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## The Business Models of E-Marketplace

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### ABSTRACT

*An electronic marketplace (EM) is an inter-organizational information intermediary that enables participating buyers and sellers to exchange information about price and product offerings and to cooperate on commodity exchange. Prior researches on EM design have not defined EM business model clearly. With a review of existing literatures on business model, this paper developed taxonomy of EM business models and classified existing EMs business model from a network role perspective. Further discussion of the evolution of EM business model is provided at the end.*

### INTRODUCTION

An e-marketplace is a virtual information intermediary embedded in industrial network and facilitated by telecommunications, created to enable multiple buyers and suppliers to exchange information and complete transactions (Zwass, 1999). E-marketplaces once exploded in almost every industry but have gone through a period of consolidation after 2002. While it was once predicted that more than 80 % of the Global 1000 companies would participate in B2B e-marketplaces by 2002 - and 100,000 of these marketplaces would be operational by 2001 worldwide (Gartner Group Report, 2001), there are now less than 1000 B2B emarketplaces world wide with the majority being located in North America and Europe (Standing et al, 2006). Struggling to attract firms to their website for survival, EMs are under great pressures to refine their business models in order to enhance competence and eventually survive. As many practitioners have been aware of the importance of sustainable EM business model, surprisingly, there are not many systematic researches clearly defining and classifying the viable business models for EMs. Questions remains include: what is EM business model, what are the components of EM business model construct, and what are the viable business models for EMs? How to design an EM's business model?

Following an overview of studies on business model and EM, this article developed a taxonomy that classifies the existing EM business models. It then described the on-going evolution of EM business models. Using the taxonomy developed here, the parishioners and the academic can understand the notion of business model in EM context, refine their design of EM business model, and use the EM business model construct to investigate EM design related issues.

*Business Model Research*

Business model is a term that only comes into the management literature recently but increasingly attracting attention within research on e-business (Timmers, 1998; Afuah & Tucci, 2001; Amit & Zott, 2001; Applegate, 2001; Cheng et al., 2001; Weill & Vitale, 2001, Hedman and Kalling, 2003). A business model is critical to a firm because it is directly relevant to the company's market appearance (e.g., potential customers, core products and services, customer process orientation, sales channels), its competence and strengths, and ultimately its performance (Heinrich and Leist, 2000). While business model is often used to describe the unique competitive strategies of a given business (Afuah and Tucci 2001), the term has both narrative and artifact characteristics. Researchers have highlighted that "the business model tells a logical story explaining who your customers are, what they value, and how you'll make money providing them that value.(Magretta 2002)", and is a hypothesis to be tested in the marketplace and often subject to public scrutiny particularly by investors(Peter and Sajda, 2006). As an abstraction of how a business making money and that blend the value stream, the revenue stream, and the logistical stream for the business (Betz 2002, Mahadevan 2000), business model can also become a product in and of itself (Hawkins 2004). In the U.S. business model is allowed to be patented under business method category if it can demonstrate the invention is useful, non-obvious, and novel.

E-business model research by far falls into two main streams. The first stream tends to build up business model as a research construct therefore give much efforts on defining what the business model is (Hedman and Kalling 2003) and what components a business model should consist of (Mahadevan 2000). For instance, Mahadevan (2000) defined a business model as a blend of three different streams including value stream, revenue stream, and logistic stream. Afuah & Tucci (2001) present a list of business model components including customer value (distinctive offering or low cost), scope (customers and products/services), price, revenue sources, connected activities, implementation (required resources), capabilities (required skills), and sustainability. Based on a systematic and practical analysis of several case studies, Weill & Vitale (2001) states that a business model needs to address consumers, customers, allies, suppliers, flow of product, information and money. Instead of specifying the components, Dai and Kauffman (2001) discovered three dimensions of business model including market functions, management needs, and technological adaptation. At an attempt to draw a complete picture of business model, Hedman and Kalling (2003) proposed a generic business model that includes several causally related but cross-sectional components: customer, competitor, offering, activities and organization, resources, supply of factor and production inputs, and process. These authors' work are discussing the nature of business model. Their lists are usually comprehensive but overlap and conflict in their understanding of key components whose interdependence is often not very clear. Various different business model taxonomies resulted from these lists often have very limited applicability to the practice and other business model research.

The other stream of business model research tends to avoid decomposition of general business model itself and targeted on specific e-business models and their application (Timmers 1998, Cherian 2001, Applegate 2001). For example, Timmers (1998) observed 11 e-business models such as e-shop, e-auction, e-procurement, e-mall, third party marketplace, virtual communities, value chain service provider, value chain integrators, collaboration platform, information brokerage, trust services etc. Based on genetic market roles (suppliers, producers, distributors, customers), digital business (online or not), and platform, Applegate (2001) presented 5 general

business models and 22 specific e-business models. Rappa (2002) denied a single comprehensive taxonomy for e-business model classification but comply different models into 8 categories: brokerage, advertising, intermediary, merchant, affiliate, community, subscription, and utility. This line of researches usually gives an vivid and clear description of how each specific model generate value. However, lack of generic framework to guide their work, the business models found by these authors are not well defined and are usually not much different from specific services delivered by business. Timmer(1998), For instance, viewed e-auction would be a different model from third party marketplace by assuming that auction site will not be the same as third party online market. However, since independent electronic markets today are providing more and more services including auction on their sites, it would be hard to tell whether these business are applying two business models simultaneously or developing a new business model with various compatible services? It appears that a bridge is missing between the two streams of business model researches. Systematic studies on classifying EM business models, in particular, are even rare.

Even though few consensus have been reached, the existing literature seems to agree on that value generation is the core of a business model. This point is clearly carried out by Amit and Zott (2001) in their both theoretically and empirically rigid general framework for value creation in e-business. According to them, although their definition of business model construct from transaction content, structure, to governance are limited to transaction only. Peter and Sajda (2006) went further to point out that a business model expresses the logic of value generation. The sense of logic explains the hypothetical nature of business model and separates it from general strategy that is more on the implementation layer. According to these authors, a fruitful extension of taxonomies of business model is to map them into taxonomies of value generation. An analysis of the value description of a business model will enable us to identify the value generation activities of the firm and the economic implications of those activities. Following this line of thinking, the article here tends to map EM business model into taxonomy of value generation within the industrial network underlying the EM. As Porter (1985) pointed out, value is “the amount buyers are willing to pay for what a firm provides them. Value is measured by total revenue ... A firm is profitable if the value it commands exceeds the costs involved in creating the product”. In the case of an EM, the value created through an EM will be the amount EM’s participants (customers) are willing to pay for the information /products /services that the EM provides them. A value generation perspective on EM business model classification can answer the following questions: (1) how does the EM enable business transactions? (2) How is value extracted from this process of enabling transactions? (Amit and Zott, 2001).

To the viewpoint of this article, an EM business model needs to include three main components: value proposition, value-generating/adding process, and value appropriation. The **value proposition component** of an EM business model refers to the utility that the customer derives from the information, product or service acquired from the EM. The **value generating/adding process/activities component** of an EM business model refers to the transformation process that takes place within EM as they take less valuable supply inputs and turn them into more valuable supply outputs. The **value appropriation component** of the EM business model depicts the value EM itself can retain from participating at a particular stage in the supply chain. Each component above implies some sort of relationship between what is physically done and the

utility (the financial and non-financial benefits) derived from doing it. The value propositions enable EMs to think about the wants and needs of customers, as well as what must be done (and at which price) to win a larger share of the available market. The value-adding process helps an EM to think about the unique activities that allow the organization to make distinct and unique products and services. The value appropriation allows the EM to think about whether what it does provides an acceptable return on its capital employed. Overall, these three components are complementary yet distinct in EM business model (Cox, Sanderson and Watson, 2001). All three components together define the design of transaction content, structure, and governance so as to create value through the exploitation of business opportunities (Zott, 2003). In the case of EM, the three value components together would clearly depict the business roles that an EM plays in its industry network. Overall, this paper proposes that *an EM business model is the conceptualization of the business roles an EM play in its industry network, which can be defined as distinct, technologically separable, value-added activities undertake by e-marketplaces in a given industry structure*. Next section will further explain our finding.

### *EM Business Model Taxonomy*

A common practice on e-business model classification has been to apply actor and roles analysis. For example, Timmers (1998, p.4) defines an e-business model as: "An architecture for the products, service and information flows, including a description of the various business activities and their **roles**". Weill & Vitale (2001) present a similar definition: "... a description of **the roles** and relationship among a firm's consumers, customers, allies, and suppliers that identifies the major flows of product, information, and money, and the major benefits to participants." Although these researchers didn't consistently categorize all their business models from an viewpoint of actor and roles, their approach has revealed rich description of each type of business model. From such a viewpoint, business model is not simply a service delivered by the actor or the e-business firm. It is more about the interaction between the actor and its surrounding players. The relationships among actors restraint their interactions, the value flow among them, and therefore the services carried out by the focal actor.

An EM is a network facilitated by telecommunications created to enable multiple buyers and suppliers to exchange information and complete transactions (Zwass, 1999). A network role-based abstraction is particularly appropriate for EM research. First, since EMs operate as the hub of existing industry network, it will reduce the complexity of analyzing industry networks by focusing attention on the roles undertaken by EMs rather than the EMs themselves. This will simplify representation of the business network structure. Second, role delineation on the basis of technological separability focuses attention on how changes in technology affect the population of role providers, i.e., the EMs, and the ways of organizing tasks within a role. Third, transitions in individual EM strategies can be systematically mapped by considering the roles by which an EM positions itself in its industry and how it manages interdependence with other roles in the industry network (Kambil and Short, 1994). Applying a network role perspective on the classification of EM business model would let us clearly tell who provides its goods and services, what goods and services will be provided, when and where they are provided, why the EM provides them, how the EM provide them, and how much revenue the EM takes in to continue its effort.

Previous researchers have discussed various specific roles that EMs play. Bakos (1998) , for instance, explained the functions or roles of electronic markets as matching buyers and sellers, facilitating transactions, providing institutional infrastructure, aggregating product information, price discovery, and providing procurement and industry specific expertise. Each of these functional roles requires different and distinct technologies, in terms of knowledge and skills as well as equipment. A comparison of these prior works is provided in Table 1.

<i>Representative Authors</i>	<i>Roles of EM</i>	<i>Comments</i>
Chatterjee and Segars (2002)	<ul style="list-style-type: none"> <li>• Project/Specification Managers</li> <li>• Supply Consolidators</li> <li>• Liquidity Creators</li> <li>• Aggregators</li> <li>• Transaction facilitator</li> </ul>	Specific but not theoretical taxonomy
Weller, Todd C. (2000)	<ul style="list-style-type: none"> <li>• EM Platform providers</li> <li>• EM operators</li> </ul>	Specific but not sound taxonomy
Timmers(1998)	<ul style="list-style-type: none"> <li>• E-shop, E-procurement, E-auction, e-mall</li> <li>• Virtual Communities</li> <li>• Value Chain Service provider</li> <li>• Value Chain Integrator</li> <li>• Collaboration Platform</li> <li>• Information Brokers</li> </ul>	Specific but not be able to differentiate each other theoretically
Malone et al. (1987)	<ul style="list-style-type: none"> <li>• Communication</li> <li>• Brokerage</li> <li>• Integration</li> </ul>	Functionality focused, not specific roles
Bakos (1998)	<ul style="list-style-type: none"> <li>• Matching buyers and sellers including determination of product offerings, search, price discovery</li> <li>• Transaction facilitation including logistics, settlement, trust</li> <li>• Institution infrastructure, e.g. legal or regulatory</li> </ul>	generic and applicable to both electronic and non-electronic market, not specific roles
Dai and Kauffman(2002)	<ul style="list-style-type: none"> <li>• Complete market functions</li> <li>• Fulfill management needs</li> <li>• Adapt technology</li> </ul>	Generic, complementary but not distinguishable taxonomy

**Table 1: EM Roles Comparison**

However, these classifications of EMs' roles overlap and are functionality-oriented. They are either not specific roles or not based on a theoretic taxonomy. Moreover, the prior literatures haven't been able to link these roles with business model construct. To be able to clarify the roles that EM can play within its industry network, this paper will first review the three components of

business model for EM context and then identify the major roles that an EM can act in the network.

*EM Value Proposition* Prior literatures have addressed different utilities that EM offers (). These value proposition in general falls into the following categories:

- **Communication enhancement**--rapid transmission of and access to large amounts of information at low cost
- **Transaction automation**—Automated business transactions and order execution including cost savings in logistics, transportation, distribution, inventory and payment systems.
- **Brokerage coordination**-- access to large numbers of buyers and suppliers, consideration of many alternatives and efficient selection of best alternative.
- **Process integration**-- tight coupling of buyer and supplier processes enabling lower inventory levels, greater responsiveness

*EM value generating/adding process/activities* Facilitated by different EM functions and technologies, these process or activities are usually bounded with each other to fulfill EM's market functions, satisfy management needs, and serve the role of technology adapters (Dai and Kauffman 2002). EM implement these processes or activities in order to support their value propositions including communication enhancement, transaction automation, brokerage coordination, or processes integration.

EM activities that enhance network communication include content provision such as public storefronts, capabilities for browsing supplier/ product, RFP/RFQ (Request for Product /Quotation), classified Ads, and other information services, e.g. discussion forums, industry newsletters, events calendar, bulletin board, scrolling ticker, industry rolodex. These activities can enhance communication and coordination among multiple parties within the virtual community represented by EM. Example EM include Realcommunities, Intralinks, MetalSite, PaperExchange, PlasticsNet etc.. In addition, storage of vast quantities of transaction data becomes the excellent source for developing procurement knowledge as firms analyze purchase patterns (e.g. Instill, RiverOne).

EM activities that automate transaction primarily fall onto three types: electronic cataloging, either private (e.g. SciQuest) or public (e.g. CommerceOne, MarketSite) is the common mechanism that e-markets use to aggregate supplier offerings, through which B2B e-markets compile product information from many suppliers so that buyers can do one-stop shopping on the Internet. Dynamic trading processes or electronic auctions (e.g. FastParts) implement matching what is wanted with what is offered in the market. It requires EM to do more coordination among trading partners but still are transaction oriented. Facilitation services such as financial services (e.g. TradeCard) and logistics arrangements (e.g. Optimum Logistics) help firms to close interfirm transactions.

EM's activities that coordinate value chain are to coordinate demand forecasting and production scheduling in real time (e.g. Transora) so that collaborative supply chain management can be possible. Private trading mechanisms, allowing firms to transact with preferred business partners,

accommodate firms' requirements for maintaining preferred business partnership, are particularly favored when the goal is to strengthen strategic buyer-supplier relationships.

EM's activities that integrate member firms' back-end enterprise systems with the marketplaces, let the EM be able to create value for buyers and sellers by opening up more trading opportunities and by connecting more business partners within marketplaces (e.g. Citadon, NewView Connect (previous E-Steel Connect from e-Steel)). For the same reason, third-party business service providers, such as financial institutions that offer options to close on-line business transactions, can also be integrated into EMs. Standardizing the data formats used in exchanging business documents and implementing common business processes among trading partners enhance the connectivity of a network technology, and helps system integration (e.g. Converge). B2B e-markets also offer platforms to streamline workflow and promote inter-organizational collaboration, supporting business process management (e.g. ChannelPoint). To help member firms to overcome some of the adoption hurdles resulting from technical complexities, IT outsourcing services in terms of systems analysis and implementation is available as well (e.g. PurchasePro).

*EM value appropriation* In contrast to the value proposition that addresses the long-term sustainability of the business and often sets the context for identifying revenue streams for an organization, the value appropriation of EM reflects the realization of revenue in the short-term. EMs typically generate revenues through different fees structure, e.g. subscription fees, advertising fees, and transactional income (including fixed transaction fees, referral fees, fixed or variable sales commissions, and mark-ups on direct sales of goods), etc. (Woods 2002, Goldman 1995). They sometimes use variants of these basic revenue-generating modes, and often use them in combination. Table below gives different revenue stream that EMs currently generates.

Based on the above analysis on various value components of EM business model, this article proposes four elementary business models for the EM: communicator model, transaction facilitator model, valued chain coordinator model, and collaboration enabler model. Each model represents different roles of EM in its economic network as depicted in the table 3.

*Communicator model* enhances the communication between participants in the EM as its value proposition. EMs adopting this model mainly serves the role of an information intermediary within an industry network. In this communicator model, the creation, approval, and release of content (or information) are predictable and controllable as any manufacturing process. EM examples of the communicator model include Introlinks.com, Worldoil.com, Rfpmarket.com, and wtexpo.com, etc.



Revenue Stream	Definition	Example	Advantage/Disadvantage
<b>Subscription (or membership) fees,</b>	One-time joining fee or annual maintenance fee for membership	<ul style="list-style-type: none"> <li>• CreditTrade web</li> <li>• PaperExchange</li> </ul>	<ul style="list-style-type: none"> <li>• Easy to track and charge</li> <li>• Attractive to new members for free view..</li> </ul>
<b>Advertising and permission marketing fees</b>	Fees for banner advertising and other extended listing services on the website such as "Opt-in"	<ul style="list-style-type: none"> <li>• VerticalNet</li> </ul>	<ul style="list-style-type: none"> <li>• High requirement on customer retention and loyalty</li> </ul>
<b>Transaction fee</b>	Based on the value of the transaction, sometimes with a minimum per trade or a maximum per trade for large deals.	<ul style="list-style-type: none"> <li>• E-steel -- 7/8 of 1% to sellers.</li> <li>• PaperExchange-- 3% of the value of the transaction for paper related and equipment listings</li> </ul>	<ul style="list-style-type: none"> <li>• High income when transaction volume is high</li> <li>• Raise the hurdle of trading entry</li> <li>• Hard to track over-the-counter transactions</li> </ul>
<b>Posting fees</b>	A fee for each "posting," or order entered into the system.	<ul style="list-style-type: none"> <li>• Nasdaq charges a fee for each quote</li> </ul>	<ul style="list-style-type: none"> <li>• Dilemma of whether to permit free posting initially to encourage volume or whether to charge</li> </ul>
<b>Listing (or hosting) fees</b>	Fees for users to list products on the system for trading	<ul style="list-style-type: none"> <li>• VerticalNet—a fee to host the supplier's storefront and list the supplier's products in its website</li> </ul>	<ul style="list-style-type: none"> <li>• The exchange have to take regulatory roles mostly</li> </ul>
<b>Information selling fees</b>	Fees for receiving valuable and disseminated trading data/information	<ul style="list-style-type: none"> <li>• Manheim online charges a fee for car dealers to buy the list of all the sale prices from the online auctions held each day</li> </ul>	<ul style="list-style-type: none"> <li>• Based on economic power of trading information.</li> <li>• Limits the initial visibility of the exchange and can slow down the overall rate of take-up in the industry</li> </ul>
<b>Information licensing fees</b>	Fees for the use of pricing data used in the formulation of the derivative contracts	<ul style="list-style-type: none"> <li>• Dow Jones and Standard Poor's indices are licensed to Chicago Mercantile Exchange and the Chicago Board of Trade</li> </ul>	limited to Derivative contracts
<b>Revenue Sharing</b>	Revenues generated through strategic partnerships with business partners who provide analytics, ratings, and news services or publishing their own data and analysis.	<ul style="list-style-type: none"> <li>• Non specific</li> </ul>	EM must set up the partnership or provide analysis tools for their data.
<b>Software licensing fees</b>	Fees for licensing sophisticated trading platform with integrated logistics and back-office functionality.	<ul style="list-style-type: none"> <li>• Maoi Technologies</li> <li>• Commerce One</li> <li>• Right Works</li> <li>• I2 Technologies</li> </ul>	EM has to have huge investment on internal system development
<b>private networks sponsorship fee</b>	A monthly administration fee for private network, which depending more on revenue than transaction fee	<ul style="list-style-type: none"> <li>• BigMachines</li> <li>• Catex</li> <li>• CreditTrade</li> </ul>	Private network is tied into the EM's core system—a good way to forge strategic relationships with key industry participants.

<p><b>value added service fee</b></p>	<p>A fee per service, e.g. percentage of cost savings</p>	<ul style="list-style-type: none"> <li>• ESPRIT project TRANS2000 in multi-modal transportation</li> <li>• MarshallNet and Parternet</li> </ul>	<ul style="list-style-type: none"> <li>• Focus on value adding service requiring integration and cooperation along value chain,</li> </ul>
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**Table 2: EM revenue stream**

EM business model Type (Network Role based)	EM business model Components (Value-centered)		
	Value Proposition	Value Adding Process	Value appropriation
<p><b>Communicator model</b> Eg. Introlinks.com, worldoil.com, Rfpmarket.com</p>	<p>Communication enhancement</p>	<p><b>Content provision, e.g. :</b> public storefronts, capabilities for supplier/ product search, Request for Product /Quotation ( RFP/RFQ), classified Ads etc.. <b>Other Information services</b> discussion forums, industry newsletters, Events calendar, bulletin board, scrolling ticker, industry rolodex</p>	<ul style="list-style-type: none"> <li>✓ advertising and permission marketing fees,</li> <li>✓ posting fees,</li> <li>✓ information selling fees,</li> <li>✓ Listing fees</li> <li>✓ Information licensing fees</li> </ul>
<p><b>Transaction Facilitator model</b> Eg. Arbinet.com BigMachines E-chemicals PlasticsNet</p>	<p>Transaction automation &amp; aggregation</p>	<p><b>Spot trading, search and price discovery related services, e.g. :</b> E-trading and aggregated catalogs <b>Post-sale transaction automation, e.g.:</b> Online issuing of P.O., invoicing, e-payment</p>	<ul style="list-style-type: none"> <li>✓ Transaction fee,</li> <li>✓ Listing (or hosting) fees</li> <li>✓ Information licensing fees,</li> </ul>
<p><b>Value Chain Coordinator model</b> Eg. Catex PaperExchange CreditTrade Newview.com Commerx.com</p>	<p>Brokerage &amp; logistics coordination</p>	<p><b>Selection and Dynamic pricing, e.g.:</b> auction/reverse auction, private negotiation, online comparison of offers &amp; recommendation (auto-matching) <b>.Logistic coordination, e.g.</b> warehousing, transportation, quality assurance , clearing and settlement, Escrow</p>	<ul style="list-style-type: none"> <li>✓ value added service fee (percentage of cost savings,)</li> <li>✓ subscription fee,</li> </ul>
<p><b>Collaboration-enabler model</b> Eg. Covisint Snecma</p>	<p>Integration &amp; initiation of innovation</p>	<p><b>Collaboration facilitation. e.g.:</b> private sellers' extranets with pricing personalized to individual customers, inventory visibility, design sharing Co-R&amp;D or Co-marketing</p>	<ul style="list-style-type: none"> <li>✓ subscription fee,</li> <li>✓ membership fee,</li> <li>✓ private networks (PN) sponsorship &amp; customization fees,</li> <li>✓ Revenue Sharing</li> </ul>

**Table 3: Electronic Marketplaces business Model Taxonomy**

Content management is the major value-adding process of this model, which includes providing public store fronts, supporting buyer/seller information search, facilitating requests for products or quotations (RFP/RFQ), dispersing customized news feeds, and providing document management, etc. Accurate and timely content can speed the exchange of goods, match buyers and sellers, and determine customer satisfaction. For example, Content Intelligence Services (CIS) organizes business-critical content by automatically tagging and categorizing it -- turning unstructured content into intelligent, structured content. With these powerful capabilities, CIS enables precise searching, easy navigation, and effective personalization while promoting content reuse across multiple initiatives and increasing productivity through process automation. In addition to content management, some other communication services provided by this model include discussion forums, industry newsletters, calendars of industry events, bulletin boards, scrolling tickers, industry rolodexes, and classified Ads, etc.

Since the communicator model creates value mainly through information processing, it is not surprising that companies adopting this model make money from information exchange through the EM. Charges on information flow, e.g., advertising fees, permission marketing fees, products posting fees, information selling fees, and listing (or hosting) fees, etc., represent the main revenue stream.

The **transaction facilitator model** specializes in offering spot trading, search and price discovery services. The value proposition of this type of model is to facilitate transaction automation and aggregation. EM examples of this model include Arbinet.com, BigMachines, E-chemicals, and PlasticsNet, etc.. These EMs try to provide a one-stop shop for many types of products and services. By affiliating themselves with other marketplaces, they can offer great reach and connectivity for companies trying to increase market share and/or looking for scarce direct and indirect materials and other supplies.

The underlying value-added from this model is reduction of cost through process improvement and/or access to more sources of supply or more potential customers. Major value-adding processes in this model include spot trading, search and price discovery services, and post-sale transaction automation, e.g., e-procurement, aggregated catalogs, online issuing of P.O., invoicing, and automatic clearing and settlement.

The membership costs in these open marketplaces are likely to be low or nonexistent; the fee structure is likely to be flexible to make it attractive for clients conducting both low and high volume transactions. Main revenues of transaction facilitator model come from transaction fees, listing (or hosting) fees, and information licensing fees.

While deceptively simple, firms driving exchange in these marketplaces face a number of challenges. Foremost among the challenges is the retraining of procurement personnel and the redesign of business processes. Many firms have discovered that simply adding web-based technology and conducting business without redesign of process or adjustment of skills is more costly than traditional commerce. An additional challenge is developing a marketplace that both attracts and retains participants, especially, those participants whose technology and business processes are sophisticated enough to enable the marketplace to realize its potential benefits.

The *Value Chain Coordinator model* specializes in offering tools and functionalities that will enhance information visibility and speed up information sharing across the entire supply chain. The overall goal of this model is to help integrate the business processes of manufacturers with those of the buyers, sellers and distributors. It is through such end-to-end supply chain integration that companies can realize value in many different ways: superior inventory management, manufacturing on demand, customized product offerings, and relatively accurate demand forecasting. Therefore, the value propositions of this model are reduction of demand uncertainty through brokerage and perfect information for better supply chain coordination. The value-adding processes in this model include selections, dynamic pricing and logistic coordination, e.g. different auction/reverse auction, online negotiation, online comparison of offers & recommendation (auto-matching), centralized clearing and settlement, warehousing, transportation, quality assurance, and credit analysis, etc.

EMs taking this model can charge higher subscription fees and services fees as compared to the transaction facilitator model because they are providing higher margin value-added services; often, this form of market facilitator is likely to be a technology vendor with considerable experience in supply chain management, i.e., NewView and Commerx.

The *collaboration enabler model* is suitable to further enhance a buyer–seller relationship by enabling collaborative relationships in which companies are working jointly with others, especially in an intellectual endeavor (Noekkenved, 2000). EMs adopting the collaboration enabler model is usually characterized with closed memberships. This is obviously because of the difficulty of trust building and high cost of exchanges of knowledge as well as other forms of complex information. The focus of their value proposition lies in developing new products and services through collaboration among the participants. However, the collaboration among participants cannot occur without the integration of their information system and organizations. Therefore, their value source ultimately lies in process and data integration for innovation purposes.

Value-adding in this model is achieved through collaboration, enabled by system integration among EM participants, e.g., private sellers' extranets with pricing personalized to individual customers, inventory visibility, design sharing, or co-R&D as well as co-marketing etc. Tight integration among trading partners enables them to work together to better understand future demand and put plans in place to satisfy it profitably. During this process, information is not just exchanged and transmitted, but it is also jointly developed by the buyer and seller. For example, in the case of working collaboratively on customer requirements, trading partners might collaborate on new product designs and customer demand forecasts (Grieger, 2003).

Since collaboration is the main source of their value creation, revenue streams in support of this model are the subscription fees, membership fee, private networks sponsorship fee, and revenue sharing. The milestones of collaboration are perfect knowledge and strategic flexibility. In essence, the participants seek to identify future market opportunities and then invest collaboratively to probe and exploit potentially new boundaries for the industry.

### ***The Evolution of EM Business Model***

Being a hub in the nexus of firms in the same industry or along industry supply chain, an EM is essentially embedded in an inter-organization business network among a set of multiple companies with business relationships, enabled through digital, Internet-based information connections to coordinate their separate, ongoing activities. The emergence of EMs thus can be viewed as a process of inter-organizational network development, which depends on the cooperation of network nodes because of its necessity for innovation and competitive success, high satisfaction for cooperating parties, and strong levels of efficiency and profitability as well as lower governance cost (Smith et al. 1995).

The inter-organization cooperation underlying EMs is reflective of “socially contrived mechanisms for collective action, which are continually shaped and restructured by actions and symbolic interpretations of the parties involved” (Ring and Van de Ven 1994, pg.96). This collective action across inter-organizational networks is essentially about cooperation on network value flow (Woods, 2002), which defines the roles of each participator in the network value chain and determines how the value is created and delivered through the network.

During the late 1990s, many EMs arose across nearly every industry segment. The more recent market shake-out of EMs seems to suggest that there will be only a few successful EMs within each industry (Woods, 2002). This phenomenon seems to be very similar to a natural selection process suggested by organizational ecology theory. To survive through its initial stages of network formation, an e-marketplace must generate significant value for the organizational nodes within the inter-organizational network and collect enough revenue afterwards. At the same time, it is also observed that the business models and ownership model of successful EMs usually follow different combination patterns in various industries, e.g. collaboration enabler model usually occurs with industry consortia, and most independent EMs applied transaction facilitator model (Woods, 2002).

The interaction between industry structure and congruent variation patterns among multiple different network configurations such as EM business and ownership can find its explanation on prior theories of organizational fit. As Doty et al. (1993, pg.1196) pointed out, “increased (organizational) effectiveness (success) is attributed to the internal consistency, or fit, among the patterns of relevant contextual, structural, and strategic factors”. This suggests that organizations like EMs that have a fit among and within these factors/network configurations will perform better than those are ‘misfits.’ It is natural that there is no uniformly best organization structure for all firms in all circumstances. Instead, one has to find the appropriate fit among contextual factors (e.g. environment, technology, etc.), design factors (e.g. strategy and institutional models), and structural factors (e.g. complexity, centralization, and formalization) (Drazin and Van de Ven 1985). If contextual factors such as industry structure change, design factors and structural factors may be needed to change to “recalibrate” the fit. This indicates that the nature of fit situations between EMs’ business model and network context will vary across industries and overtime.

Furthermore, the business roles that an EM implements in its industry network, or the roles it plays in the network are based on different business linkages among network nodes (Kambil &

Short, 1994). Only through these linkages, value is created and delivered to organizations within the network. In general, an EM can build its linkages within an inter-organizational network in two ways: aggregation and integration (Davenport et al. 2001). Aggregation is about aggregating buyers and sellers to provide increased information and choices, which only needs loose coupling of organizations through the EM. Integration allows network nodes to synchronize their activities across firm boundaries, and requires tight coupling of participating organizations because of the need to simultaneously lower transaction cost and induce higher relationship rents (Williamson, 1979; Kambil & Short 1994; Ring and Van de Ven, 1994; Dyer et al., 1998; Donada, 2002). Although aggregation is often viewed as the primary function of markets (Woods, 2002), integration can provide significant values, especially with mission-critical activities, e.g. reduced transaction process cost, increased speed and accuracy with which companies respond to trading partners, lower total supply chain costs that can increase overall demand, more efficient shared work flows, improved supply chain planning, and optimization etc. (Brooks, 2000). Moreover, aggregation and integration requires different depth of relationships among network nodes. Firms would have to cooperate more closely to be able to integrate together on their business process, and information system. Therefore, from simply putting their e-catalog together for information exchange to providing fully integrated information platforms for collaboration, different EM business models are distinguished on their different needs for industry members to cooperate closely within the inter-organization network in terms of aggregation and integration. These differences can be shown in figure 1.

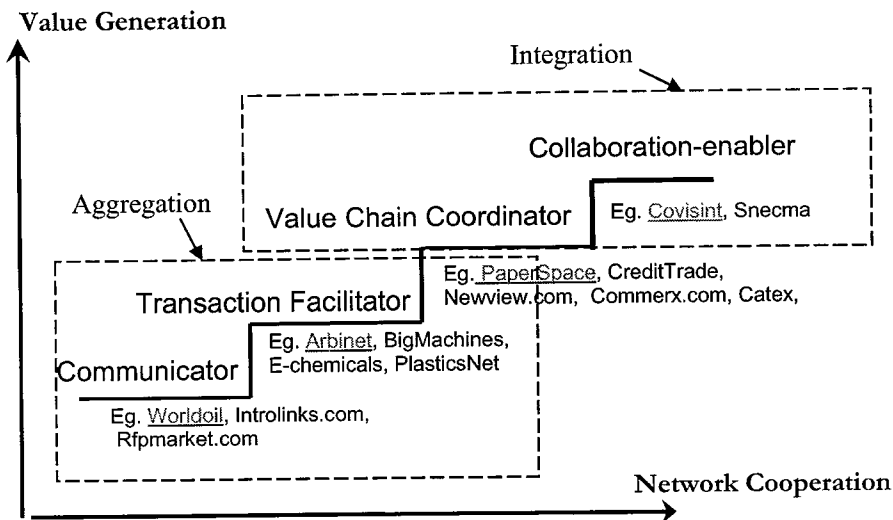


Figure 1: The relationship between EM business model and network

As a communicator, an EM serves as the information intermediary of an industry business network, a role that does not require network participants' materialized relationship with each other and with the EM.

As a transaction facilitator, an EM offers spot trading, search and price discovery related services and simple transaction automation, through which not only generic information is exchanged but real transactions flow across the network. However, this transaction automation and aggregation requires only dyadic, intermittent cooperation between trading partners. The network cooperation required for value creation 'sticks' to each transaction and therefore is at a relatively low level.

As a value chain coordinator, EM involves market functions from brokering multiple buyers and sellers to coordinating suppliers and distributors along the supply chain, which cannot be done without integrating to some extent the business processes of manufacturers with those of the buyers, sellers and distributors. This end-to-end supply chain integration among network participants generates value in many ways -- superior inventory management, manufacturing-on-demand, customized product offerings, and accurate demand forecasting -- all of which are critically dependent on close cooperation among value chain participants.

As a collaboration enabler, EM's value proposition is to develop new products and services through collaboration among the participants. Functionality provided by this role -- private sellers' extranets with pricing personalized to individual customers, inventory visibility, design sharing, or co-R&D as well as co-marketing -- requires collaboration of EM participants that cannot be achieved without fully integrating their information systems and business processes. During these collaborations, information and products are not just exchanged and transmitted but also jointly developed.

Overall, moving from the communicator model to the collaboration enabler model requires closer network participant cooperation and tighter integration of information systems and business processes, which can generate higher value for the network. At the same time, these different roles are not exclusive of each other. Higher-level EM functionalities are usually provided on a foundation of lower-level EM functionalities. In addition to the value creation of inter-organizational network, another important aspect of industrial network cooperation involves network governance. Successful inter-organizational network governance induces the cooperation among network participants that is needed in order to reduce transaction cost (Williamson, 1979, 1985). Existing research has found that an important approach to induce cooperation across a network is to involve industry partners in a firm's governance (Johnston & Lawrence, 1988; Dwyer et al., 1987; Achrol, 1991; Webster, 1992). Stakeholder representation theory further explained the importance of acknowledging stakeholder representation in corporation governance (Freeman & Evan, 1990; Jones & Goldberg, 1982). From this theory, representation of important network nodes in EM governance can promote procedural fairness by providing a means of ensuring that their considerations are more directly represented in EM decision making (Jones & Goldberg, 1982; Selznick, 1992) and is central in legitimating (Evan & Freeman, 1993) and safeguarding the interests of network nodes (Freeman & Evan, 1990). Successful inter-organizational network cooperation thus requests appropriate representation of inter-organization network participants in an EM's governance model.

At last, both value creation and governance of an inter-organizational network are influenced by industry structures. The existing industry structures are usually difficult to change in the short term. They influence the cooperation of participants within an industrial inter-organization network. Prior research has found that attributes of industry structure impose constraints on the

development of collective activity within an industry (Dollinger, 1990). Network cooperation occurs in certain industry structures and is influenced by them. These industry structures determine the relationship among network participants, or the structure of network.

## CONCLUSION

This paper intends to develop sound business model taxonomy for the emerging EMs. Based on its review of the existing literature on business model, it proposed EM business model would include three value components addressing EM's value proposition, value-generating/adding process, and value appropriation. The paper also applied network actor and roles analysis and defined four primary EM business models including communicator model, transaction facilitator model, valued chain coordinator model, and collaboration enabler model. The application patterns of these business models in the industries are then discussed. It finds out that in order to generate higher value for the network, EM would need to move from the communicator to the collaboration enabler. However, more integration oriented business models need higher degree of network cooperation and tighter integration of information systems and business processes.

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