

Examining the Relationship Between Electronic Marketplace Strategy and Structure

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Abstract—The contribution of market structure to the success of an electronic marketplace (e-marketplace) is an issue that has not received a great deal of attention in the literature. Although, researchers have given some attention to the antecedents of successful e-marketplace participation by organizations, there has been relatively little attention given to the e-marketplace structures. In this paper, the issue of e-marketplace strategy and its relationship with e-marketplace structure is examined. A classification of e-marketplace strategies is presented. The market structures of intermediary, hierarchy, consortium, and large group ownership structures are mapped onto this classification using four case studies to explain the relationship between structure and strategy. Each structural model has a range of implications for market participants. These include the economic and service benefits from intermediaries, economic benefits, and the potential to deliver improved levels of service for hierarchies, the relational benefits from the strong network ethos of consortia, and large group ownership structures which have potential for regional community or industry sector development.

Index Terms—Business-to-business e-commerce, electronic marketplace, e-marketplace benefits, e-marketplace structures, strategy.

I. INTRODUCTION

THE NUMBER of business-to-business electronic marketplaces (B2B e-marketplaces) reached a peak in 2000 after which a period of consolidation took place [14], [15]. It is estimated that there are now just under a 1000 B2B e-marketplaces worldwide with the majority being located in North America and Europe (<http://www.berlecon.de>). The significance of e-marketplaces has not diminished since those that remain offer a more viable and sustainable business model for organizations to participate in. Although, researchers have given some attention to the antecedents of successful e-marketplace participation by organizations, there has been relatively little attention given to the e-marketplaces themselves. In particular, the literature on e-marketplaces has not explicitly addressed the strategic implications embedded within e-marketplace structures. The structural implications of e-marketplaces go beyond the perception of bias and neutrality mentioned in the literature [4], [8].

The purpose of this paper is to examine the relationship of e-marketplace strategy with e-marketplace structure. A classification of e-marketplace strategies is presented. The benefits and

issues related to each structural form are examined through an extensive literature analysis and a number of case studies. The resulting framework of structural implications can be used by e-marketplace developers to decide on an e-marketplace structure to match their strategy and potential participants to inform their e-marketplace selection and assess associated risks.

II. ELECTRONIC MARKETPLACES

A plethora of e-marketplace models exist and terms such as exchanges, hubs, auctions, and catalogue aggregators have been used to describe them [21]. In its simplest form a B2B e-marketplaces can be defined as an interorganizational information system that allows the participating buyers and sellers in some market to exchange information about prices and product offerings [2]. In addition, they can be either vertical or horizontal although this is no longer a clear-cut separation. Some larger vertical marketplaces have moved toward a more “complete solution” to procurement needs and horizontal marketplaces enable the purchase of industry specific goods. Indeed, e-marketplace structures are complex and vary considerably according to the market maker’s business strategy. The identifiable ownership and governance structures are the following.

- *Private Marketplaces* (hierarchies)—operated by individual companies to connect directly to their buyers/suppliers (e.g., Volkswagen);
- *Public or Intermediary Marketplaces*—independently owned and may be horizontal operations (e.g., Freemarkets) or operate within a specific industry (e.g., Chem-Connect);
- *Consortia Marketplaces*—owned by normally competitive organizations within one industry (e.g., Covisint);
- *Community or Cooperative e-Marketplaces*—ownership and management is spread over a large number of participants and in some cases all members (e.g., regional e-marketplaces).

Ownership and governance structures have only been given a brief treatment in the e-marketplace literature. A general assumption is that ownership structures can affect the level of bias found in a marketplace [27]. Private marketplaces are often thought to be biased in favor of the owner, but consortia and intermediary marketplaces are thought to project a neutral stance. The benefits of a neutral marketplace are perceived to outweigh other models due to increased transparency, better exploitation of market and supply chain efficiencies and higher levels of trust between trading parties [8].

The establishment of trust is an important consideration in the development of an e-marketplace. Trust reduces frictions in

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commerce and enables belief in the other party to fulfill obligations [26]. These obligations are seen differently by buyers and sellers, where the former view focuses on trust and associated terms of reliability and performance, while the sellers view buyers as motivated by performance on product attributes, price, and product availability. In the electronic environment trust has added dimensions that need to be overcome if business is to flourish and protect firms from opportunistic behavior [3]. This view is supported by Ba and Pavlou [1] who highlight the differences in transaction specific risks both on and offline. They examine the use of feedback mechanisms and analyze the effect of such mechanisms on trust in e-markets. Interestingly, they have found that credibility trust (a belief that the other party is honest, reliable, and competent) can exist without prior interactions.

To establish trust and reduce risk market makers are turning to a number of initiatives, including digital signatures, legal frameworks, insurance schemes, and comprehensive security systems. The use of third parties, such as escrow services, risk management companies, certificating authorities, and credit agencies are important elements in the establishment of trust [3], [17], [25], [44], [46], [52].

Bar [4] has suggested that the literature pertaining to e-marketplace ownership has been oversimplified. E-marketplaces can employ a variety of tactics and mechanisms to achieve their objectives. These tactics and mechanisms include defining and implementing the e-marketplace structure. The authors argue that the implications of structure and ownership are manifold and that it is a critical decision that impacts on the overall success of the e-marketplace from owner and participant perspectives.

Kaplan and Sawhney's [27] proposed model focuses on the procurement aspects of e-marketplaces. It differentiates purchases into manufacturing and operating inputs then further distinguishes the method of purchasing into spot and systematic sourcing. 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 complex mechanism, but 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. Sculley and Woods [48] have added to an earlier model by Forrester Research. 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.

Piccinelli *et al.* [39] takes a different approach and their proposed 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. Their model also recognizes that other services offered by e-marketplaces beyond those of buying and selling have an impact on pricing and sales. This will have an influence on the selection of an e-marketplace by a prospective buyer who is seeking more than a trading mechanism.

Choudhury *et al.* [9] confine their differentiation of marketplaces to the level of service required by the buyer. From a transaction perspective there are three levels of activity: identification of a buyer/supplier, selection of a buyer/supplier, and facilitation of the execution of a purchase [9]. In addition, e-marketplaces now offer a range of information functions or value-added facilities tailored to their market. These include a diverse range from industry news, complex online collaboration resources, and full community-style sites. The additional services are intended to enhance the marketplace's *value proposition* and attract higher levels of activity from marketplace participants [8]. This distinction has the advantage of clarity, but it does not take into account the benefits that may be found in the value-added facilities which are a particular feature of the community portals described by Piccinelli *et al.* [39].

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 strategic intent and motivations of the market makers as a central concept to the development of e-marketplace structures.

III. CLASSIFICATION OF E-MARKETPLACE STRATEGIES AND MOTIVATIONS

The strategic intents and motivations for developing and participating in e-marketplaces have been developed from an extensive literature review. The motivations for e-marketplace development and participation are classified according to whether they produce economic, relational, service, or community benefits. We include discussion of Porter's Five Competitive Forces as a parallel framework to show how our classification builds on and develops existing theories of competition. E-marketplaces are primarily viewed in the literature as economic entities [9]. However, this perspective is an oversimplification of the strategies and benefits associated with e-marketplace participation. The four key drivers or motivations for e-marketplace development and participation are presented in this section as a group of complimentary, and on occasions competing, e-marketplace drivers.

Assessing competition within an industry is considered an important part of strategy development. The strategies and motivations associated with e-marketplace development and participation can be understood within a competitive analysis framework such as Porter's Five Competitive Forces [40], [41] and the three key strategies of cost reduction, differentiation, and focus. Porter's early work [40] was further developed to consider the impact of the Internet on industry competition [41]. He argues that although the Internet has had a major impact on aspects

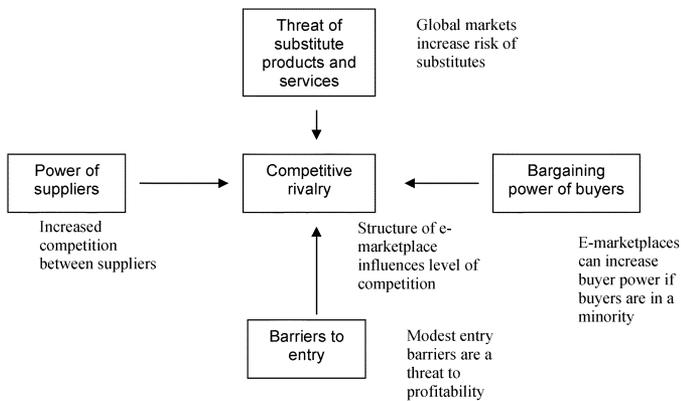


Fig. 1. Five forces model applied to B2B e-marketplaces (adapted from Porter [41]).

of conducting business the five competitive forces have not basically changed in significance. Fig. 1 applies the Five Forces Framework to B2B e-marketplaces. According to Porter, the most important determinant of a marketplace's profit potential is the intrinsic power of the buyers and suppliers in the product area [41]. If buyers or sellers are in the minority or possess differentiated products, they will gain power and profit. Most of the treatment of e-marketplaces by Porter refers to intermediaries, but he does note that if it is easy for buyers to transact directly with suppliers then they are less likely to use intermediary e-marketplaces and instead develop their own private e-marketplaces [41]. The ease with which e-marketplaces can be developed is clearly a problem for profitability and even industry associations that take over the management of digital exchanges to provide a "public good" may fail to provide ongoing benefits.

The three strategies identified by Porter can be applied to e-marketplace participation. E-marketplaces can be used as a method to drive down the costs of procurement (cost strategy), as a method to offer superior value-added services (differentiation) or as a method of streamlining procurement channels (focus). However, e-marketplace benefits are wide ranging and extend beyond economic benefits for a company. E-marketplaces have the potential to alter industry sector dynamics, especially when the major industry sector players cooperate in consortia. We argue that a multidimensional perspective of e-marketplace structures should take into a wide range of economic, relational, service, and community benefits. This classification both supports and extends Porter's Competitive Forces Model but is not limited to a purely economic perspective.

A. Economic

Major drivers for the development of interorganizational information systems (ISs) are economic and involve three potential benefits for participants; cost reductions, productivity improvements, and product/market strategy [5]. According to Porter, the main economic benefits of e-marketplace participation for buyers are low transactions costs and sometimes the ability to pool markets and in the case of sellers, lower transaction costs and access to wider markets. E-markets are

likely to improve the bargaining power of either buyers or sellers if one of them is in a minority [41].

The two mechanisms for conducting business activity are hierarchies (fixed relationships with suppliers handled within the firm) and markets [57]. Markets are seen as being more efficient from a transaction cost perspective. 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 [57]. E-markets have the potential to streamline and manage these activities and reduce some of the transaction costs associated with conducting business compared with hierarchies, where a company has to manage its suppliers and procurement processes [33]. However, market efficiencies may be related to certain types of nonrecurrent transactions [57] and some organizations develop closer relationships with their suppliers to obtain supply chain efficiencies as a form of competitive advantage [10].

The impact of e-markets on the price of goods bought and sold is a contentious issue. In some cases, e-markets enable buyers to obtain a better price but may also allow suppliers to obtain a higher price premium when they have information on availability of products [9]. This line of reasoning can be extended to a range of e-marketplace issues since both consumers and suppliers can leverage information technology (IT) to their advantage within the e-marketplace environment [22]. Even within e-marketplaces, it has been found that the benefits derived from participation are not automatic or evenly distributed among participants. In e-marketplace, some members may be passive in that they conduct few or no transactions deriving few benefits from membership [21].

The flexibility and accessibility of the Internet enables e-marketplaces to choose the extent of their target market area, ostensibly restricted only by language and distance related problems [53]. Many e-marketplaces, for example, advertise their global reach and allow participants the opportunity to trade worldwide, frequently offering a selection of language options. The development of third party logistic organizations and the proliferation of freight marketplaces offering a range of value-added services including customs, currency exchange and cargo tracking have alleviated many of the distance related problems, though costs remain significant [43]. Organizations seeking to extend their markets internationally have to address the development of strategies for managing globally [22], [34]. Despite the accessibility of the Internet, IT does not operate to global standards [53]. This leads to variations in operating environments and operating costs. Systems tend to reflect the dominant nationality of an organization's headquarters highlighting cultural differences in such areas as administration, design, and production processes [53]. Furthermore, elements of cultural difference are evident in holidays, time management, business practices, and payment methods, while complex differences in legislation (privacy, data protection, and import/export laws) apply across national and trading block boundaries. All these differences impact on the ability to establish relationships with physically dispersed suppliers [30] and build up trust [18], thereby inhibiting the development of a global supplier base. From both the market maker and supplier perspectives, these differences also inhibit

the ability to address differing customer expectations of care and support at a time when electronic commerce has led to greater expectations of individualization [48].

B. Relational View

A relational view of e-marketplaces focuses on the social and political intent within a relationship. Specifically, the term relationalism has been used to cover implicit open-ended relational contracts [23], but here we use it also to cover more formal explicit contracts that have various levels of relational embeddedness. In other words, the social factors that are part of a relationship or alliance, although they have economic implications, may be an important strategic objective in developing an e-marketplace.

An e-marketplace can be understood as a type of interorganizational relationship [36], network, or alliance [29]. Oliver [36] proposes six generalizable determinants of interorganizational relationships, which are relevant to e-marketplaces.

- 1) *Necessity*—to fulfil legal or regulatory requirements. For example, some private and government procurement systems are based on e-marketplaces. If companies wish to tender for contracts it must be done through the e-marketplace.
- 2) *Asymmetry*—potential to exert power over other organizations. Electronic marketplace consortia can be formed by major players in a market to exert influence over other organizations to participate [22]. Consortia members are in a position to define the policies and structure of the e-marketplace. When suppliers have to adopt specialized information and technology systems to participate in the e-marketplace then the supplier may feel “locked-in.” Porter [41] argues that the open nature of the Internet is less likely to result in lock-in. Although, this may be true for business to consumer e-commerce, it is unlikely to apply to the same extent to B2B e-commerce since these systems require specialized software, training, and experience. Williamson [57] argues that lock-in is symmetrical since the buyer cannot easily or quickly change suppliers. While this may act as a barrier in fixed supply chains, the buyer may have considerable choice within the supplier participant base in an e-marketplace.
- 3) *Reciprocity*—desire to cooperate, collaborate, and coordinate. Hierarchical e-marketplaces require the organizations in their supply chain to cooperate and collaborate by transacting and exchanging information [35].
- 4) *Efficiency*—internally focused efficiencies. E-marketplace participation may be seen as a way to reduce the cost of procurement.
- 5) *Stability*—in response to environmental uncertainty. A company may decide to enter an e-marketplace so it can become less dependent on a small number of suppliers.
- 6) *Legitimacy*—related to reputation, image, prestige, or congruence with prevailing norms in the environment. This has been shown to be an ineffective rationale for e-marketplace participation as companies that emphasize this as their reason for e-marketplace participation are more likely to be passive members [21].

E-marketplace owners and participants may be motivated by some of the above determinants. For example, a major purchaser may be able to use its power and influence as a consequence of being both the owner and the major purchaser to exert influence on suppliers to join or to engineer favorable market conditions [22].

C. Service Motive

Strategic objectives driving e-marketplace development can be related to service and quality improvement. These may include such things as continuity of supply [16], [19], convenience and speed of processing [31], and greater choice for buyers. Improved service can also be delivered by offering a greater range of services in a one-stop-shop environment such providing value-added information and delivery logistics services [8], [9], [45]. Along with a greater range of offerings are the capabilities to customize and personalize offerings through the digital medium [3]. According to Porter [41] a destructive aspect of the Internet is that is the reduction of competition to price alone. Forgotten in this, Porter argues, is the ability of the Internet to support improved service through convenience, standardization, specialization, and customization.

The service motive is closely aligned to the economic motive, but it has been included as a separate factor as some organizations may be more interested in improving the level of service than reducing costs (Table III). Higher service typically comes at a cost but an organization may choose to deliver higher levels of service despite the extra cost to gain a competitive advantage. There are five dimensions by which consumers evaluate service quality [6], [7] and these are explained in relation to e-marketplaces.

- 1) *Tangibles*—The appearance of physical facilities, equipment, personnel, and communications materials.
An obstacle for the online environment is making the service tangible. One method of making the service more tangible is to provide consulting support to the organizations to help them effectively use the e-marketplace. Value adding services bundled together provide the image of a one stop shop for procurement needs.
- 2) *Reliability*—The ability to perform the promised service dependably and accurately.
The participants need to trust that the e-marketplace will work effectively. The reputation of the e-marketplace is important in this respect. Participation in the e-marketplace may build up an expectation of continuity of demand for suppliers.
- 3) *Responsiveness*—Providing a prompt service and desire to help customers.
A major driver for participation is the speed and efficiency of with the transactions are conducted. An e-marketplace can provide a range of value added services to participants.
- 4) *Assurance*—The knowledge and courtesy of employees and their ability to convey trust and confidence.

The governance structure of the e-marketplace plays an important role in building trust between parties.

5) *Empathy*—The caring, individualized attention the firm provides its customers.

The e-marketplace can personalize and customize services for participants.

Improvements in service are likely to a major driver for government agencies developing e-marketplaces to interact more effectively with suppliers. Consortia and private e-marketplaces would also be concerned about using e-marketplaces to deliver better levels of service. Intermediary e-marketplaces need to consider the range and quality-of-service they provide in order to attract participants and maintain participant numbers.

D. Community Motive

Some e-marketplaces are created with a community emphasis. 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 [12]. The market-maker, usually local or state government, provides encouragement to adopt e-marketplace trading and in doing so raise the level of general e-business knowledge, skills, and technologies within the business community (Table IV). The e-marketplace itself can be viewed as an online business community. However, the ultimate aim underlying such a strategy is to further develop at least one of the following.

- *Business in a region or locality.* There are several examples of regional e-marketplaces sponsored by governments in Australia at the State and local levels [8], [12], [50].
- *Industry sector within a country or region.* A specific industry sector, possibly through a business association, may consider a community approach in order to achieve critical mass for buying and selling [41]. The Wine Industry in Australia, for example, could take a community perspective. Participants would typically be small producers that would not have the resources or bargaining power to operate independently. Working together in a cooperative style venture has the potential to impact on the viability of an industry sector as a whole. This type of arrangement has significant overlap with the relational motivation. However, a distinguishing feature is that all or at least a large number of participants have a sense of ownership in the marketplace.

Online communities that focus on resource sharing or act as learning networks are known as soft networks and could also fall in to this category [49]. However, instead of concentrating on the buying and selling and products and services the emphasis is on the sharing of information and knowledge that can be used to improve products and services or create new products or services [35].

IV. STRATEGIC IMPLICATIONS OF E-MARKETPLACE STRUCTURES

E-marketplace strategies have implications for the structural form of the e-marketplace. It is argued that the choice of e-marketplace structure is strategic in nature. Four e-marketplace structures are identified: Intermediary, Hierarchy, Consortium, and Large Group. The implications of each model for owners

TABLE I
ECONOMIC IMPLICATIONS OF E-MARKETPLACE
DEVELOPMENT AND PARTICIPATION

Economic Category	Specific Item	Source
Cost Reductions	Efficient price search	[2,3,9,33]
	Price competition	[34]
	Increased margins	[2,32]
	Transaction cost savings	[2,3,10,33,55]
	Lower prices	[53]
	Productivity improvements through value-add facilities	[8,42,3,45]
	Reduces inventory levels	[9,31]
	Speed and efficiency of transaction	[31,52,57]
Markets	Wider access to markets	[24,34,38,55]
	Pool markets	[41]
Higher prices	Higher price premiums	[13,32]
High costs of participation	High transaction commission	[59,26]
	High subscription fees	[11,16]
Lack of value proposition	Lacks critical mass and competition	[8,55,59]
	Lack of demand	[19]
	Lack of value added information	[3,21]

and participants are examined. The findings in relation to each e-marketplace have been determined through a series of case studies [58]. We have selected one major case study per e-marketplace structure. The empirical data gathering has been ongoing since from 2001 through to the present time and has involved a range of data gathering techniques including interviews with e-marketplace developers and participants, published reports, and information gathered via Web sites (Table V). A range of sources of information is important in order to provide a comprehensive understanding of the context and to form a link between the macro issues (formal reports) and the micro operation issues [47], [54]. All interviews with e-marketplace developers and participants involved questions related to the benefits, problems and issues that resulted from the e-marketplace structure. The case studies are presented in abbreviated form due to space considerations.

Rigour is maintained by an adherence to properly theorized questions, with clearly defined concepts and using a research method that is appropriate to the questions and the context [28]. This has been addressed by identifying the constructs from the literature (Tables I–IV), developing research questions from the literature and through the collection and analysis of the data. Transparency in the research process and reporting is important to provide visibility to other researchers and allow for judgement on its significance. In the study, we achieved this by keeping detailed records, recording interviews, and by using a software system to structure and store the data [28].

A. Intermediary E-Marketplace

While disintermediation has been posed as a real threat for businesses that have acted as intermediaries, some suggest that

TABLE II
RELATIONAL IMPLICATIONS OF E-MARKETPLACE
DEVELOPMENT AND PARTICIPATION

Relational Category	Specific Item	Source
Strategic dependence	Less dependence on a small number of suppliers	[33,3,55]
Power	Exert Influence others to join (compulsion)	[22]
	Power asymmetry	[22]
	IT lock-in	[57]
Legitimacy	Fear of being left out	[21]
	Reputation, image, prestige	[21]
Reciprocity	Cooperative, collaborative approach to exchange information	[3,53,8,35]

TABLE III
SERVICE IMPLICATIONS OF E-MARKETPLACE
DEVELOPMENT AND PARTICIPATION

Service Category	Specific Item	Source
Improved efficiency	Speed and efficiency of transaction	[31,59,32,52]
Specialized service	Personalisation	[3,56]
	Customisation	[3,55]
Greater range of services	Value added information	[9,8,45]
Continuity of demand	Continuous demand for products	[19,16]

TABLE IV
COMMUNITY IMPLICATIONS OF E-MARKETPLACE
DEVELOPMENT AND PARTICIPATION

Community Category	Specific Item	Source
Community benefits	Impact on region or locality	[12]
	Impact on industry sector	[49]
Resource sharing	Set up and running costs shared	[49]
Collaborative network	Emphasis on collaborative networks for information sharing and innovation	[59,8]

the Internet has increased the number of intermediaries to the extent that there is a transformation of intermediation taking place [4]. In the e-marketplace arena, there has been a very high failure rate in public e-marketplaces although the potential of the model is still recognized [19]. In the e-marketplace arena, "neutral" intermediaries have been set up to match buyers with sellers. To avoid bias, it is suggested that buyers and sellers be treated equally [48]. However, the whole concept of bias and neutrality in e-marketplaces has probably been oversimplified since intermediaries have the scope to provide certain participants with extra information, to allow some entry to the e-marketplace and refuse others entry [4].

Intermediary e-marketplaces must make a profit to be sustainable. 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, transaction costs, as well as level of service provided. When viewing the e-marketplace from a network or relational perspective a company should assess the quality and number of members. It should also consider whether some participants are being favored in terms of preferential market information. A prospective participant should not assume the market place is unbiased and is totally transparent. From a service perspective, the range value added facilities and support could be assessed in addition to continuity of supply.

An example of a business-to-business e-marketplace intermediary is Freemarkets which has recently merged with Ariba. Freemarkets was established in 1995 and specializes in auctions with a clientele amongst the Fortune 100 companies. Originally, their business model centered on their expertise in running large scale auctions (FullSource) for buyers, using a global supplier database that had been built up over time. Freemarkets organizes auctions for their clients using their knowledge and extensive database to set up and run large scale global auctions. They provide a high level of service to the buyer, assigning project managers to the client, training for buyer and invited sellers, advice on the best way to organize the auction, hosting the auction, and collating information. For their services they charge a percentage (approximately 1%) of the total value of the auction and some companies have found it rather expensive for some aspects of procurement [51]. Although Freemarkets has been designed to provide a high level of service, it does benefit from having access to company information and supplier databases of companies holding the auctions. In this respect, the notion of being entirely neutral as an intermediary is open to conjecture [51].

Interviews with Freemarkets' representatives, buyers, and suppliers identified a number of benefits and issues. Alcoa Alumina Australia have been using Freemarkets throughout the period 2001–2005 and found that they could gain immediate access to a global market to achieve their aims of cost reductions related to procurement. This resulted in them being able to make considerable cost savings on some procurement goods and services. Although there was a cost to participation in the intermediary e-marketplace, Alcoa did not have high e-marketplace development costs or maintenance costs. The auctions run through FreeMarkets provided a transparent mechanism for all participants although Alcoa had some concerns of the use of the data related to their auctions by the intermediary itself. Interviews with suppliers and buyers highlighted that the perception of the e-marketplace as relatively unbiased toward buyers and suppliers. Alcoa had reviewed other e-marketplaces as potential procurement channels but were concerned that some lacked a critical mass of participants. Procurement staff at Alcoa were impressed by the professional level of service offered by Freemarkets and the quality of the technical, consulting, and administrative support in addition to the range of value added information services. Small suppliers within Freemarkets often complained about the high costs of participation.

Alcoa's strategy of using the intermediary e-marketplace to reduce the costs of procurement was largely realized, and although there were some service benefits the economic benefits were seen as the main advantage of participation. The benefits

TABLE V
CASE STUDIES OF E-MARKETPLACES

Type of E-Marketplace	E-Marketplace	Data gathering	Data gathering period
Intermediary	Freemarkets	Developers, Buyers and suppliers Total of 23 interviews Survey of participants	From 2001 to present
Hierarchy	GEM - Government E-Marketplace	Developers, Buyers and suppliers Total of 27 interviews	From mid 2001 to present
Consortium	QUADREM	Developers, Buyers and suppliers Total of 24 interviews	From 2002 to present
Large Group	REM	Developers, Buyers and suppliers Total of 35 interviews Survey of participants	From 2002 to 2005

TABLE VI
BENEFITS AND PROBLEMS ASSOCIATED WITH FREEMARKETS (INTERMEDIARY E-MARKETPLACE)

Intermediary	Economic Implications	Relational Implications	Service Implications	Community Implications
Strategy: To realise supply chain efficiencies and improved service	High cost of participation	Attempt at transparency	Professional e-marketplace - technical, administrative support	Perceived as favouring a wider geographical market
	On-going maintenance of marketplace responsibility of intermediary	Reluctance to share information due to security and privacy issues	Value added market information usually available	
	Existing marketplace - no set up costs	More likely to be perceived as unbiased	Access to e-marketplace advice and expertise	
	May lack critical mass and competition/demand			

and problems associated with Freemarkets as an intermediary e-marketplace are summarized in Table VI.

B. Hierarchy E-Marketplace

Hierarchies are frequently referred to as private e-marketplaces. The e-marketplace owner typically has both a strong quality or service motive and economic motive in setting up the e-marketplace. The owner/buyer may put in place policies to stimulate competition between suppliers by promoting higher levels of participation and by transaction mechanisms such as reverse auctions. The power and influence is vested in one entity. Sellers should be aware of the potentially increased power of the buyer and that the buyer could also have a monopoly on the information created on marketplace transactions. There would appear to be little impetus to provide high levels of value-added service in a hierarchy since that may improve the bargaining power of the supplier. Certain types of information may be made available to suppliers so as to improve the quality of products and services supplied. Although there can be a community objective in the development of the marketplace, it could be argued this is the owner exerting its influence and applying pressure to reduce transaction costs.

The Western Australian Government has created and manages an e-marketplace in the form of a hierarchy since it is the sole buyer and has many sellers. The State Government Electronic Market (GEM) (<http://www.gem.wa.gov.au/Gem>) is Australia's first comprehensive online government buying service. GEM services cover a wide range of government buying. GEM was created with the aim of reducing costs through the introduction of more efficient procurement practices for government. In addition to cost reduction, GEM also has a number of other objectives that are aimed at improving the service to suppliers (taken from the GEM Website):

- increasing the accountability and transparency of government purchasing;
- increasing the levels of compliance with State Supply;
- commission procurement and purchasing policy (including Buy Local and Common Use Contract policies);
- demonstrating leadership in the implementation of the Australian Procurement Construction Council (APCC) guidelines and standards for electronic procurement;
- assisting West Australian industry to enter the world of e-commerce in a safe and secure government environment.

TABLE VII
BENEFITS AND PROBLEMS ASSOCIATED WITH GEM (HIERARCHY E-MARKETPLACE)

Hierarchy	Economic Implications	Relational Implications	Service Implications	Community Implications
Strategy: To realise supply chain efficiencies and improved service	Set up according to buyer needs	Security risk less in private e-marketplace	Security risk less in private e-marketplace	More likely to focus on the industry sector of developers (buyers)
	Set up costs	May lack market transparency	Improved communication with buyer	
	On-going maintenance of marketplace	Locked into buyer technology	Lack of IT/e-business sophistication in suppliers	
	Increased competition between suppliers	More likely to be perceived as biased		
		Conditions may favour buyer		

The e-marketplace involved considerable set up costs and was aimed at improving supply chain efficiencies. The State Government also emphasized improvements in supply chain service as a major driver. The development of a private e-marketplace by the government was less likely to create security issues compared with adopting an intermediary. GEM has struggled to obtain a critical mass of transactions with many small and medium enterprises being suspicious of the Government's motives for developing the e-marketplace. The perception from some SMEs is that the motive is mainly to increase competition between suppliers and as a result drive down costs. SMEs are sensitive to the power asymmetry with the Government and that Government's access to additional market information through GEM will exacerbate the issue [45]. The Government of Western Australia is a major purchaser in the region, and it is important for many companies to be awarded contracts. According to the GEM developers, the setup and ongoing maintenance of the system has been expensive but it has improved communication with suppliers in terms of contract requirements and communication of opportunities. Some suppliers felt they were disadvantaged by the e-marketplace since they lacked the IT sophistication to effectively use it.

Overall, the developers of GEM found that the e-marketplace reduced transaction costs related to procurement and, therefore, this coupled with the increased competitive pressure on suppliers provided economic benefits. The benefits and problems associated with GEM are summarized in Table VII.

C. Consortia E-Marketplace

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 members takes a leading role. In this respect, one of the group members may take on the role of the quality leader [37]. From an economic perspective the group can share the expense of managing the e-marketplace. An advantage of group ownership 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 relational

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. Such an industry network, however, 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 a consortium e-marketplace owned by a number of major mining corporations. Quadrem was developed in 2000 by 14 of the world's largest mining, minerals and metals companies as a one-stop solution to specifically meet the e-Procurement needs of the mining industry. The e-marketplace now has 20 shareholders and thousands of sellers and hundreds of buying locations, located across the globe. Quadrem has involved considerable investment from the major players and there are high ongoing maintenance costs. The emphasis of Quadrem has been on industry based supply chain efficiencies and high-quality professional service through a sophisticated technology platform (<http://www.quadrem.com>). The dominance of the mining companies that set up Quadrem has led some companies to believe that there is a power asymmetry which pressures companies to join. In addition, some felt that the system was not fully transparent as some features may be designed to favor the major buyers. However, both suppliers and buyers acknowledge the improved level of communication, the continuity of demand that major mining companies create, the reliability of the software system and the highly integrated and sophisticated nature of the e-marketplace. The high level of funding for the development of Quadrem and the critical mass of buyers allowed the development of value added services and information. Security was not mentioned as an issue by the suppliers interviewed. Quadrem has stressed the importance of developing the network of participants and alliances with other e-marketplaces, and in this respect emphasizes the relational benefits of e-marketplace involvement as much as the economic benefits.

The network benefits of Quadrem were cited as key benefits of participation. The major mining companies cooperating in such a venture meant that a more elaborate system could be

TABLE VIII
BENEFITS AND PROBLEMS ASSOCIATED WITH QUADREM (CONSORTIA E-MARKETPLACE)

Consortia	Economic Implications	Relational Implications	Service Implications	Community Implications
Strategy: To develop a major purchasing entity and to make broad supply chain efficiencies	High set up costs	Dominance of group can persuade suppliers to join	Improved communication with buyers	More likely to focus on the same industry sector of consortia developers (buyers)
	Increased competition between suppliers	Security risk less in private e-marketplace	Group provide continuity of demand	
	On-going maintenance of marketplace	Perceived as a power block	Solid ability to execute	
	Improved collaboration with suppliers	Conditions may favour buyers	Usually highly customised and integrated	
		Lack of alternatives for suppliers		
		May lack market transparency		

developed compared with any single company going it alone. The quality of the e-marketplace that could be developed resulted in a range of value-adding services and information that both buyers and sellers found useful. Although some mention was made of lower prices being obtained for some products the service issues were strongly emphasized. The benefits and problems identified with Quadrem are summarized in Table VIII.

D. Large Group Ownership E-Marketplace

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.

A key benefit of this type of e-marketplace structure is that the costs of setting up the marketplace and the running costs are shared broadly amongst the participant owners. In addition, the broad ownership structure, if managed effectively, is likely to overcome perceptions of bias. A potential problem associated with a large group e-marketplace structure (cooperative) is designing an effective decision-making and management model. If all participants are involved in the decision making, the process may be protracted. The e-marketplace may suffer due to having a "cooperative" style image which lacks professionalism. Those companies with expertise and experience in e-marketplaces may decide to go it alone and, hence, those companies that band together in a cooperative arrangement may have very little expertise in the e-marketplace arena.

The twin cities of Joondalup and Wanneroo in Western Australia initiated what they term a regional electronic marketplace (REM). The REM was operational in December of 2002.

The major drivers for the projects were to increase e-commerce adoption, stimulate greater interaction between businesses in the locality, and produce savings and efficiencies for buyers and sellers, all within a local region. The aim was to spread the ownership across a large number of entities. These include North Metro Community Association Incorporated (NMCOA) Online, Joondalup and Wanneroo Councils, Edith Cowan University, Joondalup Business Association, Wanneroo Business Association, and a range of other local businesses. NMCOA is a not-for-profit incorporated body with most of the sponsors as its founding members.

The intention was for SMEs to access the REM without high entry cost or EDI compliance barriers; access being available via a range of communication facilities including Internet, fax, or WAP-enabled mobile telephones. At the planning stage, the key motivations for development of the regional e-marketplace were the following.

- Increase e-commerce adoption in business community.
- The project aimed to improve awareness related to the benefits of e-marketplace trading in the region.
- Improve business efficiency in the locality.
- It anticipated that e-marketplace participation would reduce costs for local businesses and make them more efficient.
- Increase trade within the locality.
- It was expected that trade within the region would increase as businesses trade more with one another rather than with businesses outside of the region.
- Expansion into new markets.
- The City Councils expected that when companies became comfortable with e-marketplace trading they would be more likely to venture into other e-marketplaces and as a result access other state, interstate, and international markets.
- Development of the region generally.

TABLE IX
BENEFITS AND PROBLEMS ASSOCIATED WITH REM (LARGE GROUP OWNERSHIP (COMMUNITY) E-MARKETPLACE)

Large Group	Economic Implications	Relational Implications	Service Implications	Community Implications
Strategy: To develop an on-line community e-marketplace	Set up costs shared and so reduces costs of participation	More likely to be perceived as unbiased	May lack leadership and management	Government initiatives tend to have a local emphasis
	Lack of funding can create start up challenges	May lack professional image due to lack of funding	May lack expertise in e-marketplace management	Ownership and management responsibilities are shared
	Difficult to communicate value proposition			

TABLE X
SUMMARY OF THE STRATEGIC EMPHASISES IN E-MARKETPLACE STRUCTURES FROM THE FOUR CASE STUDIES

Strategic Emphasis	Factors	Intermediary	Hierarchy	Consortia	Large Group
Economic	Price reduction through increased competition	High	High	High	Medium
	Emphasis on transaction cost reduction	High	High	Medium	Medium
Relational	High level of power asymmetry	Low	High	High	Low
	Improve collaboration	Low	Low	High	Low
Service	High levels of service	High	Medium	High	Low
	High continuity of demand	High	Medium	High	Medium
Community	Industry sector focus	Low	High	High	Low
	Local focus	Low	Medium	Low	High
Pre-e-marketplace	Industry structure pre-e-marketplace	Local focus with close relationships with a few suppliers	Fragmented procurement system with strong relationships with key suppliers	Independent procurement systems for each company	Fragmented market dependent on procurement practices of individual firms
Post-e-marketplace	Industry structure changes as a result of e-marketplace	Global market with less dependence on a few suppliers	More competitive for suppliers and less fragmented procurement system	More cooperation and industry sector collaboration More competition between suppliers	Increased choice in buyers and suppliers
Main Benefits		Economic and service	Some economic benefits for buyer and service improvements for buyers and sellers	Relational benefits for buyers and sellers	Some economic benefits
Success or Failure		Success	Mainly a success but some benefits not delivered	Success	Eventual failure due to lack critical mass

It was hoped that the REM would play a role in developing the Northern suburbs as an attractive proposition for new businesses. The Two Cities e-marketplace Web site stated: This facility will encourage the growth and retention of jobs within our region by encouraging a more effective "buy local" attitude (<http://www.2Cities.com.au>).

The development and maintenance costs of the REM were spread across a large number of participants, although the shortage of funding meant that the system lacked a highly professional image. Generally, it was difficult to get buyers and suppliers to the value proposition and this created problems in obtaining a critical mass of participants. The companies using the e-marketplace had no concerns about the e-marketplace

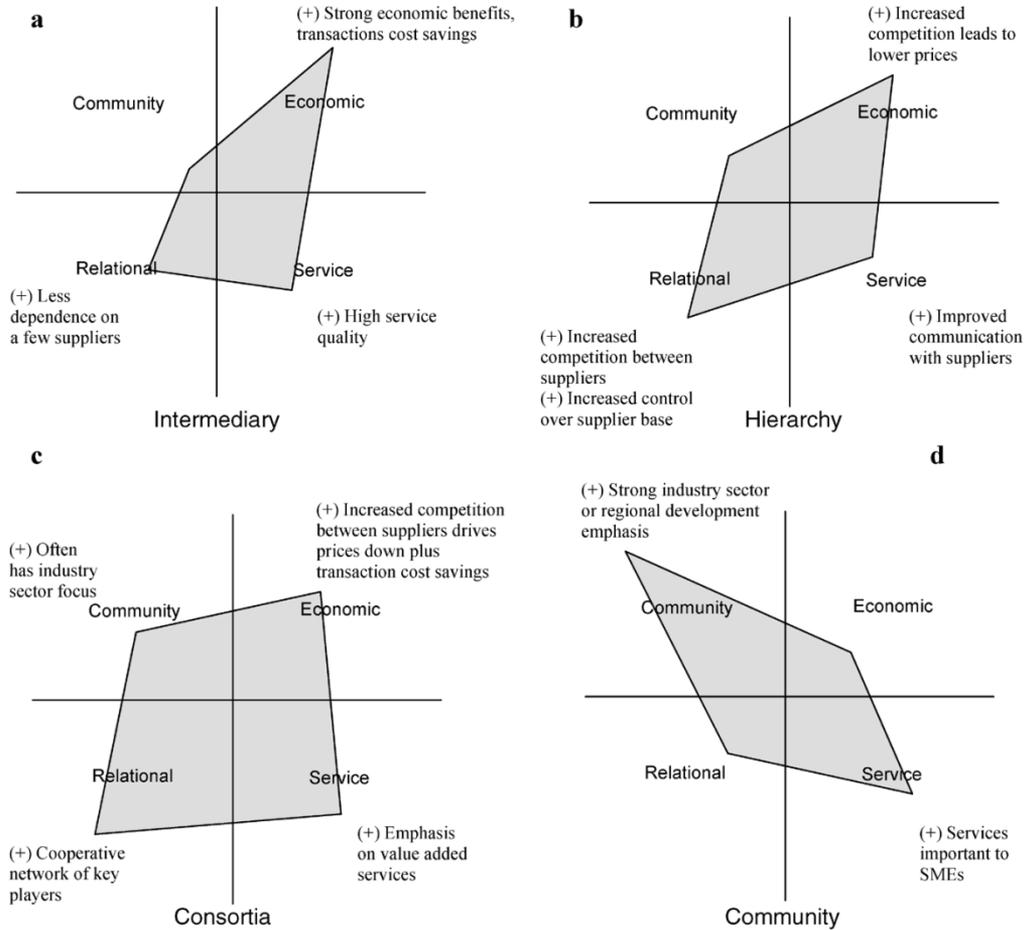


Fig. 2. Strategic implications of B2B e-marketplace structures for developers and buyers.

being biased in any way. The developers lacked experience in e-business and had never before been involved in e-marketplace trading and the shared management responsibilities delayed decision making.

Strategically, the e-marketplace was developed to deliver community benefits in the form of stimulating trade between local businesses. After trading for 18 months, the REM was withdrawn in early 2005 due to lack of transactions and participants. The main reason ascribed to the failure was the low volume of transactions and the lack of participants. These resulted in a financial crisis and meant that operations had to cease. The benefits and problems with the REM are summarized in Table IX.

Table X compares the findings from the four case studies. The e-marketplaces had a significant impact on the relationships between buyers and sellers. Less dependence on key suppliers and greater competition between suppliers meant that buyers/developers seemed to gain more power and control from the introduction in intermediary and hierarchy e-marketplaces. The four e-marketplaces demonstrate the full range of benefits being obtained. Noticeably, the consortia and intermediary were considered the most successful. In GEM, some potential suppliers were suspicious of the government's motives and the REM failed to obtain a critical mass of participants.

V. DISCUSSION

The structure of e-marketplaces has many implications for developers and members or participants. In this section of the paper, we identify the key implications of e-marketplace structures for developers and participants. The implications are determined from the analysis of the literature and the four case studies. The strategic intents of market makers to establish e-marketplaces have focused mostly in the literature on the economic objectives. There is an assumption that the motivations remain purely economic [23], but this view does not account for the development of the different market structures that are evident.

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 [33]. 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

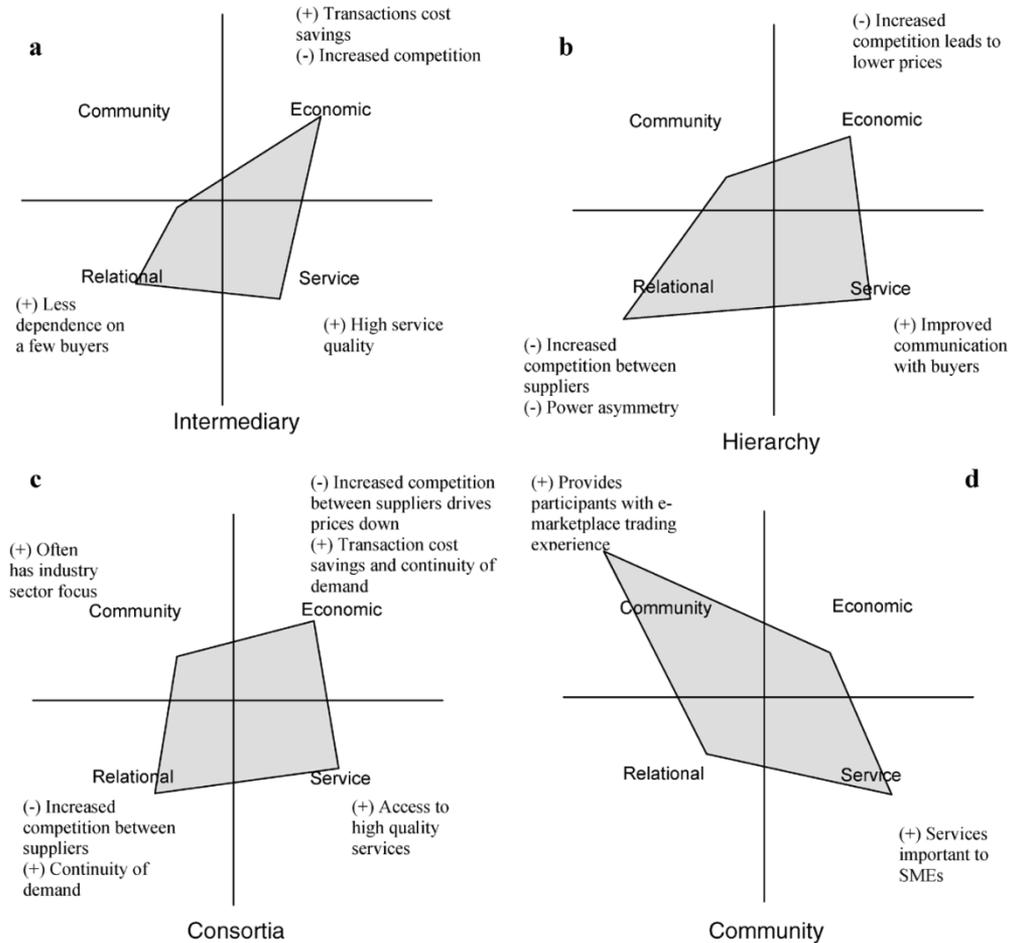


Fig. 3. Strategic implications of B2B e-marketplace structures for suppliers.

these services contribute to client satisfaction (both buyer and supplier) and ultimately enhance the economic outcomes of their marketplace. The main benefits and implications of an intermediary structure for developers and buyers are highlighted in Fig. 2(a). For suppliers, there are some economic benefits but the increased competition offsets the transaction cost savings.

In contrast, hierarchies or private marketplaces provide economic savings for buyers but the structure is also suited to delivering service improvements [Fig. 2(b)]. 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. The advantages of the private marketplace may be offset by suppliers' fears of power asymmetry between the buyer-owner and the suppliers [Fig. 3(b)].

Consortia e-marketplaces have relational benefits associated with the cooperative network of key developers [Figs. 2(c) and 3(c)]. 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 and high levels of service quality are formidable and such networks can move outside the vertical chain.

The community motive is strongly associated with government initiatives in e-commerce. However, many government sponsored e-marketplaces have met with failure due to failure to address community building tactics early in the e-marketplace life-cycle [20]. Nevertheless, the authors predict the development of large group ownership structures emerging as the ability of e-marketplaces to contribute to community development becomes recognized. The large group, or cooperative structure may deliver economic and relational benefits in the later stages of the life-cycle, but the overall focus in the early phases of development is concerned with community creation. This may take the form of an industry cluster or business in a geographic region [Figs. 2(d) and 3(d)].

The introduction of the e-marketplaces had significant impacts on altering the dynamics of the industry sector. Changes at an industry sector level emphasize the relational (or network) perspective and confirm the importance of examining alternative benefits of e-marketplace participation.

According to Porter [40], companies can only compete with one primary strategy. A failing perhaps of the e-marketplace developers and participants is that they had several motivations for participation including economic benefits, service benefits, relational benefits, and community benefits. The findings from the e-marketplace can be partly interpreted through Porter's Five Forces of Competition such as improved buyer power, increased

rivalry and, hence, pressure on suppliers to reduce prices, and barriers to entry. However, the cooperative approach shown by the mining companies in the consortium Quadrem and the community focus of the REM are not fully accounted for in Porter's industry sector perspective.

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. Bar [4] states that many of the early expectations of the Internet in relation to low entry barriers, decreased roles for intermediaries, and lower transactions have not been realized. The barriers to effective entry remained high since substantial capital is needed to gain market share. As has already been mentioned, intermediaries, albeit many new ones, have actually flourished on the Internet. Rather than the Adam Smith ideal of a perfect market the Internet uses methods and technologies to create its own friction. These take the form of switching costs, either through standards or particular implementations. Porter [41] has suggested that switching costs are low on the Web. While this may be true in the business-to-consumer (B2C) world, this is not necessarily the case for B2B activities within electronic marketplaces.

Bar [4] argues that at a conceptual level traditional markets and e-marketplaces are both dependent on architectural considerations. While the authors do not disagree with this observation, there are essential differences in the architecture of the marketplace. It could be viewed that little of significance has changed in the move to e-markets from traditional sourcing of materials and services. However, when business is done electronically, then all the details related to the market can be recorded digitally. The market-maker, therefore, has information that the other participants do not have access to and this can be used to quickly adapt the marketplace to increase or maintain margins, to develop e-marketplace loyalty, to create barriers to participants dropping out of the marketplace, and so on. In addition, some of the information can also be sold on to participants as a value adding service. Indeed, the key business advantage for the market-maker is owning the information not the market place. In the predigital era, the market place itself or access to it in a physical sense was the key advantage.

E-marketplaces can be set up to have a global reach and so the tyranny of distance, at least from a communication perspective is mitigated. The delivery of physical goods from overseas can still be a problem if speed is of the essence but the sourcing of suppliers and the transaction process can be done in real time on a global basis. Business conducted internationally brings along with it its own problems such as working across time zones, linguistic, and cultural differences. When the geographical scope of the marketplace increases, there is likely to be an increase in the number of potential suppliers and as a result this could have the impact of driving prices down. Digitally conducted business processes can reduce delays in the transaction process and also automate much of the transaction process thereby reducing overall transaction costs for the owner. However, these savings may not necessarily be passed on to other participants [4].

Features of the e-marketplace architecture can be changed relatively quickly, for example, creating additional functionality to gain a competitive advantage of other e-marketplaces

or even creating barriers to switching. E-marketplaces are software systems and although software development is a complex process working on a modular basis can improve the capability to quickly change form.

VI. CONCLUSION

This paper has classified e-marketplace strategies and related these to e-marketplace structures. There are three main points that can be drawn from this analysis for research and practice. First, the structure of e-marketplaces has a number of implications that are likely to impact on the perception of the success of the e-marketplace. It has been argued that the definition in the literature of neutral and biased e-marketplaces is an oversimplification. Each structure has implications in terms of bias that need to be addressed. Improving the levels of transparency in the e-marketplace so that it is clear which participants have access to certain types of information is one method of reducing perceptions of bias. Prospective participants may be wary that the market structure has been set up and is managed to further the goals of the developer or buyer. E-marketplace owners clearly need desirable outcomes to offset the investment but it likely that the best way to do this is to develop high levels of trust.

Second, the discussion has shown that there is a range of strategies that could be important when developing an e-marketplace structure. The literature has emphasized the importance of economic benefits of e-marketplace participation but an e-marketplace can be viewed as a relational entity that delivers relational benefits, a vehicle for improving service and as an online trading community. Although relational, service, and community strategies are likely to have economic implications viewing e-marketplaces as purely economic entities, it is again an oversimplification of their purpose.

Third, different e-marketplace structures are likely to require certain technical features. When a strategy emphasizes economic savings, then systems that streamline processes and integrate with back-end systems may be required. Community focused e-marketplaces, however, may emphasize low-end technology platforms to achieve high levels of participation. A service strategy is likely to offer access to valuable information on the market and provide high levels of technical and administrative support.

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