An Asian Perspective on Airline Industry eMarkets

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Abstract
eMarkets allow buyers and sellers to conduct their business relationships within an electronic environment, yet companies are not participating in them as expected. This research investigates the buyer’s perception of key success factors for eMarkets. The results indicated that both basic enablers and differentiators were perceived as a given. The implication for marketing strategy is that new differentiators need to be developed to position eMarkets relative to their competition. eMarket-makers also need to consider the impact of external environmental factors on the marketing strategies they develop.

Keywords: eMarketing, Asia, eCommerce

1. Introduction
Business-to-Business (B2B) eMarkets provide value by connecting buyers and suppliers within a virtual environment. The basic concept is similar to that of traditional (off-line) markets which bring buyers and sellers together in a central place such as a shopping mall, village fete or garage sale to trade goods and services, but with the use of Internet protocols within an electronic environment (Lennstrand, Frey and Johansen, 2001; Eng 2004). In addition, eMarkets utilise the power of the Internet by allowing companies to connect and transact on a ‘global’ basis without having to change their geographic location (Kandampully 2003).

In January 2000, GartnerGroup predicted that worldwide electronic B2B trade would grow from $145 billion in 1999 to $7.29 trillion in 2004 (GartnerGroup, 2000a). Many other analysts at that time presented similar forecasts for rapid growth in B2B e-commerce. However, a few months later, the B2B hype started to diminish. The news articles changed focus from success stories to reports on lay-offs and restructuring were expected to survive. AMR Research predicted in April 2000 that only 50-100 of the 600 venture capital-backed eMarkets would survive through year 2001. Only one or two huge eMarkets per industry were supposed to survive in the long run (Latham, 2000). During 2001/2002, the problems met by eMarkets became more obvious. Accenture (2001) reported that only 10 per cent of surveyed eMarkets had converted registered customers to actual, repeat traders. McKinsey (2002a) estimated that over 70 percent of launched public eMarkets had either ceased to exist or had modified their business model.

Although there was a dramatic decline in the number of eMarkets, organisations have continued to remain optimistic that B2B electronic commerce initiatives will continue to grow. One of the reasons for continued growth is the value that organisations obtain through participating in eMarkets. Such optimism is confirmed with the rapid rise of consortia and private eMarkets. McKinsey (2002b) found that 15% of Fortune 2000 companies have set up private eMarkets, with this number rising over the next few years.

This paper looks at the development of eMarkets in the Asia Pacific Region, which is seen as an area for rapid future growth (IDC, 2001a). B2B technology is also viewed as a new competitive weapon for Asian firms, helping them to overcome issues caused by their geographic distance, time zone and language differences from key economies such as US and Europe (Michael and Sutherland, 2001).
Nonetheless, the uptake of B2B technology by Asian organisations has been rather slow, especially in comparison with companies from more developed countries (Michael and Sutherland, 2001). The key objective of this paper is to evaluate the Key Success Factors (KSF’s), which should be focused upon by eMarket-makers for the effective development of services in the Asia Pacific region.

The paper uses results from field interviews with senior management from airlines and aviation service providers in Asia, to highlight major success factors for the effective development of eMarkets in Asia.

2. The eMarket Concept
An eMarket can be defined as an inter-organisational information system (Choudhury, Hartzel and Konsynski, 1998) through which multiple buyers and sellers interact to accomplish one or more of the following market-making activities:

1) Identification – of potential trading partners, i.e. to buy from and/or sell to.
2) Selection – of a specific partner, based upon the individual company’s trading criteria (price, delivery, service levels, etc).
3) Execution – of a transaction, i.e. the completion of an on-line trade.
4) Monitoring/Management – of post-sales processes, such as delivery status tracking, goods receipt, payment and warranty.

This basic Commerce platform acts as the foundation for an eMarket to offer an additional range of value added services (Sculley and Woods, 2001). B2B eMarkets commonly share the following key features for on-line commerce: centralized and neutral market space; standardized contracts, documents and product/service information; pre-qualification and regulation of users (members); provision of pricing, price history and market average information; transparency and confidentiality; clearing and settlement; logistics management; and integrated supply chain management. The value added services include: payment, security, logistics, sourcing, data mining, community, financing and various personalization services. These services allow eMarkets to differentiate themselves relative to their competitors (Raisch, 2001; Eng 2004).

2.1 Business Models
As B2B eMarkets proliferated at an astounding rate, they tried to position themselves to present a strong value proposition and differentiate their services in the crowded marketplace (McKinsey, 2002a). Consequently, a variety of business models developed to cater to the varying needs of participants. It is difficult to provide a concise classification for the variety of eMarket business models that have been developed, however for this research they are classified into three basic types, as follows:

2.2 Public eMarkets (many-to-many):
These are independently owned and developed on-line marketplaces generally funded by venture capitalists or owned by a private, independent party. They are usually positioned as providing a neutral platform for electronic trading and provide a forum for listing products and services (along with their related features and pricing) within a transparent market. Public eMarkets help reduce the costs of gathering information by quickly identifying potential trading partners and market pricing. Examples include partbase.com (airline industry) theoilsite.com (energy industry) and marketboomer.com (hospitality).

2.3 Consortia eMarkets (few-to-many):
Consortia eMarkets are owned and jointly developed by two or more large industry players, or sometimes a grouping of major buyers or suppliers, or a hybrid of both. Functionality focuses more on supply chain processes, forecasting and inventory planning. Industry-sponsored marketplaces often address industry standards and build community-related services. Examples include aeroxchange (www.aeroxchange.com: airline industry), covisint (www.covisint.com: car industry) and quadrem (www.quadrem.com: mining and construction industry).

2.4 Private eMarkets (one-to-many):
Privately owned eMarkets are used to manage and optimize a company’s own supply chain process with key trading partners. As with consortia, the functionality can address any value chain process and is ultimately tailored to the needs of the individual company. Private exchanges often require business partners to adapt or integrate with the owner’s technical platform and/or data management standards in order to participate. Examples include Boeing (myboeingfleet.com) and Cisco (cisco.com).

This paper focuses on Public and Consortia eMarkets, as these are operated as commercial businesses in the open market environment and are affected by market dynamics and business strategy issues. Private eMarkets are a growth area (McKinsey, 2002b), however they operate as private and closed ventures and not
necessarily measured in terms of commercial success such as profit. Participants in private eMarkets may be made to participate by the operator of the marketplace. Therefore, key success factors in private eMarkets would be different to those in public and consortia eMarkets.

2.5 Benefits of eMarkets

EMarkets can potentially benefit individual participants and industries through adding value by increasing market efficiency, increasing supply chain efficiency and new value creation (Brunn, Jensen and Skovgaard, 2002). Figure 1 shows business benefits of participating in eMarkets.

Buyer-side benefits: buyers can use eMarkets to reduce their direct and indirect supply chain costs by leveraging their global scale and focusing spend on preferred suppliers whilst also utilizing advanced search facilities to find and qualify new suppliers. Additionally, buyers can take advantage of dynamic eMarket tools such as auctions and bid-quotes for more efficient sourcing and spot purchasing (Brunn, et al., 2002; Raisch, 2001).

Seller-side benefits: sellers can significantly lower their sales channel costs and gain access to new customers on a global basis without the need to set up an international office infrastructure. B2B eMarkets can extend this reach even further by creating close collaboration between trading partners in a secure environment (Brunn et al., 2002; Raisch, 2001).

3. B2B in Asia

The Asian region has seen strong Internet growth, from a base of 64 million in 2000, Asia Pacific web users (ex Japan) will exceed 240 million by 2005 (IDC, 2001b). About half of the region’s Internet population will be in today’s nascent online markets (China, India, Malaysia, Thailand, Indonesia and the Philippines). The more mature markets such as Hong Kong, Taiwan and Singapore are already well developed. Therefore the region’s Internet growth will largely be driven by the future development of emerging markets (Michael and Sutherland, 2002).

Intra-regional Internet differences are significant and...
based on variations in government policy, online payment systems and fulfillment infrastructure (Trappey and Trappey, 2001). These obstacles need to be overcome by governments, businesses and service providers in their respective countries for the expected e-business growth and the resulting economic benefits to be fully realized. B2B eMarket usage in Asia is forecast to grow from US$9.2 billion in 1999 to US$995.8 billion in 2004 (GartnerGroup, 2000b). This tremendous growth rate highlights the future importance of B2B for Asian corporations.

Asian companies are being driven by the promises of e-business derived costs savings and efficiency improvements, and also by the new market threats provided by an e-business environment allowing for more open trading and dynamic competition (Eid et al., 2002). However, the business process changes required are presenting a challenge to many Asian corporations due to their rather old-fashioned organisational structures and management styles (Michael and Sutherland, 2002).

4. Key Success Factors

Literature on eMarkets identified the following seven factors as critical to the development of e-Markets (Raisch, 2001; Brunn et al., 2002; Standing and Stockdale, 2001; Scully and Woods, 2001; Kandampully 2003): critical mass; liquidity; independence/neutrality; security/credibility/trust; ease of use/reliability; value added services and relationships.

4.1 Critical mass

Critical mass primarily relates to the number of customers and/or the number of transactions required to ensure it is effective in both operational and financial terms (Standing and Stockdale, 2001; Raisch, 2001). An eMarket requires a certain number of users and usage to make it an effective forum for trading, i.e. too few sellers will not be a viable proposition for buyers and vice versa. Therefore, an eMarket needs to simultaneously attract a large number of both buyers and sellers (Lennstrand, Frey and Johansen, 2001). The eMarket requires sufficient customer numbers to drive transaction volumes for the business to cover costs and make a profit. An additional advantage of achieving critical mass is that this can provide very high barriers to entry for other potential exchange competitors, since inertia prevents members from shifting for one exchange to another (Sculley and Woods, 2001).

4.2 Liquidity

Liquidity is defined as “the ability of a business to meet its obligations as they come due; the more liquid a business is, the better able it is to meet short-term financial obligations” (The Lectric Law Library, 2002). Liquidity is a vitally important issue for the majority of eMarkets as they are in the start-up phase of their market development (Sculley and Woods, 2001). Liquidity is primarily a function of costs and income. Costs include establishment and communication expenses to ensure the eMarket is ‘heard’ above the competition (Sulley and Woods, 2001). It has been estimated that a typical B2B exchange will cost US$25-30 million in this set-up and start-up phase (Sculley and Woods, 2001). Income for eMarkets can be derived from: transaction related fees; membership/licensing fees; sales of industry information; value-add service fees; advertising and marketing; and sales of accumulated marketing data (Standing and Stockdale, 2001). As eMarkets are primarily trading environments their income is usually linked directly to the volume of usage of the marketplace. Therefore, the critical mass of users and their usage is of key importance to liquidity.

4.3 Independence/Neutrality

Independence/neutrality means that the eMarket-maker operates a central, unbiased platform not allowing any unfair opportunities or benefits to certain users or user groups (Standing and Stockdale, 2001; Scully and Woods, 2001). A neutral eMarket is not owned or managed by any major industry players and attracts companies not comfortable in joining a consortia eMarket operated by competitors. The eMarket is also governed by a set of rules and regulations ensuring the maintenance of fairness and equality, especially regulations pertaining to confidential information such as pricing and inventory levels (Raisch, 2001). The requirement for neutrality has now become more blurred with consortiums claiming to be neutral based upon using independent management teams.

4.4 Security/Credibility/Trust

In this new e-business environment many organizations face ‘dual uncertainty’ by having difficulty in deciding who they can now trust and having confidence in the electronic systems in which the transaction will take place (Ranasignam, 2003). A lack of trust increases uncertainty and reduces the confidence of participants in trading within the eMarket (Pavlou, 2002; Ranasigam, 2003).
The area of trust is both a threat and an opportunity for B2B marketplaces as it could negatively affect user participation, but it can also provide a way for eMarkets to add further value to the process. B2B eMarkets need to assure participants that proper mechanisms are in place to ensure transactions are trustworthy, eventually developing into global trust networks (Raisch, 2001). To increase trust eMarkets can police and set up codes of conduct and offer certain “vetting” services e.g., to help organizations find out more about the financial standing of potential trading partners (Raisch, 2001).

4.5 Ease of use and service reliability

eMarkets must be easy to use, reliable, and convenient in order to attract and retain participants but also must be robust and sophisticated to handle highly complex functionality at the back-end (Standing and Stockdale, 2001). The eMarket model relies upon light client-side technology i.e. the buyers and sellers must be able to do business over the site through a standard browser. However, the eMarket must be able to manage the commerce process from negotiation and requisition right through to order fulfillment and payment. This end-to-end support must take place over network application architecture capable of supporting thousands of users in a highly distributed, fully scaleable Internet environment (Raisch, 2001).

4.6 Value added services

B2B eMarkets need to offer a certain level of “basic functionality” and a certain level of service to be credible with potential customers including search capabilities, bidding/negotiating, and transactions. However, a successful eMarket needs to add further value above and beyond the basic needs of commerce (Raisch, 2001). Value added functionality allows market-makers to differentiate from their competition and develop new revenue streams. Some key areas of value-add are: domain expertise; life cycle support; logistics support; electronic payment and escrow services; community building; integration capabilities; and data mining services (Raisch, 2001).

4.7 Relationships

Organisations operate through their business relationships and networks in which they are embedded. eMarkets are no different and need to develop relationships between buyers, sellers, marketmakers and

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**Figure 2: The virtuous Cycle of eMarket Key Success Factors**

- **Differentiators:**
  - Business model / niche
  - Value added services
  - Domain expertise
  - Community service
  - Integration

- **Basic Enablers:**
  - Core e-Commerce functions
  - Ease of use / reliability
  - Trust / security
  - Independence / neutrality
  - Technical infrastructure

- **Number of Suppliers:**
  - Drives usage / revenues
  - Attracts buyers
  - Credibility / references

- **Transactions/Usage:**

- **Liquidity / Critical Mass:**

A reciprocal relationship - Buyers and sellers affect each other
technology providers in order to be competitive (Kandampully 2003). Examples such as Covisint partnering with Commerce One and Oracle highlight how eMarkets need strong technology partners if they are to have a competitive advantage (Kandampully 2003).

5. Conceptual Model of the relationship between eMarket Key Success Factors

Figure 2 provides a conceptual framework on how the identified KSF’s operate. The model shows KSF’s in a “virtuous cycle” relationship, whereby volumes of buyers and sellers drive transactions and revenue and attract each other accordingly. The cycle in turn allows the eMarket to achieve critical mass and then focus on delivering new value-added services to users attracting more users and usage completing the cycle.

The functions of the eMarket are classified into two types:

1) Basic enablers: required core commerce functions needed to perform basic trading and are viewed as the “must haves”. It is also “a given” that eMarkets are easy to use and reliable. They must also operate with fairness, security and be trustworthy in their dealings such that all information is deemed confidential by participants.

2) Differentiators: in addition to the basic enablers, an evolving set of KSF’s act as “differentiators” providing additional revenue streams and are the “nice to haves”. Differentiators position the eMarket within the competitive landscape and are the basis for buyer and seller decision making.

6. Research Methodology

eMarkets are going through many changes as market-makers and participants determine how they can develop the eMarket concept into a viable business function. Research into eMarket development within the Asian region is particularly limited creating a current lack of understanding regarding Asian customer needs, experiences and perceptions of eMarkets. Therefore, this research is taking initial steps towards developing an understanding of customer perceptions within the Asian Region. The following research question was developed to help guide the research:

How do Asian users (or potential users) perceive Key Success Factors for eMarkets?

As many emarkets are industry focused it was decided to focus on a particular industry: the airline industry. This industry was chosen for a variety of reasons. Firstly, it is

<table>
<thead>
<tr>
<th>Name of eMarket</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Hardware Exchange</td>
<td>Independent</td>
<td>Closed</td>
</tr>
<tr>
<td>Aerospan.com</td>
<td>Independent</td>
<td>Closed</td>
</tr>
<tr>
<td>Aerochina.com</td>
<td>Independent</td>
<td>Closed</td>
</tr>
<tr>
<td>AeroV</td>
<td>Independent</td>
<td>Closed</td>
</tr>
<tr>
<td>Aeroxchange <a href="http://www.aeroxchange.com">www.aeroxchange.com</a></td>
<td>Airline Consortia</td>
<td>Operating</td>
</tr>
<tr>
<td>Airnewco</td>
<td>Hybrid Consortia</td>
<td>Closed</td>
</tr>
<tr>
<td>AviationX.com</td>
<td>Independent</td>
<td>Closed</td>
</tr>
<tr>
<td>Avolo</td>
<td>Independent</td>
<td>Closed</td>
</tr>
<tr>
<td>Cordiem</td>
<td>Consortia</td>
<td>Closed</td>
</tr>
<tr>
<td>Exostar <a href="http://www.exostar.com">www.exostar.com</a></td>
<td>Supplier Consortia</td>
<td>Operating</td>
</tr>
<tr>
<td>ILS <a href="http://www.ilsmart.com">www.ilsmart.com</a></td>
<td>Independent</td>
<td>Operating</td>
</tr>
<tr>
<td>iShopAero</td>
<td>Supplier-led</td>
<td>Bought out by Singapore Technology Aerospace</td>
</tr>
<tr>
<td>Myaircraft.com</td>
<td>Independent</td>
<td>Closed</td>
</tr>
<tr>
<td>Partsbase <a href="http://www.PartsBase.com">www.PartsBase.com</a></td>
<td>Independent</td>
<td>Operating</td>
</tr>
<tr>
<td>Skyfish</td>
<td>Independent</td>
<td>Closed</td>
</tr>
<tr>
<td>Tradeair <a href="http://www.tradeair.com">www.tradeair.com</a></td>
<td>Independent</td>
<td>Operating (10 staff)</td>
</tr>
</tbody>
</table>
a competitive industry where procurement plays an important strategic role. The airline industry purchases goods and services for a broad range of areas, including engineering parts and services, fuel, uniforms and accessories, food and beverages and computer and entertainment equipment. This paper concentrates on the aircraft parts supply chain, which is highly fragmented and has significant annual sales value in excess of US$5 billion worldwide (Choudhury, Hartzel and Konsynski, 1998).

Secondly, the airline industry was also chosen because they have been using electronic communications and EDI standards to support the procurement of goods and services for over 40 years. A collaboration of major industry groups developed the airline industry’s own EDI protocol called SPEC2000, which is used predominantly for procurement transactions between airlines and major suppliers. Today, the overwhelming majority of spares parts orders are placed using SPEC2000 e-commerce standards, with most major airlines and suppliers handling 60 to 90 percent of their orders electronically. SPEC2000 standards are broadly accepted and deeply embedded in the industry’s e-procurement systems (SPEC2000, 2001).

In addition to EDI, the industry has also been using electronics markets for many years with Inventory Locator Service (ILS) started in 1979 to allow sellers to list their parts inventory and repair shops to list their capabilities. Another airline industry eMarket called Partsbase was formed in 1996, and from 1998 onwards a large number of eMarkets emerged to service this space and are summarized in Table 1.

The airline industry is different from other industries in that there are still government regulations controlling many aspects of their operations. Such regulations, especially in the area of safety and quality, ensure that procurement of aircraft parts is a task which is critical to the success of the organisation and documented to follow government guidelines.

Overall, this industry has experienced a number of different electronic business models for procurement. As the industry is experienced in evaluating many different electronic business models it would understand which success factors would suit their current business requirements. This industry is also extremely competitive with procurement practices an important aspect of overall business performance. Therefore, this industry offers aspects which make it an interesting case on which to conduct the research.

Respondents operate within complex, technical environments suiting a qualitative research approach in gaining rich and in-depth data on user’ needs, experiences and perceptions. A qualitative approach was suited for this research as data collection was focused on how decisions on e-marketplaces where made and what were the critical factors used in the decision making process. Telephone interviews where conducted with key informants (users and/or potential users of eMarkets) across various Asian markets. Normally there are only 1 or 2 airlines per country; therefore the population of potential respondents was limited. Telephone interviews were chosen for 2 main reasons:

- They provide a one-to-one and real-time discussion environment, allowing for flexible and detailed data gathering on areas of specific interest.
- They allow broad geographical coverage in a cost effective manner.

Given the small population size of the airline industry it was particularly important that key informants were able to provide meaningful data. Key informants where chosen based on the following criteria:

- Experience: They needed to have used or evaluated different industry eMarkets. Therefore, respondents would have an understanding of the services offered in e-marketplaces.
- Organisational position: All respondents needed to be involved in the decision making process of accepting or rejecting the use of eMarkets. The criteria ensures that the respondent would understand why eMarkets were rejected or accepted and understand the strategic and decision-making issues relating to eMarkets, as opposed to more operational issues such as web-site design, navigation and ease of use. Also respondents would know which factors offered would improve their current procurement practices. Therefore, senior managers in charge of airline purchasing were targeted as respondents.
- Organisational type: The airline industry is made up of organisations that range in size and focus. By gathering data from a number of international and regional airlines and service providers in the Asian region it ensured that the results reflected the wider scope of the airline industry and not just the large international airlines.
- Geographic location: Asia consists of a diverse range of countries for conducting the research. To ensure
that this diversity was captured during the data collection a range of countries was chosen. Countries ranged in size, economic development, Internet infrastructure, politics and culture.

Table 2 provides profile information for each of the key informants. This table highlights that data was collected from a range of countries and with respondents that were managers within their purchasing departments.

A structured protocol was developed to provide consistency during the interviews. Open questions were used to facilitate the free flow of ideas, views and experiences from respondents. Gathering their views and experiences of working within eMarkets is vital in understanding what advantages these eMarkets offer over current practices.

One researcher conducted all interviews based on the interview protocol. To help overcome some language comprehension issues, due to English not being the first language of all respondents, the protocol and background information was provided prior to the telephone interview. Reading the information helped the respondent to prepare their thoughts on the topic area. Each interview lasted for approximately 1.5 hours and was taped. All interviews where then transcribed. To improve the internal consistency of the data analysis, two researchers were involved in developing the initial codes. Themes were originally based on the conceptual development outlined in Figure 2, but others emerged during the data analysis. Once agreement was reached on the codes, one researcher was involved in coding the interview data.

7. Research Findings – overall trends

7.1 Overall Trends

Seven themes were developed during the data analysis stage. These themes, although related to the KSF’s, did not always align exactly to the factors previously given.

Usage and buy-in: Results showed a high degree of interest in eMarkets and a high level of trial in the Asian aviation industry with all interviewees using or had used an eMarket. Several companies had also invested as co-founders of consortium eMarkets. One of the main drivers for joining an eMarket or consortium was a high level of confidence and optimism that this was the direction in which the industry was moving. One consortium investor indicated that “We thought they had the ability to create standards and shape the future. The best way for us to be a player was to be an investor, a thought leader and be able to influence change” (Hong Kong A). Much of this early buy-in can be related to the fact that aviation companies had been using EDI for several decades and are well versed on the benefits of electronic trading.

2. Perception of services delivered: However, from this initial positive reception, the overall market perception on eMarkets is now mixed. Whilst some interviewees still maintain confidence, others have been disappointed with the actual services and value delivered. Few interviewees

Table 2: Key Informant Profile

<table>
<thead>
<tr>
<th>Interview</th>
<th>Company Profile</th>
<th>Company HQ Location</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Large International airline</td>
<td>Hong Kong A</td>
<td>GM, Strategic Purchasing</td>
</tr>
<tr>
<td>B</td>
<td>Large International airline</td>
<td>Japan A</td>
<td>Director, Purchasing</td>
</tr>
<tr>
<td>C</td>
<td>Large International airline</td>
<td>Australia</td>
<td>GM, Purchasing</td>
</tr>
<tr>
<td>D</td>
<td>Regional airline</td>
<td>Japan B</td>
<td>Manager, Purchasing</td>
</tr>
<tr>
<td>E</td>
<td>MRO service provider</td>
<td>Singapore A</td>
<td>VP, Purchasing</td>
</tr>
<tr>
<td>F</td>
<td>Medium international airline</td>
<td>Taiwan</td>
<td>Senior Manager, E-business</td>
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<td></td>
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<td></td>
<td>Projects</td>
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<tr>
<td>G</td>
<td>Medium International airline</td>
<td>China</td>
<td>Manager, Purchasing</td>
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<tr>
<td>H</td>
<td>MRO service provider</td>
<td>Hong Kong B</td>
<td>GM, Purchasing</td>
</tr>
<tr>
<td>I</td>
<td>eMarket (Asia Pacific)</td>
<td>Singapore B</td>
<td>Managing Director</td>
</tr>
<tr>
<td>J</td>
<td>eMarket (now closed)</td>
<td>US (with Asia operations)</td>
<td>ex-President</td>
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</table>
completed substantial real transactions within eMarkets and were disappointed with the functionality delivered. One interviewee indicated that "eMarkets are still having their functions based upon very traditional models but this really does not fit for our organisation and our way of doing business" (Hong Kong B).

3. Inventory and data credibility

Whilst Asian airlines (i.e. buyers) showed a good degree of buy-in to the eMarket concept, it appears that the majority of suppliers did not entirely share this enthusiasm. Many eMarket-makers had a significant challenge developing adequate volumes of trading inventory thus, having a negative impact upon the value proposition for buyers. Coupled with this was a major issue with the credibility of data provided by suppliers who did join. One interviewee indicated "All sorts of data is dumped without verification or auditing and there is all sorts of duplication of inventory ... there is a lot of spurious data out there" (Hong Kong B). Credibility of data pertaining to the quality standards of airline parts is extremely important to airline maintenance.

There also appears to be a problem with "ghost inventory" which occurs when listed inventory is not actually held by the listing supplier and the eMarket is being used as a purely speculative sales device for brokers and middlemen. "They have serious problems with "phantom inventory" or lack of documentation or the supplier is purely acting as a broker. It's an industry problem" (US).

4. Comparison to the existing EDI systems

The existing EDI (SPEC2000) platform has set high standards for users within the industry. SPEC2000 is a long standing and proven standard that has many supporters. SPEC 2000 also sets some significant barriers to entry for emarkets, due to the costs and complexity of integration with legacy systems. One quote highlighted they "do not believe SPEC 2000 will be replaced anytime soon ... there are just too many funny old legacy systems out there" (Hong Kong A) Or "Even if SPEC 2000 is a high cost due to SITA, it can exist for a while because it is an exclusive communication protocol, therefore its security is much higher than using the public internet" (Japan A).
Credibility: The initial market hype and the proliferation of eMarket sites caused a degree of confusion within the Asian aviation industry. Many airlines adopted a ‘wait and see’ approach, where they joined eMarkets on a trial basis but never actually committed to long-term participation. With the bursting of the Internet bubble, the majority of aviation eMarkets went out of business. There is still no clear emergence of leaders or standards causing a general loss of confidence and some pockets of cynicism. “People said, if you are not part of it you are going to miss out on influencing the direction, I said well what is the direction coz their not doing anything” (Australia).

Reduced expectations: There now appears to be a reduction in expectations regarding what value eMarkets can provide and the timeframes for delivery of such value. “It’s just been much slower and harder work than we had hoped” (Hong Kong A). The leveling off in expectations is supported by research which estimates potential savings from e-commerce have slipped from early promises of savings of 20% or more to an average closer to 12% and in the latest survey this has come down to 7%. Figure 3 illustrates the research results.

Regional diversity: Results also showed a marked regional diversity with regards to levels of buy-in and usage. The usage and investment in eMarkets was higher for more economically developed countries, such as Hong Kong, Japan and Singapore. These countries have more developed IT and Internet infrastructures supporting eMarket usage compared to emerging markets, such as China and Indonesia, showing a lower level of usage and commitment. It should also be noted that less developed countries had lower exposure to SPEC2000 and therefore could have lower EDI-related ‘barriers to entry’ (China) for eMarkets.

7.2 Research Findings related to KSF’s

Overall, there was little perceived differentiation between the KSF’s as it appeared that all features and functions of an eMarket where seen as having importance for an eMarket to be effective and successful. Both the “basic enablers” and many of the “differentiators” where seen as “a given”. Of the differentiators discussed, most emphasis was placed on integration capabilities in particular the ability to provide a clear path between the existing EDI platform and the new eMarket platform. It also covered the issue of integration into the customer’s internal or back-end systems. Regarding integration of eMarkets to back-end systems, one interviewee indicated “I think this is the key to the success of this whole thing” (Hong Kong B).

Whilst identified KSF’s were relevant, results indicated that they where neither the prime reasons for usage nor the prime issues perceived by interviewees. It appears that the identified KSF’s focused mainly on the “internal” aspects of an eMarket, whereas many “external” aspects also needed to be considered.

Results showed many environmental factors had a strong bearing on the success of eMarkets. These factors appear to present significant barriers to entry and are summarised as follows:

Industry power and politics: A degree of political power struggle was evident within the industry supply chain, between major buyers and sellers. eMarkets provided both a threat and an opportunity to various parties leading to significant “political maneuvering” by certain key industry players, which hindered the effective development of eMarkets. eMarkets pose a threat to the balance of power in the marketplace that was previously held by large OEM suppliers. Therefore, many suppliers set up their own private eMarkets and consortium sites, competing with public eMarkets. “The larger vendors expect you to sign up or use their sites. We talked to XXXX (major supplier) about linking to our procurement site. They weren’t interested at all and told us to use their site or nothing at all” (Singapore A).

Existing EDI platform (i.e. SPEC 2000): The airline industry has been using it’s own proprietary EDI protocols (SPEC2000) for several decades and this platform is well entrenched, both in terms of usage norms and also in terms of IT systems integration. The existence of this strong incumbent EDI platform has a great impact upon the willingness and the ability of users to adopt the new eMarket alternatives. SPEC 2000 has been in place for over 40 years and some airlines use it for over 90% of their purchases. “I think ATA is working on and a web front end for SPEC 2000, but this is a big issue. The industry’s order volumes are much too high to take data out of one system and key into another one” (Hong Kong B)

Industry and technology standards: In addition to the SPEC2000, the airline industry is governed by strict quality standards that incorporate documentation required for parts purchasing. Airlines themselves also have their own internal (or country specific) quality standards regarding suppliers and parts. All of these standards provide a challenge for the easy transition to eMarkets, as any changes to processes still need to
comply with existing quality standards requirements. There also appears to be a high level of confusion regarding the standards that are being developed for eMarkets and how these can be integrated with the existing SPEC2000 standards.

**IT and Internet infrastructure in the country and company:** The ability of users to access the Internet and the reliability of this access has a significant impact on the potential for eMarkets. Variations in IT and Internet infrastructure have great impact upon the eMarket uptake across Asian countries. Some markets (eg China) are still excited about the benefits of using PCs and simple email functionality on the Net. “Infrastructure is key in developing countries. If you go to countries like Indonesia, the rate at which data is being transferred is so slow that they don’t even bother with online services and anyway most buyers down there don’t have a PC on their desk” (Singapore B).

**Economic conditions and issues (e.g. 9/11):** The aviation industry in Asia (and indeed globally) has been suffering from significant economic problems and cost pressures in recent years that have greatly impacted the industry’s confidence to invest in new technology. In addition, the recent downturn in Internet business optimism has greatly affected this confidence level on B2B. “At this point in time the market is bad, ever since the dotcom bubble burst – everybody is careful of spending a single dollar on IT. They are very cautious” (Japan A) or “we are an associate member of XXXX (Consortium name) but we have not engaged in any activity as yet and the priority of these activities has been shifted due to the effects of 9/11” (Taiwan).

7.3 Overall model development

Given the importance of environmental factors on eMarket success, a revised KSF relationship model is required to provide a more “holistic view”. The initial model focused primarily on the “internal” functions and features of the eMarket and took some account of users and usage. However, the research highlights the need to incorporate the “external” environmental factors in more detail. A revised model is illustrated in Figure 4 categorising the KSF’s into four distinct bands.

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**Figure 4: Revised KSF Model – an holistic view**
Core functions: these are the basic e-commerce capabilities described as the “basic enablers” in the initial conceptual model. These include the ability to search, select, transact and manage. In addition they cover the need for an eMarket to provide a secure, reliable and easy to use platform for electronic trading.

Value added services: these are the additional features and functionality that help an eMarket position itself relative to the competition, deliver additional value above and beyond the core capabilities and also drive additional revenue streams. These include the development of community services and select consortium groupings, as well as the ability to provide innovative functionality such as supply chain management and inventory management.

Market readiness: relates to the prevailing conditions in the industry or sector being targeted by the eMarket. Confidence levels, as well as the level of hype or buzz, regarding the introduction of new technology need to be considered. Market readiness also relates specifically to user uptake and usage of eMarkets.

Environmental influences: are the external forces in the environment that influence the market and the level of market readiness. These environmental factors have been studied in great depth in classic marketing literature and include politics, technology, economics and infrastructure.

Overall, the marketing strategy used by the eMarket-maker should consider each of these aspects when developing their offering. This research has shown that external environmental factors play a large role in the viability of new ventures.

8. Implications for business

Although the above model was developed based on the case of the airline industry there are many characteristics that this industry has in common with other industries. For example, the use of an existing well-utilised EDI platform and the requirement for quality control of direct inputs is also prevalent in other industries such as: automotive; pharmaceutical; finance; distribution/warehousing; government services and many more. EDI is used by 80% of the Fortune 500 firms with it commonly being used for procurement by many businesses. Internet infrastructural differences between different countries will affect all industry electronic procurement practices, not just the airline industry. Although economic conditions such as 9/11 and SARS affected the airline industry greater than other industries other environmental issues will conceivably affect other industries. Therefore, the results might be generalised to other industries where similar characteristics are prevalent.

The key implications for business are as follows:

B2B eMarkets need to develop business strategies that incorporate the whole environment.

The bulk of current literature on B2B eMarkets focuses mainly on features, technology and functionality, which are essentially under the control of the eMarket provider. However, the research highlights that many external factors in the environment have a significant impact upon eMarket success. Therefore it is critical that B2B eMarkets develop business strategies that reflect the trends, opportunities and threats in the external environment – such as social, cultural, political and economic factors.

In this particular case, it is clear that technology and economic issues play a very important role in the environment. But such situations will arise in many different industries and therefore, eMarkets must adopt strategies that adequately account for these conditions. A complete environmental analysis is therefore vital prior to the development of strategy. Environmental factors can also be incorporated into the “performance dashboard” of the business (Rayport and Jaworski, 2001) so that managers are continually updated on opportunities and challenges as they evolve.

In particular, the regional diversity in IT and Internet infrastructure presents a challenge to eMarkets developing business in the Asia region. However, it should be noted that the region’s main areas of Internet growth are forecast to be the less developed markets. The research also highlights that these markets have much lower EDI related barriers to entry and may therefore present the biggest opportunity for future eMarket development.

eMarkets need to position effectively in relation to existing EDI platforms.

A strong existing EDI platform can have a ‘double-edged sword’ effect on the development of eMarkets within an industry. It is very clear from the research that many users are confused regarding the pros and cons of adopting the new technology, especially if many industry players believe the existing EDI platform works very well. It seems that eMarkets targeting the Asian aviation
sector did not adequately recognize the significance of SPEC2000 and may have assumed that the new eMarkets would simply replace the existing platform. The last 3 years have shown this not to be the case and eMarkets are now adapting their product to co-exist with SPEC2000.

It is critical for eMarkets to effectively position themselves in the industry with regards to the existing EDI platform and to communicate clearly, to all industry stakeholders, the benefits, costs and related issues. The positioning of eMarkets against the well-established EDI platform will be a challenge for eMarket-makers as EDI has many supporters. It may therefore be advantageous for eMarkets to position themselves as a “complementary” technology to EDI or offer services such as integrating third parties that existing EDI may not offer. The emphasis can then be placed on assuring the industry that the migration to eMarket usage will not disrupt existing processes and will provide clear additional benefits for all parties involved. eMarkets need to integrate with the existing EDI platforms to ensure that they do not compete directly. Kandampully (2003) highlighted integration between EDI and eMarkets in the case of Covisint.

eMarkets need to work on changing perceptions within the industry and reducing levels of confusion and cynicism amongst potential users.

In addition to the general industry confusion regarding eMarkets, there appears to be a relatively high level of cynicism amongst users. This is perhaps understandable given the roller-coaster ride that Internet fortunes have taken in the last 5 years. It is now important that the remaining eMarkets focus efforts on re-building overall confidence levels within the industry to improve the industry’s levels of “market readiness” as described in the Revised KSF Model (Figure 4).

9. Future Research

These findings can be further examined and tested through research of other, similar industries in the Asia region, such as the automotive industry which also has a well-established EDI platform. Additionally, the research base could be extended to cover companies in other continents, to measure the impact of identified environmental factors on the development of eMarkets in the aviation industry.

The conceptual models developed in this paper appear to have merit, based upon the research findings. However, further work is needed to develop more conclusive models on the relationships between the internal and external KSF’s for eMarkets, which have been identified. In particular it would be interesting to explore the impacts of changes in “environmental factors” on the “market readiness” factors identified for eMarkets. This research would be helpful to support management decision-making and strategy development in this field.

10. Conclusion

Purchasing managers are still uncertain about the use of eMarkets in their overall procurement strategies. This research indicated that eMarkets do have a long term role, but they need to be robust enough to weather external environmental factors as well as differentiate themselves from competitors. Previously discussed differentiators are perceived by users as standard, forcing e-marketmakers to provide customer service that differentiates itself from current EDI system. One quote which summed up the attitude of the managers was “in simple terms I was being asked to change placing orders from a high speed secure network to using a low speed insecure network – and not much else changed” (Japan A). Marketmakers need to consider their marketing strategies relative to both their external and internal environments.

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