-RAs can make significant contribution to the profits ▪ Top management support is critical 	<ul style="list-style-type: none"> ▪ Engineering-construction ▪ 471 auctions through 2002 ▪ E-RAs require increased process discipline and market knowledge ▪ Repeat auctions for same/similar services can be successful ▪ Total installed cost can be used to determine winning bid ▪ E-RAs assist in keeping projects on schedule ▪ E-RAs are not detrimental to supplier relationships 	<ul style="list-style-type: none"> ▪ Automotive ▪ 1,900 auctions; volume of € 22.8 billion as of 9/30/2002 ▪ Primary goal is efficiency/ buyer productivity ▪ If it can be specified, it can be auctioned ▪ Ongoing need for active change management ▪ Strong reputation as highly professional and trustworthy online buyer is key ▪ The new technology can be successfully used in a global sourcing context 	<ul style="list-style-type: none"> ▪ Retail ▪ 750 auctions; volume € 680 million as of 9/30/2002 ▪ Management attention kept high by monthly auction reports documenting bottom-line impact of e-RA. ▪ Dual goal: higher market transparency and process efficiency ▪ Precision in preparation is key ▪ Auctions complement existing processes ▪ Documents like <i>Golden Rules</i> and <i>Codes of Conduct</i> help implementation

Top-Down Implementation Approaches Are Most Successful

Resistance from:

Other functional areas in the organization

Purchasing function

Supplier community

Ways to overcome the resistance:

- Top-down implementation approach
- Education and training of the buyers
- Obtaining buyer input in developing e-RA strategy
- Provide performance incentives
- Share success stories
- Communicate
- Provide training and run mock auctions
- Overcome technical issues through test runs and contingency planning
- Create e-RA centers of excellence

E-RAs and Other Proven Sourcing Strategies Can Be Integrated and Will Reinforce Each Other

Spend Analysis

Leverage	Strategic
Commodities	Bottleneck

Product related:

- **Aggregation--** consolidate demand company-wide
- **Standardization--** decrease part numbers company-wide

Supplier related:

- **Globalization--** find suppliers worldwide
- **New Supplier Qualification--** develop new suppliers

90% of the Success of an E-RA Is Determined during the Preparation

E-RA Preparation

E-RA Event

Implementation/
Follow-Up

Competitive market

- While two suppliers can be sufficient, most successful events involve four or more suppliers
- The average dollar volume of successful e-RAs is over \$45 million (and just over \$1 million for the unsuccessful e-RAs)
- Rank-visible auctions create more bid activity than price-visible ones

Clear specifications

- Item or service must be clearly described in terms of technical, logistical, and commercial requirements
- E-RFQs are key in developing clear specifications
- E-RAs involving multiple lots are more often successful than single-lot e-RAs

Pre-e-RA communications

- The decision criteria (i.e., low bid versus TCO) should be shared with suppliers
- Conduct close-to-reality mock auctions

Buyers Have Options to Influence Bidding Behavior

E-RA Preparation

E-RA
Event

Implementation /
Follow-Up

Degree of market transparency for suppliers

- Rank-visible auctions create more bids than price-visible auctions
- Rank-visible are better if e-RA is followed by traditional face-to-face negotiations
- Rank-visible auctions are better when price differences are large

Bid increments

- Keeps suppliers active, prevents (last minute) surprise bids
- Can be in absolute amounts or percentage declines

Closing strategy

- Hard close (e.g., one hour fixed)
- Limited soft close (e.g., maximum of three 5-minute extensions)
- Unlimited soft close (e.g., continue if there is activity within last 2 minutes)

Auction communications

- Messages can be sent and made visible to individual suppliers or to all suppliers
- Help desks prevent cancellations of e-RA due to technical problems

Follow-Up Activities After an Event Influence the Success of Future Events

E-RA Preparation

E-RA Event

Implementation /
Follow-Up

Award credibility

- Follow the announced decision process
- Have clear policies regarding how to handle bids submitted outside the e-RA

Feedback to suppliers

- Provide suppliers with explanations of the outcome of the e-RA
 - Improves perceptions of fairness
 - Motivates suppliers to participate in future events

Feedback to own organization

- Inform all functions involved of the e-RA result
- Capture knowledge gained for future events

E-RAs Can Be as Ethical as Traditional Face-to-Face Negotiations

Potential Ethical Issues

Buyers may...

- submit phantom bids
- use unqualified suppliers
- simply benchmark price
- force suppliers out of business

Suppliers may ...

- engage in collusion
- log in just to watch (birdwatching)
- bid unrealistically low
- not be able to deliver as promised
- first bid too low, then recoup profits by charging for changes

Countermeasures by Buying Organization

- Explain and follow rules and conditions
- Have provider software prevent phantom bids
- Have buyers sign code of conduct
- Investigate market upfront
- Implement birdwatching policy
- Decide how to handle contract violations

Potential Overall Effects

- Strong e-RA reputation
- Improved objectivity
- Less cronyism
- More transparent negotiation rooms (for both suppliers and purchasing managers)
- Higher levels of trust

Emerging Issues That Will Alter the Environment of Suppliers and Service Providers

Supplier related:

- Aggregation and standardization will lead to fewer *actual* suppliers
- Ability to negotiate many rounds on a worldwide basis will lead to larger number of *potential* suppliers
- E-RAs will allow buyers to efficiently determine the "real" market price and to fully leverage the power of competition among suppliers
- Buyers will have more time for sophisticated negotiations on non-price items

Provider related:

- Experienced buyers move from full-service to self-service e-RAs
- Experienced buyers may auction auction services
- Buying organizations will look for "holistic" e-functionality including:
 - spend analysis
 - RFx
 - TCO analysis
 - performance measuring
 - ERP integration/interface

The Research Team Conducted In-Depth Interviews with Buying Organizations, Suppliers, and Service Providers in North America and Europe

The following buying companies were interviewed. Some were not using e-RAs.

The following providers of e-RAs services were interviewed.

The following suppliers were interviewed. All had participated in e-RAs. Most were suppliers to the buying companies interviewed.

3M	JCPenney	Ariba	B&F Contracting
Airport Vienna	Kimberly-Clark	B2E	Cebal
Bechtel	Lufthansa AG	cc-chemplorer	Chin Poon
Cessna Aircraft	Lufthansa Technik	Covisint	CTS Corporation
Cisco	METRO AG	Diligent	Cypress Semiconductor
Clariant	Michelin	eBreviate	Eaton Automotive
Cognis	MIELE	Emptoris	Georg Fischer Mössner GmbH
Colgate-Palmolive	Motorola	FreeMarkets	Gould ITT Pumps
Corning	Nestle	Goodex	Machining Specialist Inc.
Deutsche Telekom AG	RWE AG/RWE Systems	Portum	Peguform
Eaton Corporation	Scientific-Atlanta	Procuri	Perfect Circuit
First Data Corp	Siemens	PurchasePro	Praxair
GlaxoSmithKline	St. Paul Companies	Quadrem	Stellax Precision Machining
Gulfstream Aerospace	Teradyne Inc.	SupplyOn	Theysohn
Henkel	US Filter	Trade2B	Tubex
Hewlett-Packard	Volkswagen	WWRE	Valeo
Intel	Wella		Visteon

Introduction

In the mid-1990s, a new electronic sourcing tool emerged that has had, and is continuing to have, a profound impact on the way in which firms source goods and services from current and potential external suppliers. This tool, while known by other names (e.g., “online negotiation”) is the *electronic reverse auction* (e-RA).

The purpose of this study is to present the initial results of a comprehensive study of e-RAs undertaken by CAPS Research during 2002.

Defining E-RAs

In its *basic* form, an e-RA is an online, real-time dynamic auction between a buying organization and a group of pre-qualified suppliers who compete against each other to win the business to supply goods or services that have clearly defined specifications for design, quantity, quality, delivery, and related terms and conditions. These suppliers compete by bidding against each other online over the Internet using specialized software by submitting successively lower priced bids during a scheduled time period. This time period is usually only about an hour, but multiple, brief extensions are usually allowed if bidders are still active at the end of the initial time period.

Reverse vs. Forward Auctions

The term “reverse” auction is in contrast to a traditional “forward” auction where bidders offer successively higher prices until a winner is declared by the auctioneer. Nor is an e-RA like a “Dutch” auction where the supplier successively drops the price of an item being auctioned, in fixed decrements, until one of the competing buyers accepts the proposed price. Finally, an e-RA’s dynamic process (multiple rounds of bidding) is in sharp contrast

to the traditional “sealed bid” process where suppliers respond to a request for Quote (RFQ) from the buying firm.

In an e-RA, the bidder with the lowest price (or lowest total cost) is usually awarded the business, but the buying organization can specify in advance of the e-RA that business may not be awarded to the low-price bidder, or for that matter, to any supplier, if bids do not meet its targeted price and non-price requirements. (It should be noted that, during an e-RA, some buying firms report, in real time, the *lowest current price* to all competitors during the event, while others only show how each supplier’s last price bid *ranks in comparison* to the other suppliers’ last price bid. Showing only rank comparisons mitigates some suppliers’ reluctance to share specific price information with their competitors as well as encourages them to continue bidding rather than dropping out.)

Objectives of the Study

The objectives of the study are as follows:

- Understand the nature of e-RAs in their various forms and functions.
- Determine both the current and potential economic value added (EVA) for both buying and supplying participants resulting from their use (or non-use) of e-RAs.
- Determine what forms of e-RAs are best suited for different commodities, economic conditions, buyer-supplier interdependencies, supply/demand dynamics, and strategic sourcing initiatives.
- Compare and contrast the experiences from buying and supplying firms that do/do not participate in e-RAs, including the perspectives of third-party e-RA service providers.
- Explore the decisions of those firms that choose not to participate in e-RAs.
- Understand the issues related to buyer-supplier professionalism and ethics associated with e-RA deployment.
- Understand the role and EVA of e-RAs in firms' overall *strategic sourcing* processes.

- Third-party providers of e-RA services (e.g., eBreviate, FreeMarkets)
- A targeted number of firms who had specifically chosen not to use e-RA tools for sourcing

A detailed description of the study's methodology is shown in Appendix A.

Overview of the Study's Methodology

The study's methodology consisted primarily of analyzing face-to-face and teleconference-structured interviews performed in the United States and Europe during mid-2002, with the following organizations:

- A targeted number of firms who were considered to be "power users"* of e-RAs for sourcing goods and services from external suppliers
- A targeted number of suppliers who had participated in e-RA events

*"Power users" are large multi-national firms that were determined to have had extensive experience with e-RAs.

Why E-RAs?

Why the intense interest in e-RAs? The dramatic growth of the use of e-RAs over the past few years has been facilitated both directly and indirectly by a number of converging internal and external developments and forces, including:

- An intense need by firms to reduce costs of externally sourced goods and services (often amounting to 60 percent or more of total costs of goods sold) to become or remain competitive in the challenging economic environment of the late 1990s and early 2000s.
- Aggressive initiatives by firms to rationalize (usually reduce) their supply base and give more business to fewer suppliers or, alternatively, add new sources as a hedge against risk.
- Increased ability to aggregate company-wide demand for sourced goods and services through integrated ERP systems and thus, facilitate standardization and SKU reduction.
- Widespread ability for buyers and suppliers to economically communicate in real time, worldwide, via the Internet.
- Development of robust, user-friendly Internet-based software systems to support worldwide e-RA events that are either hosted by a third party or designed to be run by the buying company with little or no outside assistance.
- Many buying organizations have recently enjoyed a buyers' market where excess supplier capacity exists, and suppliers are willing to reduce prices, in some cases, just to cover variable costs.
- Intense initiatives by suppliers to reduce their total costs has often resulted in increased margins that may not have been passed on to their customers in price reductions, especially if they enjoy differentiated oligopoly or niche market power.
- Recent order-of-magnitude improvements in quality and cycle-time reductions have resulted in buying companies perceiving superior quality and service as "givens." Thus, they have shifted their emphasis toward *low price* as a major sourcing decision variable.
- Emergence of sophisticated and disciplined *strategic sourcing* processes that enable buyers to systematically use various e-tools (including e-RAs) to increase their competitiveness.
- Increased emphasis on global sourcing due to a combination of drastically improved quality of goods and low labor costs from developing countries.

The birth and acceptance of e-RA tools has not been without controversy, because, for some, its process is contradictory to the long-term benefits associated with collaborative/cooperative buyer-supplier alliances. This perceived conflict is primarily caused by the tool's emphasis on awarding business based on aggressive price competition (the classical arm's length coercive/competitive model) instead of long-term total cost of ownership (TCO) considerations. However, for a growing number of firms, e-RAs have found an appropriate niche in a strategic sourcing toolkit, allowing firms to efficiently source goods and services that are highly standardized, can be replicated by competitors, and have insignificant switching costs. In contrast, those suppliers of strategic items, where alliance-level supplier relationships are critical, are usually not subjected to e-RA sourcing. Generally, suppliers asked to participate in e-RAs, especially incumbent suppliers, do so reluctantly for fear of losing business. Overall, incumbent suppliers win about half of the e-RA events in which they participate, with the balance going to contender suppliers, sometimes at prices that are barely profitable or are even below variable costs.

Top Management's Expectations and Support of E-RA Use

There continues to be an ongoing controversy between some sourcing professionals and their top corporate managements regarding awarding business on the basis of lowest TCO versus lowest price. Sourcing professionals argue that higher prices can often result in lower total landed costs due to non-price variables such as suppliers' superior quality, service, technical ability, and long-term commitments between the two entities. Part of this controversy is caused by the difficulty of measuring the components of total cost versus the transparency of measuring reductions in price. As a result of this transparency, most top managements not only embrace the use of e-RA tools, but in some cases, seeing the impressive results of early e-RAs, set aggressive goals for e-RA use in annual sourcing requirements. This is especially the case when top management learns that the documented return on investment from e-RA use can run as high as 10 to 1. This is not to imply that TCO criteria is not used nor accepted for awarding business through an e-RA event. To the contrary, there is a growing acceptance to use TCO criteria as more sophisticated e-RAs (and other e-sourcing tools) are developed.

Benefits/Dysfunctional Aspects of E-RAs

The unique attributes and processes associated with e-RAs can create the following benefits and issues for those firms that employ them.

Direct Cost Reductions

The major benefit from the use of e-RAs is the potential for measurable direct cost reductions of purchased goods and services through either price reductions or believable TCO reductions. In general, reported reductions range from 10 to 20 percent below historical prices.

Biddable Attributes

Is everything a company buys a candidate for e-RA application? The answer clearly is no. Especially exempt are items or services that do not have clearly defined attributes that competing suppliers can translate into unambiguous specifications (e.g., software development, skilled contract labor). Second are items that are highly differentiated strategic items supplied by firms that are tightly coupled through strategic alliances with the buying firm (e.g., jet engines for an aircraft manufacturer). Third are instances in which switching suppliers would result in unacceptably large change costs (e.g., unique, proprietary process with no acceptable substitutes, re-certification of flight hardware by NASA). Fourth are items where the volume or value is so low that the potential savings do not cover the cost of holding the event.

What then, are the major attributes of a biddable good or service? In general, they are:

- Items can be clearly specified (design, terms, and conditions) and translated into prices a supplier will commit to charge the buyer.

- There is a strong likelihood that the current price is sufficiently higher than the market price so as to make the e-RA event cost effective.
- Switching costs are acceptable.
- A sufficient number of qualified, competitive suppliers exist in the marketplace.
- Qualified suppliers of the item(s) are willing to participate in an e-RA.

All of the firms in the study believed that if good specifications could be written and if a competitive supply market existed, then an e-RA was a viable approach to purchasing the good or service. The converse is also true, as several companies discovered in unsuccessful e-RAs. (In fact, a subsequent benefit was the resulting unambiguous, clear specifications that were developed in preparation for the e-RA.) Several firms reported that they had tried e-RAs for commodities that were controlled by just two or three major suppliers. The suppliers essentially refused to meaningfully participate, resulting in a failed e-RA. Likewise, e-RAs for which suppliers were provided with incomplete or confusing specifications resulted in suppliers bidding on essentially different items. The result was that the low bid in some cases was not acceptable because it was not responsive to the intended buy.

E-RAs Can Create Markets

Clearly, the development and use of e-RAs has created competitive “relatively efficient” markets for many goods and services where none previously existed. While this “market making” only hints at the efficiency of the organized stock, commodity, and currency exchanges, they are substantially more effective in determining market prices than the traditional static sealed bid or tender processes still in wide use throughout the world. As a marketing strategy, suppliers traditionally have relied

upon buyers' lack of knowledge about market prices and acceptable substitutes for their products and services. In addition, suppliers spend considerable effort to differentiate their products to divert attention from price to non-price features. E-RAs, on the other hand, provide a practical mechanism to bring several suppliers together with one buyer to "make a market" for a broad range of non-pure commodities, such as highly engineered parts, specialty chemicals, PCs, MRO, and services such as temporary labor, maintenance, and transportation.

Cycle-Time Savings for Buyers and Suppliers

The use of traditional processes for sourcing goods and services can consume several weeks, months, or more. The cycle-time from issuing a request for information (RFI), request for proposal (RFP), or request for quote (RFQ) (all generically termed RFx), to contract award can be painfully long and consume a substantial amount of time and effort from professional buyers. Much of this time is spent in managing several rounds of information sharing and negotiation with competing suppliers. On the other hand, a successful e-RA requires much greater time and preparation up front in order to correctly and adequately specify the requirements, select suppliers to participate in the event, and communicate and coordinate with suppliers. One supplier said, "The more information that the buying organization can provide, the better position the supplier is in to respond." In addition, post-e-RA negotiations can also consume substantial time and effort. However, the tradeoff between these extra up-front and back-end efforts versus the hour or so taken to "negotiate" an acceptable price can result in a substantial net reduction in the RFx-to-contract award cycle time. Buying firms report this cycle-time reduction to range from "no significant reduction" to as much as 40 percent over traditional sourcing processes. The result of this greater up-front preparation is a significant shortening and compression of the negotiation period into a 30- to 90-minute event.

The majority of suppliers also believed that e-RAs resulted in decreased cycle times. Many felt that e-RAs not only decreased the negotiation phase of the sales process, but could also improve cash flow: "With a non-e-auction it may take [our company] eight months to see any revenue; with an e-auction, it may take only three months to see revenue." Like their buyer counterparts, suppliers also emphasized the decrease in negotiation cycle times, where multiple face-to-face price negotiations that might have occurred over several weeks were condensed into a period of a few hours. Finally, suppliers noted that the scheduling process of an e-RA can minimize the possibility of buyers postponing bid deadlines:

"E-RAs decrease cycle times because when a customer signs up [with an e-RA provider], the customer has to schedule an event, and it is difficult for the buying company to keep changing the date of the event, so the customer has to drive themselves to meet that date."

Increased Buyers' Reach

Because most e-RAs are hosted through standard (secure) Internet connections, the reach to include qualified suppliers worldwide is increased substantially. Some integrated e-procurement systems (usually provided by third parties) include semi-automated release, receipt, and analysis of RFxs in multiple language formats. Prior to the auction, these RFxs are sent electronically to suppliers that have been identified by the buying firm or that may have been pre-qualified by the service provider. This expanded reach results in providing an effective and speedy supplier search mechanism.

Total Cost Analysis

While TCO analysis of bids is available in most e-RA systems, it is used *explicitly* only by the most advanced user of the tool. Some systems allow for the integration of a dozen or more variables to be factored into a price bid during the event. This is usually done by adjusting each supplier's bid price up or down based on a pre-e-RA analysis of each competing supplier's performance in relation to the non-price variables. Often, these variables are weighted to reflect their relative importance. On the other hand, buyers that announce that the business may not necessarily be awarded to the low-price bidder are *implicitly* considering non-price factors in determining who will win the business, and thus are *de facto* users of the TCO criteria.

Price Visibility

E-RAs offer the unique opportunity for buyers to gain insight into price levels, market prices, price elasticity (as related to various volumes), and price rigidity (from powerful oligopolies) from suppliers that participate in the event. The use of e-RAs, however, will not guarantee that the low-price bid is the true market price. This is because the low bidder may be willing to go even lower than true market price, but the competitors in the event are not. Nonetheless, price visibility, in general, is more transparent through e-RAs than in traditional sourcing processes. This knowledge of markets and prices can result, in some cases, in a "power shift" from strong

suppliers to weaker buyers not previously attainable until information is revealed through pre-event RFX submissions, the event, and post-event analyses.

Transparency of the Purchasing and Supplying Processes

If fairly administered, both the buying firm and the supplying firms have a clearer level of transparency into purchasing and supplying processes. Buying firms spend more up-front time defining specifications for the items to be auctioned, determining what suppliers are qualified to be awarded the business, and gaining insight into the supply market's nature by analyzing pre-event, event, and post-event behaviors. Likewise, suppliers have a clearer picture of what they are expected to deliver, have an opportunity to retain current business or gain new business, and are less impacted by non-rational decisions made by buyers or internal customers that want to maintain status quo.

Overall Process Efficiency/Productivity

Users of e-RAs report that they are able to spend less time on managing the tactical and operational logistics of sourcing, thus enabling them to spend more time on such strategic sourcing functions as spend analysis, opportunity assessment, market evaluation (e. g., performing Porter's five forces analysis), developing commodity sourcing strategies, identifying potential suppliers, current supplier development, supplier evaluation, and contract administration. Because the e-RA event drastically shortens the cycle-time of price (or TCO) negotiation, more time can also be spent on pre-event planning and post-event negotiation issues.

Specifically, user companies indicated that the use of reverse auctions has enhanced their professional buyers' productivity. One user company estimated a 25 percent reduction in cycle-time to source a part. Other buying organizations said, "Therefore there is more throughput per buyer," and "[E-RAs] are just a tool that results in increased productivity." Reverse auctions also force buyers to structure the bidding rules prior to the event, to standardize the procurement process, and to often times develop a strategy for their purchased items or material groups. However, these activities may not result in increased productivity for buyers until they become accustomed to the e-RA process and have conducted repeat e-RAs.

The fact that buyer productivity is increased also frees the time of buyers and purchasing managers to undertake

more professional, value-added activities beyond traditional negotiations, as described by one German purchasing executive:

"The target of a purchasing manager is to do as many saving projects as possible. So, if you can do one part with electronic tool support, it gives you more space or time to focus on new suppliers, on worldwide supplier search, and on traditional negotiations where an auction is not appropriate."

Other/Indirect Savings

The effective use of e-RAs can result in a ripple effect of cost reduction in such areas as shorting the cycle-time of new product introduction, higher inventory turnover, quicker introduction of lower-cost materials, more effective use of sourcing professionals, and, in some cases, headcount reduction due to automation of some components of the sourcing process.

Benefit/Cost Justification

E-RA users justify the set-up and operational costs with their documented hard and soft savings benefits. Reported payback can be achieved after the first few uses of the tool. (One user reported that the investment in an e-RA system paid for itself during the first five minutes of their first event!) Nonetheless, there has been some resistance to the fees charged by full service providers of e-RAs events. These providers have listened to their customers and have responded by developing less expensive do-it-yourself systems that are rapidly gaining acceptance.

Dysfunctional Aspects of E-RAs

Like any tool, e-RAs can be misused, or, even if used appropriately, can result in a dysfunctional outcome. Some of the causes of poor results gleaned from the interviews are:

- Inadequate up-front event planning or unclear item specifications and auction rules.
- Insufficient training in the use of the e-RA system (buyers and suppliers).
- Allowing unqualified bidders to participate.
- Misreading the market and setting a reserve (maximum) price that is too far below the market price, resulting in no bidder responses.
- Awarding business to a supplier at a price so low that it cannot deliver as specified or its survival is severely threatened.

- Targeting the wrong commodity with which to apply an e-RA, creating an instance where the market will not be responsive, or even suppliers will refuse to participate.
- Holding repeated e-RA events for the sole purpose of pressuring incumbent suppliers to reduce their prices.
- Use of an e-RA that results in destroying the trust and mutual interdependence between the buying company and a key strategic alliance supplier.

Benefits to Suppliers

As discussed earlier, most incumbent suppliers indicate they are reluctant participants in e-RA events, but rarely refuse the chance to retain their current business or increase their business if supplier consolidation is an objective of the e-RA. In contrast, contender suppliers appreciate the chance to develop new business through their e-RA participation. In addition, suppliers also gain valuable insight into their competitive environment through their own post-event analysis of the outcome. If they win the business while maintaining a decent margin, that indicates they probably are competitive. Likewise, if they lose the business to a competitor, that indicates their cost structure and/or their margin requirements may need to be leaner.

Other potential benefits to suppliers might include lower marketing/sales costs and quicker award/non-award cycle times (Sometimes awards are announced at the end of the event, or a day or two later versus weeks or months under traditional sourcing processes). Suppliers also cited the benefits of constructive feedback from some buyers as to why they won/lost the business if they were not/were the low-price or highest ranked bidder.

Actual vs. Potential Application of E-RAs

What is the reported potential for using e-RAs for sourcing? Most firms indicate their current usage is in the single-digit percentage range of their annual spend. However, they say the potential is well beyond this range. Aggressive users of the tool estimate that the potential can be as high as *half of their annual spend*.

Others were more conservative in their estimates, indicating that only 10 percent to 15 percent of the spend could be reverse auctioned. Whatever the estimate of maximum possible spend, none of the firms had yet achieved this level of usage. *This strongly suggests that there is substantial opportunity for growth in the use of e-RAs.*

The Strategic Context of E-RAs

The use of an e-RA tool is but one component of a buying firm's *strategic sourcing process* and is not designed to be used to source all of a firm's requirements for purchased good and services. Rather, it is one alternative to use with other sourcing strategies such as vertical strategic buyer-supplier alliances, horizontal purchasing consortiums, e-marketplaces, spot buys, outsourcing all or part of the sourcing function, and even in-sourcing, where external supply markets fail to deliver adequate added value. Thus, it is appropriate to show where the e-RA tool fits into a firm's typical *e-oriented strategic sourcing process*.

variation in how this process is depicted. The process shown here is an amalgamation (and simplification) of several of these depictions, and is not attributed to any specific organization's model.)

What follow is a brief discussion of each of these eight chevrons in the graph. However, the focus of this research is on the six components in the middle, with specific emphasis on interviewees experiences with the two elements most darkly shaded (Develop Reverse Auction Strategy and Hold Reverse Auction).

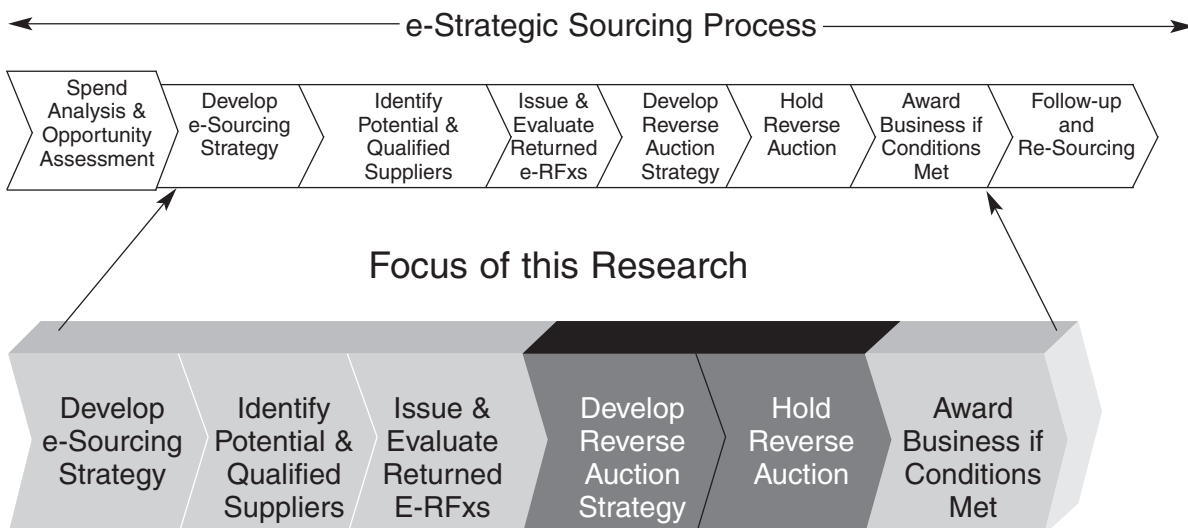
The E-Oriented Strategic Sourcing Process

Figure 1 shows the major components in a firm's typical *e-oriented strategic sourcing process*. (Note: There is a wide

Spend Analysis and Opportunity Assessment

Step One in the e-oriented strategic sourcing process is to *capture and analyze current and potential spend* through

Figure 1
Components of Typical E-Oriented Strategic Sourcing Process



a “dump” of files from accounts payable and other data mining opportunities available from ERP systems. In addition, firms report they use standard Pareto and other market analysis tools (e.g., Dun & Bradstreet, Hoover’s, Thomas Register, and industry-specific services such as iSupply) to determine where opportunities exist for the application of a formal strategic sourcing process. This can be done for all sources of spend, including direct and indirect materials, services, and capital expenditures. Following this initial analysis, firms often categorize their spend into the classic 2 x 2 matrix to determine the appropriate sourcing strategy or tactic. See Figure 2.

In general, e-RAs have been used for sourcing three of the four cells of the sourcing strategy matrix: *commodities*, *leverage*, and *bottleneck* direct and indirect materials, services, and capital goods. Only for *strategic* items, which often involve long-term strategic relationships with suppliers and high switching costs, have e-RAs not found great application. Discussion of the use of e-RAs in each cell follows.

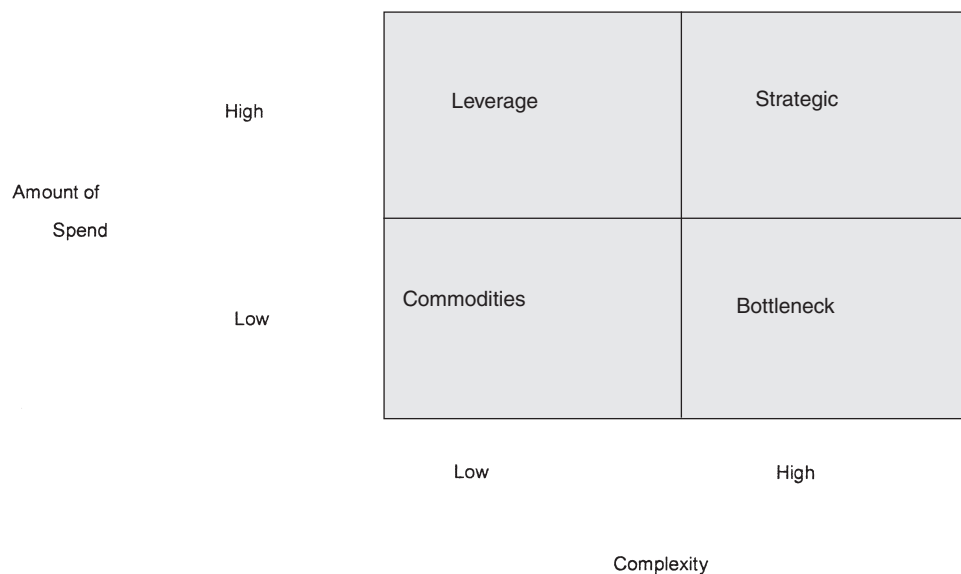
Strategic: An aviation company interviewed defined propulsion and avionics systems to be strategic goods. The suppliers had participated in the early development of these systems for specific aircraft and were under long-term contracts to support the systems for the life of the aircraft. For these reasons, the aviation company did not envision a role for e-RAs in buying these systems.

Bottleneck: An electronics company purchased a large number of “quick turn” printed circuit boards for product development. The boards were made-to-order with short lead times and the number of suppliers was limited. The boards were not used in production so the purchase volume was low. The electronics company was able to reduce its costs for the prototype boards by using e-RAs in conjunction with a program of early supplier involvement in the board design.

Leverage: A machinery manufacturing firm reported that they had been paying too high a price for plastic molded pieces. Although there were several suppliers for the product and the price for the base resins fluctuated, the price paid for the molded plastic parts tended to be fixed. An e-RA was organized with the incumbent and several other qualified suppliers that resulted in a substantial price reduction.

Non-critical: A specialty chemical company used e-RAs to buy packaging material. The product was considered a commodity and the need was not urgent. The supply base included many suppliers (international and domestic); some were pre-qualified and some were not. Two suppliers won the e-RA, one of which was pre-qualified while the other was not. The pre-qualified supplier was awarded 100 percent of the business, while the other was offered the opportunity to become qualified. A purchase price decrease of 20 percent achieved, plus one new supplier was later qualified.

Figure 2
Sourcing Strategic Matrix



Adapted from: Kraljic, Peter, “Purchasing Must Become Supply Management,” *Harvard Business Review*, September-October, 1983, pp. 111-112.

In addition to being employed to buy direct and indirect materials, e-RAs have also found use in the purchase of services and capital. Some examples follow.

Services: A construction engineering company routinely used e-RAs to purchase construction services for cell phone transmission towers. The suppliers bid according to their ability to perform the service and, most importantly, their open capacity or their need for the business. Many of the same suppliers participated in the e-RAs. The winning bids are routinely lower than the estimated construction cost.

Capital: A pharmaceutical company used an e-RA to buy capital equipment for its laboratories. The winning bid was lower than the estimated cost prior to the e-RA. An airline and a telecommunications company were using e-RAs to buy facilities.

Other spend categories: One last category of spend that is of interest is commodities that have a published price index. There actually are two categories of commodities with indices. First, there are commodities that are traded on an organized exchange, for which the minute-to-minute current prices are known, plus for which future markets are established. (Many agricultural products fall into this category.) No cases were observed of e-RAs being used to purchase such commodities, nor does it seem likely that e-RAs would ever be used for this class of commodities. While not all transactions for such commodities are processed through the established exchanges, price discovery is not an issue when two parties are negotiating a private transaction for these commodities. Therefore the value-add of an e-RA would be quite small.

There are also commodities that are not traded on an exchange, but for which a price index is published regularly that reflects transactions reported to the publishing agency. (Memory chips are an example of such a commodity.) In this case, some providers have reported that they have hosted e-RAs that routinely result in bids that beat the published index. This could be due to imperfections in the index or could be just a matter of timing. While none of the study's case firms reported using e-RAs for this class of commodities, other firms might be.

Develop E-Sourcing Strategy

Firms that are, or are becoming e-sourcing oriented, have a variety of e-sourcing tools available to use, and more are under development. In addition to e-RA and e-RFx tools, new e-sourcing tools that are complementary to e-RAs and e-RFxs are becoming available such as e-spend

analyses/opportunity assessment, e-design collaboration, e-supplier evaluation, e-award/decision support (with optimization), e-invoicing, and e-funds transfer.

Thus, **Step Two** in the e-oriented strategic sourcing process is to determine the appropriate mix of available e-sourcing tools to use for the items or services under evaluation.

Identify Potential Suppliers

Step Three is to identify potential suppliers for the items or services being subjected to the e-oriented strategic sourcing process. This is done most often by tapping the experience a firm has with its current supply base as well as using the firm's supply management staff to conduct searches for new suppliers. In some cases, firms make use of external consultants that have item category expertise or e-RA providers who offer supplier search services.

The search for potential suppliers may or may not be successful, but usually, a potential list appears that may range from one to several dozen. From this list, the next step (step four) is to pare the list down to a reasonably sized list of *qualified suppliers* through the RFX process, which may or may not be e-enabled.

Issue and Evaluate Returned RFXs

Step Four entails issuing an appropriate RFX to the broader list of potential suppliers. The RFXs may or may not be e-based. Suppliers responding to the RFX are then evaluated to determine those that are *qualified* to be invited to participate in a e-RA. Finally, if the list of qualified suppliers is too small (one, maybe two, in some cases) or too large to be handled logistically, the final list of invitees may be decreased or increased by an additional supplier search and/or inviting suppliers believed to be potentially qualified.

Develop Reverse Auction Strategy

As mentioned earlier, an e-RA is but *one* tool in an e-oriented strategic sourcing process. In fact, the list below shows a *sampling* of the various strategies and tactics that may be used individually, or in combination, to develop an overall strategy to source a good or service, depending upon the specific economic and technical environments facing the buying and supplying firms. (Note that e-RAs are just one of many sourcing strategies and tactics.)

Generic sourcing strategies and tactics (both traditional and e-oriented):

- Strategic alliance for high value/high risk strategic commodity
- Traditional face-to-face negotiation, perhaps only with key alliance suppliers
- Traditional sealed bid process (low volume/low value, “C” items)
- Negotiated or non-negotiated catalog buy, with p-card authorization (to control maverick buying)
- Aggregation of an item’s demand across divisions, nationally and globally
- Component standardization (SKU reduction)
- Source domestically and/or globally
- Supplier-managed inventory with/without consignment
- Spot buys from formal commodity markets (e.g., sweetener, orange juice, pork bellies, jet fuel)
- **E-reverse auctions of appropriate goods and services (generally, commodities, leverage, and bottleneck items as shown earlier in Figure 2, but not strategic items)**
- Outsource of all or part of the procurement function (Ariba, CommerceOne)
- Source through a buying consortium (O’Hare Group) or third-party e-market (ChemConnect)
- Single/multiple source (supply base rationalization)
- Take partial ownership position of supplier

However, the decision to use an e-RA to source a specific good or service in itself requires the development of an e-RA strategy, which is **Step Five**, in the e-oriented strategic sourcing process. A *sampling* of some e-RA strategy questions to be considered follow:

- Should the buying firm aggregate all of its spend in this category for an e-RA event, or run separate e-RA events for different product divisions, locations, etc.?
- Should the buying firm hold an e-RA for sourcing a single-item category (standard-sized rental cars from Hertz, Avis, Budget, etc.); or a group of similar items (rental cars and trucks from Ford, GM, etc.); or multiple dissimilar items (rental cars, air travel, hotel rooms from a competing group of travel agencies)?
- Should bidders be required to bid on entire packages (cars, air travel, hotel rooms) or be allowed to “cherry pick” what they bid on (hotel rooms only)? Likewise, will the buying firm inform the competitors up front that they may “cherry pick” and award business for rental cars to one supplier, air fare to another, and hotel rooms to a third, or other combinations?
- Will the buying firm guarantee that the lowest-price bidder will definitely be awarded all of the business? Or, will they announce in advance that non-price

variables will be considered (such as switching costs, quality, and delivery performance), and in fact, that they may not award any business to any bidders unless certain conditions are met? Furthermore, what are these conditions?

- At what level will the buying firm reveal to the bidders the maximum (reserve) price they will accept before awarding any business and its own internal (confidential) target price they are hoping to achieve through the auction to justify the cost of holding the e-RA event and incurring switching costs, if the incumbent is not the low-price bidder?
- Should the buying firm award all of the business to a single supplier (to gain price-volume leverage) or to multiple suppliers for continuity of supply, capacity limitations, or regional demands?
- What will the buying firm do if no suppliers agree to participate or no serious bids are submitted?
- What will be the specific rules for the e-RA event?

Hold the Reverse Auction

Step Six is to hold the e-RA. As mentioned earlier, this can be hosted entirely by the buying firm or with partial or full help from a service provider. Later sections of this report will provide the details on the mechanics of e-RA events, along with research findings detailing how they are deployed.

Award Business If Conditions Are Met

Step Seven in the e-oriented strategic sourcing process is to decide which bidder or bidders, if any, should be awarded the business. Here are the major options observed in the study:

- Award business to one or more bidding suppliers based only on lowest price.
- Award business to one or more bidders that may or may not have been the low-price bidder(s), after considering non-price variables (quality, delivery, switching costs, etc.).
- Award business to one or more bidders only after conducting post-e-RA negotiation session(s) with selected bidder(s).
- Decide not to award the business to any bidders because pre-e-RA conditions or post-e-RA evaluation and/or negotiations were not satisfactory.

While the details regarding the incidence of these award alternatives are discussed later in this report, one interesting observation is that incumbent suppliers are awarded the business sourced through e-RAs about *half the time*.

Follow-Up and Re-Sourcing

Step Eight entails an ongoing formal process for evaluating the performance of the winning bidder(s) to see if they have met the conditions of the e-RFx, and, if applicable, the post-e-RA negotiated terms and conditions. While most firms still use traditional, non-e-tools for this step, providers are beginning to offer e-supplier evaluation models in their suite of applications (e.g., Open Ratings).

Finally, “re-sourcing” refers to a buying firm’s plan to re-bid the business with a future e-RA or return to more traditional strategic sourcing process, once the current contract nears expiration. For example, some buying firms have used an e-RA to choose a *new strategic supplier*, but would not consider subjecting that supplier to a future e-RA because of the need for close collaboration between the two firms. On the other hand, for a repeat buy of a *leverage* item, the buying firm may award a short-term contract (one year or less) with the intent of holding periodic e-RAs for this item if it believes there is still some price (or TCO) savings to be realized. Unfortunately, the timing of this study (mid-2002) did not provide much experience relating to re-sourcing due to the relative infancy of the tool’s use.

The Interaction of E-RAs and the Other Components of the Strategic Sourcing Process

An e-RA, albeit a tool that is growing in importance in a firm’s strategic sourcing process, is but one “e” device to use in sourcing goods and services. However, its expanding use is expected to have a substantial impact on several of the strategic sourcing components shown in Figure 1. One reason for this potential impact, as mentioned earlier, is the current development of new e-sourcing tools that are complementary to e-RAs, such as e-spend analyses/opportunity assessment, e-RFx deployment and analyses, e-design collaboration, e-supplier evaluation, e-award/decision support (with optimization), e-invoicing, and e-funds transfer. These e-tools are being developed and deployed by some buying firms (see the GlaxoSmithKline case study) as well as third-party solutions providers (e.g., FreeMarkets and eBreviate). It is envisioned that this new breed of e-tools could provide a means to integrate the components of the strategic sourcing process and perhaps other links in the supply chain.

Spend Dollars, Percentages, and Trends

E-RA Event Experience

The range of e-RAs conducted by buying organizations participating in the structured interview study was from 21 to 1,900, with the majority of buying organizations having conducted over 100 events. Thus, most of these firms can be considered “early” or “middle” adopters of the tool rather than “late” adopters which had only experienced a small number of e-RA events.

Experience across the Global Economy

Knowing the dollar volume of spend awarded through e-RAs and the trends in this area can help managers benchmark their activity in this area and help them define the appropriate role of e-RAs in their overall sourcing strategy. However, estimating the dollar volume of spend awarded through e-RAs across the economy, across industries, or across economic regions is not easy. There are several reasons for this. First, companies do not routinely report these data. Second, providers of e-RA services do not report total activity, except in general and often in conflicting terms. Furthermore, most providers of e-RA software and functionality do not know the full extent of use of their products. As more companies move

to so-called “do-it-yourself” e-RAs, the activity and outcomes are not visible to the providers of the e-RA software.

A third difficulty in compiling statistics about e-RA usage is that not all companies and providers use the same counting system. For example, one provider counts each separate e-RA in a multi-e-RA event as one e-RA, while another provider counts a multi-e-RA event as one event. These counts are clearly not comparable.

Two useful sources of data on e-RA volume are CAPS Research and a survey conducted by the Institute for Supply Management (ISM) and Forrester Research.

CAPS Research conducted two separate polls in 2002 with two diverse sets of large companies, concerning the volume and trends in e-RA usage. The first poll indicated that 68 percent of the respondents were using e-RAs. (See Table 1.) For those companies using e-RAs, the rate of usage in 2001 was about 2.6 percent of total spend and the expected growth rate was about 17.5 percent for 2002.

The second poll indicated that 83 percent of the companies (N=46) were using e-RAs. For those

Table 1
CAPS Research
Large Company Survey

	Spring 2002 (N=114)	Fall 2002 (N=46)
Percent of companies using e-RAs	68%	83%
Average number of e-RAs in 2001	20	NA
Average \$ value of an e-RA in 2001	\$2,200,000	NA
Average % spent in e-RA in 2001	2.6%	5.5%
Expected increase in e-RA spend from 2001 to 2002	17.5%	NA
Expected % spend in 2004	NA	11.5%

companies using e-RAs, the percent of total spend in 2001 was estimated to be about 5.5 percent. For all companies combined, the percent of total spend through e-RAs in 2004 was expected to be about 11.5 percent.

As part of its ongoing benchmarking program, CAPS Research asked companies in eight industries about their use of e-RAs. Out of 81 responding companies, 42 companies (52 percent) indicated that they were using e-RAs in 2002. The average spend through e-RAs for these companies was 3.6 percent of total spend. The median spend was 1.04 percent, indicating that some of the companies were “power” users. Indeed, one firm reported using e-RAs for 27 percent of its total spend.

ISM and Forrester Research started publishing a *Report on eBusiness* in January 2001. One of the questions in the underlying survey asks if companies are using e-RAs. Figure 3 shows the results of this quarterly survey for the past two years. (Unfortunately the survey does not ask about the extent of the usage.)

The results of this survey show that about 20 percent of all responding firms are using e-RAs, with 30 to 35

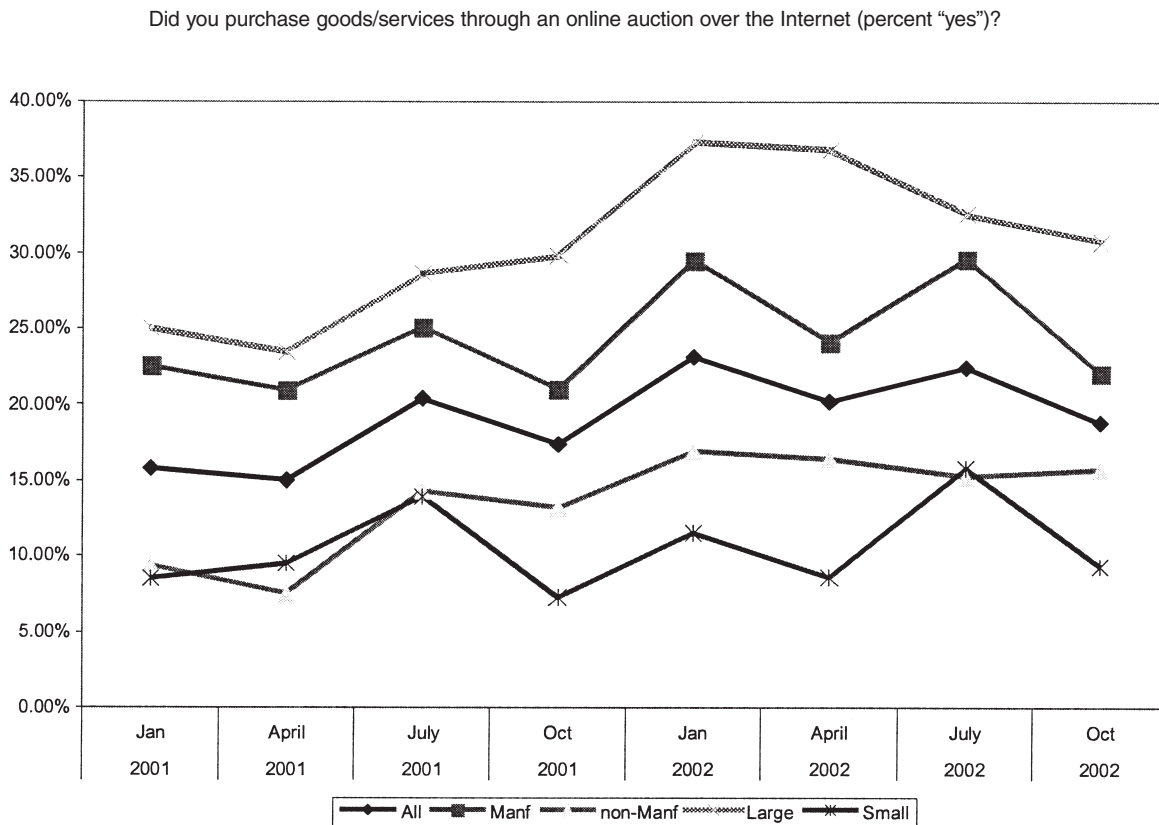
percent of large firms and 25 to 30 percent of all manufacturing firms using e-RAs. According to this survey, small firms and non-manufacturing firms are less likely to use e-RAs.

The difference between the number of firms reporting using e-RAs in the CAPS Research and the ISM/Forrester surveys is probably due to the size of firms in the sample populations. The CAPS Research respondents are all Fortune 500 firms that actively participate in research programs with CAPS Research. These firms tend to be first movers in the adoption of new technologies. The largest firms in the ISM/Forrester report had purchases starting at \$100 million, so they were smaller on average than the firms in the CAPS Research poll.

These data lead to several conclusions.

- The percentage of larger firms (over \$100 million in spend) using e-RAs is at least 35 percent and probably over 50 percent. The percentage is lower for smaller firms and non-manufacturing firms.

Figure 3
Companies' Use of E-RAs



- The average percent of spend going through e-RAs is still modest (less than 5 percent), but some firms are already using e-RAs for over 25 percent of their spend.
- The growth rate in usage is strong (10 to 15 percent increase per year). While most users expect that the solid cost savings produced by e-RAs may taper off, they also expect that the efficiency of e-RAs will continue to fuel the growth in use.

Experience across Industries

The use of e-RAs is not limited to a few or selected industries. The research team was able to find “power users” in the automotive, electronics, aviation, pharmaceutical, construction engineering, machinery, chemicals, and packaged goods industries. (The four case studies presented later in this report are examples of these “power users.”) Nonetheless, two different industry-specific conditions can limit the use of e-RAs. First, in industries with unusually long-term supply contracts for direct material (e.g., aviation) the very terms of the contracts preclude putting material up for e-RA until the contracts expire. Because e-RAs are a relatively new buying tool, long-term contracts have limited the opportunity for buying direct materials through e-RAs. Furthermore, the long product development cycles in the aviation industry and the need for suppliers to be deeply involved in the product development process may continue to limit the use of e-RAs in this industry.

A second limiting condition occurs in industries with unusually high switching costs (e.g. pharmaceutical, due to regulatory requirements). Companies operating under these conditions find the potential value of low bids for direct materials and packaging overwhelmed by the high costs of qualifying new suppliers.

In contrast to the above examples, an electronics company with short contract commitments (six to 12 months) and low switching costs estimated that up to 50 percent of its total spend could be conducted through e-RAs. Even in aviation and pharmaceutical companies, significant portions of the spend for indirect goods could be purchased through e-RAs. (See Figure 4.)

Experience across Commodity Types

Initially, many firms conclude that e-RAs will find most application in purchasing indirect material and direct materials that are commodities or near-commodities. The basis for this thinking is the belief that commodities and indirect goods can be safely purchased largely on the basis of price. Furthermore, many companies initially believe that e-RAs will not be a suitable way to source with suppliers of direct materials and capital goods that are used in critical applications, that have (apparently) a limited number of possible suppliers, or for which non-price considerations have great importance.

Upon reflection, and after some experience with e-RAs, most firms come to the conclusion that e-RAs can be

Figure 4
Applicability of E-RAs: Switching Costs vs. Length of Current Contract

APPLICABILITY OF REVERSE AUCTIONS

Long Contract Agreements	Limited	Low
Short Contract Agreements	High	Limited
	Low Switching Costs	High Switching Costs

applied to many areas of their spend, including direct and indirect goods, capital goods, and services. The spring 2002 CAPS Research poll indicated that the majority of responding firms used e-RAs most often to buy direct goods. There are two compelling reasons for this change of direction. First, for manufacturing firms, the greatest portion of their spend is for direct material. If cost savings are to be achieved using e-RAs, it only makes sense to apply them where the most money is spent. Second, many indirect and commodity items have low value-add by the suppliers and are already priced with low margins. Therefore, the cost saving potential from e-RAs is limited for these buys.

Sustainability of the Use of E-RAs

Sustainability of E-RAs As a Tool

Are e-RAs here to stay or just another passing fad of the digital economy? The skeptics relish the question, the early adopters scoff at the question, and the new adopters are hopeful that they have chosen a winning tool.

All of the evidence collected in this study suggests that e-RAs are here to stay and that their use will continue to grow. There are several facts to support this position. First, e-RAs have been shown to work — that is, produce cost savings across a wide number of goods, services, industries, countries, and economic regions. While there are cases of specific e-RAs failing, this research found only one firm that had tried e-RAs and later abandoned their use. (Even this firm indicated they might try e-RAs again at a future date.) Furthermore, this research found that the success of e-RAs had mostly overcome the early resistance and philosophical objections to their use. Indeed, this research did not find any firms not using e-RAs because they objected to their use. The non-using firms either had not seen an application for them or had not gotten around to using them.

Second, e-RAs are one of the few new e-tools that can be used in a stand-alone mode (although this may not be the optimal deployment), without integration into ERP or other sourcing systems. This makes them relatively low-cost to install and use. Many of the fees charged by third-party providers go to support the expertise that the provider brings to the process, acting as a consultant in terms of supplier identification or specification writing, for example. Thus, companies can reduce many of the associated fees by using self-service auctions.

Third, e-RAs are a very efficient method of getting to a final best price from a group of suppliers. Early uses of e-RAs may result in substantial cost savings that are not sustainable later on. However, the efficiency remains whatever the outcome. One company said that e-RAs

resulted in outcomes that were as good as its best negotiations and better than most of its negotiations. Therefore, e-RAs delivered best or near-best results in an efficient manner, even if the result was not a large cost savings.

Fourth, e-RAs are becoming a desktop tool with a commodity status. Many providers can provide the basic functionality for e-RAs and can place it on the desktop of every buyer. Buyers can arrange e-RAs with minimal effort and time.

Lastly, although not required, many companies are integrating e-RAs into a more complex set of tools. These tools encompass more of the sourcing process, particularly the RFx process. As this integration continues, buyers will have e-RAs available as a routine choice, along with sealed bids and traditional negotiations, to complete the buying process.

On the other hand, no one quite knows what to expect if the economy surges and tight supply markets develop. Two possibilities exist. The first is that suppliers might organize forward auctions and sell their capacity to the highest bidder. Many suppliers currently being coerced into e-RAs voice this as a veiled threat. But, it could prove to be an efficient means to clear markets, just as e-RAs have been in a “buyer’s market.”

A second possibility is that both buyers and suppliers will prefer to abandon e-RAs in favor of face-to-face negotiations. However, this return to the “old” way of doing business would sacrifice many of the efficiencies gained by e-RAs. Companies may not be able or want to accommodate an increase in process inefficiency. Of course, it is unlikely that all supply markets will be tight at the same time. As is true today, e-RAs are applicable only in certain circumstances. It seems unlikely that these circumstances will disappear altogether under any but the most extreme economic conditions.

Sustainability of E-RA Results

Long-term sustainability of e-RA results (i.e., substantial cost savings) is a question on the minds of most users and non-users alike. Logic alone suggests that buying companies cannot expect to save, say 25 percent, on *repeated* buys for the same good and have the supplier, or even supply base, stay in business. The companies in this study all suggested that they did not expect to maintain the same percentage of cost savings on repeated buys. Nonetheless, several companies had experienced substantial cost savings on the second e-RA for the same good. Longer term, most firms indicated the savings will level off and become more driven by the supply-demand conditions at the time of the e-RA. Thus, future results could be price increases rather than price decreases.

In the current economy, several factors seem to be at work to produce the price decreases currently enjoyed by buying firms.

- Suppliers do not know or are ignoring their costs. They get carried away in the “frenzy” of the e-RA and submit bids for which they have no hope of making a profit.
- The economy is stagnating, and many supply markets have excess capacity. Suppliers are submitting bids that are below total costs but, hopefully, covering marginal costs. When the economy turns around, the suppliers will submit bids that reflect total costs.

The research team heard reports from buying firms and selling firms that results had been obtained in some cases due to these factors. Both scenarios are non-sustainable in the long run. Suppliers must eventually cover their costs or go out of business.

- Suppliers know their costs and margins and are reducing their margins to gain or retain business. The net result may be more volume and profit, but at a reduced margin.

The research team heard from both buyers and suppliers that this is a frequent outcome. This seems to be a bidding strategy for many incumbents, whose bids end up below their previous selling price. This strategy is sustainable, although suppliers cannot indefinitely reduce their margins and stay in business.

- Suppliers work to lower their costs (following the e-RA) in order to sustain their profit margins with the new lower selling prices.

Buying companies hope for this scenario but cannot be sure. Several suppliers, however, did identify this as their strategy. Participation in e-RAs would make them a better supplier and would allow them to take business from their competitors in the future. This is a sustainable outcome, although even in this case, the decline in costs and bid prices will surely level out.

Sustainability of Supplier Performance

Sustainability of supplier performance is related to the above discussion, but has another important dimension. Many suppliers have been quoted as saying that as they drop prices, they would not be able to sustain many of the “free” services surrounding the goods they now provide to their customers. Design services, repair services, emergency deliveries, and so forth would all disappear because the new low prices would not cover the costs of providing these services.

The buyer response to these statements has been three-fold. First, none of the buying companies in this study could identify a case where supplier service had diminished after an e-RA that resulted in a new lower price. Thus, the buyers were skeptical of the claims. Second and more importantly, the buyers were interested in testing the value of the un-priced services. If the services had value and were withheld, the buyers would return to the suppliers and explicitly negotiate (or use e-RA) for the services.

Lastly, the experienced buying companies in this study were generally confident that they could include all of the services they needed in the specifications for the e-RA. This would not only allow suppliers to fairly price and bid on the complete package of goods and related services, but also allow the buying firms to better know what they were paying for.

Based on the evidence collected in this study, there is little or no evidence that e-RAs are driving all suppliers into non-sustainable relationships with buyers. Actually, there is evidence to suggest the opposite. E-RAs are sharpening the relationships by removing some of the ambiguity about market prices, forcing buyers to be clearer about what they desire to buy (i.e., better specifications), and forcing suppliers to be clearer about what they are supplying. However, while it is clear that buyers are enjoying the efficiency of e-RAs in getting to a price, the efficiency gains on the supplier side are less visible. While there is scant evidence from this research that suppliers have been able to reduce sales costs or personnel because of e-RAs, some sales managers indicated that they now use their time differently. Prior to e-RAs they spent a lot of time in negotiations talking

about price or cost elements. With e-RAs, they spend less time negotiating price face-to-face. This function is “delegated” to the e-RA. The face-to-face time is used more for discussions about creative, joint problem solving. However, this may be somewhat over-simplified. In former times, price discussions and creative problem solving were merged, while in this new approach, they are separated. The old model is still favored by the majority of the suppliers as it leaves more opportunity for creativity.

E-RA Implementation Strategies

Implementing an e-RA initiative or process requires strategy on the part of both the buying firm and supplier firms. Also, training issues exist for both groups.

Implementation of E-RAs in Buyer Organizations

The interviews revealed that e-RAs can be implemented using either a top-down approach, in which the organization's top management directs the use of e-RAs, or a bottom-up approach, in which the implementation originates from managers within the purchasing function. For the buying organizations that were visited, the implementation of e-RAs was almost evenly split between a top-down and a bottom-up approach. In examining the patterns between these approaches and barriers to e-RA implementation, it was observed that a top-down approach was not associated with resistance from any internal departments other than purchasing. Conversely, for firms that undertook a bottom-up approach, internal resistance was encountered in the marketing, information technology, and manufacturing (internal user) departments. *Thus it appears that a top-down implementation approach to e-RAs is more effective than a bottom-up approach in minimizing resistance from other functional areas in the organization.*

Unlike some past process changes that have involved unrealistically high management expectations, there was no consistent pattern across buying organizations regarding how realistic management expectations were at the beginning of the e-RA implementation process. Top management expectations, however, were unrealistically high for most companies, were realistic for some companies, were unrealistically low for a small number of firms, and some reported no expectations at all.

In addition, no relationship between a top-down versus a bottom-up implementation approach and the occurrence of resistance *within* the purchasing function was observed. Over two-thirds of the buying organizations, regardless of implementation process, noted such resistance from within their own departments. The most common means of overcoming this barrier was through e-RA education and training of buyers, obtaining the input of buyers in the development of the e-RA process, and by providing internal performance incentives, including making e-RA use and performance a part of the buyer's formal performance appraisal.

The majority of buying organizations also encountered resistance to e-RAs from suppliers. One tactic used by buying firms to overcome this issue was simply to leave suppliers no choice but to participate in e-RAs. As stated by one buying firm, "There is much crying [by suppliers] about reverse auctions, but that is just life." More commonly used tactics to overcome the barrier of supplier resistance included communicating with and educating suppliers regarding the use of e-RAs.

Implementation of E-RAs in Supplier Organizations

While technical difficulties can occur for buying firms, the study found this to be a much more common problem among suppliers. These technical barriers included access issues and having a general understanding of how the e-RA software works in a rapid, real-time environment. One supplier's computer jammed the first time it participated in an e-RA, but the problem was rectified by not allowing others at the supplier's company to access the Internet during the e-RA event. Another supplier detailed the technological learning curve with the following comments.

“The other challenge is understanding the actual software that [we are] using. The first time that a supplier navigates around the software package, it is difficult to understand how to send a message and keep an eye on the bidding process at the same time.”

Most suppliers overcome this hurdle simply by gaining hands-on experience with the software. Another strategy is to develop what the research team labels “centers of excellence” (COE). These COEs can be created in both the buyer and supplier organizations to facilitate organizational learning and centralized e-RA knowledge and experience within a company. As an example of such a COE, one supplier has created a COE reverse auction team that participates in customer e-RAs across all divisions and geographical sales territories. Here is the process it uses:

When this supplier receives an invitation to participate in an e-RA, the event is first summarized along several characteristics including:

- the value of the opportunity
- the risk regarding the stated terms and conditions
- the current risk that the supplier is already experiencing with this customer

Next, the supplier’s COE auction team identifies and distributes a detailed summary of the event to the key players and decision-makers within its organization. Third, the supplier’s auction team conducts a teleconference with the key internal players to clarify questions and issues regarding the e-RA. Finally, the business unit and auction team make a decision of whether or not to participate, with the ultimate decision being made by the business unit. This final decision can be to 1) participate unconditionally; 2) not participate; or 3) participate with a “work-around.”

There are two work-arounds that this supplier uses:

- If it is possible to insert comments into the software bidding console, an e-RA team member will insert boilerplate legal language that the supplier prefers to use in its contracts. This boilerplate language states that “our bid is based on our terms and conditions.”
- The second work-around is a letter that is sent to the buyer (and event provider, if one is used) that states that this supplier is interested in participating in the e-RA, but that there are certain terms and conditions of the RFX that the supplier cannot and will not accept. The letter asks the buyer to allow the supplier to participate, with the understanding that the supplier’s participation does not mean that the supplier accepts the original terms and conditions

put forth by the buyer in the RFX. This supplier reported that buying organizations would agree to allow it to participate under this scenario in about half the e-RA events.

The advantages realized from this supplier’s use of an COE e-RA team are significant. The e-RA team now has experience with over 60 e-RAs across 10 different auction platforms. The supplier noted that this experience is key, as it takes a tremendous effort to participate in e-RAs and to do them well: larger auctions have multiple-lot structures and are typically at multiple locations that cross five or six sales regions. These complex events require substantial internal coordination. The e-RA team structure also allows the supplier to negotiate better e-RA terms and conditions, and provides the supplier with the structure and ability to walk away from an e-RA if it is not in its best interest. In fact, this supplier has walked away from about half of the e-RA invitations it has received. Finally, the supplier’s COE e-RA provides increased discipline during the bidding process “because it’s really easy to get tied up into this bidding frenzy or get emotional — it’s a real emotional thing.” This supplier always has a predetermined walk-away price and sticks to it.

E-RA Training for Buyers and Suppliers

Training is a key enabler for the successful implementation of e-RAs. This includes training of both participating suppliers and the buyers who conduct the e-RAs. Training is conducted by either the buying organization or is outsourced to a e-RA service provider. Buyer training can be extensive. At one buying organization, over 300 individuals have each received over 13 hours of training in the use of e-RAs. Above and beyond the amount of time required for training, this company noted that hands-on training yields better results than videoconference training. In the hands-on training sessions, the buying company’s staff can discuss the key attributes of a “mock” auction and run and rerun it under various scenarios. Such training has increased the adoption rate of e-RAs and removed most of buyers’ resistance to their use.

Training for supplier participants is also important to achieve the successful use of e-RAs. While suppliers’ e-RA training generally is not as extensive as it is for buyers, nonetheless, it is necessary to ensure that suppliers thoroughly understand how to use the software and what it (and they) can and cannot do. Thus, it behooves buyer firms to take the time and make the effort to verify that participating suppliers are adequately trained in both the use of the software and the rules in place for each e-RA event.

Planning and Managing the E-RA Event

The E-RA Sourcing Decision

In every case study firm visited, the purchasing function was involved in some way in the decision to conduct an e-RA. In over half of these firms, purchasing had sole discretion. For the remainder of the firms, the internal customer and/or engineering were the two dominant functional areas involved in the decision-making process. The purchasing function was also responsible for preparing for the e-RA in all of the case study firms. As opposed to the decision-making process, the preparation for the e-RA tended to be more cross-functional in nature. In the majority of these firms, engineering and/or the internal customer also were involved with the preparation for the e-RA.

The decision-making process in the buying organization stands in contrast to that in the supplier firms that were interviewed. For the majority of these suppliers, the sales and marketing function had sole discretion for making the decision to participate in e-RAs. However, only three of the 15 suppliers had declined to participate in any e-RAs. For the other firms, the corporate sales policy was to always participate in e-RAs. It should be noted, however, that participation by a supplier does not guarantee to the buyer that the supplier will provide viable bids. Most suppliers felt pressured to participate in e-RAs, and some suppliers would react to this pressure by placing only nominal bids. As stated by one supplier: “If one should not want to participate, one keys in only one price and stops bidding or declares to the customer that one had technical difficulties.” Finally, the marketing and sales functions were involved in the preparation of the e-RAs in all of the interviewed supplier firms. For the majority of these firms, the preparation process also involved engineering, and to a lesser extent, finance, accounting, and production.

Preparation for the E-RA Event

From the interviews with buying firms, it became clear that a well-planned (and often rehearsed by both buyers and participating suppliers) e-RA strategy developed *prior to the event* is one of the most important predictors of event success. Firms reported that while more time and effort was required up front to develop these plans than for the traditional sourcing process, the speed of the auction itself often made up for this extra time and effort. In addition, as firms held more e-RAs, there was a reported learning curve effect. Further, for each item being auctioned, some unique issues usually must be considered and included in the auction's plan. Some of these issues are:

- Ability to clearly define specifications that are universally understood by the supply base, including global suppliers.
- Identifying a sufficient number of qualified competitors who are willing to participate in the auction event.
- Potential impact on incumbent suppliers and plan to offset possible negative consequences (e.g., supplier of a strategic item).
- Understanding the unique characteristics of the item's supply market structure, degree of competitiveness, key cost drivers, and current open capacity (i.e., is it a buyers', suppliers', or neutral market?). This information is essential for setting an appropriately aggressive reserve price.
- Degree of experience of both the buyer and suppliers in participating in an e-RA event, including familiarity of the Web-based software being used.
- Event format; that is to say, what will be revealed during the e-RA for this particular group of suppliers (price, rank, weighted price or rank, etc.); rules such as closing rule (e.g., hard close, soft close, rules for

soft close); participation rules (bird-watching, offline communications); and award rule (low price guaranteed the business, post-negotiations, no award guarantee).

- Need to use a formal RFx (e-based or manual) for this particular event.

Observations from Interviews Regarding Preparation

Here are some specific observations, gleaned from the interviews, that relate to the development a buying firm's e-RA strategies for specific events.

- One of the most common *supplier* complaints concerning e-RAs was the lack of a clear specifications and rules from the buying firm. During an e-RA event (which can take from 10 minutes to 3 hours), there is not the time or mechanisms in e-RA functionality to make on-the-fly clarifications.
- One buying firm reported that its traditional sourcing processes only achieved about 30 percent of the correct specification clarification before beginning face-to-face negotiation, while the remaining 70 percent was determined during the negotiation. Now, in preparing for an e-RA event, their specifications were about 90 percent correct. This process improvement, it reported, has carried over to all its sourcing activities. This suggests that proper preparation for an e-RA can spill over to a general improvement in the strategic sourcing process.
- The vast majority of companies interviewed believed that at least three qualified suppliers are required for a successful e-RA.
- Several companies reported that they do not realize reduced cycle-times (the cycle of opportunity identification to award) when using an e-RA, because the preparation time is increased. However, several others reported they did incur significant cycle-time reductions as they became more experienced with e-RA use, or re-bid a particular item.
- One company said conducting a successful e-RA is "75 percent preparation, 5 percent execution, and 20 percent fulfillment."

Role of Cross-Functional Teams in E-RAs

Cross-functional teams are commonly used in sourcing organizations and have been considered good practice for many years. In designing and managing e-RAs, the use of cross-functional teams becomes even more important because of the increased preparation time required. The

majority of firms reported their teams were commodity-oriented and consisted of individuals from operations, engineering, and supply management. Most teams also included support from information systems if they did not use a third party e-RA provider onsite for the event. Other firms interviewed, including pharmaceutical, electronics and aviation companies, included quality control engineers on their cross-functional commodity teams. When indirect goods and services were the target, the teams included appropriate internal stakeholders. When formal commodity teams existed, the team was responsible for deciding if an e-RA event was the correct sourcing tool. If the commodity teams were more informal, the commodity manager usually made the decision to use an e-RA.

An important precursor to holding an e-RA is to gain agreement between the commodity manager, the commodity team, and key internal stakeholders. They must agree on the components of the e-RA strategy, including the format, rules, and suppliers invited to participate. If TCO is to be considered instead of lowest price, then the components of TCO and their relative weights must be established and agreed upon.

Buyer-Supplier Communication

One of the most important determinates of a well run e-RA is the development of a clear strategy for communicating the purpose, rules, and award criteria with both potential suppliers and qualified suppliers who are invited to participate in an e-RA event. One commonly observed misconception communication among suppliers is that buying firms, by using an e-RA, are shifting from a TCO-award policy to a low-price criterion. However, only one or two buying firms of those interviewed indicated they followed a strict "low price wins" strategy. The vast majority of buying firms tell bidders that TCO is the decision criteria, and low price will win the business only if all bidders are equal in all non-price variables, and other conditions are met, such as the reserve price. In fact, as indicated earlier, less than 50 percent of e-RAs are awarded to the low-price bidder, and this is done only after TCO is either explicitly or implicitly considered. Suppliers, on the other hand (with two exceptions) believed price was the most important criteria used in e-RA awards. One supplier stated that the buying firm had "changed their [sourcing] philosophy from quality to low price." However this buying firm actually was using a sophisticated, electronic TCO model to make award decisions. Whether withholding this information from the supplier was intentional (as part of the strategy) or an oversight was not clear. Another supplier reported that it was waiting for the market to change from a buyers' market to a suppliers' market,

hoping it can achieve enough market power to be able to refuse to sell to this customer. Another supplier stated that the use of e-RAs was leading its senior management to re-think their relationship with the buying company. The supplier was moving the buyer from a “collaboration customer” category to a “transactional customer” category. On the other hand, this buying company firmly believed their use of an e-RA with this supplier was improving their relationship and increasing collaboration among them.

What can buying firms do to eliminate this e-RA communication disconnect with their supply base? Here are some “best practices” that were gleaned from the interviews.

- Clearly communicate the award policy for each specific event held. Some may be low price, others may be TCO, and some may be “no award promised” and then award or pass accordingly.
- Provide timely and constructive feedback to both award winner(s) and losers. Over the long run, this will generate trust by the suppliers that the buying firm runs fair e-RAs.
- Train both buyers and suppliers in the use of the tools and do a mock test run so that both parties clearly understand the rules and how to interact with the software.
- Warn to the suppliers that no deceptive practices (e.g., phantom bidders, allowing unqualified suppliers to bid, accepting offline private bids) will be tolerated, and that e-RAs are subject to the same strict ethical policies as other sourcing processes.

Buyer-Supplier Communication during an E-RA Event

Ad hoc communication functionality (called messaging) exists in most e-RA systems. This communication can be a broadcast to all bidders or targeted to a specific bidder. A broadcast message can inform all bidders of a common issue that needs to be addressed (e.g., a mistake has been made by a specific bidder and the bid is being removed). A targeted messaging may be used to encourage bidding or to notify a bidder that the rules are not being followed (e.g., a supplier is not participating or “bird watching”). These e-RA communication tools assist in an orderly auction and add credibility to the auction process.

Most provider software packages allow either the buyer or supplier to send these messages during the event. In most cases for those firms interviewed, these messages have full visibility among the bidding suppliers. Thus,

any questions or misinterpretations that may arise during the event can be dealt with in a fashion that allows full transparency and minimizes the perception of ethical improprieties. Provider help desks are also often available to provide technical assistance and answer other supplier questions. At one buying organization, there are separate individuals assigned to each supplier during an e-RA, in order to assure that suppliers do not encounter busy phone lines. Many software packages have built-in error checking. If a bidder reduces his or her bid by more than, for example 10 percent, the software will ask the bidder if he or she really wants to submit this bid. To further help eliminate mistakes, some software will not allow bidders to reduce their bid by more than, for example, 25 percent. These parameters can be set by the buying firm according to the situation surrounding the event.

Role of RFxs in E-RAs

The use of appropriate, well-written RFxs are key to developing both clear specifications and qualified suppliers to participate in an e-RA. The three RFxs most commonly used are:

- *Request for information* (RFI): An RFI is designed to obtain an overview of a supplier’s capabilities and financial health. It may not be specific enough to decide if the supplier is qualified to be invited to the e-RA event. This usually is the first “screen” through which a potential supplier must pass to be considered qualified.
- *Request for proposal* (RFP): An RFP asks a supplier to articulate how it would respond to a specific need. At one extreme, the RFP may only detail the end use or performance characteristics of the needed item or service and ask the supplier to propose specifically how they would satisfy these needs. (e.g., office supplies) At the other extreme, an RFP may include detailed specifications and precise “build-to-print,” quality, and delivery requirements, and asks the supplier to propose how they would meet these needs as stated, or by alternative means that would be more cost effective (e.g., highly engineered component).
- *Request for quote* (RFQ): Most specific of the RFxs, the RFQ asks the supplier to quote a price based upon detailed requirements, terms and conditions of delivery, quality, payment terms, warranty, and any other important specifications. This is where meticulous preparation is required by the buying firm to clearly specify requirements and by the supplier to identify its costs, desired margins, and open capacity should they be awarded the business.

When used on the front end of an e-RA to identify both potential and qualified suppliers, RFxs may be either e-based or non-e-based. From observing the firms in this study, there seems to be a trend toward using RFxs that are e-based and are integrated into the e-RA process, some with automatic analysis functionality. The e-RFx may have the ability to perform complex, weighted total cost of ownership measurements and/or optimize buyer “cherry picking” calculations.

Which RFX or combination of RFXs (if any) is most appropriate for differently sourced goods and services, as categorized earlier in Figure 2?

- *Commodities* (low purchase volume, low complexity): For a straightforward, price-oriented reverse auction for non-direct, non-strategic standard (commodity) items, where suppliers are well known (office supply firms such as Staples, OfficeMax, Office Depot, or Boise Cascade) it may be appropriate to not use an RFX. Suppliers can be invited, scope and specifications communicated, and an auction held. Often these suppliers already have participated in several e-RAs. On the other hand, the least specific of the RFxs, the RFI, is probably adequate for this class of item.
- *Leverage* (high purchase volume, low complexity): For this class of items, it depends upon a buying firm’s knowledge of the existing supply base. If it is transparent, the use of an RFQ is most appropriate; if not, initial screening can be done with an RFI, followed up by an RFQ for those suppliers that are either clearly qualified or potentially qualified. Generally, because of the low complexity of the item, use of an RFP may not be useful.
- *Bottleneck* (low purchase volume, high complexity, but not strategic): Here, one might argue for the use of all three of the RFxs, in sequence. First, use a streamlined RFI to identify only unknown potential suppliers, followed by an RFP to previously known and newly discovered potential suppliers to capture each proposal, and finally, for the short list of qualified suppliers, ask them to submit an RFQ.
- *Strategic* (high purchase volume, high complexity): While any or all the RFxs can appropriately be used for this category, few buying firms expose the suppliers of these critical items to e-RAs. Nonetheless, each of the RFxs are useful tools to use in traditional negotiation processes. In fact, some firms were observed to be using sophisticated e-RFXs that did not run e-RAs.

Test Runs, Contingency Planning, and Supplier Training

Successful e-RAs are preceded by *test runs* of the software, include the development of a specific contingency plan if systems go down, and include thorough training of system use for both buyers and participating suppliers. The test run ensures that the appropriate technologies are in place and that buyers and suppliers understand how the auction operates. Contingency planning establishes and tests the backup protocol in case of technology failure. Supplier training entails running mock auctions to familiarize the bidders and buyers with the auction technology and the nuances of the particular event.

After inviting suppliers to an e-RA, *system testing* is necessary to ensure the software and hardware will work flawlessly. This testing can be part of the service provider’s offering or performed by the buying company. Because reverse auctions are Web-based, a browser and an Internet connection are the minimum requirements to access e-RA software. In complex auctions, with multiple lots or complex attribute bidding, DSL bandwidth is often required. Backup is simply a dedicated telephone line if computer technology fails. The most common backup technique is for an impartial party to accept phone calls and place proxy bids for a company having technical problems.

In addition, a test of the *contingency plan* ensures the ability for a bidder to continue bidding if technical problems arise. If a problem arises during an e-RA event, using the e-RA communication functionality, the buying company communicates to all bidders that a bidder is having technical problems and proxy bids are being placed.

It is important that bidders are thoroughly *trained*, comfortable with how bid entries occur, and knowledgeable with the “look and feel” of the e-RA tools being used. Even if a bidder has used a buyer’s e-RA tools in the past, newly assigned individuals from the bidding firms may not be familiar with the tool. The provider, in many instances, offers training for suppliers; however more and more buying firms are assuming this responsibility. Training usually includes a mock e-RA event that mirrors the planned event, showing the information that each bidder will see (price, rank, multi-attributes, virtual currency, e-messaging, etc.) as the event unfolds. Good-practice auction training uses a sample auction that is similar to the actual event.

Non-Participation Rules

Several buyers interviewed had “bird watching,” or non-participation rules in place, which require a supplier to place a minimum number of bids during an e-RA in order to continue to view the unfolding results of the e-RA. Other buyers did not have such rules in place. The interpretation of these various responses regarding non-participation rules is that if the buying organization believes that an e-RA will result in significantly lower prices than were paid in the past, then the buying organization probably does not want to include non-participation rules in the event. This lack of non-participation rules then allows the other suppliers to see how low the price of the item has gone. Conversely, if buying organizations do not believe that prices will go down significantly, then they probably do want to include non-participation rules.

Lotting Strategies by Buying Firms

Lotting strategy is one important element in developing an e-RA strategy. It entails the buying firm developing a rational and appropriate market approach to its strategic sourcing process, taking into account what item or service is being sourced and the makeup of the supply market. These strategies fall into two main categories: market basket lots and individual lots.

A *market basket lotting strategy* is used when many items in the same or similar commodity/purchase family group are bid and most, if not all, of the items can be sourced from each bidder (e.g., plastic injection moldings). Often, it is more effective to run an e-RA event for a family of items, perhaps based upon an 80/20 Pareto analysis, than it is to bid each item. A market basket lotting strategy is more effective if quantities are known and each item can be weighted according to projected usage. Most market basket reverse auctions require bidders to submit bids in an RFQ on all items; then, if a supplier receives the award, the percentage reduction in its e-RA bid from the RFQ is used to calculate items not included in the e-RA. Several mature e-RA buyers regularly use the market basket on large-volume auctions.

Individual lotting strategies have multiple variations, depending on the items to run through an e-RA, the market, and the supply base. Lots consist of specific items. In a simple lot, only one item is bid (e.g., a highly engineered part). Complex lots have multiple items and the majority of lots have like items. If quantities are not known, the item is bid in a quantity of one. One telecommunications company uses this lotting structure because its demand for the item is difficult to forecast. An

e-RA may consist of multiple lots of single items and have different closing rules for how the e-RA will end. Each lot might be open for only 10 to 15 minutes or all the lots may be open for the entire duration of the e-RA event. Lots also can be structured toward global, regional, or local needs or in combination to enable award optimization. One company, using optimization tools, used this strategy regularly.

Why is lotting an important e-RA strategy? By analyzing the market and the bidding suppliers' capabilities, lots are structured to increase cost reduction opportunities. The buying company can develop lot-bidding rules that requires all participants to bid on every lot, allow bidders to only bid on the lots they can effectively supply, or even allow suppliers to structure their own lots, thus enabling them to maximize their efficiencies.

Buyers can review the TCO of the lots suppliers have constructed and see where supplier efficiencies can improve TCO. Quantity discounts also can be part of the RFQ, giving suppliers the ability to reduce cost if awarded larger volumes of business. Lots can also be structured for global or regional aggregation and placed in the same e-RA. To decide what lotting strategy is best for a specific e-RA, careful analysis is required. Provider's e-RA tools have different lotting capabilities, and some may limit the variations available for use.

Closing Strategies

When developing a reverse auction strategy, choosing the *closing strategy* is important. A closing strategy is generally defined as the rules for extending the time period(s) beyond the targeted closing time. However, this definition is an oversimplification of the closing strategy. An e-RA generally has some bidding activity at the beginning, has some slowing in the middle, and rises to the highest activity level near the end of the scheduled stop time. This often leads to a “bidding frenzy,” with some bidders becoming unrational and submitting prices that are unprofitable. Suppliers interviewed regularly observed this “bidding frenzy” behavior. The word “crazy” was used by several suppliers. Thus, determining the best strategy to close an e-RA is dependant on both the buying and supplier firms' auction maturity. The basic closing strategies are:

- Set the auction time period and end it on time without any extensions. (Generally, a domestic auction is set to run from 30 minutes to one hour, while a global auction is set to run from one to two hours.)
- Establish a specific number of extensions if there is activity within the last two or three minutes. An

example would be a maximum of three, five-minute extensions if there is activity within the last two minutes of the auction, or the first two extensions.

- Allow unlimited extensions, if there is activity with the last two minutes of the auction or any extension.

Other variations of closing strategies are:

- Only extend if the one of the lowest three bidders has activity.
- Have individual lots close at 10-minute intervals during a multi-lot auction.
- Keep all individual lots open for the entire duration of a during a multi-lot auction.
- Close the auction early if the reserve or target price is not met.

When developing closing strategies, understanding supplier behavior is important. For instance, if a supplier knows most of the activity takes place in the last few minutes of the event, will it bid before then? If a supplier, through its bidding behavior, is able to send a signal the other bidders that it intends to win the business at no matter how low the lowest price, sophisticated suppliers will quit bidding early. For example, one supplier stated that it will drop out of an auction if it sees repeated bids of the minimum decrement plus a small amount. This, it felt, was a signal that this competitor was going to bid to obtain the business regardless of how low the price went.

Bid Commitment Duration

Bid commitment and duration rules are an important component of an e-RA strategy. However, the duration of the winning bidder's commitment to deliver at a given price (and other terms and conditions) is market- and supplier-dependent. Generally, the reverse auction contract duration is no different from that of a traditional sourcing contract. However, because of the speed of dynamic e-negotiations, certain commodities, where the market changes quickly, may lend themselves to shorter commitment durations. If a qualified supply base is identified, and the market for a particular commodity/purchase family group changes rapidly, e-RAs are an excellent tool to award business for short duration and re-auction regularly. For example, one company interviewed purchases highly engineered printed circuit boards quarterly through e-RAs.

E-Tool Suite Development

Who should develop a company's e-tools? Several providers have developed or are developing e-RFx tools.

The advantage of using an external provider is increased implementation speed and greater return on investment. The disadvantage of using a provider's e-tools is the inability to purchase a complete suite of e-tools from any one provider. No individual provider interviewed in mid-2002 demonstrated a full suite of e-tools that covered the eight steps in the e-strategic sourcing process depicted in Figure 1 from *Spend Analysis & Opportunity Assessment to Follow up & Re-Sourcing*. However, a few companies have internally developed e-tools complemented by a mix of providers' e-tools. For example, GlaxoSmithKline (see case study) has developed such a system that is quite advanced.

Successful vs. Unsuccessful E-RA Events

As part of the study's interview protocol, buyer firms participating in the study were asked to describe a pair of specific e-RA events. One of these events was one that they considered to be "successful," and one to be "unsuccessful." Here are some observed best practices of this component of the research

Defining Success

With regard to a specific e-RA event, buyers interviewed unanimously defined successful auctions as those that exceeded the expected or perceived savings of a face-to-face negotiation or traditional bid process, while unsuccessful auctions were those that did not exceed these expectations. Given this definition, several distinct differences between successful and unsuccessful e-RAs were observed.

Level of Competition

The key success factor appears to be the level of competition that exists among suppliers. Typically, a large number of suppliers in an auction can be an indication of a competitive marketplace. That successful auctions generally included a greater number of suppliers than unsuccessful auctions could be due to the fact that the buyers could only find a limited number of suppliers to invite to the unsuccessful e-RA. However, while an e-RA can theoretically be conducted with only two suppliers, all of the successful auctions discussed by buyers involved four or more suppliers. What is perhaps more important though, is that most of the unsuccessful auctions involved relatively uncompetitive supply markets, and tended to result in a smaller number of uncompetitive bids from suppliers. For example, one reported unsuccessful e-RA included five suppliers, but only one competitive supplier. The competitive supplier

submitted only one bid at the beginning of the e-RA. The bid, which was far higher than the buyer's maximum (reserve) price, was still sufficiently low to stifle competitive bidding by the other four suppliers, and it ultimately was the lowest bid.

Size of the E-RA Event

The size of the e-RA, in terms of dollar volume, was significantly greater for observed successful e-RAs. The average dollar volume of the successful e-RAs identified by buying organizations was over \$45 million, compared to just over \$1 million for the unsuccessful events. The significant relationship between dollar volume and a successful e-RA could be due to a greater emphasis preparation by the buying firm, or the increased interest by and competition among suppliers, due to the greater dollar volume. Thus, one way to spur competition (and achieve a successful e-RA) among suppliers may be to increase the size of each e-RA's spend.

Supplier Visibility

Another means of increasing competition among suppliers in e-RAs may be to use rank, rather than price, visibility. One buyer suggested that a "rank order keeps bidders active in an auction for a longer [period of] time." The observations made by the research team provide some support for this statement, with unsuccessful auctions involving price visibility and some successful auctions utilizing only rank visibility. A rank-visible auction may also be advantageous when buyers want to minimize transparency, such as in the case of rising markets or when the buyer intends to conduct further, traditional face-to-face negotiations. Here, the buyer simply needs to identify the best three suppliers based on bid price. There is no need to allow the low bidder to

know how much lower its bid is compared to the second lowest bidder.

As a final example of the transparency-minimizing advantages of a rank-visible auction, one German buying organization conducted a price-visible e-RA that, while successful in the short-run, will likely lead to large price increases in the future. The sixth bid in this auction was submitted by a low-cost supplier at a price that was 40 percent below the prior bid. No additional bids were submitted during the event. When this buying organization conducts its next auction with this supplier, the supplier will know that its price is 40 percent lower than the competition and will likely raise its price by a significant amount.

Lotting Strategies

The findings provide stronger support for using multiple lots than a single lot in an e-RA. In the firms for which this variable was captured, the successful e-RA involved multiple lots, while the unsuccessful event consisted of only a single lot. This finding could be a facet of the larger size of successful events, or it may be due to the complexity of a multi-lot event that requires suppliers to focus on many decisions simultaneously, perhaps making them less efficient in the bidding process.

Item Specificity and Complexity

Complexity can be considered along three dimensions:

- 1) technical complexity — the manner in which different parts interact with each other in a system
- 2) commercial complexity — the presence of price and exchange rate fluctuations
- 3) logistical complexity — the location (e.g., China) of the competitive supply base.

In the case of technical complexity, the purchased item is often critical to the function of the final product and may be difficult to produce. Commercial complexity can include not only fluctuations in commodity prices and currencies, but also differing payment schedules (e.g., percent net and annual rebates) and clauses for evergreen contracts. Finally, logistical complexity can encompass the use of multiple transportation modes for a move, multiple receiving plants and facilities, and JIT requirements.

While increasing the difficulty of the sourcing process, these complexities do not preclude the successful use of e-RAs. Instead, the key aspect of e-RAs is that of

specificity: the buyer must be able to provide adequate specifications in order to conduct a successful e-RA. While this report is not suggesting that specificity is the sole criterion for a successful e-RA, one case study participant suggested enthusiastically, “If you can spec it, you can bid it!”

Switching Costs

Another important facet of the e-RA that relates to the auction environment is the degree of switching costs that a buyer would incur by choosing a new supplier. Several buyers suggested that low switching costs are an important — if not necessary — prerequisite to conducting a successful e-RA. Spend items with high switching costs, such as those that involve unique suppliers, asset specificity, or a high degree of past buyer-supplier collaboration, were viewed by many as being unsuitable for an e-RA, and its use would result in an unsuccessful event in the long run. Conversely, one buyer suggested that if he held an auction and a new, untested supplier was the most competitive, the buyer would retain the contract with the old supplier, but would begin to qualify the new supplier if the potential cost savings were enough to cover testing and qualifying costs.

In some industries, such as pharmaceuticals and aerospace, switching costs are high, while in others, such as some high technology industries that use commodity-like inputs, the switching costs can be minimal. However, regardless of the industry, the interviews revealed that most buying firms were not capturing the dollar value of these switching costs. Thus, it is suggested that e-RA users should quantify the cost of switching suppliers and use this information either within a multi-attribute e-RA or as one of the decision criteria that is combined with the bid from a price-based e-RA.

Supplier Success and Change Costs

On the supplier side, incumbents usually are aware that they do not have to be the low bidder in order to win business. For example, one supplier noted that one of the significant challenges of e-RAs is to try to find out what the acceptable price level is for customers, because customers are not choosing the lowest price. Thus, the challenge for this supplier is in identifying the threshold price that will win the supplier the business, without bidding any lower than that threshold price. This statement shows that e-RA strategy is evolving, not only on the buyer, but also on the supplier side, as both become more experienced with e-RAs.

The Auction Experience of Buyers and Suppliers

Interestingly, the researchers did not find a pattern relating prior e-RA experience of the buyers and auction success. Similarly, when buyers were asked to describe successful and unsuccessful e-RAs, no indication was found that the unsuccessful e-RAs that they described were some of the earlier or initial e-RAs conducted by the firm. Thus, there is not necessarily a link between the auction experience of buyers and auction success, in that both successful and unsuccessful e-RAs seem to occur throughout the adoption process of buying organizations. However, it is important to note that this finding may very well be a facet of buyers “picking the low-hanging fruit” for initial e-RAs. If that’s the case, buyers should be cautious when testing the boundaries of e-RAs, understanding that as they evolve and use e-RAs to a greater extent, the low-hanging savings have already been captured. On the other hand, buyers should be aware that the outcomes of moving down the learning curve include not only price (or TCO) savings, but other valuable benefits such as decreased cycle-times and other process improvements.

Several of the interviewed suppliers felt that they were at a disadvantage during their first few e-RAs because they did not understand the e-RA process in general and the software in particular. Thus, even though these suppliers had gone through some sort of training, the suppliers did not know what to expect during the actual event. One supplier said, “the participation in test runs does not necessarily help as the test auction and the real thing are not necessarily designed or conducted in the same way.” Further, many suppliers had no real strategy when entering the auction. For example, one supplier bid its lowest (best) price at the very beginning of the event, without any clear tactical or strategic intent in doing so, and several others had not even established the lowest price that they were willing to submit during the auction.

Buyer-Supplier Relationships

Researchers observed a 2-to-1 ratio of buyers who felt that e-RAs improve, as opposed to harm, their supplier relationships. The buyers who felt that relationships had been improved cited increased levels of trust, greater access to supplier data, and a greater amount of business for suppliers in the case of aggregation auctions. Higher level of trust might be engendered due to the transparency and objectivity of the auction process.

Perhaps not surprisingly, the vast majority of suppliers felt that e-RAs have had a negative, as opposed to a

positive, effect on their relationships with customers. This broad feeling of deterioration in customer relationships is likely based on several, more specific outcomes discussed by suppliers. First, three suppliers indicated that the level of trust they had in customers had decreased, and no suppliers indicated an increase in trust. Similarly, commitment levels to customers appear to have decreased. Finally, 80 percent of suppliers noted lower sales prices as a result of e-RAs. The remaining 20 percent indicated no change in sales prices.

Several suppliers stated that one common response has been, or will be, to provide fewer services and less dedication to customers that employ e-RAs. This “price-only” sales strategy may also involve an unwillingness to provide e-RA customers with additional capacity when overall demand increases:

“I’m afraid that companies that solely rely on e-RAs for their normal way of conducting business might be left out in the cold. We don’t want to lose customers like this, but they’re the ones who have made their own bed.”

Emerging Issues

The emergence of and growing use of e-RAs has generated several issues that deserve discussion.

Will Repeat Buys Deliver Value?

Are e-RAs effective for repeat buys of the same items, or is there diminishing marginal returns (savings) after the first or second repeated buys? Since the tool is in its early adoption stage, the vast majority of e-RA-sourced items are *not* repeat buys, and, therefore, a definitive answer has not been determined by this research. However, the few companies that have performed repeat buys have reported successive cost reductions, albeit generally smaller than those obtained through the initial event.

Repeat buys are common for items with regularly changing markets such as perishables, construction services and printed circuit boards. One buyer considered e-RAs to be an effective method to determine market price in an expanding or contracting economy. This company performs repeated e-RAs with its suppliers to ensure it is getting the best market pricing. For example, an electronics company is performing regular repeat buys for printed circuit boards and envisions the use e-RAs for 50 percent of its direct spend.

On the supplier side, a manufacturer of printed circuit boards has participated in semiannual and annual e-RAs for the same items and anticipates that about 20 percent of their 2003 sales will be via e-RAs.

A company's strategy for sourcing an item or family of items is important in determining the potential value of repeat buys. That is, will the savings generated from a repeated buy exceed the cost of holding the event? If the buying firm's strategy is aggregation and the development of a collaborative supply base for *strategic* items, repeat buys through e-RAs are generally not an effective ongoing

sourcing strategy. (This does not preclude e-RA use in finding a new supplier for a strategic item through an *initial* e-RA, especially if the current strategic supplier is no longer economically or technically competitive.) Thus, referring to Figure 2, repeat buys are most likely to be cost effective for *commodities* and *leverage* items (less complex categories), and not so for *strategic* and *bottleneck* items (more complex). However, as stated above, this research was not able to verify this hypothesis due to the relative infancy of the use of e-RAs.

Will Smaller or Larger Supplier Bases Develop?

Rationalized supplier bases have been considered to be a best-sourcing practice for many years. While "rationalization" generally means supply base reduction, it also means an increase in a supply base where not enough competition exists.

The e-RA tool (along with complementary tools such as e-RFXs) has the unique ability to help a firm rationalize its supply base in both directions. First, it allows a company to exponentially expand its geographical supplier reach and simultaneously negotiate with a larger number of suppliers. On the reduction side, the tools aid in the ability of the buying firm to aggregate demand and offer larger consolidated buys to a few large-capacity suppliers who can translate economies of scale into lower prices. The issue here is: will these e-sourcing tools lead to an increase in qualified competitors (both large and small) through their global reach, or result in a concentration of market power in a handful of large competitors when buying firms aggregate and standardize more and more of their spend?

Do E-RAs Result in a Shift in Power from Suppliers to Buyers?

Are e-RAs affecting suppliers' market advantage?

Potentially, a supplier has a market knowledge advantage over the buying organization, because it specializes in limited product or service markets while a buying company only has limited knowledge of the markets for a broad range of the things it buys. Gold, for example, has a world price that is constantly updated, thus equalizing market knowledge between buyers and suppliers. However, few goods (except for those traded on organized exchanges) or services have exact, known market prices.

On the other hand, a well-conducted e-RA shifts the advantage from the supplier to the buyer because the buyer is passive during the event. That is, the dynamic nature of an e-RA demands that the bidders determine a microcosm of "today's market price," at least between the bidders and the buyer, when qualified suppliers place real-time bids. Observing an e-RA clearly demonstrates this shift in power. During an auction, the buyers passively observe bidding activity while competing suppliers are busy setting the market price, which is usually lower than they would charge if so much focus was not on price alone.

The key question is: because this study was conducted in 2002, when the world economy was in a severe economic slowdown and many suppliers faced a strong buyers' market, will this perceived shift in power prevail when the economy rebounds? Or, will suppliers who have taken reduced margins refuse to participate in some or all e-RAs proposed by their customers?

What Effects Will E-RAs Have upon Negotiation Skills?

There is ample evidence that well-run e-RAs achieve results equal to or better than a company's best negotiators, with significantly reduced negotiation cycle-times. Two companies reported that after completing company-wide traditional negotiations for their spend, they are seeing an additional 15 percent average cost reduction through their e-RA programs. Another company reported that it is achieving e-RA savings that are 10 percent better than its best negotiator.

Thus, the question is: over time, will buyers' negotiations skills diminish because e-RAs are simply online, automated negotiation sessions? The answer clearly is no. Companies using e-RAs are deploying sourcing personnel

to higher value-added activities. The "best negotiators" can be deployed to negotiate strategic activities, adding even greater value. In addition, many post-e-RAs include further negotiation sessions with the winning bidder, and the issues discussed usually require more knowledge and skill than price determination. From the interviews, those companies that plan to source 50 percent of their spend through e-RAs require strategic negotiations for the other 50 percent. Negotiation skill may even improve over time due the extensive up-front preparation required for effective e-RAs.

What is Happening to the Development of E-RA Functionalities from Providers?

E-RA functionality has become a commodity. Providers are rapidly attempting to differentiate themselves from their competitors, and users are requesting robust and dynamic e-functionality. One provider says that potential customers are looking for "holistic" e-functionality. As a result, it is expected that e-sourcing functionality development will improve and integrate spend/opportunity analysis, TCO analysis, robust e-RFxs, optimization, and performance measurement.

However, in mid-2002, no single provider has developed a fully integrated suite of e-tools; few buying companies have even defined their e-RA requirements. For the e-RA tool itself, several providers have developed and deployed do-it-yourself systems that have been used successfully and at much lower cost than if run by a provider.

Are Dynamic E-TCO Tools Available?

Many suppliers dislike participating in e-RAs because they perceive them as purely low price oriented. Generally, early e-RAs were price-oriented, and many still are. However, buying companies are striving to make rational TCO decisions in awarding business. Today, both objective and subjective attribute weighting models, as well as other traditional methods, are used to measure cost, quality, delivery, and productivity. However, how one designs and implements a dynamic e-TCO (one that is dynamically updated in real-time) remains a challenge. Some providers have developed e-TCO functionality, but adoption to date is limited. Further development is on everybody's "to do" list, but the current economy has precluded much of the development of this e-tool. At present, most TCO criteria will be considered in a static sense, that is, after the e-RA event is over, when non-price variables are taken into account.

Will the Importance of E-RFxs Increase?

The answer to the above question is a firm yes. E-RFx tools offer the ability to expand buyer/supplier activities. An integrated e-RFx is a platform for both internal and external collaboration, reducing preparation cycle-times while improving the quality of proposals and quotes from suppliers. The e-RFx family of e-tools enables an organization to move all sourcing activities to e-status, not just reverse auctions. Dynamic information sharing from e-RFxs can qualify new suppliers, transfer complex drawings and specifications, obtain internal and external experts' input, modify proposals, and compare responses from potential suppliers. This class of e-sourcing tools will prevail with or without e-RAs.

Do Global Obstacles Limit the Use of E-RAs?

High quality, low-cost suppliers exist throughout Europe, Asia, South America, and India. However, available tools, in the past, have limited the ability to fully exploit global supply strategies. Addressing language differences, time zones, exchange rates of currency, and culture is required before a successful global e-RA event can be held. Fortunately, most e-RA systems have been deployed worldwide by both service providers and buying companies. Thus, the reach of e-RAs has increased both the opportunity and the feasibility for holding global sourcing events, and it is predicted that these low-cost, high quality markets have barely been touched.

Non-User Observations and Issues

One component of this study included interviews of some buying firms that had never been involved in an e-RA, or had used them in the past, but chose to discontinue their use. The following observations and issues emerged from the firms interviewed.

Reasons for Non-Use

The vast majority of the organizations interviewed had firm plans to begin using e-RAs in the near future. Only one of the firms interviewed had used an e-RA tool in the past and discontinued its use because the savings were no better than their traditional sourcing methods. However, even this firm indicated they planned to return to e-RA use in the near future in areas where it felt there were more opportunities for positive results. Interestingly, none of the firms had any major philosophical or ethical objections to e-RA use for sourcing certain targeted (i.e., non-strategic) commodities.

When asked why they were only now planning to use e-RAs, here are the reasons the firms gave.

First, interviewees all were aware of the general nature of e-RAs, but some had higher priorities and limited resources to devote to their use. In addition, some firms had received proposals from third-party e-RA service providers with fees they thought were too high when compared to expected benefits. However, recent publicity about e-RA value had changed their minds, and some were planning pilots.

Next, one firm believed their current traditional RFx process, coupled with its face-to-face negotiation strategy was delivering satisfactory results, and it felt it couldn't do any better with e-RAs. A small number reported that only a few of their procured items were suitable for e-RA application, primarily because they had several long-term

contracts in place that would not expire for a few years, or e-RAs would not be appropriate for their key "strategic" suppliers. Further, one respondent indicated they were so highly decentralized that they would find it difficult to get enough aggregate demand to make e-RAs cost effective. Also, a few interviewees expressed concern that their suppliers may not participate, or not enough qualified competitors would join the e-RA event. Some minor resistance from internal clients and top management was voiced, but this was not a major deterrent to e-RA use. When asked if they were concerned about the fairness of e-RA processes, a few rumored anecdotal stories about phantom bidders, but generally, the respondents were not concerned. In fact, some of the non-using firms asked the interviewers to give examples of what was meant by "unethical practices" with e-RA use. Finally, there was some concern about the nature of the e-RA systems' range of capabilities and their ease of use. However, this too was not a major issue.

Conclusions Regarding Non-Users

In summary, this component of the study did not reveal any serious barriers to the use of e-RAs. In fact, *it seems from these findings that many firms who have taken a "wait-and-see" strategy now believe they could be at a serious disadvantage unless they add e-RA tools to their sourcing strategies.*

Ethical Issues Related to E-RA Use

Observed Ethical Issues

Some of the potential ethical issues surrounding e-RAs, as described by informants, are briefly defined in Table 2. There were different perceptions of ethical behavior *within* the buyer group and *within* the supplier group, as well as *between* the buyers and suppliers. Some buyer organizations, while addressing at least some of the ethical issues shown in Table 2, stated that e-RAs are no different from traditional negotiations with regard to ethical improprieties. Another group of buying organizations stated that e-RAs actually improved the state of ethics and fairness by making the sourcing process more objective (e.g., through the elimination of cronyism and supplier “wining and dining”) and more transparent, as suggested by the following statements from purchasing managers:

- “Now all suppliers get the same information at the same time – this increases fairness.”
- “[E-RAs] change the ‘old boy network’ of sourcing.”

- “[There is] no more hiding bad performance of the buyer, and no more lying to the supplier.”
- “[E-RAs] eliminate cronyism, just as does job rotation and giving buyers new materials groups every three years. [E-RAs] eliminate cronyism without having to put buyers through frequent learning curves.”

As suggested by this last statement, e-RAs might even act as a substitute for job rotation in terms of eliminating cronyism, while minimizing the disruptive disadvantages associated with job rotation.

Several suppliers interviewed echoed sentiments similar to those of their buyer counterparts regarding a lack of change in any ethical issues after the introduction of e-RAs. Counter to some of the recent assertions found in the trade press, some of these suppliers also stated that e-RAs were a fairer process of awarding business, indicating that e-RAs helped to “level the playing field” through increased transparency.

Table 2
Ethical Issues Surrounding Reverse Auctions

Buyers using e-RAs can force suppliers out of business by accepting what they know to be unreasonably low prices.
Buyer pretends to be a supplier in the e-RA event and bids low to force down price.
Buyer includes suppliers in e-RA who are not pre-qualified and probably not viable.
Suppliers engage in collusion.
Supplier bids unrealistically low price.
After winning the business based on low price, the supplier then recoups profit by charging for change orders.
Suppliers “participating” in an auction but not bidding, with goal of gaining market intelligence.
Supplier cannot deliver product/service as promised.
After the e-RA event is closed, another supplier meets or beats the low bid and is awarded business, based on either buyer’s or supplier’s initiative.
Low prices “forced” some suppliers to cut corners in the safety arena.

Potential vs. Actual Unethical Practices

The same sets of *potential* ethical issues that were mentioned by buyers (described in Table 2) were also discussed by suppliers. One important difference, however, is that while buyers might mention a particular ethical transgression in which their firm *could be* involved, but actually was not, suppliers often mentioned the same ethical issue with the thought that buyers *might actually be guilty* of that transgression. One common example mentioned by suppliers was that of buying firms that submitted “phantom” bids during an e-RA in order to artificially increase competition. While buying organizations mentioned this as a potential ethical issue, they provided numerous examples of how this unethical behavior could not occur within their organizations, due to the existence of safeguarding mechanisms within the provider software and/or the presence of multiple buyers and even personnel from another function during the e-RA. Nonetheless, some suppliers were not entirely convinced that phantom bidding was not actually occurring. Other suppliers indicated that they had these suspicions during their early experiences with e-RAs, but that their concerns had been assuaged after buyers had explained the safeguards that were in place to prevent phantom bidding. An example of a supplier transgression is that of collusion before or during an e-RA. While no supplier admitted to collusion, a few of the buying companies indicated that they had suspicions regarding a few of their suppliers.

These examples lead to two important points. First, there are some differing perceptions between buyers and suppliers regarding the involvement of each group in unethical activities. As has been shown in earlier ethics research, such differences in perceptions can damage the buyer-supplier relationship. In fact, *perceptions* of ethical improprieties can be just as damaging as *actual* ethical transgressions. Second, the researchers identified effective ways buyers and suppliers counteract these misperceptions.

Avoiding Actual or Perceived Unethical Practices

Both buyers and suppliers stated that one effective means of avoiding, or at least lessening, ethical misperceptions is to clearly explain and communicate to the other party the event rules and conditions and other details of the e-RA. Or, as was stated by one buyer when asked how ethical misperceptions could be avoided, “You need to explain what you are going to do, then walk your talk.” Another observed way of avoiding ethical improprieties is thorough training. This can include training of suppliers

to ensure that they are familiar with the software and event rules, as well as training buyers to ensure that they understand both the mechanics of the event and appropriate behavior and communication surrounding the event.

Perhaps an even more powerful avoidance mechanism to unethical behavior is the fear of damaging the reputation of a firm or an individual. At the company level, organizations suggested that, “Our reputation is key...therefore this [unethical activity] is out of the question,” and that, “As soon as you mislead suppliers, they will discuss this with their association, word gets out, and you [the buyer] lose your credibility.” Further, there is a similar avoidance mechanism at the individual level, as suggested by another purchasing manager: “If a sourcing employee engaged in any unethical behavior, such as fake proxy bidding, they would lose their job.”

Ethical Issues Unique to E-RAs

On the buyer side, phantom bidding by buyers was the unethical behavior most commonly mentioned by both buyers and suppliers. As mentioned above, several suppliers had at least some suspicions that their customers were engaged in this activity, even when customer assurances were provided. Other buyer activities that were viewed as being unethical include using unqualified suppliers in the e-RA in order to stimulate competition, and using an e-RA to simply benchmark price with no intention of awarding the business.

Due to the transparency of e-RAs, a supplier can determine whether or not it submitted the lowest bid price (or tied with other low-price bidders) during an e-RA, even if only bid ranks are shown. Thus, a corresponding supplier activity that was considered to be unethical is providing unrealistically low bids (below variable costs) in order to win an e-RA, followed by high change order charges in order to recoup profits. Another possible consequence of an unrealistically low bid by a supplier is a request by the supplier to submit a higher, more realistic bid after the auction, with the excuse (either true or untrue) that it made a mistake in calculating its costs. Buying companies indicated that they would generally not hold a supplier to an unrealistically low bid, but would also not allow that supplier to re-bid outside of the e-RA. The award goes to the next bidder. Finally, “bird watching,” the process of viewing, but not seriously participating in an e-RA, with the goal of gaining market intelligence, was viewed by some buyers and suppliers as unethical, while other buyers and suppliers viewed this simply as a consequence of participating in or hosting e-RAs.

Finally, note that many of the above activities have been discussed within newly emerging codes of conduct developed for e-RAs within specific industries, such as the Original Equipment Suppliers Association (OESA) of North America, www.oesa.org/pdf/Conduct.pdf, and the European Aluminum Foil Association (EAFA), www.alufoil.org/pdf/eCommerce.pdf. While the activities discussed here are even more encompassing than those included within the codes of conduct of associations, they nonetheless show a growing recognition of the need to provide assurances that strict ethical behaviors are practiced by both buyers and suppliers involved in e-RA sourcing.

Finally, the observations from this research do not allow speculation as to the prevalence of the identified unethical behaviors, nor do the researchers make normative judgments regarding the ethicality or unethicality of these activities. Rather, these are real or perceived behaviors that were mentioned by informants when asked about ethical issues surrounding their use of e-RAs.

Conclusions

Based on this research, the following conclusions can be reached:

- For a growing number of buying firms, e-RAs have found an appropriate niche in their strategic sourcing toolkit, allowing them to efficiently source goods and services that are highly standardized, have sufficient spend volume, can be replicated by a reasonable number of qualified competitors, and have insignificant switching costs. In contrast, the research indicates that those suppliers of strategic items, where alliance-level supplier relationships are critical, are usually not subjected to e-RA sourcing.
- Reported payback usually can be achieved after the first few uses of the e-RA tool.
- There is little or no evidence that e-RAs are driving a significant number of suppliers into non-sustainable relationships with buyers.
- Firms who have taken a “wait-and-see” strategy indicated that they could be at a serious competitive disadvantage unless they add e-RA tools to their mix of sourcing strategies.
- Buyers believe that e-RAs are no different from traditional negotiations with regard to ethical improprieties, and suppliers indicate that e-RAs, in general, are a fairer process of awarding business, because they “level the playing field” through increased transparency.
- E-RAs are here to stay and that their use will continue to grow.

Case Studies

The following four case studies of “super users” of e-RAs were chosen to provide some specific examples of these firms’ use of this tool:

- GlaxoSmithKline (global pharmaceutical company)
- Bechtel (one of the world’s largest engineering-construction firms)
- Volkswagen Group (Audi, Bentley/Rolls Royce, Bugatti, Lamborghini, Seat, Skoda, VW, and VW Commercial Vehicles)
- METRO group (major European food, hard, and soft goods retailer)

GlaxoSmithKline

Company Background

GlaxoSmithKline (GSK) (www.gsk.com) is a leading global pharmaceutical company with a strong mix of skills and resources that provides a platform for delivering exceptional growth in today’s rapidly changing healthcare environment.

GSK’s mission is to improve the quality of human life by enabling people to be more active, feel better, and live longer.

Headquartered in the United Kingdom, the company is the result of mergers of GlaxoWellcome and SmithKline Beechem. GSK has an estimated 7 percent share of the world’s pharmaceutical market, and its products focus on four major therapeutic areas:

- anti-infectives
- central nervous system

- respiratory
- gastro-intestinal/metabolics

In addition, GSK is a leader in vaccines and has growing portfolios of oncology products, non-prescription drugs, oral care products, and nutritional drinks.

In 2001, GSK had sales of almost \$30 billion from 140 countries and profits (before taxes) of almost \$9 billion. Pharmaceutical sales accounted for \$25 billion, with 22 percent of these sales coming from new products. Annual external spend is about \$10 billion, with \$7 billion for indirect goods and services and \$3 billion for direct production goods. Currently, GSK has an aggressive goal of taking \$1.5 billion (15 percent) out of its annual spend. It expects a good proportion of these savings to come from the estimated \$1 billion of its spend it plans to run through e-RAs in 2003.

Management’s Expectations of E-RAs

GSK began experimenting with e-RAs in 1999. During this experimentation, the firm’s top management as well as their procurement professionals, were pessimistic about the value of e-RAs. However, by 2002, both groups had a dramatic about-face, and strongly believe in the value of the use of e-RAs in conjunction with e-RFX tools. (See Figure 5.)

How GSK Defines E-RAs

GSK has a formal strategic sourcing process to select the appropriate sourcing strategy or tactic for various commodity families. However, they believe that the use of e-RAs is a major and integral strategic tool for their “Sourcing Group Management Process.” (See Figure 6.)

GSK’s E-Sourcing Tools

GSK is particularly proud of its e-sourcing platform (GalaXy™) which combines decision support tools with

Figure 5
GSK Management's Changing Expectations of E-RAs



state-of-the-art RFX capabilities. (See Figure 7.) They have created an e-sourcing portal (GalaXy™) that houses the “Trak™” systems and e-RFX software (Emptoris ePASS™). Included in this online systems portfolio are:

- SpendTrak™ (122 data feeds from 59 countries) for spend data management
- ConTrak™ for contract development and management
- SourceTrak™ for maintaining supply base information and management of sourcing strategies
- SaveTrak™ for validation, management, and reporting of all savings projects
- ChangeTrak™ which analyzes the impact of material changes in the direct material area
- PlanTrak™ for determining annual material standards
- CapExTrak™ which aids in the management of capital projects

This suite of decision support tools is complemented by Emptoris ePASS™ RFX functionality that supports e-RAs, requests for information, sealed bids, and sourcing optimization.

How Does GSK Decide to Use an e-RA and What is “Auctionable”?

GlaxoSmithKline uses the classical 2 x 2 risk-versus-spend value matrix to determine the appropriate sourcing

strategies and tactics for each commodity family. (See Figure 8.) GSK has three main requirements for a category to be “auctionable”:

- Does the category lend itself to negotiation?
- Are there three or more suppliers who are willing to participate?
- Can specifications and customer requirements be clearly documented prior to event?

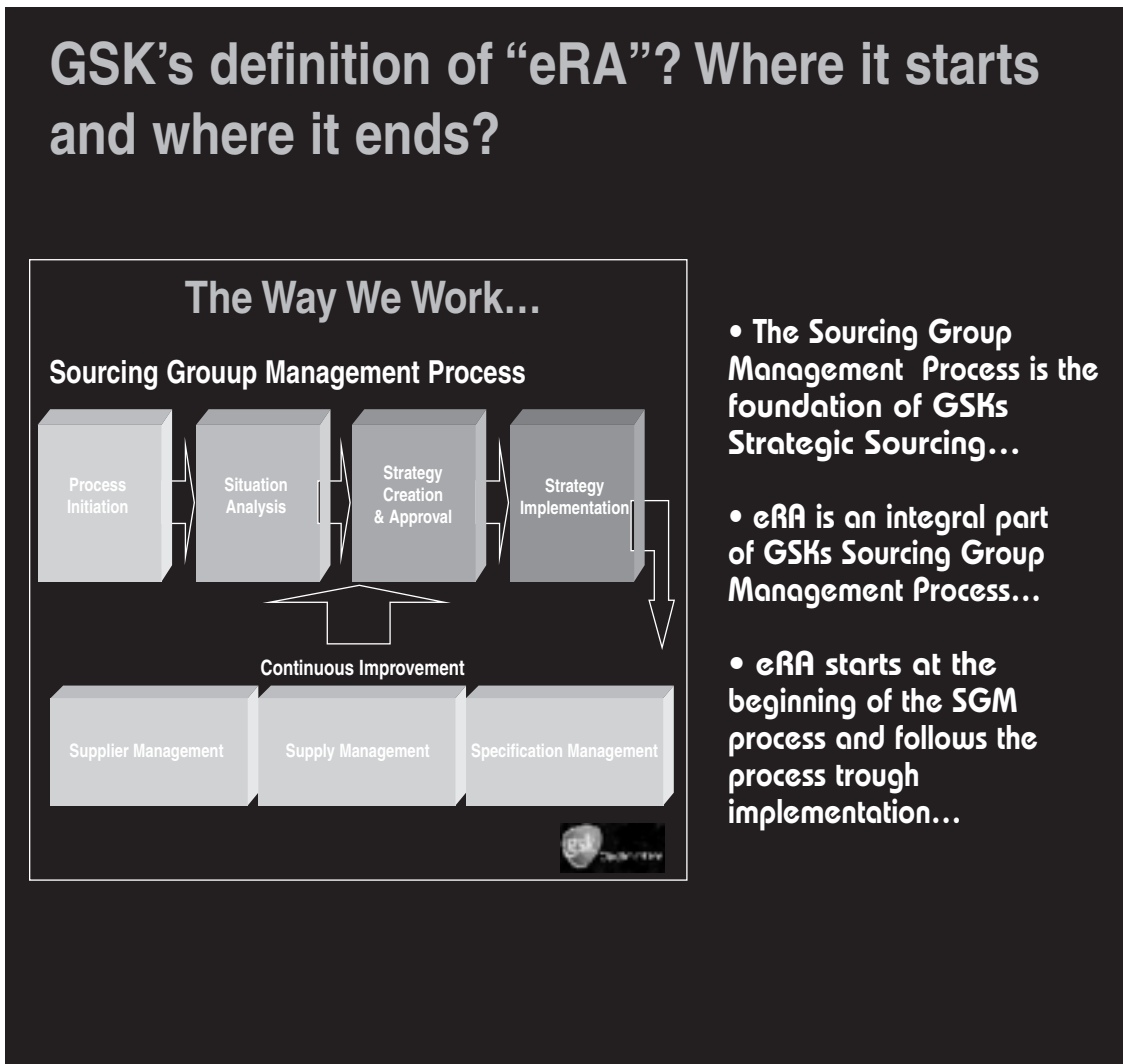
Table 3 shows the broad array of “auctionable items” that GSK has sourced through e-RAs.

GSK's Use and Results of E-RAs

- GSK has held about 190 e-RA events between 1999 and 2002, accounting for \$912 million in spend.
 - There were events were held in 2001 (28 with a third-party service provider; 17, self-service).
 - There were 90 events held in 2002 YTD (20 with service provider; 70 self-service). (Clearly, they are shifting from a full-service to a self-service delivery of e-RA events.)
 - GSK has used FreeMarkets as its service provider.
 - Savings realized over historical prices to date is \$165 million (18 percent).

- The vast majority of e-RA events are based on price only, however GSK is beginning to experiment with

Figure 6
GSK's Definition of E-RAs



multi-variable bidding so decisions can be based on TCO. In general, bidders only see the ranking of their price during an event.

- Reported cycle-time savings:
 - Overall savings from RFx-to-contract award largely is unchanged.
 - However, "negotiation" cycle-time, on average, has been cut in half.
- GSK plans to use e-RAs about \$1 billion of spend in 2003, and has a goal of running 80 percent of its annual spend through a combination of e-RA and e-RFx sourcing tools.

GSK's General Rules for E-RA Events

Bidders:

- Bids are legally valid quotations without qualification. No bids can be withdrawn except for data entry errors.
- Bids are only accepted for complete lots. No partial bids permitted.
- Bids can only be submitted through the online bidding mechanism supplied by service provider. No bids may be submitted via any other mechanism, including but not limited to e-mail, fax, verbal, post, or courier, unless specifically requested by GSK or service provider.

Figure 7
GSK's E-Sourcing Tools

eRA as a critical GSK Procurement Strategy ...

eRFX (eRA / eSourcing) has become the predominant strategy for GSK Procurement:

- The *Galaxy* platform for eRFX provides the technology solution to drive 80% of GSK spend through eSourcing by 2004
- GSK Procurement is reorganizing to leverage technology

Value Proposition = Faster Process + Greater Savings + Fewer People

Figure 8
GSK Sourcing Tool Matrix

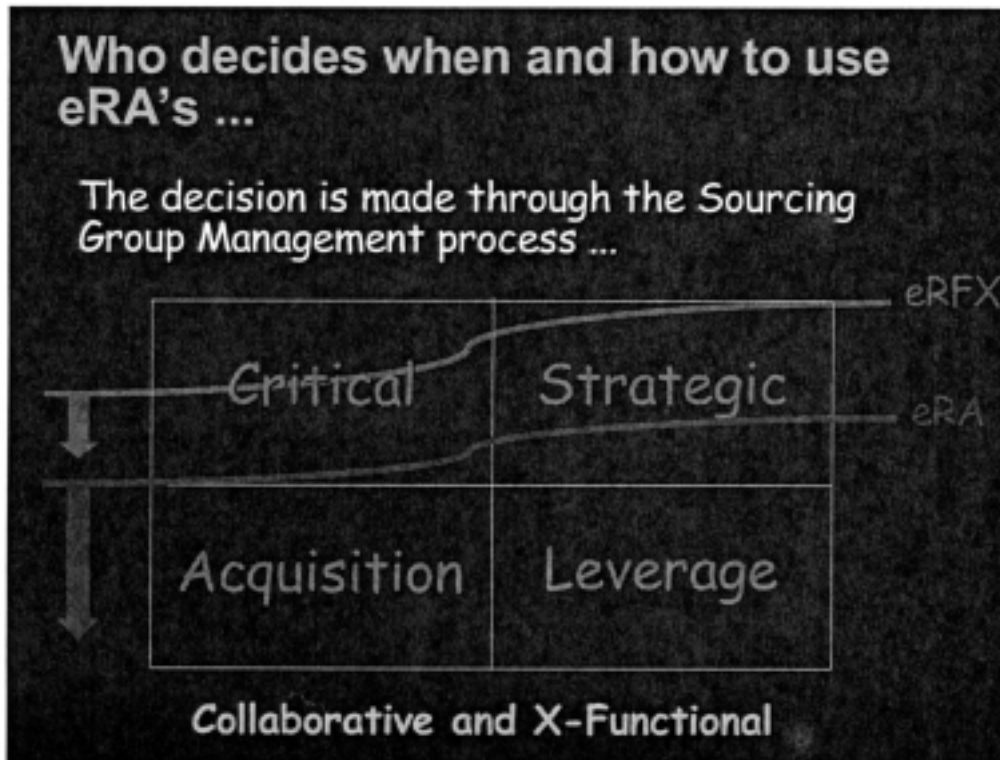


Table 3
Items GSK Sources Via E-RAs

Aluminium Tubes
Caffeine
Capsules
Chromatography Consumables
Citric Acid
Corn Derivatives (Sweeteners)
Corrugated Packaging
Desktops/Laptops
Document Management
Electricity
Elevators
Fire Prevention Systems
Firewalls
Glass Bottles
Global Car Hire
Hotel Room Nights
Iodine
Kraft Paper
Labels
Lucozade Coolers
Malted Barley/Extracts
MRO
Office Furniture
Paracetamol
PC Periphe-RAs (Consortium)
Plastic Bottles
Professional Engineering Services
Promotional Items
Promotional Print
PVC Films
R&D Raw Materials
Road Freight (Primary Trucking)
Solvent - Phenol III
Structural Steel
Sucrose (Sugar)
Supply and Storage Bulk Nitrogen
Telemarketing
Teleservices
Toothpaste Outsourcing
UM R&D Cabling
Vending Machines
Vitamin C & Premix

- Participant difficulties must be communicated to service provider immediately. Difficulties include any event or problem that interferes with the bidder's ability to participate in the e-RA and may include, but are not limited to, data entry errors, software problems, or hardware problems. Participants have five minutes after a lot goes into pending status to notify service provider of any problems. If the service

provider judges that any participant has been disadvantaged by a problem, the service provider will correct the problem and may return the lot to open status.

- Bidder is party to Participant Agreement which protects the confidential information of GSK and service provider.

GSK:

- GSK will approve each bidder invited to participate in the e-RA event.
- GSK intends to award business only to participating bidders and to neither negotiate with nor award to non-participants.
- GSK may consider multiple criteria in addition to price to determine the final award.
- GSK may set a bona fide reserve price for each lot, representing the price at which GSK is willing to consider, in good faith, a price quote.
- GSK will refrain from additional price negotiations outside of the e-RA, except to clarify final logistical details as are typically reserved until after the bidding.
- All parties will prohibit unethical behavior and are expected to notify the service provider if they witness practices that are counter productive to the fair operation of the e-RA.

Contained in the RFQ:

- RFQ questions and updates: additional information, including responses to individual supplier questions, is shared with all participating suppliers via e-mail.
- Lot structures will have clear instructions of requirements.
- Conduct of the parties: GSK will fairly and objectively analyze all bids received against the requirements contained in the RFQ.
- Bidders are to conduct themselves in an open, honest, and ethical manner during the bid process. Any bidder who seeks favor from any GSK employee or agent during the bid process will be disqualified from proceeding.
- Award decisions: GSK strongly encourages all suppliers to bid competitively across all lots to be considered favorably for an award. All prices and pricing structures, as negotiated through the online e-RA process, will become effective immediately following the final award decision. However, GSK will not necessarily award to the lowest bidder(s).

Conclusion

The attitude towards GSK's use of e-RAs is best summarized by comments from people that have been intimately involved in their use, as follows.

- Director of GSK's e-Sourcing: "This [use of e-RAs] is an incredible experience ... while there's risk associated with being an early adopter, the opportunities and rewards of pioneering this space are fantastic!"
- Director of GSK's Global Systems and Processes: "We're going to put over \$2 billion of spend through our e-sourcing program in 2003 with a target of \$1 billion being reverse auctions. This is a tremendously successful program. We are leveraging supply and demand real time, online. This is good for GSK and even better for the supply base. Only the best suppliers can compete long term in this environment. It promotes high quality, low cost, lean processes and innovation ... all the traits we're looking for in supplier relationships."
- Vice President, Procurement Finance: "At the end of the day it's about having made significant contribution to the bottom line. The accountability that this procurement team has achieved within the business is outstanding ... not only are there rigorous processes in place to validate the major savings achieved, but the focus on supply, quality, and service remains consistently high."

Bechtel

Company Background

Bechtel (www.bechtel.com) is one of the world's largest engineering-construction firms. Founded in 1898, Bechtel provides premier technical, management, and directly related services to develop, manage, engineer, build, and operate installations for customers worldwide. Currently Bechtel's 50,000 employees team with customers, partners and suppliers on 950 projects in 67 countries. In 2001, Bechtel booked \$9.3 billion in new business and worked off \$13.4 billion in revenue. Bechtel is privately owned and in its fourth generation of Bechtel family leadership. Bechtel's business sectors include: engineering, procurement, and construction management (EPCM) for Civil and government infrastructure; power, petroleum, & chemical; mining & metals; and Telecommunication.

Until approximately 20 years ago, Bechtel did not engage in negotiations with suppliers and accepted only sealed bids for equipment, goods, and services. In 1999, Bechtel began using e-RAs. Today negotiations and reverse auctions are considered critical success factors for the business. Bechtel believes that reverse auctions shift the advantage from the seller to the buyer if the market environment is correct. Safety and quality are critical supplier qualifications. For Bechtel, safety is so critical

that each employee has a personal safety plan, including all office personnel. Zero accidents are Bechtel's goal, internally and externally.

Role of Reverse Auctions at Bechtel

For projects in the Power, Petroleum & Chemical and Mining & Metals business sectors the Bechtel cost breakdown is:

- 50 percent of the spend is for material and equipment.
- 40 percent of the spend is for construction services.
- 10 percent of the spend is for engineering, procurement and construction (EPC) services to design, procure for, and manage the project.

Bechtel considers that 67.5 percent, for projects spend with this typical cost breakdown is potentially auctionable, if a clear scope can be developed and a competitive supply market exists. Non-auctionable spend includes performance specified equipment (3-5 pieces, 12.5 percent of spend), for which few suppliers are available. Additionally, goods or services with a requirement for high levels of buyer/supplier collaboration are not good electronic reverse auction targets.

Bechtel has rapidly ramped up from six e-RAs in 1999 to a planned 125 e-RAs in 2002. However, it is on track to complete about 400 e-RAs in 2002. Six of Bechtel's seven strategic business units have participated in e-RAs, and over 300 personnel are trained in reverse auction usage.

Bechtel is committed to using reverse auctions as a critical sourcing tactic. It believes reverse auctions offer direct and indirect, financial and non-financial benefits.

Operating Reverse Auctions

Bechtel uses an internally developed, robust, e-request for quotation (e-RFQ) system capable of receiving and transmitting complex specifications and drawings. Bechtel's goal in using the e-RFQ is to develop a total installed cost (TIC) for goods and services purchased for projects. Total installed cost is calculated using the following formula:

$$Y = mX + b,$$

where,

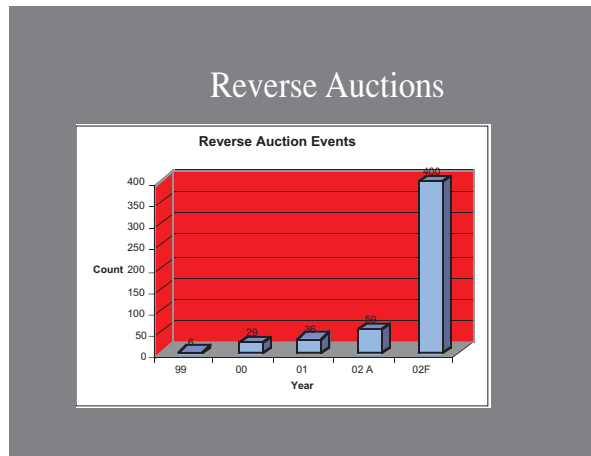
Y is the total installed cost

X is the bid price

m is a cost multiplier (e.g., duty, currency exchange, etc.); m can be more or less than 1.0

b is a cost adder (e.g., transportation, cost of doing business, etc.); b can be plus or minus.

Figure 9
Bechtel Reverse Auctions



RFQs and traditional purchasing methods are used to determine the values of m and b for each bidder.

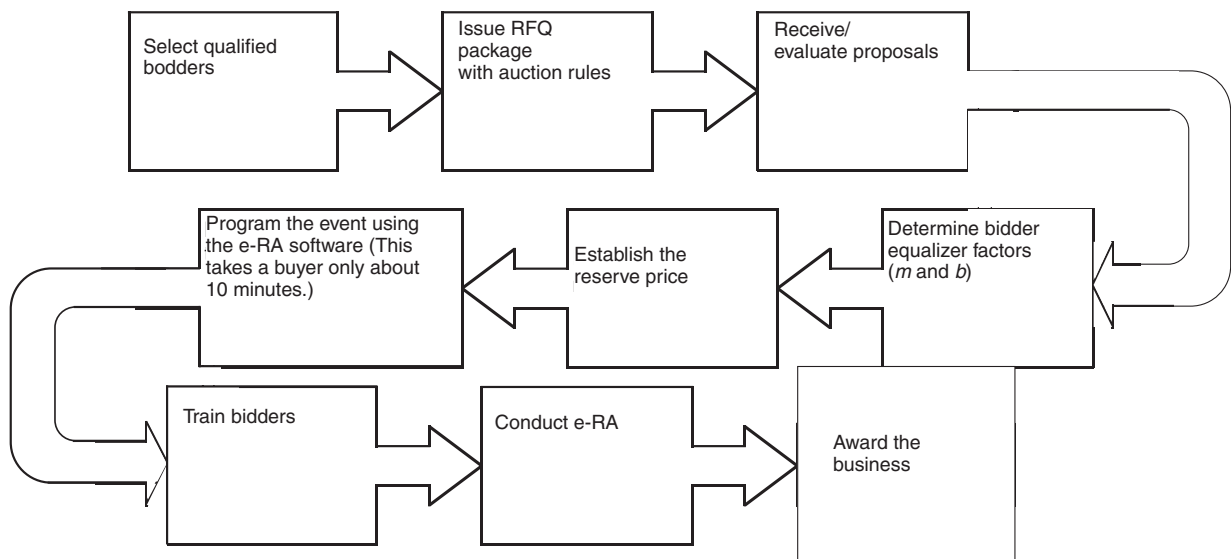
The Bechtel process for conducting an e-RA is depicted in Figure 10.

Bechtel uses a self-service auction model. Its internal domain expertise precludes the need to purchase additional sourcing or e-RA services.

Bechtel operates its e-RAs with the following rules in place.

1. Bidders receive an e-mail notification a few days before the e-RA. The e-mail will include the following event specific information:
 - date, time, and duration of the e-RA
 - hyperlink to Bechtel e-auction Web site
 - user name
 - randomly generated password
2. A reserve price is established before the start of e-RA. This is the maximum price at which Bechtel will commit to award business through this e-RA. If the reserve price is not met, Bechtel may declare the event null and void.

Figure 10
Bechtel E-RA Process



3. A ceiling price is established. This is the maximum bid a supplier can submit during the event.
4. Two minimum bidding decrements are established. The first is the minimum amount by which a bidder can lower its bid at one time. If a supplier bid is 10 percent below its last bid, it receives a notification asking if that is a correct bid. The second decrement prevents a supplier from lowering its bid by more than 25 percent at one time.
5. During the e-RA, bids are ranked using the TIC formula. Bidders receive instant feedback on their rank. Rank position 1 has the lowest TIC.
6. Proxy Bidding — To ensure that every bidder has an opportunity to participate, a proxy bidding service is provided. Phone bids are accepted at Bechtel e-RA operations center. A Bechtel representative will submit the supplier's bid to the auction.
7. All conversations during proxy bidding are recorded. The e-RA will continue beyond its scheduled closing time if the first-, second-, or third-ranked bidders continue to submit lower bids.
8. After the e-RA closes, the supplier with the lowest TIC is notified via e-mail.

Outcomes

Bechtel calculates savings from budgets established during the initial phase of a project. The direct financial benefits achieved from reverse auction have averaged over 10 percent, with a range of 1 percent to 20 percent. Over 90 percent of Bechtel's e-RAs have achieved savings from budget.

At Bechtel, e-RAs have not decreased the overall cycle-time from RFI to award, although the actual negotiation time is decreased from weeks to hours. However, e-RAs require increased discipline in the work process and a better understanding of competitive markets. The preparation work is more detailed and the output higher quality than achieved with traditional sourcing methods.

Bechtel views the non-financial benefits of e-RAs as equally important to the financial benefits. These benefits include:

- Improved negotiation results. There is a range of negotiation skills among the buyers and top negotiators are not available for all buys. Bechtel gets as good of or better results, in less time, from reverse auctions than from its best negotiators.
- Projects are time and schedule-driven, and reverse auctions assist in keeping projects on time.
- Supplier performance is as good, if not better, than business awarded when auctions are not used.
- Bechtel has found that reverse auctions assist in better understanding market prices.

Training

Beyond the cost running an e-reverse auction, the biggest barrier is the lack of e-reverse auction knowledge, understanding how e-RAs work, and ensuring the proper use of an e-RA. Over 300 people at Bechtel are trained in the use of e-reverse auctions. Each individual requires 13 hours of training. "Hands-on" training affords better results than videoconference training. In a two and one-half hour training session, Bechtel can discuss a previous e-RA, then run and rerun the reverse auction. Bechtel records all auctions for debriefing and training activities. When rerun, the recorded e-reverse auction looks identical to a live e-RA.

A training and reverse auction enabler is a Bechtel champion. Bechtel appoints individuals as companywide champions for reverse auction adoption and success. The champions have accelerated e-RA acceptance and adoption.

Conclusion

Bechtel performs electronic reverse auctions because they believe e-reverse auctions:

- provide competitive advantage
- provide lower market pricing
- provide lower cost for material, equipment, and services
- save negotiation time
- determines total installed cost for all bidders

Bechtel considers the critical success factors are:

- Market and cost knowledge
- Clear scope with minimal uncertainty
- Selection of qualified bidders in competitive bidding environment
- Integrity, ethics, professionalism, and fairness
- Training, planning, and organization

Volkswagen

Overview of the Volkswagen Group (VW)

The Volkswagen Group's activities focus on the automotive market, and VW offers products and services, such as financing and leasing, along the entire automotive value chain. Nine independent brands belong to the Group: AUDI, Bentley/Rolls Royce, Bugatti, Lamborghini, Seat, Skoda, VW, and VW Commercial Vehicles.

In 2001, Volkswagen produced more than 5 million vehicles in 45 plants worldwide. Sales in that year were 88.5 billion Euro; the number of employees 322,070. Headquartered in Germany, the Volkswagen Group is represented in all major markets of the world. Its

worldwide market share is 12.5 percent; in terms of regional markets the share is 30.2 percent in Germany, 18.9 percent in Western Europe, 31.9 percent in Central/Eastern Europe, 6.6 percent in the United States, 22.7 percent in South America, and 51.3 percent in China.

Volkswagen enjoys a high reputation in its home country Germany, similar to that of Toyota in Japan. In terms of continuous growth since the 1950s, the company is a national success story. In the 1950s and 1960s, the company became world famous with the Beetle, also known as the People's Car at that time. The company has successfully build a reputation as a producer of reliable and affordable cars engineered in Germany. While its customers enjoy "Fahrvergnügen," and its workforce is proud of the products, VW is also known for its innovative approaches to managerial problems. During a severe economic downturn in 1994, for example, VW took a new stakeholder-oriented approach to protect its employees from ups and downs of economic cycles and introduced the four-day workweek for VW employees, combined with flexible hours, core time for specialist workers, and early retirement provisions. This so called "Breathing Factory" initiative involved the Board of Management, Work's Council, and the trade union.

With a Group-wide purchasing volume of 59.9 billion Euro in 2001, which equals roughly 68 percent of total sales, VW's suppliers play a key role in driving the company's success.

The Strategic Sourcing Context of E-RAs at Volkswagen

VW has build up a highly effective global purchasing network over the last decade. A matrix structure is used for group/central purchasing with the brands forming one dimension. The other dimension consists largely of the material groups (metal, power train, chemical interior, chemical exterior, electric, and machinery & equipment) and the global/forward sourcing function. Sourcing activities are supported by regional purchasing teams (also called LPT for local purchasing team) in core sourcing markets. These teams are integrated into sourcing processes across the entire Group. The advantages of having local staff right on site are numerous: not only do they have local procurement skills, but they also speak the local language and are familiar with particularities in the relevant market. Regional purchasing offices not operating under a brand are responsible for the regional supply markets in Benelux/France, Israel, and Japan/Korea.

Volkswagen Group's sourcing footprint is as follows:

- 54 percent — Germany
- 26 percent — other European countries

- 7 percent — North America
- 6 percent — Latin America
- 6.3 percent — Asia
- 0.7 percent — rest of the world

The final sourcing decisions are made by the cross functional Corporate Sourcing Committee (CSC). In this committee, the CPO, the heads of the LPTs, the heads of purchasing for each brand, R&D, cost management, quality management, logistics, and production come together. The sourcing recommendations presented by the single buyers have to get approved by this committee. This is the standard procedure for both the so-called global sourcing decisions and so-called forward sourcing decisions. Global sourcing means that the items are in production already whereas forward sourcing is for parts prior to the start of production (early sourcing).

VW pursues all modern purchasing strategies discussed in the automotive industry, such as standardization, modularization, simultaneous engineering, globalization, development of new suppliers in regions like Southeast Asia, and early sourcing including concept/design competition among suppliers. Figure 11 shows the major fields of collaboration between VW and the supplier community.

Also, VW considers itself at the forefront of innovations in purchasing management when it comes to electronic sourcing. The Volkswagen Group already manages nearly its complete procurement volume of almost 60 billion Euro via the Internet. The Internet platform started in early summer of 2000 is up and running. Under the domain "VW Group Supply.com" the most important components, online catalogs, online inquiries, online negotiations, and capacity management have already been introduced. (Volkswagen uses the term online negotiations instead of e-RA.) VW points out that the main advantages of this private B2B supplier platform are the reduction of administrative tasks, the acceleration of processes, improved planning accuracy, and improved transparency in the collaboration with its suppliers. All applications are free of charge for the suppliers. Across all applications, more than 500,000 transactions have been performed with more than 5,500 suppliers. As of September 30, 2002, the transfer volume per application is illustrated in Table 4.

Figure 12 details the VW Group Supply.com infrastructure and positions online negotiations.

Key Characteristics of Online Negotiations at Volkswagen

As mentioned above, Volkswagen uses the term online negotiations instead of e-RA. This is done mainly for two reasons. First, the term "auction" implies that the bidding

Figure 11
VW/Supplier Areas of Collaboration

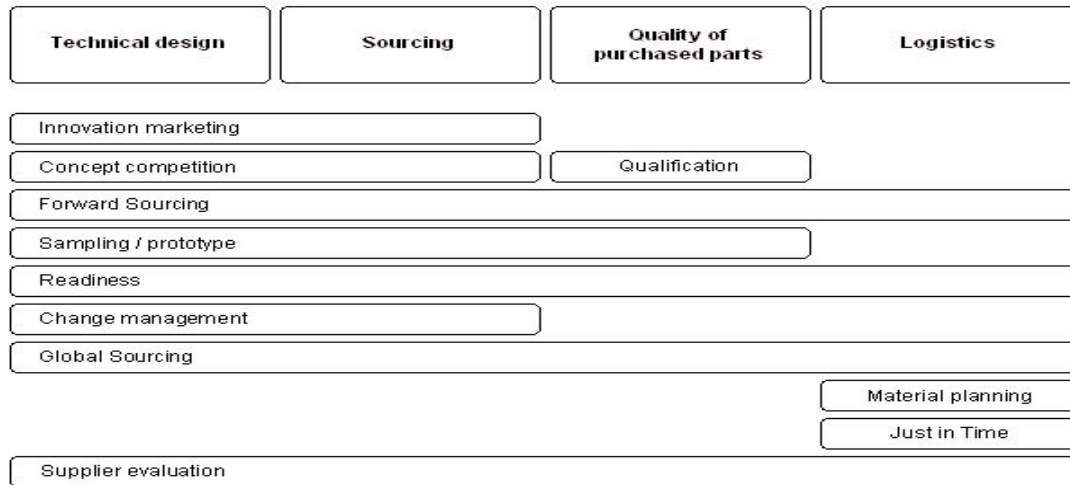


Table 4
VW Application Transfer Volume

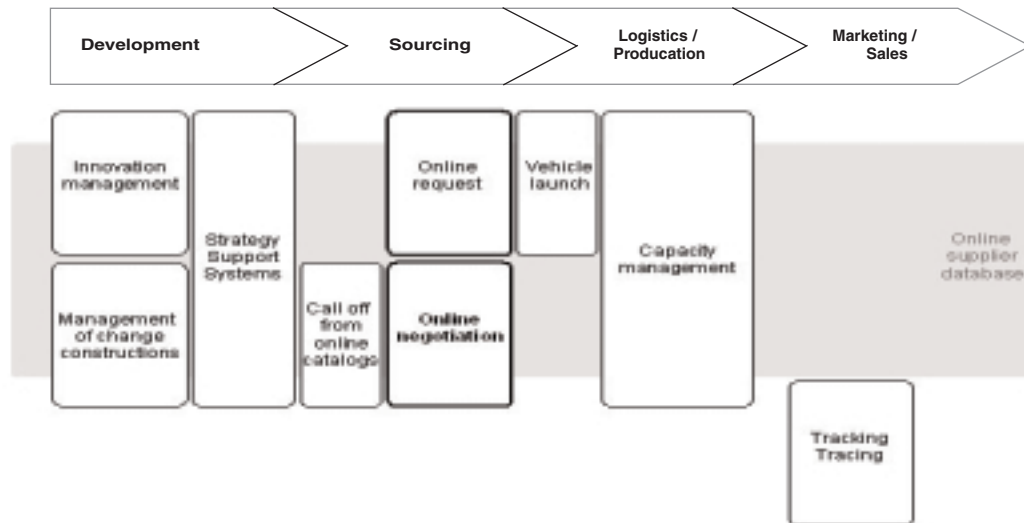
Online Inquiries	<ul style="list-style-type: none"> • 5,500 suppliers linked • 530,000 inquiries processed
Online Negotiations	<ul style="list-style-type: none"> • 9,000 suppliers have participated at various times • 1,900 online negotiations conducted • 22.8 billion Euro turnover in volume (during contractual period) negotiated
Online Catalog	<ul style="list-style-type: none"> • 575 suppliers linked globally • 775,000 articles in global catalog • 7,500 internal users
Capacity Management (eCap)	<ul style="list-style-type: none"> • 200 suppliers integrated; among those 60 already migrated to the new eCAP/3 release • 4,000 critical parts identified

process results in a winner; in other words, the result is binding. While this is in general the case at VW, because in 80 percent of all cases the lowest bidder gets the business, this is not always the case. In the remaining 20 percent, VW chooses another bidder, either directly after the electronic bidding event or after post-event, traditional, face-to-face negotiations. In these cases the electronic event is a part (the online part) of the overall negotiation process. Second, the term is used to point out that the electronic events are a natural part of the usual purchasing process. They do not replace the global- and forward-sourcing processes established within the Group. They also do not replace the decision-making process in the central decision committee, the Corporate Sourcing Committee. Rather, the online negotiation tool is integrated in the proven processes — “to make something good even better.”

VW’s e-sourcing initiative is strongly supported by its top management. Jens Neumann, member of the Board of Management for Group Strategy, Treasury, Legal Matters and Organization, stated: “Our strategy to concentrate on process improvement and using Internet technology as an enabler has proved to be right.” In line with this statement purchasing managers at VW point out that the primary goal of online negotiations is not to achieve cost savings for direct material, but to improve purchasing productivity. VW feels that it had a highly effective sourcing organization prior to the introduction of online negotiations and that the prices achieved were already the best in the industry. The main objectives therefore, of online negotiations, are:

1. to reduce cycle-time
2. to reduce negotiation complexity and process cost

Figure 12
VW Online Auction Positions



3. to improve market transparency for both VW and the suppliers
4. to be able to act on a worldwide basis

Managers at VW emphasize that online negotiations are viewed in a larger context. They should not substitute the personal contact between the buyers and their suppliers — quite the opposite. The administrative workload of buyers, which could imply that up to 50 percent of a buyer’s time is used to key in data, should be reduced in order to be able to work more on strategic topics with suppliers. To this end, VW ensures a seamless flow of sourcing data as the results from eRFxs are automatically transferred to the online negotiation tool. The results from the negotiation tool can then be automatically uploaded by the buyers to prepare their presentations of the sourcing recommendations to the Corporate Sourcing Committee. Buyers estimate the average cycle-time reduction to the range from 10 percent for complicated modules to 50 percent for simple parts like corrugated cardboards.

When it comes to selecting purchase items for online negotiations, VW has a clear position: all items are generally suitable for online negotiations. Under the realistic assumption that a major automotive company almost always will find enough suppliers to bid for its requirements, the only obstacle is to clearly specify the need. One VW executive said, “All suppliers have to understand what you need, and you need to be able to compare their offers. So, if you do a lot of input in the preparation phase, you can really auction or online negotiate everything.”

Given this “can-auction” mentality, it is not surprising to see that in 2002 about 20 percent of Volkswagen Group’s spend was sourced through online negotiations. Management expects this figure to go up to 40 to 50 percent over the next two to five years.

To achieve this high level of online negotiated spend management, Volkswagen has to continue to manage the change toward online negotiations. VW estimates that the majority of buyers still has to learn to use the new, improved process. However, this will take time. Volkswagen’s philosophy: “This is a process, not a matter of one day of training.” To speed up the implementation of online negotiation, VW Group Supply has set targets for each commodity group in terms of numbers of events to be carried out and spend to award through online negotiations. In order not to give buyers the impression that they have to “take their hands off the wheel” when negotiating online, no rules have been established about when to use certain auction formats such as best-bid or rank. Currently, the ratio of these two formats is about 50:50 at VW.

Volkswagen forcefully tries to build up a strong reputation as a trustworthy online buyer in the automotive industry. This is done by carefully ensuring up front that all participants meet Volkswagen’s technical and commercial prerequisites so that everyone has equal opportunities during the negotiation. Further, e-Sourcing Management and Group Supply try to inform and train the suppliers in a highly professional way. Suppliers are informed about the date and precise regulations on time. Before an online negotiation, test runs are performed to familiarize all participants. Figure 13 shows an example

Figure 13
VW Sample Invitation

Forward Service Enquiry: FVW 00 7205
Light Metal Wheel 7x17 (Centelon Lack): 1T0 601 025 8

Online Negotiation: VW E LIGHTMETALWHEEL 1 PQ35 D2101 L

Dear Ladies and Gentleman,

The Internet provides new opportunities for business transactions, ensuring all business partners advantages in terms of increased process facilitation, speed and cost efficiency.

Online negotiation of offers by means of Internet online-bidding is one of the new opportunities. This enables you and VW to achieve significant cost and time savings compared to the previous negotiation practice.

We would like to realize the benefits of cooperating with you and thus intend to negotiate online your bid on the above stated contract volume on November, 2 at 10:00 a.m. (GMT+1).

You have been appointed as responsible contact person during the online negotiation by the buyer, [name]. Should you not be available or if there are any amendments, please let us know. Should your company want to appoint another contact person for this online negotiation, could you please furnish us with this person's contact data, i.e., name, function, telephone number, fax number, mobile phone number, and e-mail address.

May we kindly ask you to send the required phone/fax numbers to [name, title, e-mail] by Thursday, November 1, 2001, 12:00 a.m. (GMT+1).

During online price negotiations you will be able to see your bid (a price per unit for 50% and 100%, logistic cost per unit for the consuming plants, invest, and long term conditions) in comparison to your quartile position. In case a new best bid is made, you will see any changes immediately and have the chance to respond accordingly. However, data are kept confidential, so that you will not be able to identify the bidder of the most favorable bid. You may improve your bid at any time and as often as you like by a minimum of 0,10 Euro (a price), 0,01 Euro (logistic cost), 1000 Euro (invest) and 0.25 steps for ratios. At the beginning of the online negotiation, you will see your offer as received in the writing/ESL. In case you have not made any offer yet, you will have to enter your first offers directly after the online negotiation has started.

Technical Requirements:

All you need is a secure connection to the Internet and a browser, either
MS Explorer 5.0 [Web site]
or
Netscape Navigator 4.7 [Web site]

In order to be able to follow up the auction process, you should be provided with the following hardware:

- Computer, Pentium (> = 200 MHz)
- Modem: 56k or ISDN
- ROM: . = 64 MB
- Operating System: Windows 95, 98, 2000 or NT
- Screen: 600x800 pixel

Please inform your contact person to be prepared for online price negotiations on November 2 at 10:00 a.m. (GMT+1). Please make sure that you are logged in on time! Negotiations will take 10 minutes, and will be extended twice automatically by 5 minutes, if lower bids are offered within the last 5 minutes towards the end. Altogether you should be prepared for at least 20 minutes. To improve and update your offer during the negotiations the contact person should have the relevant decision power from your company or you should ensure that the relevant decision makers are available during negotiations.

Figure 13 (continued)

We kindly ask you to confirm your latest bid in writing after online price negotiations.

VW – i.e., the relevant decision-making bodies – will then place a contract with the most favourable bidders. Having placed the best bid is the most important decision criterion.

Should you have any further questions concerning the FS enquiry, please contact the responsible buyer, [name, phone number]. For questions regarding the online negotiation, please contact [name, phone number, e-mail address].

Yours faithfully,
[name]
[title]
[company]
[address]
[phone number]
[e-mail address]

of an invitation to an online negotiation to pre-selected VW-suppliers. “Bird watching” is usually not tolerated. If a supplier does not submit a new, competitive bid after a certain time during the auction, VW sends a individual message to this supplier through the auction tool’s messaging system letting the supplier know that if it does not reach the next (intermediate) target, it will be excluded from the rest of the event. Buyers are strongly recommended to conduct follow-up discussions with the suppliers after the events to provide feedback and improve their online negotiation skills for future events. Due to this high degree of professionalism, neither Volkswagen nor the suppliers of VW interviewed expressed any concerns about online negotiation-specific unethical behavior.

In the beginning of the online negotiation initiative, Volkswagen also tested the full service offers of service providers for selected purchase items. The result was that these could not offer significant advantages in terms of market making or finding better suppliers. Volkswagen developed its e-sourcing competence with the support of eBreviate. The decision to buy the software, to continuously improve and customize it, and to keep all data for VW and the suppliers inhouse was taken early for two reasons, a) data security and b) protection of VW’s competitive advantages.

As Volkswagen tries to bundle purchase power to the largest extent possible and uses online negotiations worldwide, researchers were also interested to learn whether regional differences exist in the acceptance of online negotiations either on the buyers’ side or on the suppliers’ side. While acceptance was slow in Brazil at the beginning and still is in Spain, two regions, Mexico and the Czech Republic, were mentioned as highly receptive to the new technology and the innovative process.

Key Learnings

Key learnings from the interviews with this “super-user” were:

- The primary goal was efficiency/buyer productivity, not direct cost savings.
- Whatever can be specified clearly can be auctioned successfully.
- A large portion of direct cost can be covered through online negotiations.
- There is an ongoing need for active change management and top management support for online sourcing activities.
- For a successful roll-out of online negotiations in the supplier community, a strong reputation as a highly professional and trustworthy online buyer is key.
- Experienced users treat provider services largely as a technology commodity.
- The new technology can be successfully used in a global sourcing context.

METRO Group

Company Background and Group Buying

The roots of the companies belonging to METRO group today go back to the 19th century in some cases. However, 1964 is generally held to be the birth year of the METRO company: Otto Beisheim opened the first METRO Cash & Carry store in Germany, a wholesale market where traders could collect their merchandise against cash. The pioneering spirit of Beisheim and innovative business models characterized the development of METRO at all times. In 1996, METRO as we know it today was created within only 10 months by merging three major independent German retail companies that each had their own long traditions. The

newly formed company went public the very same year. On July 25, 1996, the METRO stock was quoted on the German DAX for the first time. Based on its successful performance in the domestic market, the group soon expanded into foreign markets as well. Today, with more than 2,200 locations in 26 countries METRO Group is the third largest trading and retailing group in Europe and the fifth largest in the world. The company employs around 230,000 people (186,000 if converted to full-time equivalents). In 2001, METRO generated sales of almost 50 billion Euro, some 5.5 percent more than in the previous year, 44.4 percent of which come from outside of Germany. As of December 31, 2001, METRO's market capitalization was 12.9 billion Euro.

The operating business is divided into four business units in which six so-called sales divisions act independently in the market with their individual brands. Cross-divisional service companies, such as procurement, logistics, IT, advertising, financing, insurance, and catering, provide services to all sales divisions. The six sales divisions are: METRO C&C Wholesale in the cash-and-carry business unit (423 outlets in 23 countries); REAL hypermarkets and Extra food stores in the food retailing business unit (771 outlets in 3 countries); Media-Saturn consumer electronic centers and Praktiker Do-it-yourself in the non-food specialty business unit (720 outlets in 12 countries); and the department store line Galeria Kaufhof (149 outlets in 2 countries).

The major pillars of the strategy of profitable growth are:

- the optimization of the distribution concepts
- the optimization of the portfolio
- the internationalization of the company

All organizational units of METRO Group have a common performance, leadership, and social policy identity. This is expressed by main strategic guidelines of METRO Group, the so-called 12 Corporate Principles. Further, METRO follows the German Corporate Governance Principles. These serve to make transparent the responsible management of METRO, directed toward real net output, and to control, safeguard, and improve the high standards of the business activities of the METRO Group. They also promote and enhance the trust of present and future investors, customers, employees, and the interested public on national and international markets and, thus, to further the acceptance of METRO on the international capital markets.

METRO Group Buying (MGB) is a 100 percent subsidiary of the METRO Group (METRO AG). It was established in 1993 as the central purchasing unit of the METRO Group. It employs around 780 people. MGB handles above 43 billion Euro of purchases per year. Operating as

a cost center, the strategic mission of MGB is to use "its strategic potential in negotiations and co-operations with domestic and foreign suppliers to effectively improve the buying conditions for the METRO Group." Its services include the negotiation of conditions for buying and payment, the sample meetings, listing, sales promotion, and merchandising as well as constantly keeping suppliers' data and article data up-to-date. MGB feels it is doing a highly important job within the group as the effects of a buying unit's performance are more directly reflected in the sales price in the retail industry than may be the case in others.

Integration of E-RA and the Strategies and Processes of METRO Group Buying (MGB)

METRO started with electronic reverse auctions in 2000. As of September 30, 2002, METRO has conducted 750 auctions with an overall volume of 680 million Euro. It is expected that in three to five years up to 10 percent of the annual purchase volume will be bought through auctions.

The METRO board member responsible for purchasing strongly supported the initiative and top management was involved in the e-RA initiative from the very beginning as METRO had to make an investment decision that finally resulted in taking a significant equity stake in the marketplace: GNX (GlobalNetXchange; www.gnx.com). Other equity partners include Carrefour, Kroger, J. Sainsbury, Coles Myer, Sears Roebuck, Oracle, and PWC/IBM. While GNX is seen as an important business partner in METRO's auction initiative, MGB would never consider buying full services from any service provider — "Se rent a car, but will never let somebody else drive it."

The overall goal of the e-RA initiative was to achieve higher market transparency and increased process efficiencies as compared to face-to-face negotiations. It was expected that in many cases, the savings in terms of price and process efficiency would be at least twice as high as in the traditional mode. MGB's long-term vision for e-RA is as follows:

- Auctioning is a standard application for all buyers within the METRO Group.
- The buyer is using the application for all "auctionable" purchase activities. The application can include requests for information, requests for quotation, or e-RA.
- Auctioning is an integral part of the standard training of all buyers and assistants within the METRO Group.
- All necessary supplier contact data can be accessed or entered by the buyer without special support.
- The internal support is focused on questions related to auction strategies and tactics.

METRO's e-buying process generally consists of four phases. The first phase is internal pooling of demand; the second is request for information; the third is request for quotation; and the fourth is the reverse auction. During the three phases preceding the auction, all aspects except for the price are set (i.e., sample tests are done and supplier audits are conducted). Therefore, everything can be auctioned according to MGB — it is only a matter of whether it can be described precisely:

"I have to tell the suppliers clearly what I want. Complexity in terms of technical complexity is not that important. We auctioned the construction of whole stores including the freezing equipment and the facility management – everything. Yes, it is hard to define what you want in cases like this, but at the end we had three highly competitive suppliers that bid in the auction. After half a year there was the common understanding there. And, by the way, I think that all this work had to be done anyway, no matter if you do an auction on price at the end or face-to-face negotiations."

In the beginning there was the fear of losing the flexibility which is inherent to face-to-face negotiations. "However, this does not take place; the traditional format is just replaced when it comes to negotiating price, everything else is negotiated up-front in the traditional way — maybe in a different order."

MGB has identified three key success factors for auctions:

1. Two to three actively competing suppliers
2. No conflicts with existing agreements
3. Specifications and quantities are available

Figure 14 shows that METRO sees the preparation phase as key.

Consequently, expectations for cycle-time reductions are moderate:

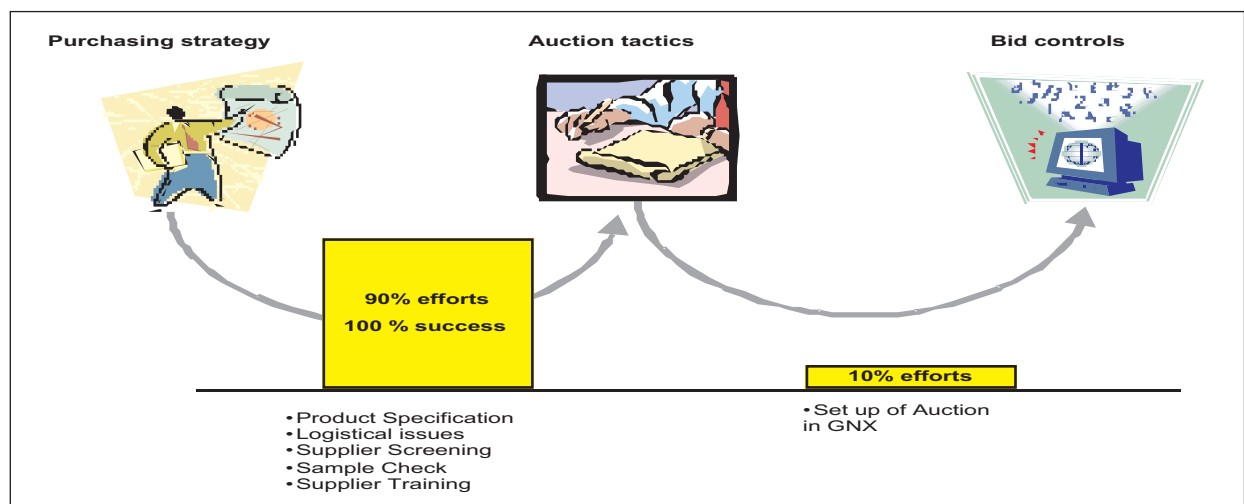
"Total time to contract (TTC) is shorter only for repeat buys. However, the process quality is significantly improved. This will be decisive in tomorrow's competitive arena. When everyone is using the tool in a couple of years, there will be no comparative advantage in terms of savings (price and process). The only thing that will matter then is whether or not your process quality is higher — these auctions should allow you to buy smarter, to focus on strategic issues, and not to waste so much time wrestling about price."

METRO summarizes the main advantages of e-RAs:

1. Forces each buyer to do a sophisticated negotiation preparation
2. E-RAs increase efficiency of negotiations: "five to 20 negotiation rounds in 90 minutes."
3. Sales persons are bidding in their offices
 - Multiple internal colleagues (e.g., production and logistics) can attend.
 - Suppliers can contact their suppliers directly.
4. Has the psychological effect of "no gambling"
 - Salesperson: "Now I know where I am in my competition."

Communicating the advantages and limitations of auctions to both buyers and suppliers was of highest priority during the whole roll-out of the e-RA initiative.

Figure 14
E-RA Process at METRO



METRO started in 2000 by bringing buyers and division managers together in a focus group. After about six months the team came to the conclusion that auctions will work for the METRO organization. Since then, regular planning rounds are conducted for e-RA activities. There are basically two planning rounds per year, a major one with detailed targets and a second one that serves as an opportunity to update the plan and to adjust actions in the middle of the year. Furthermore, MGB keeps management attention and commitment high through monthly reports covering all auction activities. These reports demonstrate the bottom line effects of the group to the board and to the top executives in charge of each of METRO Group's six sales divisions.

Another measure helped implement the concept quickly and effectively: management never criticized buyers for any previous result, meaning that if a buyer achieved for example 23 percent savings for an item through an e-RA, he was not questioned whether or not he had done his job properly in the previous (non e-RA) years. Further, intense feedback was provided to the buyers every time they conducted an auction. The same holds true for the supplier community — METRO wanted and still wants to make sure that all suppliers, including those who did not win the event, are motivated to participate in future auctions. During the entire international roll out, METRO did not face any country- or culture-specific hurdles.

The managers at MGB feel that METRO has built up a strong auction reputation. This might be because METRO puts utmost emphasis on ensuring that its auction activities are conducted in accordance with high ethical and legal standards. This is done by following a set of "METRO 'Golden Rules' for Buyers and Suppliers":

1. Auctions are complementing the classical way of price negotiation.
2. Auctions are set up with the intention to award business.
3. Bids outside of GNX must not be accepted.
In the case of re-bidding, the auction has to be re-set up.
4. All suppliers receive the same information and are treated equally.
No exclusive information for any suppliers.
Identical rules for all suppliers.
All bidders have to be potential suppliers.
5. Auction content has to be transparent.
All aspects of the final decision should be included within the auction.
All aspects beside price have to be mentioned.
6. Quantity, volume, and dates of an auction contract are binding.
7. Fictitious bids are absolutely forbidden for all participants.
8. All auction data has to be treated confidentially.

A further measure to secure high professional standards is that METRO has all employees participating in auction-related activities sign a form declaring their compliance with competition and antitrust laws as well as with the GNX Code of Conduct. These two documents are reproduced in Figures 15 and 16.

Due to these strict measures, it does not come as a surprise to see *positive* effects resulting from auctions in terms of ethical behavior. One executive said:

"Unethical behavior? Nothing really changed. Things become even more transparent for all parties involved. Buyers, salespersons, and their respective managers can take a look into the negotiation room and see what their people have been doing."

Despite the fact that METRO has conducted a large number of auctions so far, it has not undertaken efforts to analyze cross-event data in order to test for correlations e.g., between the number of bidding suppliers and the savings achieved. Based on the research interviews, the conclusion was reached that many buying organizations and service providers currently engaging in such efforts are on a fishing expedition and do "measurement without theory." METRO therefore is focusing the efforts on communicating negotiation experiences among all buyers on a regular basis.

Purchasing managers at MGB gave the general advice that the whole e-RA issue has to be kept simple and transparent from the beginning for both buyers and suppliers in order to achieve an effective and fast implementation.

Key Findings

The key learning's from the interviews with METRO were:

1. Top management was involved from the beginning; top management attention is kept high by monthly auction reports documenting the bottom-line impact of auctions.
2. The company has a dual goal: achieve higher market transparency and increase process efficiency.
3. Everything can be e-auctioned as long as it can be specified; technical complexity is no major roadblock. Precision in preparation is key.
4. In general, e-RAs are nothing spectacular; they complement existing processes — things can and should be kept simple for all parties involved.
5. Documents like "Golden Rules" and "Codes of Conduct" help ensure that e-RA activities measure up to the highest ethical and legal standards. This increases external and internal acceptance, helps building a strong e-RA reputation in the market, and speeds up implementation.

Figure 15
METRO Registration Form + Undertaking

REGISTRATION FORM + UNDERTAKING	
_____ Last name of employee	_____ Company (e.g., Metro France)
_____ First name of employee	_____ Work phone (e.g., +49-211-969-xxxx)
_____ Function (e.g., Buyer, Assistant etc)	_____ Work e-mail
_____ Department (e.g., Frozen Food)	
Copy :	Fax to +49-211-969-xxxx
Original:	Forward to your Local Auction Coordinator
<p>My work with my employer, _____, a company of the METRO AG group ("METRO group"), comprises, among other professional activities, the handling of transactions via the GlobalNetXchange internet platform (the "Exchange"), respectively participating in these activities in a supportive manner.</p> <p>I am aware of the fact that any contract or agreement on auctions, sales and purchases as well as any other transaction via the "Exchange" requires strict compliance with all applicable competition and antitrust laws, rules and regulations. I do know as well that in case these laws, rules and regulations are offended or infringed upon both METRO group and any individual staff member may face severe penalties, and that this may be severely injurious to the interests of or damaging to my employer and METRO group as a whole.</p> <p>For these reasons, METRO ONLINE USA, Inc., a company of METRO group, has signed the "Code of Conduct" enclosed to this undertaking and is obliged to strictly comply with this Code of Conduct. Therefore, I have read this Code of Conduct in detail, and I undertake to accept and pay respect to it and to behave in such manner as shall not give rise in any way to any infringement of this Code of Conduct neither by METRO ONLINE USA, Inc. nor by any other company belonging to METRO group.</p> <p>I ensure not to do any joint or collective purchases, nor engage in these, with companies not belonging to METRO group unless the person at MGB METRO Group Buying GmbH (formerly: METRO MGE Einkauf GmbH) responsible for GNX matters, currently Mrs. Svoboda, expressly instructed me to do so and only after the legal situation and the facts have been closely examined and scrutinized.</p> <p>The aforementioned undertakings shall be an integral part of my contract of employment. They shall, without prejudice thereof, remain in effect and be complied with not only throughout the duration of the contract but also after my employment with the company of METRO group has been terminated.</p>	
_____ [place & date]	_____ [Signature]
Enclosure: Code of Conduct GlobalNetXchange	

Figure 16
Code of Conduct
GlobalNetXchange

GlobalNetXchange (GNX) shall operate in compliance with all applicable laws at all times. In connection with applicable antitrust laws, three fundamental principles (Fundamental Principles) shall be complied with at all times by GNX and its Members when using the GNX Exchange (the Exchange). “Members” means each person who is a Member pursuant to that certain Limited Liability Company Agreement of GlobalNetXchange LLC dated as of July 20, 2000, and engages in the retail industry as a retailer, supplier or distributor. The “Exchange” means the internet connection www.gnx.com.

Fundamental Principle 1

All members shall separately and independently negotiate the purchase and sale of goods or services for resale. No joint or collective purchase and sale of goods and services for resale are permitted.

Fundamental Principle 2

No Member shall share with any other Member any information regarding the conditions of the purchase of goods and services for resale.

Fundamental Principle 3

GNX shall not share with any Member information regarding the conditions of the purchase of goods or services for resale negotiated by any other Member.

Application of the Fundamental Principles

Pursuant to the Fundamental Principles, no joint or collective purchases and sales of goods and services for resale are permitted when using the Exchange. Each Member must separately and independently negotiate such purchases and sales without using information regarding the purchases and sales of goods and services for resale negotiated by any other Member. Neither GNX nor any Member may share with any other Member any information regarding the conditions of the purchase of goods or services for resale acquired as a result of the use of the Exchange. Joint purchases of goods and services not for resale may be engaged in by the GNX or Members, but only after the guidelines and procedures for making such purchases, including any related exchange of information, are approved by GNX.

Compliance with the Fundamental Principles

It is essential that all employees of GNX, all employees of Members, and all employees seconded (or assigned temporarily) to GNX by any Member, whether full or part time, who acquire information concerning the purchase and sale of goods and services for resale as a result of the use of the Exchange, shall comply with the Fundamental Principles.

With regard to all employees seconded to GNX, the Fundamental Principles shall be complied with not only throughout the duration of the secondment but also after the end of such secondment when such employees return to the employ of the Member.

Failure by any Member to comply with the Fundamental Principles could result in the exclusion of that Member from the Exchange as determined by GNX. Failure of any employee of GNX to comply with the Fundamental Principles could result in the termination of that person’s employ as determined by GNX.

Implementation of the Fundamental Principles

1. The negotiation of the purchase and/or sale of the same category of goods and services for resale shall not be conducted by the same person on behalf of two or more Members using the Exchange.
2. Each Member and GNX shall adopt internal procedures to ensure that no information with regard to the conditions of the purchase and/or sale of goods and services obtained as a result of the use of the Exchange is shared with any other Member and that the Fundamental Principles are adhered to each of their respective employees.

Figure 16 (continued)

3. Each Member and GNX shall appoint a manager responsible for implementation of and compliance with all internal information control procedures necessary to comply with the Fundamental Principles. In particular, the manager shall be prepared to verify upon request by GNX that such procedures are in place and no information developed as a result of the use of the exchange by one Member concerning the commercial strategies and/or conditions of the purchase or sale of goods and services for resale has been shared with any other Member, except as permitted by the GNX guidelines and procedures adopted with respect to the joint purchase of goods and services not for resale.

Certification of Compliance

Each signatory and authorized representative of the Members executing this document acknowledges, on behalf of such Member, that it understands the Fundamental Principles and their importance in the lawful operation of the Exchange and according certifies that:

1. The undersigned Member will not directly or indirectly communicate information concerning the conditions of the purchase or sale of goods and services for resale, which it may acquire as a result of the use of the Exchange, to any other Member using the Exchange or any employee of GNX.
2. The undersigned Member will not seek to discover information concerning the conditions of the sale and/or purchase of goods and services for resale negotiated by any other Member with suppliers or sellers of such goods and services.
3. The undersigned Member will not use any information regarding the conditions of sale or purchase of goods and services for resale negotiated by any other Member acquired as a result of the use of the Exchange in any purchase or sale the undersigned Member negotiates.
4. The undersigned Member shall inform the manager at GNX responsible for ensuring compliance with the Fundamental Principles of any violation of the Fundamental Principles of which the undersigned Member becomes aware.
5. The undersigned Member acknowledges that these undertakings shall not be construed to prohibit joint purchases of goods and services not for resale that are permitted by the GNX guidelines and procedures or the exchange of related information among GNX and its Members.

Date: _____
At: _____
By: _____
On Behalf of: _____

GNX and its authorized representative executing this document acknowledges, on behalf of GNX, that it understands the Fundamental Principles and their importance in the lawful operation of the Exchange, and accordingly, GNX agrees to comply with the Fundamental Principles and their implementing rules, guidelines and procedures at all times.

Date: _____
At: _____
By: _____

Appendix A:

Methodology

Determining the Sample of Study Participants

The research team began the field research by conducting case study visits of third-party providers of e-RA services, and of buying firms that use e-RAs (users). To provide a full picture of the e-RA phenomenon, the team also conducted in-depth interviews of suppliers to the case study buying firms, as well as in-depth interviews of buying firms that currently do not use e-RAs (non-users).

Third-party service providers were chosen to include 1) the major providers (i.e., those with the most customers and in the business for the longest amount of time); 2) a variety of business models (e.g., full-service, some services, and self-serve); and 3) industry-sponsored consortia that provided e-RA services along with other e-services.

Buyer firms were chosen based on a requirement that they were at least “moderate” users of e-RAs, that is having conducted more than 20 reverse auctions in 2001. Once this criterion was met, firms were chosen in order to represent a diverse group of industries and auction experiences, so as to derive a comprehensive set of findings. These buyer firms were identified through a survey of firms at the 2002 CAPS Research International Executive Purchasing Roundtable. Attendees of this event are limited to chief purchasing officers of large firms (Fortune 500) that regularly participate with CAPS Research activities. In addition, a similar survey was sent to other CPOs that were not in attendance at the 2002 Roundtable, but were active participants with CAPS Research. Further, providers identified some of their most frequent users. Finally, the team attempted to obtain matched perspectives of users and suppliers, by asking each of the sampled buying organizations to identify two suppliers that had participated in their e-RAs that would be willing to participate in the study. As for non-users, they too were identified through the above surveys of firms attending the 2002 CAPS Research Roundtable.

The Site Visit and Interview Processes

The team conducted day-long case study site visits with 17 providers and 16 buying firm users, and in-depth teleconference interviews with 15 suppliers and nine non-users. Firms continued to be interviewed until a point of redundancy or what is called “saturation” was met for each of the major informant groups — buyers, suppliers, providers, and non-users.

The team followed a semi-structured interview protocol across cases and interviews, which, in contrast to an unstructured approach, allowed the team to be selective in collecting data and facilitated the coordination of researchers across multiple cases in order to aid in cross-company comparisons.

A draft buyer interview protocol was developed by the researchers based on a review of the trade literature and initial interviews with service providers. This draft interview protocol was then reviewed by e-RA providers and modified based on their feedback. A pilot test of the interview protocol was conducted with two buyer user organizations, one in Germany and one in the United States. Finally, the buyer interview protocol was further refined based on the results of these initial case study visits. In a similar fashion, initial supplier and non-user interview protocols were developed from findings from the user interviews and were further refined based on feedback from these users.

Data Analysis

The case study and in-depth interviews were recorded and transcribed. Interpretive notes were then constructed for each organization, based on a compilation and comparison of the researchers’ field notes, interview transcripts, additional records such as company

brochures and Web sites, and other internal documentation. The use and comparison of these different data sources allowed the researchers to corroborate and ensure the reliability of the information that was used to develop the interpretive notes.

Next, the team developed broad coding categories that included general information questions, barriers encountered by buyers and suppliers, ways of overcoming those barriers, outcomes of e-RAs, and potential ethical issues surrounding e-RAs. Afterward, specific activities, or codes, for each of these categories were identified based on an iterative review of the interpretive notes. The same researcher then applied these codes to all of the interpretive notes for the buyer and supplier data. The reliability of the coding was tested by having two researchers separately code the field notes.

The coded interpretive notes allowed the team to aggregate the data, contained in the several hundreds of pages of interpretive notes, into matrices, in order to identify both commonalities and contrasts across company perspectives, and to more systematically interpret and present the findings contained in this report.

Appendix B:

Auction Typology

Long before the evolution of electronic reverse auctions, economists and mathematicians were studying auctions. Much of their work is concerned with the theory of auctions, bidding strategies, and observing outcomes from subjects participating in experimental auctions.¹ A smaller, but growing, portion of the literature focuses on the best use of auctions for commercial transactions. Some of the different auction types that have found use in commercial transactions are discussed below. Unfortunately, the terminology of auctions is not entirely standardized. The terms employed below to describe auctions are commonly, but not universally, used.

There are two characteristics of auctions that help in their classification. First it is important to know if the auction is a competition between sellers or buyers (or in some

cases both.) For our purposes we will identify auctions as having either one buyer and multiple sellers or one seller and multiple buyers. (Auction theory makes no distinction between these two cases. However it is helpful to our understanding of auctions to make this distinction).

The other important characteristic to know is if the auction is a forward (ascending) or reverse (descending) auction. Forward auctions are often called English auctions, but a specific sub-type exists that is also called an English auction. Reverse auctions are often called Dutch auctions, but a specific sub-type exists that is also called a Dutch auction.

These two dimensions yield a matrix with four cells as shown in Figure 17.

Figure 17
Auction Typology

Reverse	eRAs (as discussed in this report)	Dutch
Forward	“forward” Dutch	English Japanese
	One Buyer Multiple Sellers	One Seller Multiple Buyers

Forward Auctions with One Seller and Multiple Buyers

English sub-type

In forward auctions with one seller and multiple buyers, offers to buy (bids) start at a low level, go up, and never go down. As the bid price goes up, bidders drop out. The auction ends when the next to last bidder drops out and the last bidder wins the auction at his/her last bid. In an English auction, bidders can drop out and come back at a later time (assuming the auction has not closed) and can jump the bid by any amount. English auctions are also called open outcry auctions (because bidders call out their bids.)

A more recent variation is the online auction typified by eBay. In this case, the buyers do not know or see the other buyers. The auction proceeds as above, except that it closes at a set time. The highest bid wins.

Japanese sub-type

In auctions of this type, all buyers are presumed to bid at a starting (low) bid. Bids are increased in regular intervals and jump bidding is not allowed. Bidders must publicly signal they are dropping out and once out, they cannot return. Bidders drop out before the price is next raised. The auction literature refers to this as an *open, second-price, ascending auction*. The second price refers to the fact that the winning bidder wins the auction at the price at which the next to last bidder dropped out (the second price). Basic auction theory assumes ascending auctions meet these requirements.

Ascending auctions are commonly used to sell new and used equipment, antiques, cell phone spectrums, and many other goods and services.

Forward Auctions with One Buyer and Multiple Sellers

This auction type does not appear to be named in the literature. The research team found a company using this type of auction to buy non-complex, well-specified goods. In this auction the bid price starts at a value lower than any supplier is willing to offer the good for sale. The bid price goes up at regular intervals until one supplier bids and wins the auction. This is a *first-price, ascending auction*. (The company referred to this as a Dutch auction, but this terminology does not appear to be standard or common.)

Reverse Auctions with One Seller and Multiple Buyers

This is the true or traditional Dutch auction. The seller offers the item (e.g., tulip bulbs or treasury bonds) for sale at an initially high price, higher than any buyer is expected to bid. The offer price is lowered over time in regular intervals until one buyer bids and wins the auction. In the literature this is called a *descending, first-price auction*.

Reverse Auctions with One Buyer and Multiple Sellers

This is the e-RA discussed in this report. However, because it allows bidders to quit and reenter and allows jumps in the bids, it does not meet the assumptions of the basic auction theory. The theory also does not account for the information suppliers glean from knowing other bids or the rank of their own bids, or for supplier bidding strategies (e.g., incumbents bidding somewhat higher than the lowest bid.) Furthermore, inactive bidders may be dismissed from the auction by the buying company.

Many variations on these basic types of auctions exist. Some of these are discussed below.

First-Price, Sealed-Bid Auction with One Seller and Multiple Buyers

Each bidder independently submits a sealed bid for the item. The bids are opened and the highest bid wins. This is called a *first-price, sealed-bid auction*.

Second-Price, Sealed-Bid Auction with One Seller and Multiple Buyers

Each bidder independently submits a sealed bid for the item. The bids are opened and the bidder submitting the highest bid wins. However, the winning bidder pays the price of the second highest bidder (the second price). The purpose of this rule is to encourage bidders to bid a price equal to what they believe the value of the item to be. This type of auction is often called a *Vickery auction*, named for William Vickery, an auction theorist and Nobel prize winner.

Sealed-Bid Auctions with One Buyer and Multiple Sellers

These auctions work exactly the same as the above sealed bid auctions except that the lowest (or in the case of second-price, the second lowest) bid wins.

Auctions with Multiple Buyers and Multiple Sellers

In these auctions, buyers' offers will go up and sellers' offers will go down, until a match or overlap is reached. This is the basic mechanism of stock and commodity exchanges.

Multiple Units for Sale

When more than one unit of an item is available in a single auction, a different set of ascending *Dutch auction* rules are often applied. (The similar terminology is unfortunate.)

The seller specifies the number of items available and buyers enter a bid equal to the starting price or higher and the quantity they are interested in purchasing. The auction ends when no more bids are forthcoming. The items are allocated starting with the last (highest) bidder. This bidder gets the number of items he or she declared at the start of the auction. If items remain, they are allocated to the next highest bidder, who gets the number of items he or she declared. This continues until no items are left. All of the bidders pay the same price — namely the bid price of the final bidder to be allocated any items. This is of course lower than the highest bid.

Some Surprising Results from the Theory of Auctions

Under the mild assumptions that: a) bidders know the true value of the good to them, and these values are unknown by the other bidders; b) bidders are risk-neutral; and c) buyers do not collude; then auction theory tells us that:

first-price, sealed-bid auctions are equivalent to descending first-price (Dutch) auctions are equivalent to second-price, sealed bid auctions are equivalent to ascending second-price (Japanese) auctions.

In this statement, equivalency means equal expected revenue to the seller (and equal expected payments by the buyer). In other words, under certain assumptions, all four auction types results in the same expected outcome for the seller.

Auction theory has advanced beyond these statements by relaxing the assumptions and introducing others. However, these results are beyond the scope of this discussion. Unfortunately much of auction theory is of little value in designing practical auctions.

What really matters in auction design are the same issues that any industry regulator would recognize as key

concerns: discouraging collusive, entry-detering and predatory behavior. In short, good auction design is mostly good elementary economics.

By contrast most of the extensive auction literature is of second-order importance for practical auction design.²

In this report we have tried to present the practical aspects of e-RAs that can lead to success for both buying and selling companies.

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Appendix C:

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