CURRENT RESEARCH ON REVERSE AUCTIONS: PART II - IMPLEMENTATION ISSUES ASSOCIATED WITH PUTTING COMPETITIVE BIDDING TO WORK

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ABSTRACT

This article serves as the second part in a two-part series that provides an overview of the reverse auction concept, building on the best research in the field of supply chain management. In this instalment, we look at the concerns involved in making reverse auctions work in practice – the implementation issues. Frist, we look at when reverse auctions should – and should not – be utilized by a buying organization. We then examine the decision rules that should be used in determining which of the competing suppliers wins the reverse auction. Next, we look at the best research available as to how the use of reverse auctions impacts the buyer-seller relationship. Finally, we examine what is in essence a "make or buy" decision in regards to whether the purchasing organization should run an auction in-house or make use of the services of a third-party "market maker.

KEYWORDS

Reverse Auction, Auction, e-Procurement, Acquisition, Supply Chain, Government, Public Sector, Private Sector, Competition, Buyer-seller Relationships, Market Maker, Purchasing, Procurement Strategy

1. INTRODUCTION

1.1. Understanding Reverse Auctions

In the first part of this two-part article, entitled "Current Research on Reverse Auctions: Part I - Understanding the Nature of Reverse Auctions and the Price and Process Savings Associated with Competitive Bidding," we looked at the growth of reverse auctions in both private and public sector procurement. We then provided a differentiation between the more readily understood forward auction concept and the emerging practice of reverse auctioning. We then examined the two-sides of the reverse auction savings equation, looking at the "first order" savings to be derived from the use of competitive bidding to secure lower purchase prices, as well as the "second order" savings that can be achieved through making the procurement process more efficient.

In this second instalment, we will look at the implementation issues in putting electronic reverse auctions (eRA) to work, both from the perspective of the buying organization and participating vendors. These will include:

- When reverse auctions should – and should not – be used?
- How to determine the "winner" of a reverse auction?
- How does the use of eRAs impact relations between the buying organization and its suppliers?
- What are the advantages and disadvantages of running a reverse auction "in-house" versus making use of third-party "market makers"?

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In doing so, we build upon the most current thinking in the field of supply chain management, presenting the reader with a complete perspective on the nature and workings of reverse auctions in practice today. In conclusion, we summarize the findings of both papers and call for increased utilization of what is now a proven e-procurement tool for both private sector procurement and governmental acquisition operations.

2. WHEN SHOULD REVERSE AUCTIONS BE UTILIZED?

2.1. Reverse Auction Suitability

There have been many ideas advanced over the past decade as to which precise products or services should - or should not - be the subject of reverse auctioning, as well as ideas on what set of conditions should be in place for a reverse auction to succeed, or alternatively, which factors automatically negate the possibility for reverse auction success. One of the best is a two-dimensional model based on the degree of rivalry between suppliers (to ensure competition) and the specifiability of the good or service in question (to ensure that the competition is on an "apples to apples" basis) [1]. This model, replicated below in Figure 1 (*A Model of Reverse Auction Applicability*), makes for a useful starting point for determining what can - and can not - be sourced through reverse auctioning.

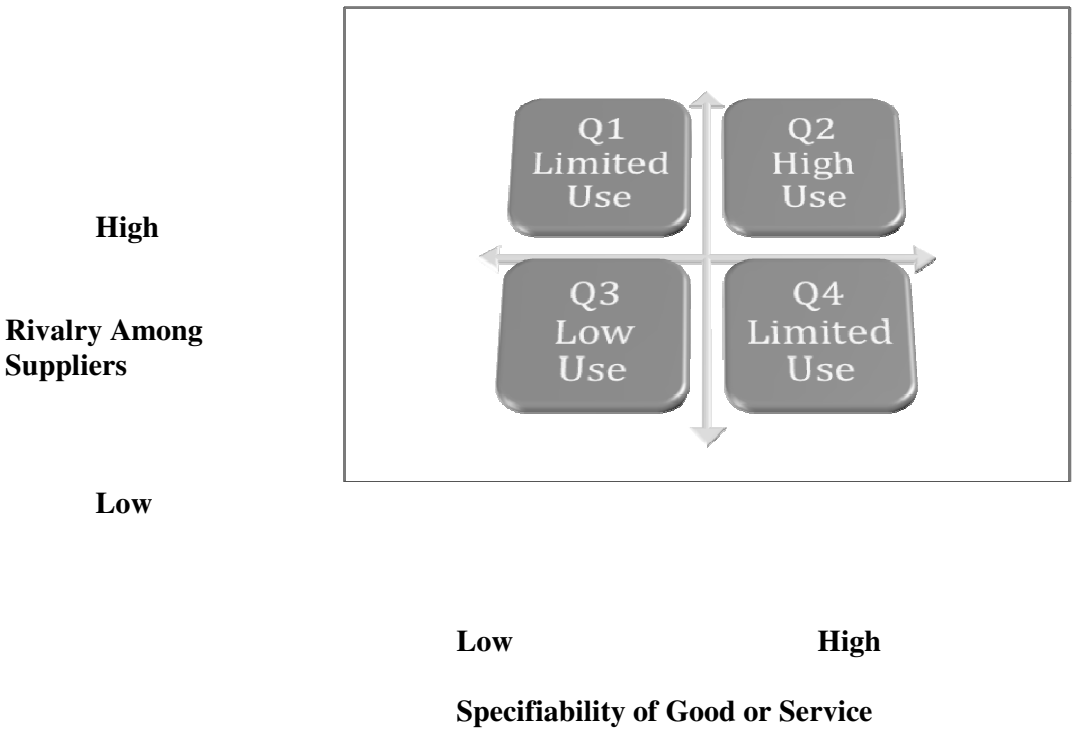

Figure 1. A model of reverse auction applicability

2.2. What Can - and Can Not - be Sourced through Reverse Auctions?

In organizations where there has been the most eRA penetration and adoption, the first question to be asked for any acquisition is simple: "'Can it be auctioned?" (n.p.) [2]. So, what types of goods and services are best suited for reverse auction-based acquisitions? There have been a variety of perspectives set forward in the purchasing literature. According to a recent white paper, reverse auctions are especially suited for the procurement of:

- Goods with low or no price volatility
- Goods with little variance among supplier capabilities
- Goods sourced primarily on price with limited ancillary considerations
- Goods sold by a large, competitive supply base with all top suppliers willing to participate [3].

Through research, reverse auctions have been found to be appropriate for "low complexity" items, which entails products and services that are easily understood by both buyers and suppliers and thus there can be easy comparison made between the offerings of competing vendors [4], as well as bulk items and goods "that are manufactured based upon an agreed upon standard" [5]. Reverse auctions have also been established as suitable for items that are "non-strategic" in nature and where there are a sufficient number of suppliers with the capacity to deliver the good or provide the service [6]. Finally, reverse auctions have been characterized as being proper for:

- purchases that feature little collaboration,
- shorter term contracts,
- products with common specifications and little complexity, and
- purchases where there are savings opportunities [7].

Conversely, some researchers have addressed items that *should not* be procured using reverse auctions. First, the number of available, truly able and competitive suppliers dictates whether a reverse auction should be utilized for any good or service in question. The matter has been framed as: "Goods and services that can only be provided by a limited number of suppliers will not be effective with reverse auctions since the vendor, not the buyer, will have all of the power in the situation" [8]. Also, products that require frequent changes in their design and/or components should expressly not be purchased through competitive bidding due to the problems associated with such items [9]. Finally, items that require extra, non-standard features and/or services (such as a warranty), are not well-suited for competitive bidding [5].

2.3. The Specifiability Concept

Overall, procurement research has shown that if a good or service can be properly specified, it can be successfully procured through competitive bidding. In this regard, "specifiability" – defined as the ability to provide a thorough and unambiguous description of all the requirements of a good or service being procured – has been characterized as *the* most important criterion for determining if a reverse auction was appropriate for a particular acquisition [10]. Indeed, leading companies such as HP and Delta Air Lines have a significant track record of sourcing both direct and indirect spend goods and services through reverse auctions [11]. Likewise, organizations have found the ability to compete even complex services, such as insurance and employee benefits through reverse auctions. They have discovered that not only can such services be successful procured through competitive bidding, but that they can gain price concessions and service level improvements through the process [12]. As such, researchers have categorized the widely-held belief that reverse auctions should only be utilized for procuring commodity-type items and routine services is a "myth" [13]. Thus, as organizations gain experience in competitive bidding or partner with experienced market makers (more on their functions later), they should be able to source ever-greater percentages of their total

procurement needs through competitive bidding. And, today, "e-auctions are being used to procure a broader and more complex range of goods and services, not purely commodities" [14].

MTV Networks is example of an organization that routinely acquires *very* complex services through reverse auctions. MTV's vice president of procurement, Bob Koontz, reflected on his company's experiences procuring such services through competitive bidding, stating that: "Bidding out services requires a lot more pre-work than materials-bidding events. It's important to have the service levels and the penalties for not meeting those service levels agreed to up front. Only then can you put it out to a bid" [15].

Guy Frankling, e-sourcing and implementation manager at Royal Dutch Shell, reminded us that specifiability is key across all procurement methods, stating: "If you are not clear on your specification, you won't be successful doing it (procuring the good or service) either manually or electronically" [16]. However, not having clear specifications in a competitive bidding situation can be "disastrous" [17]. This is because without a clear understanding of what they are exactly bidding on, the uncertainty will cause vendors to either not bid or to not offer their lowest possible price. At best, such inaccuracies in specifications lead to inaccuracies in pricing - and the attendant uncertainty for both the buyer and the "winning" supplier [18]. In the worst case scenario, suppliers could actually think they are bidding to deliver different products or services than what was intended, leading to negative consequences for all parties. Alternatively, clear specifications have been found to not only increase supplier participation in governmental reverse auctions, but to allow them to be more aggressive in their price offerings when they have clear certainty on precisely what they are bidding to provide [19]. When it comes to services acquisitions, it is crucial that organizations be very clear on what is - and what is not - included in the intended procurement and specify both benchmarks - and penalties for these service levels and/or target dates not being met [15].

Of course, having clear specifications is important, but making sure that all participating suppliers understand and are bidding on the same "apples to apples" basis for the goods or services in question is essential, as "ensuring that all suppliers are on equal footing in terms of quality, delivery, and service is a critical success factor for reverse auctions" [20]. Once this is done, the benefits accrue to both the buyer and to the competing vendors, as suppliers have the chance to "put their best foot forward" on what is effectively "a level playing field" - procurement decisions can be made far more quickly on a more informed and competitive basis [21]. Thus, whether a reverse auction or an alternate procurement method is utilized, it is incumbent on buyers to have well-developed specifications on all dimensions associated with a procurement. However, this becomes especially critical with a reverse auction, as the more standardized the product is, the better fit the item is for a reverse auction [22].

2.4. Reverse Auction Appropriateness

Reverse auction appropriateness can be defined as "the degree to which a sourcing professional views the use of an e-RA as a fit between the attributes of the tool, the specific requirement being sourced, and the supply market" [23]. The factors that play into the situational appropriateness for the use of reverse auctions include:

- organizational policy,
- manager mandates,
- organizational incentives,

- competition,
- specifiability,
- price-based selection criteria, and
- leadership [23].

These researchers go on to clarify that while a sourcing professional may deem reverse auctions as being appropriate for a given procurement situation, extraneous factors may not translate an appropriate competitive bidding environment into an actual success [23].

3. WHO "WINS" IN A REVERSE AUCTION?

3.1. Decision Making on Pricing

How does a buyer actually determine the vendor who "wins" the auction and therefore gets the award? Jap broadly classified the two general basis for determining which vendor would be selected based on the results of the reverse auction into being buyer-determined and auction-determined award rules [24]. Under a buyer-determined award rule, suppliers understand that they are placing bids for the buyer's business. However, the buyer retains the right to make the award decision on any basis. This is the commonly used approach in public sector procurement and is widely used in the private sector as well. This is because it gives the procuring organization the latitude to take a variety of other factors (quality, reputation, past performance, etc.) into the award decision. Less commonly used is the auction-determined award rule, whereby suppliers are told upfront that the business will be awarded to the first place (the lowest price) bidder or alternatively, to the next to the lowest price bidder (using what is know an a Vickrey auction). Indeed, the best research conducted to date on this issue shows that less than twenty percent of all reverse auctions are structured to use the auction-determined rule, and while it is indeed in the interest of the buying organization to have bidders believe that the lowest price will be chosen (to stimulate the maximum amount of competition), the reality is that procuring organizations have to date more valued the flexibility to base decisions on "price-plus" or softer decision processes than a hard and fast "price-only" rule [25]. Research has indeed confirmed that in corporate and governmental use of reverse auctions for procurement, most awards are typically made on a "price-plus" basis. In such instances, rather than strictly awarding a contract to the lowest bidder, other factors, such as quality, reliability, reputation, etc., are factored into the buyer's decision calculus to determine who gets the business resulting from a competitive bidding event [26].

Certainly, competing suppliers often report that in the frenzy of a reverse auction - especially in ones with very short time parameters for bidding, and thus, for making decisions on whether to "go lower" in order to win the competitive bidding event - that they lower their prices too much. This is a very real concern for both suppliers and for the buying organization, as this manifestation of the so-called "winner's curse" means that the winning vendor faces an unprofitable situation at best, and perhaps a disaster at worst. Moorhouse spoke of the "herd mentality" that can often be seen guiding suppliers' decision making in the final stages of a reverse auction [25]. Smeltzer and Carr labelled this as a "dog-race effect" wherein suppliers competed past the point where any profit is possible due to the competitive nature of the auction environment [27].

Thus, it is indeed important for suppliers to always keep their emotions in control and not be a victim of the winner's curse. As Wheaton cautioned: "Suppliers need to realize that they should never deviate from their normal pricing structure, even if it means landing a new contract" [28]. As such, competing vendors should always have a "walk-away price" - a price point that if

bidding drops below that dollar amount that they would not pursue winning the auction [29]. Vendors should have a good grasp on their cost structures, and, as Hannon (2004a) bluntly advised: "If a supplier allows its margins to get too thin through auctions, it needs to reduce its internal costs or bow out of the event" [30]. Indeed, as Keough advocated, the "worst thing" a supplier can do is to - borrowing the poker analogy - to go "all in" - in a reverse auction, getting caught-up in a bidding frenzy and making a poor business decision that could be quite costly, even devastating, to the firm [31].

So, while price is important, procurement decisions invariably have to be made on a TCO (total cost of ownership) basis, whether the price to be paid is arrived at through a reverse auction or a more traditional sealed-bid or negotiated basis [32]. In the long-term, whatever initial "price" is arrived at will be meaningless - and perhaps even a curse - if the performance/quality/durability etc. of the good or service acquired does not meet the buyer's expectations. It is thus incumbent on both parties - the buyer and the competing supplier - to make sound pricing decisions when it comes to reverse auctioning.

3.2. Pricing Visibility in Reverse Auctions

In regards to pricing visibility issues, reverse auctions will generally have either full visibility (where suppliers can see competing bidders' price offerings anonymously on screen in real-time) or partial visibility (where vendors can only see "lead-lag" information, whereby they can only determine if they are in the "lead" position - and thereby do not need to enter a lower bid - or in a "lag" position - and thus would need to enter a lower bid to have a chance to capture the business up for bid). Research has shown that suppliers have far more confidence in their bid positions and in their overall trust in the process when they are not afforded full visibility [24]. This stems from the perception that full visibility reverse auctions exert more pressure on vendors to lower their bid offerings, promoting vendors to be whipped into a "bidding frenzy" and thereby suffering from the "winner's curse." Full visibility auctions may not draw the highest level of competition due to the fact that even bidding in an anonymous fashion, some suppliers may be unwilling to participate out of fear of revealing pricing intelligence to their rivals. Additionally, in a full visibility auction, there is a perception among suppliers that the process is more susceptible to bidding collusion, promoting greater supplier trust and buy-in for the competitive bidding process.

3.3. The Size and Scope of Auctions

There are strong reasons - both for the interests of both the buying organization and for the interested suppliers to have reverse auctions involving higher volume transactions (both in terms of units and total price). As Shalev and Asbjornsen recently explained: "In order to compensate for lower prices and lower margins, suppliers seek higher volumes to maintain or increase the total revenue. Buyers, in turn, benefit from the lower transaction costs and economies of scale that result from larger volumes...The procurement volume must be sufficiently high to provide sufficient profits to attract enough suppliers, and provide buyers with enough savings to cover their additional costs" [19]. Government agencies have recognized the need for sufficient volume to be there for reverse auctions to make sense. In fact, according to its reverse auction guidance for its buyers, the government of the State of New South Wales, Australia (NSW) clearly advised that: "Generally, the higher the volume of the procurement, the greater the potential for realizing savings" [33]. However, it has been noted that "differing auction volumes may attract different suppliers" [19]. Simply put, smaller companies may be more able and ready to compete in auctions that are small in scope, whereas they may be less able to compete against larger firms - or even be able to provide the goods/services in the quantities/locales needed - in higher volume acquisitions. So, a varied approach is vital for agencies, as focusing their reverse auctions only for acquisitions above a certain unit volume or dollar threshold may work against the interests of both the agency and smaller enterprises.

Finally, what is the minimum number of suppliers that make a reverse auction "work"? Academic research has shown that the wider the field of qualified suppliers, the more likely it is that the reverse auction will produce a successful outcome for the buying organization. Researchers have found that there is a strong correlation between the number of firms bidding and the intensity of competition in the reverse auction [34]. And, taking it to the next step, analysis has shown that more competing bidders leads to higher amounts of savings from reverse auctions [35]. And so, most researchers agree that there should be at least 3-5 suppliers actively bidding in a reverse auction for the power of competition to work to produce a lower, real-time market price [19].

4. HOW DO REVERSE AUCTIONS IMPACT BUYER-SUPPLIER RELATIONS?

4.1. Overview of What is "A Delicate Balancing Act"

The buyer-supplier relationship is a dynamic one in any situation, but reverse auctions add different elements into the equation. As such, there are a wide number of considerations that must be taken into account. One significant difference that must be recognized is the fact that with competitive bidding, the process is even more buyer-driven than "normal" procurement methodologies. It has been observed that: "the buyer cannot determine the auction outcome *ex ante*. However, the supplier's experience in the auction is, in large part, a function of the buyer's *ex ante* choices regarding the auction design, such as the number and type of participants, the contract size, and the format (i.e., the degree of price visibility and award rule)" [36].

Analysts have cautioned that introducing reverse auctions into the buyer-seller relationship requires the procuring organization to walk "a delicate balancing act" to be able to preserve those relations in a positive manner [24]. The challenge is "for buyers to manage the process such that enough savings can be generated to make the process worthwhile from their perspective, while cushioning the impact on the interorganizational relationship through smart design." Some critics have riled against reverse auctions as a concept that flies in the face of more modern supply chain management, which focuses on collaborative relationships, deemed as vital to "produce the kind of speed and reaction time to customer demands that are needed in today's business world" [37]. Researchers have found that suppliers can have negative perceptions about reverse auctions, perceiving a loss of trust with buyers through the process [26]. Indeed, some incumbent suppliers will perceive the very act of a buyer opening-up a reverse auction competition as a sign of a soured relationship [38].

Much of the criticism directed at reverse auctions is not directly assignable to the mechanism per se. Rather, it is because of the impact that competitive bidding has on suppliers by lowering the prices paid to them by a major buyer - such as a government agency - for their product or services offerings. In fact, it has been observed that: "When suppliers need to lower their prices, it reduces their profits. If you asked 100 suppliers if they liked reducing their profits, they would probably all say "No!" (and) reverse auctions are very effective at lowering prices when they are used well" [7]. Further, based on their own standing with the buying organization, suppliers often view reverse auctions entirely differently. For incumbent suppliers, they will often interpret the shift to eRAs and threatening - both from the perspective of their margins and as a threat to the way the buyer-seller relationship has been conducted to that point. However, for smaller, non-incumbent suppliers, they will often see that the buying organization's move to eRAs as a way of opening up their business to new competition, creating opportunities for the new entrants. Quite naturally, research has indeed shown that incumbent suppliers are reluctant to have their status challenged and quite likely, their margins lowered to hold on to the business through reverse auctions [39]. Contrary to the widely-trumpeted view that eRAs ruin buyer-supplier relationships, when reverse auctions are properly conducted - with an emphasis on

fairness and transparency - the practice can actually work to improve relations between these parties and open-up the procurement process to new suppliers [2].

4.2. Coercion...or Opportunity?

Reverse auctions have been characterized as "the technology that has triggered more ethical concerns in the e-commerce arena than in any other segment of activity" [40]. Some observers have specifically criticized reverse auctions as being "coercive" in nature, due to the power being exerted by the buyer to force them to participate in the auctions and to reduce their prices during them [41, 42]. Indeed, some vendors can feel pressured to participate in a process where suppliers are pitted against one another to lower their prices and all the perceived benefits flow to the buying organization. Further, some suppliers bristle at the notion that their products or services are evaluated on a single factor - price - to the exclusion of other considerations - effectively commoditizing their market offerings [43]. From this perspective, the reverse auction scenario causes an exploitative relationship between buyers and suppliers, rather than allowing procuring organizations to partner with their suppliers. Yet, there is also a perspective that such tensions are inevitable with the respective parties in the buyer-supplier relationship having conflicting needs, goals, and expectations, and that these are evidenced both in and outside of the context of reverse auctions in a number of ways [14]. So suppliers face the question - will they participate in reverse auctions? Increasingly, the answer today is that they simply have to, as greater amounts of corporate and governmental spending are shifted to be decided through competitive bidding. As Moorhouse put it bluntly, "refusing to play....is an incredibly dangerous (and expensive) approach" [25].

Now, there is an alternative school of thought being offered that suppliers do indeed benefit, rather than suffer, from their participation in reverse auctions. This comes from the fact that the need for specificity and clarity in agreeing on the goods and services being auctioned causes buyers and suppliers to actually have more communication and work more closely together in the process [13]. For suppliers, the zero sum game environment of reverse auctioning also provides them with immediate feedback on their ability to deliver the right good or service in a real-time market environment. Such feedback is far more timely and specific than in a standard government procurement opportunity [44]. As such, "If a supplier loses the reverse auction, the supplier has the opportunity to refine its operations to reduce costs, produce better products, or otherwise meet the buyer requirements better." Also, due to the short time in which a reverse auction takes place, this significantly reduces the amount of time necessary to win a customer's business - and minimizes time spent on business prospects that do not end up choosing your firm for that specific procurement.

Furthermore, other researchers have found that the opportunities afforded vendors to engage in reverse auctions not only provides companies, particularly small businesses, new business opportunities, but also fosters their ability to be more cost-competitive through the price pressures inherent in reverse auctions [45, 46]. Moreover, all of this means that not only are vendors afforded more opportunities to compete for the business of more and more buying organizations, but they can do so on far more equal terms than ever before [17]. Finally, small businesses may be more able to supply specialty or hard to find items and thus, reverse auctions that are made open to and communicated with more and more small businesses may be more likely to produce viable suppliers and competition amongst them [47]. In the era of "The Long Tail," more and more procurements - for everything from the niche items that agencies invariably have to buy to spare parts for aged machinery, vehicles and yes, computers and phones, may make a wide span approach a necessity.

5. THE "MAKE OR BUY" DECISION ON HOW TO CONDUCT REVERSE AUCTIONS

5.1. The Concept of a "Market Maker"

There is no single business model predominant for electronic markets, as e-markets can be controlled by the buying organization, the selling organization, or "hybrid" or independent model, where a third-party controls and operates the online exchange [48]. These are *market-makers*, whose function is to bring together buyers and sellers in the exchange to conduct transactions, and their business model is focused on facilitating - and yes, deriving revenue - from the dollar volume of goods and services sold through their exchange.

The concept of market makers has been around since the first origins of Internet commerce, as opportunities - and needs - arose for independent entities to create interaction spaces for buyers and sellers to meet in a virtual marketplace and to develop and enforce rules for the transactions taking place there [49]. The market maker's role is central in developing commerce between the buyer and seller community, and of course, it is in the company's interest to ensure that the transactions they facilitate occur in as frictionless a manner as possible. In their 2002 book, *Making Markets: How Firms Can Design and Profit from Online Auctions and Exchanges*, Kambil and van Heck stated that the role of the market maker is amplified in importance in dynamic pricing over static pricing environments, due to the many informational and operational challenges involved in operating the marketplace [50]. As Grewal, Chakravarty & Saini captured it: "The market maker's role in facilitating interactions between buyers and sellers requires it to emphasize governance mechanisms that can ensure that market participants are able to participate in a fair manner. The better governed an electronic market is, the higher is the likelihood that it will attract participants and thus improve market performance (conceptualized as meeting strategic and financial objectives)" [51].

the roles played by market makers in online commerce today include:

- Creating and managing content on the site
- Matching buyers and sellers (attracting new participants to the marketplace, facilitating the buyers' search for sellers and sellers' search for buyers, and having a secure payments system in place)
- Managing participant opportunism (tracking buyer and seller histories on the site and enforcing rules for both parties)
- Price-making process (establish the rules for setting prices and the systems to enable reverse auctions to take place).
- Providing secondary services (training for participants, logistics, credit, etc.) [51].

5.2. Market Makers and Reverse Auctions

Eric van Heck, in his *Theory and Practice of Online Auctions*, identified five basic processes that all online auction designs must entail:

1. Search processes allow buyers and sellers to discover and compare trade opportunities,
2. Pricing processes ensure that price and allocation take place. Auctions, fixed price, or bilateral negotiations are a way to achieve pricing and allocation.
3. Logistics processes coordinate the transfer of physical and digital goods between sellers and buyers.
4. Payment and settlement processes ensure that payments are made from buyer to seller.
5. Authentication processes verify the quality of the goods sold and the reliability of buyers and sellers [52].

When choosing to use reverse auctions, an organization has to decide how much of this functionality they wish to take on. The decision certainly is a multifaceted one, as it depends not just on the organization's internal capabilities, but also its desire to take on those necessary functions and cost/benefit analyses as to how advantageous it might be to take on these tasks versus outsourcing these functions. Thus, online reverse auctions can be used by organizations in a variety of manners along a continuum between what might be described as: full-service ("when organizations use an outsourced vendor to provide some or all of the auction services") and self-service ("when the organization decides to use software and to conduct the reverse auction events themselves") [53].

Today, there are a number of firms - established names in e-procurement and entrepreneurial start-ups as well (see listing in Table 1 - Reverse Auction Providers) - that are market makers to private sector firms and public sector agencies. Why do organizations partner with such providers of reverse auction services? The decision to outsource this part of the procurement process may be done for a variety of reasons, including:

- scarce purchasing resources,
- time constraints for the purchase,
- fear of failure, a lack of expertise,
- the size and scope of the purchase,
- to develop internal expertise and best practices, and
- to reduce liability [53].

Table 1. Reverse auction providers.

Provider	Website
Ariba	www.ariba.com
ChemConnect	www.chemconnect.com
eBridge	www.ebridgeglobal.com/
Exostar	www.exostar.com
FedBid	www.FedBid.com
HedgeHog	www.hegdehog.com
iASTA	www.iasta.com
OnDemand Sourcing	www.ondemandsourcing.com
Perfect Commerce	www.perfect.com
Sorcity	www.sorcity.com

Certainly, when making decisions regarding reverse auction utilization, an organization has to "do the math" - realistically - in making what is essentially a "make or buy" decision. If the organization - be it a for-profit company or a governmental agency - has internal capabilities and software that can handle reverse auction operations, the process can be done in-house. However, while often the cheapest option - and the option that allows the organization to retain all purchase price savings generated from competitive bidding procurements, this is generally not the option that maximizes the savings and the efficiencies to be gained from venturing into

reverse auctioning. Indeed, experience has shown that the cost of involving a market maker through as a third party solution expedites and enhances the process for both the buying organization and its sellers. Research has confirmed that these "market makers" play a greater role than simply handling the mechanics of the reverse auctions and the transactions that flow from them. Indeed, while the third-party does derive revenue from the transaction, they serve a value-added role by enhancing buyer capabilities and by enlarging supplier opportunities [46]. These market makers "make" the reverse auction process easier and more efficient for both parties through conducting important functions including, but not limited to:

- providing a structured process with milestones,
- automating the process of creating RFPs,
- offering expertise in analysis of markets and prices,
- training both buyers and suppliers in use of the system,
- offering expertise in software, technical support and project
- management, and
- recruiting new suppliers to the market place which increases the level of supplier competition [9].

These market makers also add value in an additional way. This is because if a buyer runs their own reverse auction, vendors could become skeptical as to the legitimacy of bids or come to believe that the auction software is being manipulated by the buyer. Thus, the involvement of the third-party provides a neutraility and legitimacy to the reverse auction that is not possible without the presence of the market maker [9, 54]. As such, while simply using a reverse auction can enhance the "trust factor" among both the public and the supplier base that there is an open, transparent process in place, having the third-party market maker involved can take that to levels not possible through an internal agency-led process. Indeed, organizations employing competitive bidding can accomplish significant supplier "buy-in" to the process. Hannon reported what others in private sector and governmental procurement commonly report today, with buyers finding that: "We have found that our suppliers, even the incumbents, respect the integrity of the (reverse auction) process. We believe that a well-executed direct materials e-RFP followed by a reverse auction will give an excellent sense of what the market price is" [55].

5.3. The Cost of Market Making

So, once an organization – whether in the public or private sectors - decides to make use of the services of a market maker, then the matter of cost comes into play. According to the research in the field, there are four typical business models of eRA providers. These are:

1. Winning seller pays a per-transaction fee (percent of pre-auction estimated value of procurement). The e-RA service provider assists with market research, builds the e-RA in the software, trains bidders, and runs the e-RA biding event (full service option).
2. Buyer pays a per-transaction fee (percent of pre-auction estimated value of procurement). The e-RA service provider helps with market research, builds the e-RA, trains bidders, and runs the e-RA (full service option).
3. Software-only option. The buyer acquires a license to use e-RA software, builds each auction, and conducts e-RAs in-house. Here, the buyer must provide training to bidders and conduct all market research.
4. Outsourced option. The buyer contracts with an e-RA service provider for a fixed price per time period (or for an estimated number of e-RA events). For each requirement the e-RA service provider helps with market research, builds the e-RAs, trains bidders, and runs the e-RA bidding events during this time period [56].

Likewise, there are five different pricing models that can be used between the buying organization and the reverse auction provider. These are:

1. Percentage of spend: A fixed percentage of the value of auctioned amount would be taken as a fee by the third party.
2. Percentage of savings: A fixed percentage of the difference between current contracted and winning bid prices.
3. Fixed fee per auction: Payment of a fixed fee for participating in the auction.
4. Annual membership fee: Payment of a predetermined annual fee to participate in auctions.
5. Fixed fee + percentage: The independent intermediary takes a base fee in addition to a percentage of spend for each auction [57].

So, based on the level of services and the vendor's pricing model, an organization must expect to give-up a percentage of the savings generated through engaging in reverse auctioning as a "cost of doing business." However, based on the value being delivered by the market maker - in terms of facilitating and administering the auction process - and the internal cost/labor savings - the calculus to involve the market maker is most often a positive one. Finally, there are undoubtedly costs associated with reverse auctions, whether the organization uses the services of a third-party market maker or even if it opts to conduct the bidding through its own auspices and resources. The possible indirect costs for buyers associated with utilizing reverse auctions to include:

- service fees or licensing of third-party reverse auction software,
- more supplier visits,
- increased costs associated with transporting the product,
- qualification and inspection efforts,
- longer lead-times, additional resources to manage new suppliers,
- expenses in the extreme case when litigation is necessary to address supplier non-compliance [22].

Critics have made much over the gross savings produced by a given reverse auction and the actual net savings to be realized from the specific competitive bidding event [42]. And as there are various ways to calculate the actual "net" savings number from reverse auctions, these are "sometimes hard to assess" [37].

6. CONCLUSION

At the end of the day, we indeed see reverse auctions moving to the forefront of attention in the realms of both private and public sector procurement today. The hype of the e-business era has now become reality - with proven results in the private and public sectors. Through what is in essence a very simple mechanism, reverse auctions are saving millions and even billions of dollars everyday for organizations around the world. And with judicious use of this e-procurement tool, the total could be far, far more in the coming years. Perhaps just as importantly, the competitive environment of a reverse auction levels the playing field - allowing for new suppliers to break through and make the competition more open - more open in terms of access and more open in terms of the transparency of the competition itself. And yes, while incumbent suppliers may detest having their positions challenged, the openness works for all parties. Today, we see that reverse auctions are not hype - eRAs are a very real tool that can be used by acquisition operations to produce very real, very significant results. Reverse auctions can therefore go a long way towards making procurement efforts better, faster, cheaper, and

more accountable and transparent in the process. Thus, it is incumbent on leaders at all levels of companies and governments to ask a simple question: *Why aren't we using reverse auctions for appropriate - and significant - parts of our procurement spending?*

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