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Adding Unique Value: How Intermediary Process Development Promotes Market Clearing in an Online Auction

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Abstract

Recent online auction models have not specifically focused on how the intermediary or auctioneer firm adopts processes to facilitate the information flow between buyers and sellers to promote price setting, where supply equals demand, and the market is cleared. The increase in number and complexity of online auctions makes it important to understand the role of the online intermediary firm. This paper presents an online auction brokering model that combines the hub-and-spoke network structure with the pre-sale, sale, and post-sale stages of the transaction process to identify how the intermediary integrates trader firm information needs with behavioural and relationship characteristics and the internet functionalities of reach, richness and transparency to promote market clearing. This model, which has wider implications for other online and offline intermediated business models, is supported by evidence from a case study on Market Company, an intermediary firm situated in the New Zealand electricity market.

Key Words: Online Auction; Intermediary; Networks; Reach; Richness; Transparency

Introduction

Intermediary firms, traditionally referred to as auctioneer firms in off-line auctions, have often played an important role in facilitating the transaction process between buyers and sellers to develop a pricing mechanism that increases the likelihood of supply equaling demand, and hence the market to be cleared (Mahadevan, 2000; Spulber, 1996). The internet with its low associated costs, ease of access, and reach, richness and transparency data exchange functionalities (Evans & Wurster, 2000), now potentially enables intermediary firms to facilitate a more extensive quantity and range of data exchange than was possible before. As a result, participating buyers and sellers stand to benefit by making more informed decisions, resulting in reduced transaction costs of up to 50% on some occasions (Garciano & Kaplan, 2000), increased efficiencies, and ultimately improved profitability (Amit & Zott, 2001; Voros, 2006). The rapid increase in number and variety of online auctions (Parente, Venkataraman, Fizel & Millet, 2004) together with their reported benefits, especially in the business-to-business (B2B) environment, reinforces the need to understand the role of the intermediary firm in facilitating the information flow in this mechanism and to establish relevant theoretical frameworks (Mahadevan 2000).

Given the potentially important role of the intermediary firm in clearing the online auction market no specific reference is made to the processes undertaken by this firm in the online auction literature. The scant conceptual work in this area includes Mahadevan's (2000) model of various online auction types, and Parente et al's., (2004) online auction model developed from a systems perspective in the B2B environment. In contrast, the social networks perspective recognises the value of the intermediary firm's centralised position in linking together buyer and seller firms in a hub-and-spoke network structure to facilitate the transaction process (Burt, 1992). Though intermediated online network structures are reported to provide overall reduced transaction costs and increased efficiencies (Malone, Yates, & Benjamin, 1987; Spulber, 2003), researchers have yet to address specifically the extent to which the intermediary firm can facilitate these benefits at the points of pre-sale, sale, and post-sale across the online auction process.

This study contributes to the online business model and intermediary literatures by developing a multi-theoretical model to increase understanding on *how* the processes developed by an intermediary firm in a B2B online auction increase the likelihood of market clearing. Specifically, this paper identifies how the intermediary firm combines knowledge on trader firm information needs and behavioural characteristics, with key internet functionalities, to build a unique online auction brokering model. I illustrate the model by describing a case study of Market Company (M-Co), an intermediary firm that operates an online auction mechanism within a network of buyers and sellers in the New Zealand electricity industry. First, I construct a theoretical base to guide this analysis, and then use case study findings to develop the model and to identify its effectiveness. Finally, I discuss the implications of this model for other intermediated business models in the online and offline environments.

Building a Theoretical Base: An Online Auction Brokering Model

The hub-and-spoke network structure provides a basis to investigate how the intermediary firm develops processes to promote market clearing in an online auction in the B2B environment. In the discussion that follows, I present trader firms as occupying a peripheral position in this structure, with the hub or intermediary firm taking responsibility to connect these trader firms via the online auction mechanism.

Trader Firms: The term *trader firm* is used in this article to include both buyers and sellers, since the characteristics of each are very similar, with only a few changes in their importance, depending on the role the firm takes (Parente et al. 2004). Trader firms who take on the seller role typically hold important information that describes the features, value, and location of the products they wish to sell; and conversely, buyer firms similarly have data on the nature of the products they require, how they value these products, and the geographical parameters of where they will seek them (Lee, Whittle & Austrian, 2000). Products that are highly complex to describe, or are perishable and / or change their value regularly, often require the exchange of fine-grained, time- specific information. Such information requirements bring with them an added level of complexity for sellers to ensure that comprehensive, understandable and time-specific data is provided, and for buyers to access and understand this data in a timely manner, to place an offer. Sampler (1998) argued that extra value can be leveraged from online data exchange by identifying information which is either separable by its electronic capture, store, manipulation or transfer and is specific to either time or recipient. At this point there does not appear to be any systematic investigation into the product information needs of trader firms and their influence on the transaction process in the online auction mechanism.

There appears to be scant attention given to the likely influence of trader firm behaviour, or the nature or quality of their relationship links on the online auction process. Parente et al. (2004) suggested the longevity of existing relationships between buyers and suppliers are likely to impact positively on the transaction process. These views are supported by the social network perspective, where strong relationships developed over time are argued to lead to deep and trusted information exchanges (Burt, 1992). It has also been argued that the greater the number, or density of links, between competing buyers and sellers brought together in one critical mass in the online auction format, the greater the potential for liquidity and market clearing (Lee et al., 2000; Woods, 2000). Simon (1981), though, has cautioned that any value to be derived from the electronic exchange of data will be determined by the information processing capacity of individuals within the participating firms. Given that there is very little mention of the impact of trader firm behaviour in existing online auction models it is important that the practices adopted by the intermediary firm in levering these characteristics are investigated.

Intermediary Firm in the Hub-n-Spoke Network: Intermediary firms add value to the transaction process by: (1) coordinating buyers and sellers; (2) providing liquidity and immediacy; (3) guaranteeing quality; (4) price setting; and (5) market clearing (Spulber, 1996; 2003). Spulber (1996) identified these value adding activities as taking place during the transaction stages of pre-sale, sale and post sale. Though Spulber (2003) and Malone et al., (1987) argue that the intermediary firm adds value to the online transaction process overall, enabling the required tasks to be performed with greater speed, volume and efficiency than was possible before, they are not clear regarding the extent of value-add at each stage of the transaction process, nor more specifically the procedure followed in an online auction mechanism (Spulber, 2003; Malone et al., 1987).

Online intermediary firms can broker across a wider range of business models than before within the B2B, business-to-customer (B2C), and customer-to-customer (C2C) environments. More specifically, in the B2B environment online auction models are often based on either the forward or reverse auction mechanisms. The forward auction process operates in a similar manner to the traditional off-line auction where the intermediary firm brokers the transaction between the seller and a fragmented group of buyers. In this auction type, sellers drive the auction, and then multiple buyers enter into competitive bidding that leads to an upward price movement (Woods, 2000). The reverse auction mechanism, which is unique to the online environment, requires the intermediary to broker between a buyer and a fragmented group of sellers. The buyer enters a quote for a product and multiple sellers compete, with prices typically falling as sellers seek to undercut one another (Reiley, 2000). It is important to understand to what extent, if any, the intermediary firm should employ different processes to promote market clearing in these various auction types.

Auctions have traditionally been used to sell items of unique value and / or the buyer has a specific request such as pricing a construction project (Lee et al., 2000). In an offline auction the intermediary or auctioneer takes responsibility for providing data on the items being sold either in written and / or physical and verbal format at the site of the physical auction. However, in the online environment the intermediary needs to ensure items can either be clearly described and / or viewed online. Intermediary firms may lever the reach functionality of the internet to potentially link trader firms across a greater number of partners 24 hours per day, 7 days per week, in geographically dispersed locations (Evans & Wurster, 2000; Kandampully, 2003). Intermediary firms may also use this functionality to reach across and aggregate existing trader data and thereby facilitate multiple trader transaction relationships at a group level (Lee et al., 2000), as well as point-to-point transactions between those same traders at an individual level (Woods, 2000). The intermediary firm can use the richness functionality to provide trader firms with improved quality or volume of product data (Evans & Wurster, 2000; Fulk & DeSanctis, 1995) as well as improved information customization (Woods, 2000). Furthermore, the intermediary firm may lever the transparency functionality to manage what data is released, to whom, and when these exchanges should ideally take place. The transparency concept is suggested to be embedded within the relationship of transacting firms (Lamming, Caldwell, Harrison & Phillips, 2001). However, to-date there has not been any investigation into how the transparency, or reach, or richness functionalities might be best levered by the intermediary firm in the online auction process.

In sum, past research highlights the need to address the key question of this paper: '*How* can the processes developed by an intermediary firm in an online auction in the B2B environment increase the likelihood of market clearing?' This central question leads to two specific research questions:

- What are the characteristics and sources of information required by trader firms? And, what factors are likely to impact upon their data gathering and processing, and decision- making, at pre-sale, sale, and post-sale in the transaction process in the online auction model?
- How can a model be developed that shows how the intermediary firm develops processes that combine trader firm information requirements with other influences on their decision-making, and the functionalities of the internet, at each stage of the transaction process to promote the likelihood of establishing a price where supply equals demand and the market is cleared?

To address those questions I draw on an in-depth case study with M-Co, an intermediary firm that operates an online auction mechanism between trader firms in the New Zealand electricity industry. M-Co was selected as this intermediary firm has developed numerous processes in its online auction that combine trader firm information needs and characteristics with the functionalities of the internet to enhance the likelihood of market clearing. Approximately 85% of New Zealand's electricity trade passes through this network. Interviews were conducted with six M-Co management staff, including the CEO and marketing, operations, communication, and information technology managers, and one other information technology staff member, three management staff at each of six large electricity trader firms, and two operations staff at Transpower (asset owner and operator of the high-voltage electricity transmission grid). Data was collected via 26 face-to-face interviews that varied in length from one to one and a half hours. Follow-up telephone calls or emails were made to collect additional data where required. In order to respect participant anonymity, individual trader firms and M-Co staff are not identified. Case study findings were combined with firm internet searches and literature findings, in accordance with Yin's (2002) rules of triangulation to strengthen overall validity. Data was then analysed in an iterative manner to identify the content of the trader firm characteristics and the role of the intermediary firm (Strauss & Corbin, 1990) from which the online auction brokering model was developed.

M-Co – New Zealand Electricity Background

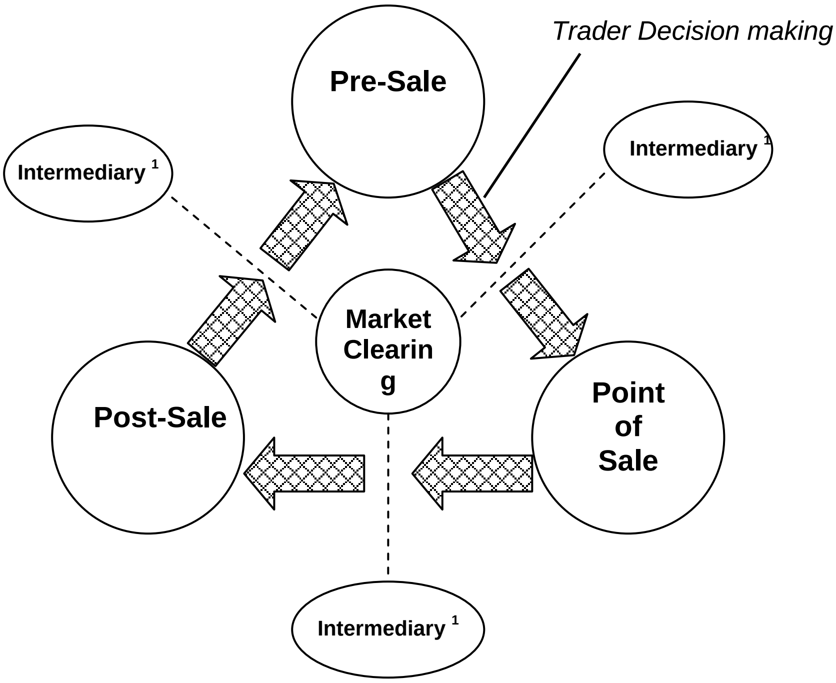
M-Co began operations in 1992, as a joint venture between the government and key members of the electricity industry in New Zealand, to establish a competitive market that included developing an online auction mechanism. Until this time "in essence, government rather than the market [had] set the price for electricity . . . Combined with this were further inefficiencies in the production and transmission of electricity" (M-Co, 2002, p.15). M-Co currently works with nine large electricity trader firms, who become generators when their supply exceeds their demand, and conversely buyers, when demand from their customers exceeds their generation capacity. Transpower is the high voltage grid provider responsible for ensuring the entry and exit of power from these traders via the 244 nodal grid points that run off the national grid that spans New Zealand.

Developing an Online Auction Brokering Model

The online auction models to date have been conceptual rather than empirical, and have made no specific mention of the role of the intermediary firm. Since intermediary firms play a central role in facilitating the exchange of increasing amounts of data across a growing number of online auctions, it is important to understand how they add value to this process. Though Malone et al. (1987) and Spulber (2003) argue that the online intermediary is likely to provide overall benefit to participating firms, there does not appear to be any specific investigation into the extent that the intermediary can add value at each stage of the transaction process in the online auction.

The multi-theoretical online auction brokering model developed in this paper (see Figure 1) shows a trader decision-making path that is influenced by their information requirements, behavioural constraints, and relationship characteristics. This path moves through the pre-sale, sale, and post-sale stages of the transaction process. The model shows how the intermediary firm, who occupies a central position on this path between each stage of the transaction, develops a series of processes to facilitate the information flow in order to promote the likelihood of market clearing. First, the intermediary acquires knowledge internal to the trader network, on their information requirements, behavioural constraints and relationship links; and then acquires knowledge external to this network, on the internet, including its reach, richness and transparency functionalities, and industry rules and regulations. Next, the intermediary firm combines these components to develop both online and offline rules and regulations that underpin the development of an on-line auction brokering mechanism. This model, which not only identifies the trader decision-making path and ultimately the transaction process as occurring in a cyclical manner, but also the important role of the intermediary firm in managing the relationship and behavioural characteristics of trader firms. This model is supported by case study findings from M-Co. The analysis that follows uses quotes and accounts from M-co to support the identification of trader firm influences on decision-making and the role of the intermediary firm.

Figure 1. On-line Auction Brokering Model



Intermediary Firm [1]

Online Auction Trading Platform

- *Internal Network Knowledge –*
  - *Trader Information Requirements*
  - *Trader Behaviour Constraints*
  - *Trader Relationship Links*
- *External Network Knowledge –*
  - *Internet functionalities*
  - *Industry and government rules and regulations*
- *Developing Processes*
  - *Combine internal / external network knowledge to develop trading rules, regulations, and structures*

Trader Firms: Influences on Transaction Decision Making

Pre-Sale: At this point electricity traders require data, external to their existing trader network, on regional and seasonal consumer demand patterns, lake levels for hydro generators, electricity industry rules, and government regulations. Trader firms also require data, held within their trading network, on the generation capacity and electricity purchase requirements of other traders. Due to the highly volatile, intangible, and perishable nature of electricity and the typically high variation in supply and demand, trader firms potentially require a large volume of complex data from both within the trader network and beyond, to increase the likelihood of increasing their accuracy in making bid / offer calculations. These findings highlight the potential benefits these traders could derive from the electronic transfer of rich, time-specific information, as argued by Sampler (1998).

All trader firms interviewed, reported that prior to entering M-Co's online auction system they were aware of their individual limits regarding the nature, quantity and extent of information they could locate and successfully extract in order to make bid / offer calculations. It was commonly reported that the rich data held in “this industry leads to information overload, really it’s physically impossible for one trader to get to grips with it all, all the time” (Trader Firm Participant). Another trader said the issues involved in gathering data “is a time thing, as well as a processing thing. There is just so much data to process that when you put it all together it’s very complex, with what you are prepared to bid or offer, and seasonal demands etc.” Findings here support Simon’s (1982) concept of bounded rationality whereby individuals or firms can become bounded by their behavioral capacity including physiological and / or psychological constraints to acquire, store, process, and recall relevant information to ultimately “solve complex problems” (p.198).

Participants from each of the six trader firms interviewed reported that they knew each other well, and together with three other large trader firms comprised 85% of New Zealand’s electricity market. Therefore, when the relatively small market size was combined with the perishable nature of electricity, these traders believe that it is not economically viable for them to reach out to find new traders. Though one trader firm’s report did say that “the more [traders] the merrier”. All traders interviewed had strong previously developed relationship links with one another, a feature that Burt (1992) associates with the exchange of rich information. However, traders typically report “really [we are] unable to share a lot of this information as we can’t afford to disclose our situation to other traders” (Trader Firm Participant), thus reflecting a need for non-transparent data exchange on some occasions to protect trader anonymity. It should be noted that all traders believed there to be overall trust in the industry. A trader reports:

> “It’s not so much that we don’t trust each other. I think that everyone has a healthy respect for each other. It’s more about putting trust into the process. We don’t want to let others know our identity and equally we are not interested in theirs. It’s about maximizing and arriving at a fair price that we either pay or offer for our product”.

Sale: At this stage trader firms are required to bring together all information gathered at pre-sale to decide on their final bid or offer price. The pressure for traders to make highly informed decisions become critical at this point. Trader firms are mindful that it is not viable to stop generation if their current production capacity exceeds their requirements, and likewise, they need to ensure that they meet the demand of their end customers and the rules established by the New Zealand government in ‘keep[ing] the lights on’. One “misinformed trade decision can cost over NZ$500,000” (M-Co Staff). It is at the point-of-sale that it becomes especially critical for trader firms to process complex, voluminous amounts of data, being mindful of their own collation and processing limitations, as well as the need to try and protect their anonymity from other traders to ensure fair trade takes place.

Post-Sale: Once an electricity sale has been made, trader firms move to this stage in readiness to calculate their next bid or offer at pre-sale. Since electricity is traded every two hours in a 24 hour trade cycle, and the next trade is likely to be in the same day, it is important that traders move quickly to understand and monitor recent sales. Trader firms can also gather sales data to build a series of longer term trends on issues such as consumer demand and the geographic location of trader supplies (M-Co, 2002). At this point, the demands on trader firm’s data processing and calculation skills are less demanding than at pre-sale and sale. However, traders still want to retain their anonymity on recent sales to increase the likelihood of fair trade in the next bid / offer time slot.

M-Co's Response: Building an Online Auction:

M-Co developed an electronic information trading platform that includes an online auction mechanism, in response to the needs of the New Zealand electricity traders, as highlighted above. This platform is referred to as the Commodity Information Trading System (COMIT). The processes incorporated in COMIT are underpinned by M-Co's knowledge of trader information needs both within and external to their trading network, their behaviour characteristics, and relationship links, as well as knowledge of the internet functionalities such as the concepts of reach, richness and transparency. This platform includes the operation of both online and offline rules and regulations. See Appendix 1 for a summary of COMIT's information functions.

Pre-Sale: At pre-sale COMIT enables trader firms to *reach* across their internal trader network to obtain data on the generation capacity and demand requirements from fellow traders, as well as to *reach* out to data sources external to the trader network, such as for hydrological data, industry rules and seasonal demands. Due to the large volume of *rich*, complex data available to traders, M-Co developed a personalized, *non-transparent* mechanism referred to as MyCOMIT that takes into account both the behavioural constraints of traders in processing large amounts of data and the need for a trader to retain their anonymity. Traders use MyCOMIT to plan their bid or offer strategies before entering the main COMIT system. For example, if a trader has limited generation capacity they can obtain *rich time* and *geographic specific* data on the purchase requirements of fellow traders in that same area by reaching across national demand volumes and filtering this data. When making bid or offer calculations, traders can move back and forth between MyCOMIT and COMIT, with this latter mechanism showing forecast prices developed in part from previous sales records, current demands and external data. To increase the likelihood of market clearing M-CO have developed the auction system whereby trader generators and buyers can enter offers and bids "for every single half hour during the 48 trading periods for that day" for "every single entry and exit point for electricity on the national grid" (M-Co Management Staff). Bids and offers can be made up to five days in advance and can be updated every five minutes up to two hours before a specific trading period. A staff member at M-Co reports:

> "What you tend to find is that 2 hours out from any period . . . just before every half hour, there's a little flurry of activity. Generators are trying to guess what that optimal price is. If they're one cent over, they don't get to generate. If they're one cent under or bang on, they'll get to generate. So they're always playing off against each other, and that's kind of how it works. Once that transaction goes through, the generators then get told that they have to dispatch, so rather than actually saying you're scheduled for electricity; you have to dispatch, you physically have to generate that electricity".

The bidding process designed by M-Co aims to maximise the data provided to traders while balancing the boundedly rational *behaviour constraints* (Simon, 1982), in their data processing. For example, the bidding system will not accept any changes to bids or offers made within two hours of trade as it is believed that other firms are unable to process the complex amounts of data required to readjust their bid or offer fairly. The mechanism also incorporates a *transparency* filter that gives bid or offer anonymity to protect the relationship between traders and to ultimately enhance their decision making.

Sale: M-Co continues to *reach* across the trader network, to identify and publish dispatch prices for electricity generated and sold from each of the 244 nodal grids for all 48 trading periods. Prices are calculated at the time electricity is dispatched and published up to 4 hours (8 trading periods) ahead of real time. The nodal pricing mechanism was developed by M-CO as a further attempt to provide generators and retailers with improved price signals so that they may “make the best possible generation and purchase decisions throughout the day and over time” to increase the likelihood of market clearing (Transpower Staff). This price also takes into account calculations made on data external to the trader network on generation and transmission costs. It is at this stage in the transaction process that traders are required to process the largest volume of time-specific data; and subsequently, it is also critical at this point that M-Co provides processes that fully lever the reach, and richness functionalities of the internet while taking into account the behavioural constraints and relationship characteristics of trader firms that include retaining trader anonymity on dispatch prices. For example, dispatch prices may be bundled across several nodal grids where there are few generators in order to protect generator identity. An M-Co staff member reports “You can’t say let’s have a look at the aggregated offers of all the generators in the lower South Island because there are only two. So you aggregate up and have South and North Island together.”

Post-Sale: At post-sale M-Co engages in a series of processes to enable traders to reconcile, clear, and settle all electricity transactions. The reconciliation process begins with M-Co reaching out to obtain data from the national grid provider who calculates the quantity of electricity bought and sold by each trader. M-Co then calculates the final price to be charged or paid to traders via a purpose-built electronic clearing and settlement system called CHASM that takes into account “over eight million pieces of data” from both inside and outside the trader network. The final price is calculated on the day after physical dispatch and available by 12 pm of that day. Full trade details identifying individual traders are not made public until 30 days after each trade day in order to reduce the likelihood of collusive or opportunistic behaviour between traders. While there is still a need to provide much time-specific data at this stage, the volume and frequency of data required is considerably less than required at the point-of-sale. Here, again, is an example of where M-Co is required to balance the information needs, behavioural constraints, and relationship characteristics of traders with their own knowledge of the internet to increase the likelihood of providing optimal data for decision-making and ultimately market clearing.

From here, the transaction process and data flow moves in a circular manner where trader firms typically use the data released by M-Co both during and after each 30-day trade period for forecasting their next bid or offer. A trader comments:

> “They [M-Co] won’t tell you who it is, but they’ll say where they think the market is going to clear . . . This allows us to decide whether we need to readjust our offers or tailor our generation. It also means retailers can use this information to readjust their bids”.

Effectiveness of On-Line Auction Brokering Model

The online auction brokering model developed in this paper is supported by case study findings from M-Co. There was unanimous agreement among trader firms interviewed that the processes undertaken by M-Co provide a platform to encourage a balance between providing voluminous amounts of data in a manageable manner that increases the likelihood of making optimal bids and offers. Since the introduction of COMIT, traders report that they have been able to consistently balance their supply and demand requirements at what they believe are fair trade prices and then clear the market; while still meeting the requirements of the New Zealand government to ensure a constant supply of electricity to final consumers. An M-Co staff member reports "the market definitely needs someone independent in the middle to sort out everyone's bids, offers, and whatever else goes through the system." One trader firm participant reports:

> "We could choose not to participate in it [M-Co], but if we didn't then we wouldn't have the competitive advantage that we currently have. We would lose customers . . . to other traders on the system who would be able to offer customers a more competitive price".

From a trader firm perspective, the future success of M-Co's online auction mechanism requires M-Co to continue to liaise with these traders to identify additional data sources that will even further enhance trader decision making, and then to build processes that facilitate this extra data flow, taking into account trader behavioural constraints and relationship links. These actions are likely to lead to even more accurate pricing than before, and therefore, will further enhance supply equaling demand, and the market being cleared.

M-Co staff believe their success in developing the online auction mechanism can be attributed to their "specific capabilities and proven performance of M-Co" in devising both online and offline processes in the New Zealand electricity industry. An M-Co staff member reports "These processes include not just information technology systems, but also governance structures, rule books, and legal structures and systems". Within each of these processes M-Co has levered the reach and richness functionalities of the internet particularly at the points of pre-sale and sale, to provide rich data segmented into knowledge specific components. At each point in the transaction process traders can obtain time and trader specific data, thereby supporting Sampler's (1998) strategic online information characteristics. The transparency functionality has in effect been used by M-Co to support the richness and reach functionalities across all three stages of the transaction process. M-Co suggests that "information transparency is considered key to enhancing the accuracy and economic efficiency of pricing" (M-Co, 2002, p.14).

M-co are now beginning to lever their online auction model for opportunities in a number of related energy and commodity markets. They have recently entered into a joint venture with the government of Singapore to build their electricity market. M-Co's systems and processes have also been used to develop a trading platform for the renewable energies market in Australia and the gas market in New South Wales, Australia.

Conclusion

Due to the increase in number and complexity of online auctions, it is important that the processes conducted by the intermediary firm in these mechanisms are understood and levered. Past online auction research has provided mainly conceptual models where no specific attention was given to the role of the intermediary firm. Though the intermediary literature argued that online intermediaries provide increased overall benefit to trader participants, no investigation was conducted into the value of these benefits when compared to their offline counterparts at each stage of the transaction process. My research has built on these findings to develop an online auction brokering model in the B2B environment that shows how the intermediary firm developed a pricing mechanism that promotes the likelihood of market clearing. This model is supported by case study analysis on M-Co, an intermediary firm, in the New Zealand electricity industry. Using the hub-and-spoke network structure this model showed how the intermediary firm developed processes at each stage of pre-sale, sale and post-sale, taking into account trader firm information needs, behavioural characteristics, and relationship links with the internet functionalities of reach, richness, and transparency.

Findings in this research can also be applied to other intermediated online auction types that exchange information on commodity as well as non-commodity products. For example, the reverse auction operated by COVISNT in the auto-industry which facilitates the exchange of non-commodity, low perish auto-parts, are likely to consider trader information needs, behaviour constraints, and relationship characteristics, when developing trade processes. Similarly, intermediary firms operating online auctions in the B2C and C2C arenas, such as eBay, take these same features into account in their processes and structures. For example, eBay has very clear and simple product search processes that can readily be used by the majority of the population, thereby reducing the likelihood of any potential behaviour constraints.

The components identified in this online auction brokering model can potentially be applied to other modes of online business, such as online catalogues or online advertising. For example, the developer of an online catalogue is typically required to collect and collate product data that displays some depth of description. Once again the developer is required to take into account the information needs, behavioural and relationship characteristics of buyers, as well as the functionalities of the internet, to provide an accurate, timely and understandable catalogue (Blodget & McCabe, 2000). Since the products listed in online catalogues are typically stable priced, high-turnover goods, once again the model developed in this paper is also likely to have value in non-commodity markets (Trepp, 2000).

My study contributes to the intermediary literature (Malone et al., 1987; Spulber, 2003) by identifying how efficiencies in the flow of data can be levered at each stage of the transaction process, including the development of processes to manage trader information needs, behavioural constraints, and relationship characteristics. This model can be used by an intermediary in establishing an online auction, or trader firms in participating in one, to identify where they are likely to lever most value, respectively. The components identified in this model could also be applied to off-line business intermediary situations, such as in the real estate industry. For example, a real estate agent can increase the likelihood of a successful property sale if they consider purchaser information requirements on a property, with their relationship characteristics and behavioural constraints, at each stage of the transaction process.

The online auction brokering model developed in this paper has made two important contributions to the literature. First, it has extended the availability of online business model frameworks. This model demonstrated that the internet functionalities alone were unlikely to benefit trader firms in the exchange of data, but rather it was the intermediary firm that played an important role in building processes that accommodated trader firm information needs and their behavioural characteristics. Second, the components developed in this model have extended the intermediary literature to show that online trade will not necessarily accrue equal value across the transaction process.

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Appendix 1

COMIT Information Functions

- Enter bids and offers to NZEM
- Obtain pre-dispatch and dispatch schedules
- Access forecast, dispatch, provisional and final prices
- View reserve prices and hydrological data
- Observe island supply and demand levels
- Receive market summaries and clearing settlement reports
- Send and receive email
- Obtain real-time news and information
- Create a personalized view of the market through MyCOMIT

(M-Co Report, 2002, p.14)