December 2003

The Role and Significance of the Electronic Market Maker

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16th Bled eCommerce Conference

eTransformation

Bled, Slovenia, June 9 – 11, 2003

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Abstract

The significance of the market structure, in particular the role of the market maker, on the overall success of a marketplace is still an unresolved issue. This paper examines market structures with a focus on the role of the market maker to identify the implications for participants of the various structures and mechanisms employed in electronic markets. Market maker strategies are classified in a framework according to economic, network, service and community perspectives. The market structures of intermediary, hierarchy, consortium and large group ownership are mapped onto this framework to provide a model that relates structure with strategy. Each ownership model has implications for other market participants. These include the economic motive for intermediaries and political (power) motives for hierarchies and consortia. The large group ownership model has potential for e-markets with community motives. Whilst all marketplaces have architectures it is the architectural detail that makes e-marketplaces different to their traditional counterparts.

1. Introduction

Markets and marketplaces have been a foundation for societies since ancient times. The Ancient Greek economy was based on the trading of olives and was both a vertical and international market. Later, medieval trade in parts of Europe was based around marketplaces, which formed a network of urban communities. Some markets had a strong community base, such as the burghers (merchants) of Turku in Finland who banded together to lower transaction costs in their trade with foreign towns (Kallioinen, 2002). In this respect, the structure of markets has been a determinant of success and continues into today's electronic world.

According to Palmberg (1998) despite arguments for the significance of market structure, and particularly the governmental role, in marketplaces there would appear to be no clear indication as to its real importance. This is particularly true of the electronic environment where there is a lack of theory on how electronic marketplace structures are developing. This research provides a framework that assesses the significance and implications of market structures in electronic markets. The framework can be used to inform and support companies considering participation in a marketplace or re-assessing their e-marketplace strategy.

The first section of the paper examines definitions of electronic marketplaces, whilst the second section discusses types of e-marketplaces. A theoretical framework for examining ownership-related issues is discussed and this is used to examine e-marketplace ownership structures. The final section proposes a model incorporating the framework and the examination of ownership structures. This can be used to help companies classify e-marketplaces according to their rationales and which can be used in the e-marketplace selection process.

2. What Are Electronic Marketplaces?

The proliferation of electronic marketplaces in the last five to seven years has been rapid and extensive. This has led to a diverse range of definitions highlighting differing perspectives such as the role of the stakeholders (FTC, 2000) or the interactivity of business communities (Brunn, 2002). However, Bakos' definition of an electronic marketplace as 'an interorganisational information system that allows the participating buyers and sellers in some market to exchange information about prices and product offerings' retains simplicity but manages to encompass the essence of marketplace activity (Bakos, 1997).

The level of e-marketplace activity has evolved from early matchmaking models to more complex interactive and interconnected marketspaces. Raisch (2001) describes four phases of e-marketplace evolution beginning with the transaction focus and evolving into the value-add marketplace that offers transaction support services. Currently, the transaction focus enables the buying and selling of goods through a variety of mechanisms, supported by transaction value-add services offering a wide range of financial and logistic capabilities. The increase in information value-add contributes enhanced industry knowledge and interorganisational collaboration and is moving electronic marketplaces into a third phase.

This will see services enhanced by capturing and utilising rich information flows into knowledge exchanges. The ability to integrate the transaction exchange, the value-add services and the knowledge services moves the evolution of e-marketplaces into Raisch's fourth phase. Value Trust Networks offer the promise of a new business platform of integrated and interconnected business communities.

3. Classifying Electronic Marketplaces

The proliferation of electronic marketplaces in the last five years has led to a wide diversity of ownership and business models, and many different classifications have been offered aimed at providing some level of clarity to prospective participants. At the most simplistic level, e-marketplaces can be defined as either vertical or horizontal although

this is no longer a clear-cut separation. Some larger vertical marketplaces have moved towards a more 'complete solution' [e.g. Quadrem] to procurement needs and horizontal marketplaces such as Freemarkets enable the purchase of industry specific goods.

Kaplan and Sawhney's (2000) well-recognised e-marketplace model focuses on the procurement aspects of electronic marketplaces. It differentiates purchases into manufacturing and operating inputs, then further distinguishes the method of purchasing into spot and systematic sourcing (see Figure 1). The dynamism of the market makers, seeking to survive in an overcrowded environment, has led to a blurring of these categories and marketplaces can now offer trading mechanisms to support one or more of the categories in the model.

Kaplan and Sawhney also make the important distinction between aggregation and matching mechanisms. The former is static in nature with fixed prices and either pre-negotiated contracts or metacatalogues. This is in contrast to the matching mechanism where prices are dynamic and buyers and sellers are fluid. Matching is a far more complex mechanism, but here again the development of software and the increasing experience of market makers are contributing to greater accessibility.

Several further classifications have been developed addressing different aspects of e-marketplaces. For example Sculley and Woods (2001) have added to an earlier model by Forrester Research, but these models are firmly based in the type of transaction mechanism and do not differentiate between what and how businesses buy. As e-marketplaces develop more complex, multiple offerings, the transaction mechanism model becomes less valid.

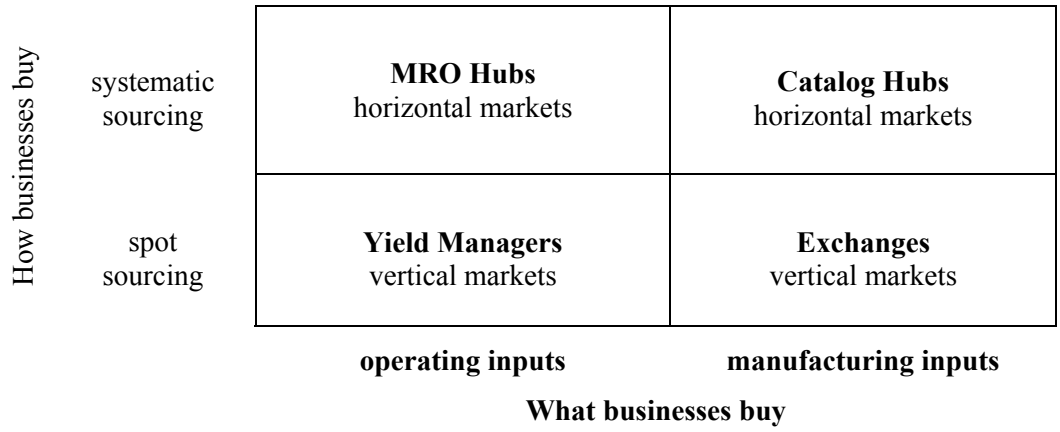

Figure 1: *Kaplan and Sawhney's B2B Matrix*

A further model by Piccinelli, Vitantonio and Mokrushin (2001) takes a different approach and its four categories of e-marketplace are based on the level of automation and the impact of pricing models. By using the level of automation as a criterion, it is possible to distinguish the complexity of the different types of marketplace, which is a useful guide when technological capabilities are important. This model also recognises that other services offered by electronic marketplaces beyond those of buying and selling have an impact on pricing and sales. This corresponds with Raisch's second phase of e-marketplace evolution where the focus on transactions and e-commerce evolves into provision of value-add services which support the transaction (Raisch, 2001). This will have an influence on the selection of an e-marketplace by a prospective buyer who is seeking more than a trading mechanism.

In contrast to the more complex models, Choudhury et al (1998) confine their differentiation of marketplaces to the level of service required by the buyer: identification, selection or execution. This distinction has the advantage of clarity, but it does not take into account the benefits that may be found in the value-add facilities which are a particular feature of the community portals described by Piccinelli et al (2001).

The classifications above each have their own perspective and the relevance of the classification feature used depends upon the view of the primary objective of the marketplace. However, none of the models described address the motivations of the market makers as a central concept to the development of e-marketplace structures. The next section examines the motivation issues of the market makers.

4. Theoretical Framework

To assess the role and significance of the market maker in e-marketplaces we use an adaptation of the perspectives of e-marketplaces presented by Forsund, Erikson, and Tangnes (2002). Market makers may have one or a variety of motives in creating and maintaining an electronic market-place and these are discussed as follows.

4.1 Economic Motive

Initial incentives for the development of an interorganisational information system are economic and involve three potential benefits for participants; cost reductions, productivity improvements and product/market strategy (Barrett & Konsynski, 1982). In addition to the opportunity for price reductions and greater access to new markets, the economic motive for engaging in e-marketplaces is bound up with transaction costs economics. Simply, the costs of a business fall into two categories: production costs and the transaction costs. The production costs are concerned with the process of transforming inputs into outputs. The transaction costs are the costs associated with finding someone with whom to do business, reaching an agreement about the price and other aspects of the exchange, and ensuring that the terms of the agreement are fulfilled (McTaggart, Findlay, Parkin, 1996). The early pioneer in this area is Ronald Coase who contends that it is impossible to understand the workings of the economic system without taking into account transaction costs (Coase, 1937).

A key work on transaction cost economics is by Williamson (1979). He identifies the critical characteristics of a transaction and links these to the institutional governance structure of transactions. The significant characteristics of a transaction are uncertainty, frequency of exchange and the extent to which investments are specific to certain transactions. According to Williamson, non-specific transactions are efficiently organised by markets, while recurrent specific transactions are more efficiently governed internally.

4.2 Network View

The network view of electronic marketplaces focuses on the relationships and communication infrastructure of groups of organizations that are bound together in some way. Interorganisational alliances are a form of network with social, political and economic implications. Here, the focus is on the socio-political arrangement. Oliver (1990) proposes six generalisable determinants of interorganisational relationships:

- Necessity to fulfill legal or regulatory requirements

- Asymmetry potential to exert power over other organisations
- Reciprocity desire to cooperate, collaborate and coordinate
- Efficiency internally focused efficiencies
- Stability in response to environmental uncertainty
- Legitimacy related to reputation, image, prestige, or congruence with prevailing norms in the environment.

4.3 Service Motives

The service motive is concerned with providing a better service to customers, which may include such things as continuity of supply, convenience and speed of processing and greater choice for buyers. The service motive is closely aligned to the economic motive but it has been kept separate, as this is not always the case. Higher service typically comes at a cost but in theory an organization could choose to deliver higher levels of service despite the extra cost.

There are five dimensions by which consumers evaluate service quality (Bebko, 2000; Berry and Parasuraman, 1991):

- Tangibles the appearance of physical facilities, equipment, personnel and communications materials.
- Reliability the ability to perform the promised service dependably and accurately.
- Responsiveness providing a prompt service and desire to help customers.
- Assurance the knowledge and courtesy of employees and their ability to convey trust and confidence.
- Empathy the caring, individualised attention the firm provides its customers.

In the e-marketplace environment, service quality relates to such things as the Web site and e-marketplace software, personnel, marketing literature and supporting documentation, the reliability of the system and help provided.

4.4 Community Motive

Some e-marketplaces are created with a community emphasis. In other words a major objective of the electronic market is to play a role in the development of a community. This is usually done through stimulating economic activity, working on the premise that if local/regional business flourishes then so will the communities they are part of. The market maker, usually local or state government, provides encouragement to adopt e-marketplace trading and in doing so raises the level of general e-business knowledge, skills and technologies within the business community.

4.5 Hybrid Arrangement

Of course, a market maker may have a set of objectives to achieve in the construction and management of the electronic marketplace. For example, the community model may be seen as being for the common good but may still need to be economically viable.

Issues such as trust between participants, information systems, revenue models, and transaction mechanisms are all features which can be used to support the primary motive.

5. Classifying Market Structures and Ownership Models

Rothwell and Zegveld (1981) examine market structure in relation to the role of government and the level of innovation in the procurement process. They make a theoretical distinction between monopsony (the government is the sole buyer in a market), oligopsony (a number of private or public sector large buyers in addition to the government) and polyopsony (the government is one of many buyers) to describe the procurement market structure.

Although Rothwell and Zegveld's work is useful for examining market structures in a government setting it is focused on how market structures impact on levels of procurement innovation and does not consider the market maker as an intermediary or neutral player. An extended version of their classification is therefore used to examine implications for participants of various market structures and market maker roles.

In considering the ownership models, we have not discussed the different levels of control that owners may wield over the marketplaces. Rather we have addressed the motivations and objectives for establishing the marketplaces, how these affect the market structure and ultimately the implications for participants. Levels of control may vary, but we argue that the implications of the underlying motivations of the ownership model remain valid.

An expanded version of Rothwell and Zegveld's market structures ownership model as applied to e-marketplaces is now discussed. The implications for participants of each model are highlighted and illustrative examples are presented.

5.1 Intermediary as Market Maker

Whilst disintermediation has been posed as a real threat for businesses that have acted as intermediaries some suggest that the Internet has increased the number of intermediaries to the extent that there is a transformation of intermediation taking place (Barr, 2002).

In the e-marketplace arena, "neutral" intermediaries have set up to match buyers with sellers. To avoid bias it is suggested that buyers and sellers be treated equally (Sculley & Woods, 2000). One such e-marketplace intermediary is Freemarkets.

> *FreeMarkets is the leading global provider of sourcing software and service solutions. Through its unique combination of industry-leading sourcing software, expert sourcing services, global commodity expertise, and operations support, FreeMarkets has helped customers around the world source $40 billion in goods and services and identify savings of over $8 billion through its FullSource offering.*
>
> *(Freemarkets)*

The primary aim of these intermediaries is to make a profit and whilst some may be doing this and some might be losing money due to the level of competition the economic motive is by far and away the driver for these market makers. Both buyers and sellers therefore should view the market maker as any other business partner or provider and consider issues such as cost of membership and transaction costs as well as level of service. Viewing the e-marketplace from a network perspective a company should assess the quality and number of members. From a service perspective the range of value added facilities and support could be assessed in addition to continuity of supply.

5.2 Hierarchy

In some cases, the sole owner of a marketplace is also the sole buyer. In theory this can happen in both private and public marketplaces. The Western Australian Government has created and manages an e-marketplace (Gem[tm]) for procuring goods and services:

> *The Government Electronic Market (Gem [tm]) is Australia's first comprehensive online government buying service. Gem is managed by the Western Australian Department of Industry and Technology (DoIT). DoIT's Government Electronic Market is comprised of a range of services. These Gem services cover the full range of government buying:*
>
> *Purchasing of low value commodities*
>
> *Public tendering for high value goods and services*
>
> *Contract planning, formation & ongoing management (coming soon)*
>
> *Through the Government Electronic Market, DoIT is creating an online environment that will streamline traditional business partnerships between the public and private sectors and significantly enhance the quality, timeliness and cost-effectiveness of services to the community.*
>
> *(Government of WA)*

The e-marketplace owner obviously has a strong economic motive and acting as an owner would allow this to remain an objective. The owner could also put in place policies to stimulate competition between suppliers by promoting higher levels of participation and by transaction mechanisms such as reverse auctions. One could argue with the power and influence vested in one entity that rather than a marketplace the structure resembles a hierarchy.

Sellers should be aware of the potentially increased power of the buyer in a hierarchical situation, where the buyer could have a monopoly on the information created on marketplace transactions. Many of the advantages of being a member of a network are mitigated under these circumstances and there would appear to be little impetus to provide high levels of value added service since if suppliers wish to supply the buyer they have to do so through the marketplace. Although there can be a community objective in the development of the sole owner marketplace it could be argued this is the owner exerting its influence and applying pressure to reduce transaction costs.

5.3 Consortium

Shared ownership by a small group of organizations takes on the form of a consortium where power is vested across the group, unless one of the group takes a leading role. In this respect, one of the group may take on the role of the quality leader (Palmberg, 1998). From an economic perspective the group can share the expense of managing the e-

marketplace. An advantage of group ownerships is that critical mass of participants should be easier to achieve which in turn should reduce the cost of goods and services by raising competition between suppliers. The strongest argument for group ownership is the network motive since organizations which once viewed one another as competition can collaborate in an industry network which can lead to a decision support and knowledge sharing environment labeled by Raisch (2001) as a value trust arrangement. However, such an industry network can form a power block to protect the group‘s interests and work to exclude competition. The service motive depends upon the ethos of the owners and the level of competition in attracting participants. Quadrem is an example of an e-marketplace owned by a number of major mining corporations.

> *Quadrem was conceived in mid-2000 by 14 of the world's largest mining, minerals and metals companies as a one-stop solution to specifically meet the eProcurment needs of the industry. Taking this vision and turning it into a reality, we have developed into a fully functional eMarketplace, with 20 shareholders, thousands of sellers and hundreds of buying locations, located across the globe.*
>
> *Quadrem is the eMarketplace for the global mining, minerals and metals industries. We offer supply-chain solutions that revolutionise traditional processes and offer unrivalled benefits for our Sellers and Buyers.*
>
> *(Quadrem)*

5.4 Large Group Ownership

Shared ownership by a large group diminishes the power of any individual owner member. The e-marketplace forms a weak network arrangement although stronger alliances may develop within the network. The owners would typically be buyers and/or sellers within the marketplace and the broader ownership base would help in gaining a critical mass of participation. Such e-marketplaces can be used to stimulate economic development and the community but may need a champion which is often the government. An example that is currently developing the profile of a large group ownership is the Regional Electronic Marketplace (REM):

> *The twin cities of Joondalup and Wanneroo in Western Australia have developed what they term as a regional electronic marketplace (REM). The e-marketplace aims to rpovide e-procurement and markting solutions for business, local government and education organisations within the North West corridor of the Perth Metropolitan area. A consortium is funding the initial development of REM that includes North Metro Community Association Incorporated (NMCOA), Online Joondalup and Wanneroo Councils, Edith Cowan University, Joondalup Business Association, Wanneroo Busienss Association and several other local businesses.*
>
> *(Joondalup & Wanneroo Internet Gateway)*

6. Discussion

The ownership of e-marketplaces is a significant issue for potential members or participants. This paper has argued that much depends on the objective of the owner(s) as to the likely implications for participants. Market structures vary according to the ownership models and the motivations of the market makers.

The motives for market makers to establish e-marketplaces have rarely been considered in the literature. There is an inherent assumption that the motivation remains purely

economic, but this view does not account for the development of the different market structures that are evident. In considering the ownership models of e-marketplaces in conjunction with the motivations for establishing marketplaces some conclusions as to primary motives can be drawn. Figure 2 establishes a framework that examines the implications of e-marketplace structures.

The earlier market makers were predominantly intermediaries and established marketplaces for economic motives. The opportunities for lowering transaction costs and reducing procurement spend were identified before the widespread use of the Internet (Malone, Yates, & Benjamin, 1987). The uptake of the Internet as a trading platform for e-marketplaces has enhanced the cost savings and extended access to new markets. Secondary motives, beyond the economic, are identifiable in intermediary owned marketplaces, but they are complementary to the main driver. For example, Freemarket's services to their clients incorporate many of the motives inherent in a service motivated market, but these services contribute to client satisfaction and ultimately enhance the economic outcomes of their marketplace.

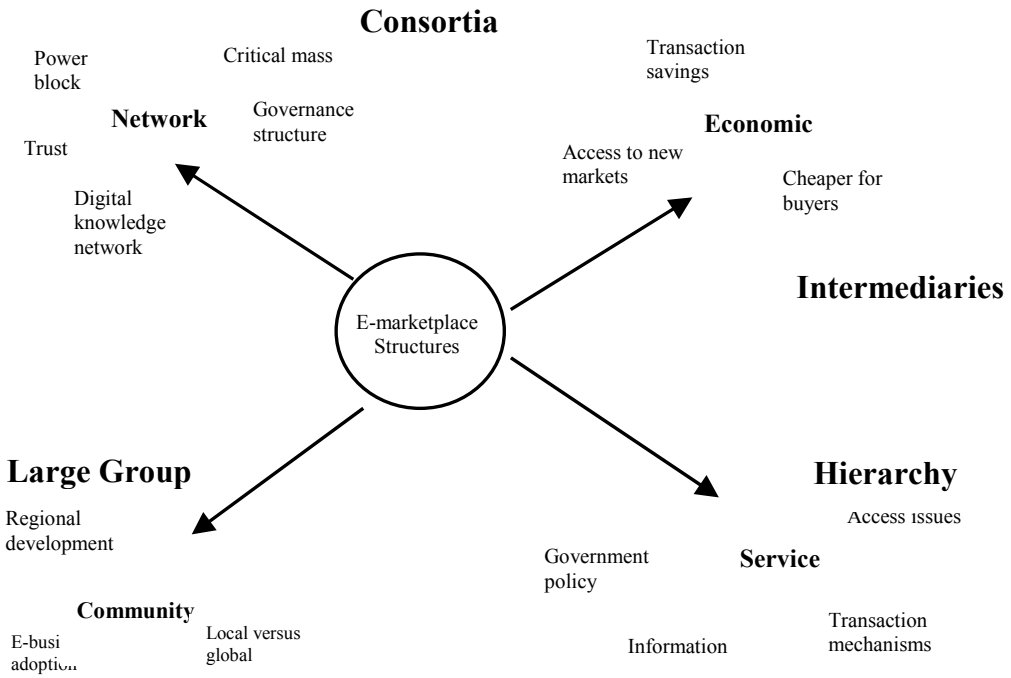

Figure 2: *A framework That Examines the Implications of e-Marketplace Structures*

In contrast, we argue that hierarchies, or private marketplaces, have an economic motive for establishing a marketplace, but their primary motive is service. Such marketplaces draw their supplier base into a closer relationship and enhance the ability of the supplier to interact with the buyer. By offering reliability and responsiveness with the assurance of trust and confidence, the market maker can attract suppliers and reduce the need for extensive searches. This in turn can reduce costs to the end customer and justify the expense of the private marketplace (Fox, 2001). However, the advantages of the private marketplace may be offset by suppliers' fears of undue influence by the buyer-owner. The hierarchy market makers include government marketplaces such as GEM, where the economic motive is evident, but competes with both the service and community motives.

Consortia market makers are perceived to have predominantly economic motives for market creation. However, on examination there is a stronger argument for the network view of the marketplace where consortium members have considerable power through their joint ownership and can bring their supplier bases to the marketplace establishing critical mass. Their ability to create an industry network is formidable and such networks can move outside the vertical chain as evidenced by the collaboration between Covisint and e-Steel (Konicki, 2001).

The community motive is very much associated with government initiatives in e-commerce. However, we predict the development of large group ownership structures emerging as the ability of e-marketplaces to contribute to community development becomes recognised. The large group, or cooperative, structure will have economic and network motivations, but the primary driver is anticipated to be community orientated.

In examining the implications of e-marketplace structures the primary motivation for establishment by the different ownership models can be identified, although there can be no definitive alignment between them. The model is designed to show the primary driver of marketplace creation and reflect the influences of other motivations. This leads to greater understanding of electronic marketplace structures and supports companies in designing strategies for e-marketplace participation. For example, a supplier in the mining industry may identify economic motives for extending their market through an e-marketplace. The model identifies further implications of the network potential for the supplier's participation if it were to select a consortium owned marketplace rather than an intermediary owned one.

7. Conclusions

The ownership of e-marketplaces is a significant issue for potential members or participants. This paper has argued that much depends on the objective of the owner(s) as to the likely implications for participants. Market structures can be set up and managed to deliver desirable outcomes for the owners. These are not necessarily economic outcomes, and they may not always be of immediate importance. Other objectives can be embedded in structures which emphasise network alliances to achieve political ends. Community development can also be a key objective but due consideration should be given to an appropriate ownership structure. Just as there is no perfect market in the digital world it is unlikely there is any neutral one either.

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