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Recognition and Use of Key Success Factors in Electronic Marketplaces

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Abstract

This study examines the critical success factors previously identified as contributing to the development and success of e-marketplaces. An analysis of twelve e-marketplaces found that they were sensitive to the needs of their target market and offered services appropriate to that market. However, although each of the critical success factors were addressed by the e-marketplaces there remained areas of concern, particularly in the areas of security, technological infrastructure and neutrality. One success factor, that of meeting participants' needs through value-add, was identified as being key in establishing competitive advantage.

Keywords

Electronic commerce, electronic markets, critical success factors, interorganizational information systems

INTRODUCTION

The development of e-commerce on the Internet 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. This is particularly true with the development of e-marketplaces and the impact these are having on complex procurement and supply chains. E-marketplaces have been developed in virtually every industry, from almonds to computer parts, and participants can buy and sell a vast variety of goods and services to a wider array of potential customers than ever before. The resulting proliferation of e-marketplaces cannot be sustained and there are forecasts of considerable consolidation taking place in the next two to three years (Forrester Research, 2000). This raises the question of which market makers are likely to survive and why. Against this background of potential upheavals, critical success factors of e-marketplaces have been identified from the business press (Standing, 2001) and used in an examination of twelve e-marketplace sites to assess how well these factors have been incorporated into the sites. By gaining empirical evidence of the recognition of these critical success factors by market makers, 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. Nevertheless, there is immense pressure on companies, not least from their shareholders and directors (Banham, 2000), to move quickly to the electronic marketplace, often without a full understanding of what benefits they can accrue from participation in them and how they should recognise the factors that contribute to the development and success of e-marketplaces.

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). The 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
- Storefronts — participants maintain an open webpage within the marketplace
- Negotiation — the marketplace acts as intermediary for transactions such as RFQs

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 assembled 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 will determine how many of these benefits can be experienced by the participants of a particular marketplace. The element of choice in selecting an e-marketplace is often constrained by traditional partners or the positioning of major industry players. However, in open e-marketplaces where entry barriers are low, there are opportunities for smaller companies to bid for business with larger companies who were previously inaccessible.

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 dot.com businesses (Spiegel, 2001) and leading the latter to re-invent their presence in the market either as service companies or consortia partners. Pressure is also 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. Forrester Research estimates that less than 200 e-marketplaces will survive within two years (Forrester Research, 2000) and 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.

KEY FACTORS OF SUCCESSFUL E-MARKETPLACES

The business press offers several factors which are believed to be key to the success of an e-marketplace (Standing, 2001) and these are summarized in Table 1:

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.
Income streams	Identified income streams include: i. transaction related fees ii. membership/licensing fees iii. sales of industry information iv. value-add service fees v. advertising and marketing vi. sales of accumulated marketing data.
Security	A secure environment in which to exchange commercially sensitive and financial information.
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, 2000a)
Technology infrastructure	Issues of: i. technological complexity resulting in additional costs to participants (e.g. hardware, software, training etc.) ii. software standards
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.

Table 1: Key success factors

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 their 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 specific data. 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; the critical success factors were listed with groups of words that related to each factor (see Table2) and the marketplace sites examined for the presence of these words or groups of words. The use of this grouping 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.

Critical success factor	Words and Word groups 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. Some industries are better served by electronic marketplaces than others and therefore a diverse range of industries was selected to give a broader view of how prevalent the recognition of critical success factors is. The twelve sites were selected to represent a range of criteria as shown in Table 3.

	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
Appliancezone	wholesalers/ high st. retailers	consumer appliances	intermediaries	open	Europe	English, French, German
PaperExchange	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
RetailersMarket 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

A distinction has been made between intermediaries and independent ownership: e-marketplaces that have been established by individuals from an industry, often in conjunction with people from technology backgrounds, are classified as independent while e-marketplaces set up by companies (industry specific and/or technology companies) are classified as intermediaries.

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.

Visible entry barriers have been recorded. All other marketplaces are subject to registration but appear to have no entry barriers.

To further define the profile of each of the e-marketplaces, their methods of transacting business is 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.RetailersMarket Xchange.com	**X**			**X**	
www.ecfood.com	**X**	**X**	**X**	**X**	

Table 4: Methods of transacting business 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 with reverse auctions) 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. The majority 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-green biz.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

Examples of five of the identified income streams were found, although four sites did not explain how income was raised and it was not possible to ascertain what income model they used. Table 5 shows where multiple income streams were found. 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). Details of income generation through the sales of accumulated market data was not available, although it is evident from the privacy statements given on a number of sites that market data is accumulated in this way.

	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'. Several 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 really 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 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 were given on all the sites relating to protection of data. 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 disenable the cookies which allow data collection.

Fulfils participants' needs (value-add)

A wide variety of 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

Several key success factors are being addressed by the e-marketplaces, all of which are very aware of the importance of critical mass and the need to show that they had sufficient participants for an effective trading site. The companies are encouraging new participants through a number of initiatives, including an initial 'try before you buy' phase, free transactions, site tours and lengthy FAQ sections. One company charged a one-off licensing fee which could have switching cost implications for small suppliers, reducing their ability to participate in several e-marketplaces. Issues of technology infrastructure and neutrality also have switching cost implications. If there is no common technological standard then e-marketplace participants 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.

The most common model of income generation remains the charging of transaction fees supported by additional forms, but it is not possible to predict which ones 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. Advertising revenue, a potentially valuable income, must be weighed against any negative images of neutrality or quality. While security is addressed by all the sites, the use of strategic partnerships with security companies to deal with the issue will not be enough to secure confidence. All the e-marketplaces declared their independence notwithstanding their ownership, although in the case of the industry consortia it remains an open issue subject to close scrutiny by government bodies (FTC, 2000b).

Relationship management must take into account the nature of the industry, the type of participant and the level of relationship that is required. There remain differences between the marketplaces on how they approach the issue of trust. The smaller companies utilise user friendliness and community orientation, while the larger companies use guided tours and presentations to display openness. None of the e-marketplaces used feedback from customers to promote trust with new participants. The issue of privacy between buyers and sellers is well recognised and e-marketplaces were also keen to promote their ability to contribute towards building and maintaining existing and new partner relationships.

The remaining success factor is the e-marketplaces' ability to fulfil participants' needs and 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. This is perhaps a reflection of differing customers' needs within complex, fast moving industries and the greater functionality required by others. Additional value-add facilities are introduced as e-marketplaces gain experience and participants.

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. 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 privacy to encourage industry relationships is evident. The issue of trust remains an area where there is potential for developing more effective strategies. This is particularly important in the current state of proliferation of e-marketplaces, where participants are able to move to new sites if their trust is compromised. Those markets that are able to develop and retain trust will gain competitive advantage in the anticipated era of consolidation.

In the areas of security, technology infrastructure and independence there remain concerns. As more e-marketplaces enable complete execution of transactions to take place 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 and the problem will be exacerbated if the anticipated consolidation of e-marketplaces occurs in the next few years.

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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