

MARKET MAKERS' RECOGNITION OF KEY SUCCESS FACTORS IN ELECTRONIC MARKETPLACES

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ABSTRACT

This study examines the recognition and use of critical success factors by market makers in electronic marketplaces. A content analysis of e-marketplace websites enabled an examination of how these factors have been incorporated into marketplace sites. Evidence of market makers' awareness of the success factors was found in all the sites although there remain questions and issues to be addressed. Awareness of the need for critical mass and privacy were very evident, but the key factors of security, technological infrastructure and neutrality were identified as areas of concern. Evidence of an awareness of the importance of trust by market makers was found, but more effective signalling of trust to buyers and sellers within the marketplaces is required.

INTRODUCTION

The development of Internet-based electronic commerce has led to great changes in the way business to business commerce has been conducted over the last few years. The Internet has enabled businesses to connect with each other in a way that requires new thinking in every area of commerce, requiring greater flexibility and speed in decision-making, responsiveness to customers and ability to assimilate new learning (Downes & Mui, 1998). This is particularly true with the development of electronic marketplaces and the impact these are having on the complex area of supply chains. E-marketplaces have been developed in virtually every manufacturing and service industry, and market makers offer participants reduced transaction costs and the ability to buy and sell a vast variety of goods and services to a wider array of potential customers than ever before. The proliferation of electronic marketplaces, holding the promise of extensive benefits, has been rapid and widespread with an estimation of over 1000 global marketplaces in existence (Hurwitz, 2000). However, the number of existing e-marketplaces cannot be sustained and the forecasts of considerable consolidation taking place in the next two to three years (Forrester Research, 2000) are becoming evident. These rapid changes in the marketplace environment raise the question of how participants might anticipate which market makers are likely to survive and for what reasons, requiring some measures of success to be recognised.

Against a background of consolidation and change, this paper uses the critical success factors of e-marketplaces that have previously been identified from the literature (Standing, 2001) and applies them to 12 mini-cases. This enables an examination of how these factors have been incorporated into marketplace sites. By gaining empirical evidence of market makers' recognition of these critical success factors, it has been possible to highlight questions and issues that remain to be addressed in the electronic marketplace environment.

ELECTRONIC MARKETPLACES

In 1987, Malone et al. predicted the increased use of electronic markets allowing some firms to become 'market makers' in the electronic environment. This development is well underway, but the profusion of electronic marketplaces, the speed of transition to the electronic environment, the variety of business models and the varying requirements of different industries and service sectors cloud an already confused marketplace picture.

There is no consensus on how the marketplaces will develop, beyond that it is hard to predict their impact. Business publications tend towards an optimistic view of e-marketplace development (Downes & Mui, 1998; Modahl, 2000; Raisch, 2001; Sculley & Woods, 2001), which is more cautiously supported in academic papers (Bakos, 1998; Ordanini & Pol, 2001; Senn, 2000) with some dissension on both sides (Friesen, 2000; Wise & Morrison, 2000). Despite the uncertainty there is immense pressure on companies, not least from their shareholders and directors (Banham, 2000), to move quickly to the electronic marketplace. This they often do without a full understanding of what benefits they can accrue from participation and how they should recognise the factors that contribute to the development and success of e-marketplaces. This section proceeds

with an overview of electronic marketplaces to provide a context against which to discuss the key success factors.

What is an electronic marketplace?

There are several definitions of an e-marketplace from the broad description offered by Malone of electronic markets as ‘information-technology-based governance mechanisms’ (Malone, Yates, & Benjamin, 1987) to the more dynamic ‘interactive business communities providing a central market space where multiple companies can engage in B2B e-commerce and/or other e-business activities’ (Brunn, Jensen, & Skovgaard, 2002). The latter definition takes into account the multiple stakeholders involved in an e-marketplace and notes that a range of activities beyond buying and selling can take place.

Descriptions of e-marketplaces as either horizontal or vertical offer an uncomplicated differentiation, although this distinction is rapidly blurring. For example some vertical marketplaces such as Quadrem (<http://www.quadrem.com>) have moved towards offering ‘a complete solution’ to procurement needs, while horizontal marketplaces such as Freemarkets (<http://www.freemarkets.com>) enable the purchase of industry specific goods. No coordinated business model exists for e-marketplaces, with different models evolving according to the type of ownership and levels of service offered.

Ownership - The Market Makers

Many companies formed e-marketplaces to gain early mover advantage and to establish a critical mass of buyers and sellers to maintain a competitive edge in an increasingly fluid market environment (Bakos, 1991). Many of the early market makers were either intermediary companies, financed by venture capital, such as Freemarkets (<http://www.freemarkets.com>), or individual, technology companies such as IBM (<http://www.ibm.com>). More recently there has been an increase in industry consortia marketplaces, resulting from unprecedented cooperation between rival companies; for example the creation of Covisint (<http://www.covisint.com>) by a consortia of automobile companies including General Motors, Ford and DaimlerChrysler. Other sites have developed from associations between intermediaries, technology companies and industry participants such as Egreencoffee (<http://www.egreencoffee.com>).

The trend towards more industry coalition e-marketplaces is affecting the survival of some of the earlier intermediary businesses (Spiegel, 2001) and leading the latter to re-invent their presence in the market either as service companies or consortia partners. Pressure has also been caused by the unsustainable proliferation of e-marketplaces; for example over 17 major e-marketplaces were identified in the mining industry in January 2001 (Ludeman, 2001) and 28 in the forest and building products industry (Industry Canada, 2000). While monopolies of marketplaces in individual industries would not be tolerated by governments, an optimal number of sites is likely to emerge from the current situation. The projection that less than 200 e-marketplaces would survive within two to three years (Forrester Research, 2000) is becoming a reality. This raises the question of which e-marketplaces will survive and what criteria will lead to the success of the survivors as well as what issues will arise from this consolidation affecting both market makers and their customers.

What do Electronic Marketplaces Offer?

Previous studies have identified the different levels of service that are offered by e-marketplaces, developing from trading hubs that support the identification of potential trading partners to more complex models offering selection and, increasingly, execution services (Choudhury and Hartzel, 1998). Models that have developed offer the following methods of trading:

- Catalogues either individual vendor or multi-vendor
- Auctions buyer or seller driven
- Exchange comparable to trading exchanges with a bid and ask system
- Negotiation the marketplace acts as intermediary for transactions such as requests for quotes (RFQs)

In addition, e-marketplaces may offer the option of hosted storefronts where participants maintain an open webpage within the marketplace, offering easy access to other participating buyers and sellers.

The potential for value-add services is an area that has not yet been fully exploited by market makers, but as technological capabilities develop, the ability to offer more of these services is becoming widespread. Value-add capabilities include transaction related services (e.g. order tracking, custom forms, escrow services and data warehousing,) and information related services (e.g. industry news, legislation changes, financial statistics and futures quotes). The latter are anticipated to offer the greatest opportunity for marketplaces to

gain competitive advantage (Bakos, 1991) and develop extensive information capabilities to attract both buyers and sellers (Brunn et al., 2002; Wise & Morrison, 2000).

Benefits of the Electronic Marketplace

The reported benefits to companies that are trading through e-marketplaces are compelling and suggest that cost savings being experienced by companies are considerable. Lucking-Reiley and Spulber (2000) report that online transactions could 'reduce costs by a factor of five or ten or more.' The following list of cost saving efficiencies was collated from a search of current periodicals and journals:

- lower procurement costs
- lower search costs
- reduced administration costs
- reduced development time
- integrated global suppliers
- cuts in inventory holdings
- up-to-the-minute order tracking
- a strengthening of relationships with commercial partners
- exposure to a global market

The scope of the individual marketplace and the commitment of the participating buyers/sellers will influence the level of these benefits that can be realised by the participants of a particular marketplace.

KEY SUCCESS FACTORS OF E-MARKETPLACES

An examination of the key success factors of e-marketplaces first requires due thought be given to the what is meant by success and the question of what constitutes a successful e-marketplace. Simplistically, a successful marketplace is one that is profitable, but market makers, suppliers and buyers may place greater emphasis on achieving significant value; for example cost savings or market share (Brunn et al., 2002), or gaining first mover advantage (Bakos, 1998). Success can be seen as a multi-dimensional concept where the different objectives of the stakeholders result in disparate perceptions of whether the marketplace can be deemed successful. In addition, in a dynamic electronic environment where consolidation of marketplaces is underway, profitability is not a guarantee of sustainability. A clear strategy that shows an understanding of stakeholder needs and the key issues affecting the online marketplace is more likely to enable market makers to survive the 'consolidation crunch' (Brunn et al., 2002).

However, gaining such an understanding of these needs and key issues is a difficult task in an immature and fast moving environment. The academic press has contributed significantly to the theory of electronic marketplaces (Bakos, 1991, 1998; Burton & Mooney, 1998; Kaplan & Sawhney, 2000; Malone et al., 1987) and research is ongoing into specific aspects of their development (Bakos, 1997; Choudhury, Hartzel, & Konsynski, 1998; Deeter-Schmelz, Bizzari, Graham, & Howdyshell, 2001; Dominique, 1998; Ordanini & Pol, 2001). However, it is the business press that offers current information on how market makers are structuring their companies in an effort to attract participants and which records the failures and successes of e-marketplaces. Business publications often source their articles from business consultants and it is often these consultants "that shape how managers think about IT" (Davenport & Markus, 1999), while articles "from Harvard Business Review, the Sloan Management Review, Computerworld and CIO Magazine" often form the basis of much IS student course readings (Davenport & Markus, 1999). Judicious use of such articles contributes to practitioner relevance in IS knowledge and can inform on current issues in dynamic environments where an established body of academic literature has not yet formed.

It was the business literature, which reflects a cross section of the dialogue being held within the business community, that formed the literature base for an earlier assessment of key success factors in electronic marketplaces (Standing, 2001). Using an analysis of over 150 business articles and reports, Standing (2001) identified the key characteristics of e-marketplaces that are perceived by practitioners to have achieved a measure of success.

Our paper extends the study by the use of 12 mini-cases to determine the extent to which these characteristics, or key success factors, are being addressed by market makers. The previously identified key success factors are summarised in Table 1. Academic sources have been identified to support the business literature used by Standing and Table 1 reflects the factors as discussed within the academic and practitioner communities.

AIMS AND METHODOLOGY

This study analyses electronic marketplace websites to determine the extent to which key success factors, identified from the literature, are being addressed. Although the analysis of websites is a recent area of study, many disciplines have moved towards an examination of them particularly in regard to judging the purpose of specific websites and assessing the effectiveness of design (Gibson and Ward, 2000). This study however, is concerned with identifying the presence of specific factors on the websites and a content analysis approach was selected as the best method for identifying the presence of such data (Berg, 2001). As a detailed content analysis was conducted on each of the selected websites, these websites can be regarded as mini-cases and are thus referred to in this paper.

An awareness of both manifest and latent content analysis strategies (Berg, 2001, p243) enables a more interpretive approach to be taken, to account not only for the physical presence of elements, but also for an awareness of the underlying meanings that may exist. A coding scheme was developed using concepts as the unit of analysis. An initial list of words, word groups and concepts was drawn up from the literature and refined by applying them to e-marketplace websites (not included in the mini-cases) to test the relationship between the critical success factor and the coding scheme. Table 2 lists the concepts sought in an examination of the 12 marketplace sites. The use of these concepts allows for verification of the analysis while not confining it to rigid constraints that ignore the apparent differences in the diversity of the various marketplaces.

Key Success Factor	Notes
Critical Mass	Sufficient number of participants to ensure effective running of an e-marketplace. Low entry costs, designed to attract new participants also encourage memberships of multiple e-marketplaces which has implications for income streams as it disperses the transactional value of suppliers' activities. (Brunn et al., 2002; Raisch, 2001; Sculley & Woods, 2001)
Income streams	Identified income streams include: transaction related fees membership/licensing fees sales of industry information value-add service fees advertising and marketing sales of accumulated marketing data. (Gallaugher, Auger, & BarNir, 2000; Sculley & Woods, 2001)
Security	A secure environment in which to exchange commercially sensitive and financial information. (Mott, 2000)
Level of independence	The ability to offer a neutral environment in which participants can trade without fear of compromise. The Federal Trade Commission reports that over-inclusive ownership by industry consortia could raise concerns of exclusion practices (FTC, 2000). (Kaplan & Sawhney, 2000)
Technology infrastructure	Issues of: i. technological complexity resulting in additional costs to participants (e.g. hardware, software, training etc.) ii. software standards (Croom, 2000; Mott, 2000)
Relationship management: Trust PRIVACY	Trust can be signalled using criteria based on those outlined by Smith et al (1999) in relation to business-to-consumer e-marketplaces: i. Online community facilities allows interaction and the sharing of positive references (Kollock, 1999) ii. Links from other trusted sites iii. Unbiased product information from third parties iv. Existing reputation (brand name). Commercial firms also offer authentication, validation and transaction services. Privacy raises issues of maintaining industry relationships and safeguarding sensitive information.
Fulfilling participants' needs (value-add)	Market makers need to achieve a form of competitive advantage to attract participants and maintain profits (Bakos, 1991). In identifying and incorporating a relevant range of facilities to meet, or exceed, participants' needs, e-marketplaces can increase viability. The advantages of community sites are well-documented (Hagel & Armstrong, 1997) and the use of community site facilities has the capacity to create trust and enables the e-marketplace to act as a one-stop portal for industry participants. (Brunn et al., 2002; Wise & Morrison, 2000)

Table 1: Key success factors

Critical success factor	Concepts sought
Critical mass	Names of major industry suppliers as participants, percentage growth rate, percentage of participant market, average transaction size, 'we have critical mass', number of participants, number of product lines
Income streams	Fees, transaction fees, licensing fees, commission, advertisements, percentage cut
Security	'highest levels of security', security statement, security guaranteed, security company participation (e.g. logo), secure environment/site
Level of independence	Statement of ownership, no affiliations, not affiliated to, independent, neutral
Technology infrastructure	Technology standards, industry standards, technology partnerships, infrastructure
Relationship management: Trust Privacy	Community facilities, links to other trusted sites, third party endorsement, validation, feedback, maintenance of partner relationships privacy statement
Fulfilling participants' needs (value-add)	Any words or word groups that relate to facilities offered in addition to buying and selling transactions e.g. news, chat rooms, what's new etc.

Table 2: Concept coding scheme

In a study of this kind the optimum number of websites to analyse is open to argument. A detailed analysis of twelve sites ensured coverage of a range of different types of marketplaces. A list of e-marketplaces, trading on the Internet, was compiled from a search of the business press, academic journals and the use of the altavista (<http://www.altavista.com>) and yahoo (<http://www.yahoo.com>) search engines.

The twelve sites were selected to represent a range of criteria (Table 3) to ensure that no one business model was evident in the research. Some industries are better served by electronic marketplaces than others and therefore a diverse range of industries, serving a cross section of market sectors, was selected to give a broader view of the prevalence of the recognition of critical success factors.

	Market Sector	Industry	Ownership Model	Entry Barriers	Geographical Range	Languages
Quadrem	Industry-wide suppliers/ buyers	mining, minerals and metals industry	industry consortia	open	Global	English, French, Spanish, Portuguese
Covisint	manufacturers and their suppliers	automobile industry	industry consortia	open	Global	English, Japanese
Converge	wholesale distribution	hi-tech goods	industry consortia	open	Global	English
Appliance zone	wholesalers/ high st. retailers	consumer appliances	intermediaries	open	Europe	English, French, German
Paper Exchange	industry wide suppliers and buyers	pulp and paper industry	intermediaries	open	Global	English, French, German, Italian, Spanish, Finnish, Swedish
Egreencoffee	commodity traders	coffee trade	intermediaries	open	Global	English, Spanish, Portuguese
E-greenbiz	small/medium wholesalers	green industry products	independent	open	USA	English
Cargofinder	service sector	transportation (shipping)	independent	open	Dutch based (global)	English
58K	medium to large scale service sector	printing	independent	industry registered printers only	USA Europe	English, French
Telemerc	reselling products and services	telecomms.	“vendor neutral”	open	Global	English
Retailers Market Xchange	small businesses	convenience stores and small business retailers	intermediaries	open	USA	English
Ecfood	‘large industry players’	food and beverages	intermediaries	certified suppliers and invited buyers	Global	English

Table 3: Selected electronic marketplaces

Representative marketplaces of intermediary and consortia type ownerships were selected and entry barriers, where evident on the websites, have been listed. All the remaining marketplaces are subject to registration but appear to have no other entry barriers. The geographical range is given as stated by the marketplaces although in some cases it is evident that the marketplaces are not truly ‘global’ in scope as can be seen from the number of global marketplaces that do not offer language options. The language options noted have an affinity to the industry sector and reflect the countries where the industry is particularly strong. For example, Covisint, the automobile consortia site offers Japanese and English while the paper and pulp industry marketplace offers a wide range of languages including Finnish and Swedish. The selection of the mini-case marketplaces to represent a broad range of criteria enabled a consideration of the recognition of critical success factors across all models of e-marketplace. As the marketplace environment matures, an assessment across industry sectors or specific business models will become more relevant.

To further define the profile of each of the e-marketplaces, their methods of transacting business are given in Table 4 and the type of service they offer is discussed below.

	Auctions	Storefronts	Negotiations	Catalogues	Exchange
www.quadrem.com	X		X	X	
www.covisint.com	X		X	X	
www.converge.com	X		X	X	X
www.appliancezone.com			X	X	
www.paperExchange.com	X	X	X	X	X
www.Egreencoffee.com			X		X
www.E-greenbiz.com	X			X	
www.cargofinder.com			X		
www.58K.com	X		X		
www.telemerc.com	X	X	X		X
www.RetailersMarketXchange.com	X			X	
www.ecfood.com	X	X	X	X	

Table 4: Transaction mechanisms offered by the electronic marketplaces

Four e-marketplaces offered identification and selection services with execution of transactions being completed externally (usually via email) and five sites offered full execution services with financial and logistical support. Three marketplaces were unclear, but it is thought that they offered, or were developing, execution services. All but one e-marketplace offered two or more methods of transacting business. The most common facility offered for transacting business was negotiation, closely followed by auctions (no distinction has been made between types of auction) and catalogues. The exchange facility, which is used for commodities and commodity-like products, was offered by only a third of the e-marketplaces and storefronts by a quarter.

FINDINGS

The findings are reported under the individual critical success factor headings:

Critical Mass

Market makers recognised the need to achieve critical mass, and to convince prospective participants that their marketplace was a relevant force. Nine sites showed figures indicating the number of registered buyers/sellers, the growth rate of transaction turnover or the number of product lines available. For example, 58K.com in which 3,680 printers participate, has a 'growth rate of 3% daily' and E-greenbiz.com has over 4,000 companies with 46,000 product line. Only three e-marketplaces did not give figures or directly address the subject of critical mass, although each of them gave details of the size of the market they were addressing.

Income streams

Four of the identified income streams were found in eight of the websites; details are shown in Table 5. The remaining four sites did not explain how income was raised and it was not possible to ascertain what income model they used. Details of income generation through the sales of accumulated market data was not available. However, it is evident from the privacy statements given on two sites that market data is accumulated in this way and therefore this method of income generation has been added to the table. Five of the sites use multiple income streams.

It is likely that other forms of income generation are being developed and used, but these cannot be identified without fuller access to the e-marketplaces (for example, income from hosting storefronts for suppliers).

	Transaction fees	Licensing Fee	Advertising	Value-add service fees	Sales of Industry Information
www.quadrem.com					
www.covisint.com	X	X			
www.converge.com	X			X	X
www.appliancezone.com					
www.paperExchange.com	X			X	
www.Egreencoffee.com	X				X
www.E-greenbiz.com					
www.cargofinder.com	Currently free		X		
www.58K.com	X				
www.telemerc.com	Currently free		X		
www.RetailersMarketXchange.com	X			X	
www.ecfood.com					

Table 5: Income streams identified in the e-marketplaces

Security

The structure of the marketplace had an influence on how the security of the sites was addressed by the companies. E-marketplaces that offered only identification and selection processes (and therefore did not carry information on financial transactions) addressed the question of privacy rather than security. However, the larger industry consortia sites had strong statements assuring participants that security was 'paramount' and two offered security help for 'company IT desks'. Seven sites relied on strategic partnerships with expert security companies to indicate their commitment to security issues. Two e-marketplaces carry the Verisign logo (<http://www.verisign.com>) although it is interesting to note that the status of one is 'revoked' and the other is 'expired', which must raise concerns about the commitment these marketplaces have towards security.

Level of independence

Only three sites did not carry statements asserting their independence as an e-marketplace. The remaining nine companies all carry statements ranging from 'E-greenbiz.com does not own any products nor is affiliated to any industry participant' to Appliancezone's statement that they are an independent, neutral company funded by venture capital. Industry consortia sites were particularly clear in stating that, although ownership is shared amongst industry players, the e-marketplace companies were completely independent.

Technology infrastructure

Four marketplaces mentioned technological infrastructure or addressed the question of standardization, three of which gave statements regarding the latter. One smaller company showed an awareness of the technical complexities that might concern its less technologically advanced customers, while two of the largest marketplaces state that their sites are standardized on XML. One consortia company is developing its own technology standards.

Relationship management

Two facets of relationship management were considered: trust and privacy.

(i) Trust. Three sites were found to have incorporated an online community aspect to their marketplaces. Two marketplaces incorporated links to other sites which were established within the relevant industry, although it was not possible to trace links back from other sites to the e-marketplaces. Two marketplaces requested feedback from visitors, encouraging unbiased product information. Five marketplaces had no identified criteria for signalling or engaging trust, although two sites recorded other aspects which could signal a measure of trust (validation of suppliers through an existing industry register and participation in

community-based initiatives). No direct use of existing reputation was discernible although all the e-marketplaces gave lists of their strategic partnerships to give credence to their sites.

(ii) Privacy statements, relating to protection of data, were given on all the sites. Four e-marketplaces included a facility to enable buyers and suppliers to maintain relationships (both new and established) by communicating and transacting in private within the market site. While several of the e-marketplaces gave assurances that information accumulated on participants would not be disclosed to a third party, there were few assurances that amalgamated data would not be collated. Indeed, at least two of the major industry consortia sites have statements that visitors will be blocked from their sites if they disable the cookies which allow data collection.

Fulfils participants' needs (value-add)

A wide variety of value-add facilities were identified, some of which occurred in a number of sites (e.g. industry news) and others (e.g. completion of customs paperwork) in only one site. E-marketplaces that incorporated an online community site had the largest range of added facilities such as tutorials, book sales, chat rooms and industry information. The larger companies offered more value-add in respect of transaction-related facilities: for example, data warehousing, logistics and financial services, transaction tracking and virtual project workspace. The more specialised sites had industry-related value-adds. For example a commodities site offered futures quotes both in real-time (paid for) or delayed time (free) while the food industry orientated its value-add towards requirements in the food industry relating to health and safety, ingredient listings and standardized ingredients

DISCUSSION

The level of recognition of the key success factors by market makers was high with evidence of two factors (privacy and value-add) being addressed by all the marketplaces and a further four addressed by at least two thirds of the marketplaces (Table 6). Less focus was given to the remaining two factors, one of which (technology infrastructure) was ignored by eight of the marketplaces. The implications of these levels of recognition are discussed to identify questions and issues that remain to be addressed in the development of e-marketplaces.

Key Success Factor	Evidence of Recognition
Critical mass	9 marketplaces gave numbers of participants or daily growth rate of the site. 3 marketplaces gave only the size of the market they were addressing.
Income Streams	4 marketplaces showed no information on income streams 5 marketplaces had more than one income stream 3 marketplaces had a single income stream (with 2 currently waiving transaction fees)
Security	7 marketplaces used strategic partnerships with security firms 2 marketplaces used third party verification (Verisign) 3 marketplaces showed no recognition of this factor
Level of independence	9 marketplaces carried statements asserting their independence
Technological infrastructure	4 marketplaces addressed technological infrastructure or standardisation
Relationship Management i. Trust ii. Privacy	i. Trust 7 marketplaces showed at least one signal of trust 5 marketplaces had no identifiable signals ii. Privacy all the marketplaces carried privacy statements
Fulfilling Participants' Needs - Value-Add	All the marketplaces had at least one value-add facility

Table 6: Level of recognition of critical success factors by market makers

Key Success Factors

The importance of critical mass to the survival of an e-marketplace is self evident: if the marketplace does not have sufficient buyers and sellers it will not attract more participants. An awareness of this 'chicken and egg' situation was evident in the mini-cases examined where three quarters of the sites used a variety of signals to show that they had sufficient participants for an effective trading site. These signals varied from a straightforward statement of the number of participants to details of membership growth rates and the number of product lines carried by sellers in the marketplace. Interestingly, the use of brand names to attract participants was not strongly promoted, even on the consortia sites where well known, multinational organisations were active. The use of brand names was restricted to strategic partnership lists that were not prominently displayed and would unlikely to be of interest to smaller prospective participants. The three marketplaces that only gave the size of the market they were addressing were indicating the potential of their marketplaces, but were not effectively signalling that a viable trading site had been established. However, all the sites were encouraging new participants through a number of initiatives, including an initial 'try before you buy' phase, free transactions, site tours and lengthy FAQ sections.

The most common model of income generation, in eight sites, remained the charging of transaction fees although two sites had temporarily waived their fees in an attempt to attract critical mass. In all but one marketplace the fees were supported by additional forms of income generation. In the two sites that waived fees, income was generated by advertising revenues and it is possible that the market makers intended to use this as the major source of income. Advertising revenue, although a potentially valuable income, needs to be weighed against any negative images of neutrality or quality that site advertisements may generate. It is not possible to predict which of the many different income streams may be viable sources of revenue (for example, it is not clear if the sale of futures quotes generates profit or is a value-add facility) and what factors affect participant preferences. A marketplace that attracts frequent transaction use by participants might better serve those participants by a move to licensing fees, while a site such as Cargofinder that hosts fewer transactions but attracts multiple visits by firms seeking shipping details may benefit more from a choice of advertising revenue.

The use of multiple income streams by the market makers may indicate that they are uncertain of the potential of each income stream and are still in an experimental stage. Alternatively, it is a likely indication of the need to generate revenues. It may also show a determination to retain flexibility thereby enabling participants to choose their level of financial commitment to the marketplace. Such flexibility is a major advantage in attracting new participants to add to the critical mass of the marketplace. Only one of the marketplaces, Covisint, has introduced licensing fees. As a consortium marketplace they have the advantage of large multinational organisations as owners, which attracts a multitude of potential suppliers thereby ensuring a level of critical mass that few of the other marketplaces can match. For Covisint, licensing fees are an additional source of income that is unlikely to have an effect on critical mass.

Security remains an issue of concern in several areas of electronic commerce (Mott, 2000) and ways of ensuring the security of sites carrying sensitive commercial data and financial records remain a problem. Statements regarding security were found on sites that offered transactional facilities beyond simple identification and selection processes (Choudhury et al., 1998). These sites used strategic partnerships with security companies to deal with the issue. While this places the issue of security within specialist companies and ensures a level of expertise, it is unlikely that it will be enough to secure confidence unless breaches of security are avoided. The commitment of some market makers to security also comes into question where third party security firm 'stamps of approval' are not valid as was the case with the two marketplaces displaying the Verisign logo (www.verisign.com). The three sites that did not address the security factor did not carry transactional data or appear to offer financial services of any kind. These sites were more concerned with the issue of privacy between buyers and sellers and carried clear privacy statements detailing their commitment to maintaining privacy within the marketplace. Such statements were carried by all the sites.

Nine of the e-marketplaces declared their independence with emphatic statements notwithstanding their ownership, although in the case of the industry consortia it remains an open issue subject to close scrutiny by government bodies (FTC, 2000). Independence is more of an issue for the consortia sites (all of whom carried statements of independence) which are comprised of normally competitive organisations within an industry collaborating in the creation of a marketplace for procurement purposes. Such collaboration necessarily raises questions of neutrality for new entrants to the marketplace. The issue becomes more complex where consortia such as Quadrem are developing buying and selling facilities for participants who are not owner-participants.

The key success factor of technological infrastructure was, perhaps surprisingly, recognised by only four market makers. There are two issues of concern here. Firstly, the additional costs of hardware, software, training and personnel remain a barrier to electronic commerce for many companies. The Internet and its availability has alleviated some of these problems, but the more complex e-marketplaces cannot offer a full range of services without additional applications that increase the cost of participation and require a degree of commitment from participants in terms of technological investment. This impinges on the second issue of concern, the setting of software standards. Without established software standards, commitment to investment in one marketplace affects the ability to participate in other marketplaces and indeed, the ability to connect marketplace activity with existing back-end systems. The establishment of common software standards will depend to a degree on the willingness of market makers with significant market share and economic power to co-operate. Covisint has already established its own standards and other powerful marketplaces are likely to follow suit.

One of the intermediary market makers showed awareness of technological issues for smaller companies wishing to participate online and offered an advice service. This awareness of the needs of small to medium size businesses (SMEs) has the potential to substantially increase the critical mass of marketplaces. 'SMEs are a vast sector within the global economy' (Stokes, 2000) and many governments are funding a wide range of initiative to increase SMEs use of Internet commerce (Poon & Swatman, 1999). Few market makers have yet shown much awareness of the potential business that SMEs can bring to the e-marketplace.

Relationship management is very much an issue of trust which is a widely discussed aspect of business to consumer e-commerce, where several signals of trust have been developed and refined since early user groups began trading online (Essig & Arnold, 2001; Geroski, 1998; Humphrey & Schmitz, 1998; Kollock, 1999; Smith, Bailey, & Brynjolfsson, 1999). Business to business issues have lagged behind those of the consumer sector in electronic commerce and this was evident from the examination of the mini-cases. There was limited evidence of the recognition of the importance of signals of trust in the marketplaces although smaller companies utilised user friendliness and community orientation, while the larger companies used guided tours and presentations to display openness. None of the e-marketplaces used feedback from customers to promote trust with new participants. Trust is a difficult issue to quantify and the building of trust is a long term and subjective process. However, it is being recognised as an essential factor of e-business success (Keen, 2001) and requires more evidence of this to be shown by market makers.

The remaining success factor is the e-marketplaces' ability to fulfil participants' needs and market makers showed that they are very aware of the need to provide more services than purely transactional ones. Some companies were developing the online community model where the value-add covers a much wider range of

facilities than more functional sites which offered minimal value-add. The community model can include a wealth of facilities related to both transactional and information needs that can be developed according to the evolving needs of the community (Hagel & Armstrong, 1997). However, other e-marketplaces serve the needs of complex, fast moving industries where greater functionality is required and the community aspect holds less value. It is the market makers' ability to anticipate and evolve their value-add facilities to meet participants' needs that will enhance the attractiveness of the marketplaces once the initial participation stage is passed.

Switching costs

Although there has been some anticipation that the Internet will reduce switching costs (Porter, 2001) there is some evidence that dominant companies will raise switching costs to retain participants within a marketplace. For example, Covisint, a marketplace with dominant market players charge a one-off licensing fee which has switching cost implications for small suppliers. They have also introduced their own technology standards which further reduces suppliers' ability to participate in several e-marketplaces and binds them more closely to the larger industry players. The lack of common technological standards has switching cost implications for all electronic marketplace participants who will need to invest in diverse technologies to access different trading sites, so reducing flexibility in the electronic environment. However, commitment to one marketplace may become more common if the anticipated consolidation of marketplaces is as concentrated as forecast.

Summary

The key success factors are all inter-related. Critical mass is essential if the marketplace is to function effectively and retain both buyers and sellers by offering a choice of trading partner. However, other factors involved in achieving and retaining critical mass include generating and maintaining income streams that allow the marketplace to function as a commercial enterprise but that do not raise barriers to entry or impinge on trust issues through concerns about sales of private customer information. Trust in the independence of the marketplace is also necessary, as overt displays of bias will alienate participants.

Technology barriers can deter the creation of critical mass, but low or diverse technology standards will not support the retention of participants or allow the marketplace to evolve its services to enhance its offered benefits. Security and privacy, defined by Keen (2001) as customer safety, often do not become an issue until there is a breach, which would destroy trust and seriously damage the viability of the marketplace. However, an assurance of security and privacy is essential to attract participants and requires the market makers to "define, implement and monitor policies and procedures to guarantee the maximum degree of customer safety as rigorously as your firm does for its finances." (Keen, 2001) Without participant faith in the security and privacy of an e-marketplace there can be no trust. Trust is therefore closely related to security, privacy and the maintenance of relationships and is an essential factor in the retention of marketplace participants. If relationships cannot be built and retained, then critical mass will not be sustained. An important contributing factor to building and retaining relationships with participants is a marketplace's ability to develop value-add facilities that reflect the needs and anticipates the wants of those participants. It is these value-add facilities that are predicted to contribute to the competitive advantage of e-marketplaces that survive the era of consolidation (Brunn et al., 2002; Wise & Morrison, 2000).

CONCLUSIONS

Using the seven key success factors that were identified for this study, it has been possible to see that e-marketplaces are recognising many of the requirements they need to develop their potential in the diverse ways that are suited to attracting and retaining their target market participants. However, several issues and questions remain.

Resources are being directed at building critical mass by encouraging new participants. Multiple income streams have been identified by the e-marketplaces and a commitment to ensuring privacy is evident. Questions remain concerning the issue of trust where there is a need to identify and develop more effective strategies. This is particularly important in the current state of proliferation of e-marketplaces, where participants have more choice of new sites if their trust is compromised. Those markets that are able to develop and retain trust will gain competitive advantage in the imminent era of consolidation.

In the areas of security, technology infrastructure and independence there remain concerns. As more e-marketplaces support complete execution of transactions, involving confidential financial and logistical data, the issue of security needs to be further resolved to the satisfaction of participants. There will be an impact on the technological infrastructure of e-marketplaces if the larger companies develop their own standards rather than work towards common ones. A fragmentation of standards will lead to greater switching costs and

reduce the ability of participants to maximise their benefits from the electronic environment. A similar result may occur if the question of neutrality of e-market companies remains ambivalent. This is being addressed by government trade bodies in several countries as more industry consortia enter the arena, but the problem is likely to be exacerbated during the forthcoming consolidation period.

The key success factor of meeting participants' needs through value add has been well recognised by e-market companies and there are many examples of these companies being innovative in their approach to value add without compromising the more basic needs. Once the other key success factors have been fully addressed, it is perhaps the value add which will encourage participants to favour one e-marketplace over another and play a major role in contributing to survival when the anticipated consolidation of the marketplaces begins.

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