B2B Electronic Markets

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Abstract

This entry provides an overview of the main characteristics of the phenomenon of Business-to-Business (B2B) Electronic Markets (EMs). After introducing this concept and discussing major effects related to the benefits and risks from an institutional viewpoint, the configuration options of EMs in the B2B domain are presented from a functional perspective. The discussion then shifts to the intermediary highlighting critical issues that shape the business model of a marketplace operator and addressing criteria that are known to influence the choice of a particular marketplace configuration. Finally, the future development of B2B EMs is discussed.

Definition and Roles

As described in their seminal article on “Electronic Markets and Electronic Hierarchies” (Malone et al., 1987), transaction cost theory distinguishes two distinct modes of the coordination of economic activities. While hierarchies use managerial supervision with defined responsibilities and decision rights to guide the collaboration of multiple actors for an extended period of time, markets coordinate economic actors based on instantaneous distribution of information. Thus, an EM may be defined as an “interorganizational information system that allows the participating buyers and sellers to exchange information about prices and product offerings” (Strader and Shaw 2000, p. 78). This section presents three views on EMs: First, from an institutional perspective, EMs may be conceived as intermediaries that operate a market platform which links multiple buyers and sellers within an institutional setting. Second, from a functional perspective, EMs supports economic interactions, i.e. transaction processes from product search and the negotiation on terms to order fulfillment. They specifically provide electronic means for the efficient allocation of goods and services among buyers and sellers, such as electronic product catalogs or auction mechanisms. Third, a design perspective sheds light on how EM providers may develop their business model.

The institutional perspective starts with contextualizing EMs as intermediaries between sellers and buyers (see Figure 1. It recognizes markets as (physical or virtual) places where transactions take place in a context of rules and regulations that provide assurances, e.g. trading partner assessment or protection against insider trading, as well as enforcement mechanisms. The intermediary adds cost in a value chain, but also adds value, e.g. by providing a transaction platform and a transaction environment to enact the market rules. This also includes the setting of standards at the industry level or higher, such as message standards, standards for product descriptions or classifications or standardized interchange agreements as well as the applicable legal framework of national or international law, e.g. contract law, financial market regulation. Specific rules safeguard market access, transparency, anonymity, assurances, or transaction fees. The institutional setting provides the “rules of the game”, while the transactions are the “plays of the game”. Since transactions are at the heart of transaction cost economics (TCE), this discipline of economic theory, e.g. (Williamson 1991), has been applied broadly to explain EMs (e.g. (Malone, Yates, and Benjamin 1987)). The main elements of TCE – contracting cost ex ante (contract preparation cost) and ex post (monitoring and enforcement cost) – are both influenced by the institutional infrastructure. In an intermediated (or
centralized) market structure, trading partners decide to play by commonly agreed upon market rules to govern their transaction, rather than having their lawyers develop a customized, bilateral (or multilateral in the case of a supply chain or hub-spoke network) contract. As much as these standardized contracts and rules are suitable for the trading partners, they will benefit from the market and have their transactions governed by it. Conversely, bilateral agreements are beneficial when partner-specific arrangements are needed.

Figure 1: Roles in (centralized) markets

Rise of B2B Electronic Markets

The convergence of information technology (IT) and telecommunication technologies has had a direct impact on the organization of economic activities. It dates to the diffusion of the telegraph in the 19th century which increased the distribution area for traded products as well as the complexity of organizations. Since the 1970s it became apparent that computation power coupled with growing communication bandwidth not only enabled more efficient calculations at a certain (company) location, but also the coordination of dispersed operations. In fact, applications that companies shared with their suppliers and customers were among the pioneering example of strategic information systems. Well known instances, such as American Hospital Supply which introduced an electronic ordering system as a vehicle to create a strategic lock-in of hospitals, or American Airlines which turned its internal booking systems into computerized reservation systems (CRS) for travel agencies, illustrate the advances and impact of electronic integration in the B2B domain. Ultimately, these systems also included services from competitors and developed into EMs. Other traditional markets that benefitted from informational and transactional efficiencies involved in electronic trading were observed, for example in the financial sector. The NASDAQ stock exchange, founded in 1971 in the United States, is claimed to be one of the first EMs with numerous other electronic exchanges to follow. As a second development path, EMs emerged in fields that were not previously governed by markets. B2B EMs spread across many industries during the late 1990s – including automotive, banking, chemicals, electronics, oil and gas and retailing – and the value of electronic B2B transactions rose to 6.7 billion USD in 2008 (up from 1.40 billion EUR in 2003) (Statista 2013). The overall number of operational EMs peaked in 2001 and dropped thereafter, but there are still more than 800 EMs listed in the directory of electronic marketplaces across a broad variety of industries (eMarket Services 2013). A cursory look at examples of EM reveals that EMs are highly heterogeneous arrangements and comprise electronic exchanges, spot markets, catalog markets and transaction platforms alike (Kaplan and Sawhney 2000). Even the financial exchanges which approximate the ideal of perfect markets are far from being homogeneous and feature systems with a continuous limit order book, a single-price auction or a trading mechanism with passive pricing (Hendershott 2003).

Characteristics of B2B Electronic Markets

The economic rationale for EMs is often explained using transaction cost theory. The existence of transaction costs highlights that the notion of a perfect, friction free market is a simplification of economic theory. From a technological point of view, an open sharing of information is feasible. However, the “information transparency hypothesis” stipulates that all participating actors (more or less automatically) benefit from an open sharing of information requires a more differentiated consideration. In the first place, EMs enable the participating business partners to execute parts
or the entirety of their business transactions in a digital form. This directly impacts the operational efficiencies of transaction processes, i.e. the access to market information, the negotiation and contracting as well as the settlement activities. The real-time communication in EMs also extends a market’s reach regarding time (24 x 7) and space (global scale) while the increased richness of communication media contributes to the representation of more complex product descriptions. Dependent on the traded objects, B2B EMs address a variety of needs: The first pattern is determined by the specificity of products: (1) When homogeneous products (commodities) are traded, the allocation problem (matching supply and demand and establishing a price) is key. Buyers typically are interested in a low price, e.g. as a result of competitive bidding among sellers, while sellers strive for high revenues. (2) In case of complex, heterogeneous products the problem is to find and evaluate offerings which meet multiple criteria and to facilitate multi-criteria decision making. In this case price is but one - and often not the prime - criterion. (3) In case of customer specific products or services, the emphasis is on (simultaneous) negotiation across several properties (Johnston 2008). The second pattern is determined by the role of the products for the businesses themselves: (1) If the products are input for manufacturing processes, then they are typically industry-specific (vertical) and face a constant forecasted demand which is handled via the company’s enterprise system (e.g. Enterprise Resource Planning System, ERP). The goal is frequently safeguarding quality and prices are often negotiated only for longer periods. (2) In case of operating inputs (so-called MRO-products, maintenance, repair and operations), such as office supplies, spare parts or airline tickets, the markets are independent of specific industries (horizontal) and the demand is often irregular, more price-sensitive and supported by catalog or auction systems (Kaplan and Sawhney 2000).

In principle, EMs have the potential to increase the frequency of transactions, reduce information asymmetry and uncertainty and lower the need for specific investments (Malone et al., 1987). Many EMs in the financial sector have illustrated that they have increased the number and volume of transactions by orders of magnitude. Financial information spreads almost instantaneously across the globe and financial EMs are highly automated, efficient ways for discovering and determining prices. Thus, EMs can considerably reduce the costs of standardized business transactions and the cost of coordination of interdependent actors that are distributed across multiple institutions and geographic locations. Although this appears to support the theoretical ideal of perfect markets, electronic trading has been shown to be contingent on the accuracy, timeliness and comprehensiveness of the provided information. It changes the perception of risk regarding the identity and behavior of business partners, the quality of the products and, more generally, of the fulfillment of the contract (Kambil and Heck 2002). Especially processes with rich social dynamics, such as the cues and rituals involved in competitive bidding or floor trading, impede a quick adoption of the electronic environment. This provides a first explanation for the slow growth of sustainable business models for EM intermediaries. It has become clear that in the B2B domain providing quality and partner assurances that mitigate the risks of electronic trading are vital. Both buyers and sellers benefit in principle from a proper and impartial execution of the trades and compliance of all parties to the contractual obligations.

In the B2B domain uncertainties (or risks of trading) and information asymmetry are of special importance. First, not all EMs were successful in attaining a sufficient volume of transactions (or liquidity). Given the infrastructure investments, costs per transaction are highly dependent on the overall frequency of transactions. Second, the financial crisis since 2008 has highlighted that a rising volume of (electronic) trading can increase the volatility of markets. This has led to cases of augmented information asymmetry as a result of the product policy of financial service providers. Contrary to neoclassical market theory, market participants often have a preference for information asymmetries in order to protect proprietary information (cf. Zhu 2004), i.e. sellers typically have an interest to create information asymmetry in order to attain higher prices. For example, some companies in financial markets have developed extremely complex products and engage in proprietary trading. Thus, besides prices and quantities, a variety of additional factors determines the organization of economic activity, such as information asymmetry between buyer and seller, uncertainty regarding product quality, self-interest of business partners, or the necessity to make partner specific investments. Third, the information efficiency in EM also has an impact on established trading relationships and may increase the risk of disintermediation (bypassing the middlemen).
Functional Perspective: Configuration of B2B Electronic Markets

Providers of B2B EM create value by offering a variety of functions and services to buyers and sellers. Three phases are widely used to characterize the execution of economic transactions: information, agreement and settlement. They relate to the three primary functions of a (centralized) electronic market (Bakos 1998), i.e. the matching of buyers and sellers, the facilitation of transactions and the provision of an institutional infrastructure. First, matching buyers and sellers encompasses the determination of product offerings, searching, and price discovery, yielding a contract between the trading partners as a result. This phase is strongly influenced by the type of coordination or allocation mechanism. As described by Kaplan and Sawhney (2000, p. 98) systematic sourcing (i.e. relationships based on negotiated contracts with qualified suppliers) is usually supported by centrally hosted electronic product catalogs which support the procurement of operating inputs (e.g. Grainger.com) and/or manufacturing inputs (e.g. Sciquest.com, EEX.com). In contrast to systematic sourcing, spot sourcing involves dynamic pricing. In addition to solutions with centralized electronic order books and a defined matching algorithm (Dutch or English auctions), spot sourcing also comprises solutions for electronic tendering (sealed bid auctions). Second, the facilitation of transactions includes supporting activities, such as fulfillment (information logistics, e.g. order processing), payment (financial logistics), logistics (physical delivery) as well as additional services such as insurance or assurance. IT has not only transformed transaction services, such as electronic delivery of digital goods, electronic payments, supply chain management and tracking and tracing services for physical deliveries, as well as ensuring security and integrity of the transactions; it has also led to a wide range of innovative service and support activities. Third, the institutional infrastructure shapes the legal and regulatory environment in which the transactions take place.

![Figure 2: Functional architecture of B2B EM](image)

Depending on the specific quality of the B2B transactions, characterized by criteria such as duration (medium to long term relationship), knowledge about business partners or frequency of transactions, the information, agreement and settlement phases in B2B EM fulfill different tasks. In the information phase, content and structure of product catalogs are often customized (i.e. defined by strategic procurement prior to operational procurement activities) and only comprise a subset of all products/offerings on the market. In the agreement phase, transactions and quotations involve authorization procedures in approval workflows: employees may directly access the catalog and order the desired/products, but in many businesses superiors need to approve the transaction. Depending on the companies involved, this may engage several hierarchical levels. In order to settle the transaction, the costs need to be billed to an internal cost center. During the settlement phase the contract is executed. Buyers look for benefits resulting from process integration, yet try to avoid increasing switching costs. Figure 2 summarizes the functionality of a B2B EM by distinguishing three levels of services. While basic trade services constitute the core of transactions in B2B EM, trade context services “enhance trust among trading parties and legitimize the trade” (Kambil and Van Heck 2002, p. 27), i.e. they address and compensate for shortcomings of the market and specific risks related to
electronic trading. In addition, infrastructure services deliver functionalities that may be used for many purposes in the transaction phases. They provide an additional lever for technology to facilitate trading. Table 1 provides some examples of the services shown in the architecture model.

- **Evaluation:** Reviews and ratings assess the quality of vendors and customers. While trading partner assessment is often used as a criterion for partner selection, there are instances (Müller-Lankenau and Klein 2003) of partner assessment feedback as an incentive to use the EM platform. They can provide mechanisms for trading partners, such as certification or assessments, to gain reputation.

- **Information:** Electronic markets provide a structured view of the offerings in a market using a centralized directory, order book or product catalog. Technology contributes to market efficiency by reducing information cost (cost of information transfer and retrieval) and by providing increasingly sophisticated tools to automatically analyze information (business analytics).

- **Collaboration:** Transactions between businesses typically require a broader set of information to coordinate activities. Platforms for supply chain collaboration, such as GXS, GS1 or e2open support the exchange of planning and status information between many participants. This comprises, for instance, the collaborative planning and forecasting or the consolidation of status information to track physical goods (e.g. Innocentive.com or Redesignme.com). The concept of crowdsourcing has transformed research and development processes in several industries (e.g. Kickstarter).

- **Agreement:** Markets and, in particular, auctions offer dynamic pricing employing a variety of coordination mechanisms (e.g. Dutch or English auction, single or double auction) and are traditionally powerful instruments when price determination is a problem. This is the case due to abundant competition or a lack of competition in many commodity markets, e.g. for unique collectors’ items. Auction markets aim for an improved allocation of resources and are also used for demand pooling.

- **Influence:** Given the breadth and complexity of products available online, intermediaries provide various forms of customer decision support from recommender systems based on customer profiles, the analysis of aggregate purchasing patterns or the inclusion of customer product reviews and ratings.

- **Settlement:** Services for executing transactions comprise E-Fulfillment for handling information activities, such as order management, E-Payment, such as Online Electronic Commerce Payments, as well as E-Logistics for shipping the goods, such as Tracking and Tracing. In financial exchanges, sophisticated settlement systems from Clearstream or Euroclear allow for a quick and time-efficient execution of the market transactions.

- **Integration:** Following the idea of clearing centers, the translation of message formats is an important function when messages are to be exchanged automatically between applications. Current standards are based on XML subsets and also include the mapping of activity chains. For example, GXS and e2open offer message handling in the electronics industry based on business process definitions from RosettaNet’s public-private processes.

Table 1: Basic trade services (bold) and selected additional services (italic) in B2B EMs

**Topology**

Transactions between businesses (B2B) have become closely linked and IT-supported value chains connect multiple players for the production of specific products or services. Empirical evidence shows that there are diverse market arrangements. The two basic patterns are depicted in Figure 3. The classical idea of a market is reflected by a constellation of n buyers, m sellers and one marketplace or market platform: \([n:1:m]\), whereby n, m > 1. This constellation reduces the dependencies in value chains and, thus, the coordination efforts. In contrast to a decentralized market \([n:m]\), the number of linkages between buyers and sellers is much lower \((n+m) \text{ in comparison to } n*m \text{ linkages}) in the *centralized market*. Suppliers, buyers, or independent companies, individual companies or consortia are acting as market intermediaries and shape the scale and scope of the market as well as the market relations. For example, Dell Computer Corporation was a pioneer in establishing the “build-to-order” model for computers. At the heart of this model is a network of actors (such as component suppliers, third party hardware and software suppliers, distributors, logistics companies, system integrators, repair and support companies and customers), which is coordinated using an electronic platform that shares information among the network participants and allows the substitution of information for inventory (Kraemer et al., 2000). These arrangements among a determined set of network partners have become known as private exchanges and have been adopted by large, dominant players in many industries from automotive and retail to defense.
Alternatively, markets can be organized in a decentralized manner, i.e. the participating actors are interacting directly using standards, rules and plans which are previously agreed (e.g. within an industry). Since these reciprocal interdependencies require considerable standardization efforts (or distinct solutions for each link), they are prone to conflicts and involve more coordination for establishing the solutions since a central intermediary is missing (Kumar and van Dissel 1996).

**Mixed Mode Governance**

In contrast to transactions involving end customers (B2C), B2B transactions are typically based on long-term cooperation and deeper collaboration relying on trust. In the literature a variety of interorganizational arrangements, such as strategic alliances, collaborative networks, and outsourcing relationships is discussed that facilitate tighter and longer relationships than the classical market model would suggest. Research has also emphasized the need for closer relationships in order to address non-contractible issues in B2B transactions, such as trust or commitment to innovation (Bakos and Brynjolfsson 1993). While the first research contributions on EMs more or less considered electronic markets and electronic hierarchies as discrete forms (Malone et al., 1987), subsequent authors observed that in response to the complementary benefits of the different governance mechanisms, companies have developed mixed-mode governance forms (Holland and Lockett 1997), i.e. sequentially coupled market and collaborative governance. The shadow of the market thus shapes the relationship and the shadow of collaboration becomes part of the decision making in the market.

Early EMs, such as the auctions in financial exchanges and the flight schedules and capacity management in computerized reservation systems, provided a limited set of coordination mechanisms. While these systems are still operating successfully, EMs in other industries have combined several coordination mechanisms as part of their business model. Examples, such as Elemica.com or e2open.com, illustrate extended transaction and life-cycle support beyond electronic auctions. So-called “all-in-one-markets” (Koch and Schultze 2011) feature a variety of coordination mechanisms, which link the possibility of competitive bidding to determine a price and to retain the pressure of competition with the advantages of a predictable relationship to encourage relationship specific investments (non-contractible issues), and functionalities for closer collaboration (Christiaanse and Markus 2003). A combination of market and hierarchical components (Holland and Lockett 1997, 485) can thus occur sequentially with the bilateral execution of a number of transactions after an auction is conducted or in a concurrent fashion where trading mechanisms are available on the same EM platform. For example, the global procurement market Hubwoo not only supports the discovery and auction processes, but also settlement functionalities which may be used separately.
Design Perspective: Business Models for EM Intermediaries

So far we have looked at the role of the market intermediary from a functional, i.e. market enabling perspective. Several (potential) reasons exist that make a centralized market a viable business model in principle. First, centralized markets reduce interorganizational complexity and coordination costs due to a lower number of linkages. Second, there are distinct functionalities which can only be provided (better) by an intermediary. Intermediaries may facilitate efficiency gains through higher volumes of transactions, bundling effects or by facilitating interoperability (communication, processes, standards, contractual arrangement). They may also influence market dynamics and benefits (called positive network externalities) akin to the logic of multi-sided markets, i.e. interdependent network externalities between distinct groups of market participants. As they are operating in a market environment, EM intermediaries first face the threat of bypassing, i.e. direct transactions between trading partners, second the competition from other electronic or traditional market intermediaries and third the competition of non-market arrangements, e.g. bilateral partnerships or collaboration platforms. This means they have to develop distinctive and competitive business models and specify their value proposition, operator model, positioning and revenue model.

Regarding the value proposition, the functional scope of an EM intermediary is a specific instantiation of the generic functions described in Figure 2. At the level of the basic trade services they have to address such issues as mechanism design and finding a balance between the incentives of buyers and sellers. Value propositions may be increased by market transparency or improved innovation processes or supply chain visibility. At the trade context level the emphasis is on rules and regulations, including access rules and levels of transparency, as well as enforcing mechanisms and institutional assurances e.g. against insider trading. It has to be complemented by institutional design (Gogolin and Klein 2006) which addresses issues of ownership and the role of the intermediary. At the infrastructure, level additional services, including standards and integration mechanisms, and safeguards, have to be defined.

The operator model refers to the origin of the marketplace operator. For example, large companies, such as Siemens, have set up their own marketplaces in order to increase the efficiency of procurement processes and to achieve price reduction of purchased items by facilitating supplier competition, e.g. by running auctions. These buyer-operated EM may be depicted as [1:1:m], i.e. one buyer using one platform to procure from m sellers. The trading partners know each other and regularly engage in repeated business transactions. While the sellers might be wary of the pressure of the market, the expected trading volume is such that they hesitate to forego participating in the market. Moreover, buyers might identify additional incentives for the sellers, e.g. supplier ranking and feedback, in order to motivate their participation. Instead of just one buyer, we sometimes find buying consortia, i.e. [n:1:m], to increase the trading volume and thus provide additional incentives for sellers to participate. In terms of marketplace governance, the platform provider may be independent, owned by one of the buyers or owned by the buyer consortium (e.g. SupplyOn, Elemica). Collaborative marketplaces provide extended service offerings such as process integration, collaborative planning, supply chain coordination, product life-cycle management from design to recycling or support services such as software integration (Christiaanse and Markus 2003). In some cases sellers (suppliers) have set up markets to support their sales activities through market mechanisms and dynamic pricing. While there are few examples of a [n:1:1] topology, the constellation where a seller consortium organizes a market [n:1:m] is more frequent. It differs from the centralized market only inasmuch as the suppliers influence the design of the market. The Aalsmeer Flower Auction (Bloemenveiling Aalsmeer) is a prominent example of a supplier owned market (Kambil and van Heck 2002). Finally, if the EM is operated by an independent organization, it should be a credible player which may either be a start-up, a spin-off or a joint venture. Having a consortium of competitors or partners is a way of attracting and pooling demand as well as assuring neutrality when assessing market participants and the quality of goods and services. Intermediaries may also facilitate anonymous trading but they can also create lock-in situations by maintaining information asymmetry (in order to avoid bypassing) or exclusive access to trade partners or trade objects.

Regarding their positioning, B2B EMs have emerged with an emphasis on horizontal and/or vertical market segments (see section 1.3). According to (Kambil and Van Heck 2002, p. 111) who state “To achieve long-term success, independent exchanges needed to deliver hard-to-replicate services for well-defined vertical or horizontal niches”,...
the positioning may be to provide services across many industries at one stage of the value chain (horizontal EMs for operating inputs) or to offer services across may tiers within the value chain of one specific industry (vertical EMs for manufacturing inputs), such as the automotive or the retail industry. Two-sided or multi-sided markets address several distinct but related market segments in such a way that the positive network effects for one segment are linked to the network effects for the other. For example, companies using a travel market benefit from the number of travel suppliers as well as the other way round.

Finally, the revenue model determines the economic viability of the EM. Market intermediaries typically benefit from service or transaction fees. A B2B EM may rely on transaction fees (with or without a link to the transaction value), membership fees, fees for advertising, fees for using dedicated infrastructure or trading services, or fees for selling aggregated information from transactions in the market.

Developments for B2B Electronic Markets

Although the dynamic of the evolution of electronic markets since the 1970s has not followed the expected pathway, EMs have achieved a prominent role in many industries and they have transformed markets. There are five trends in the EM field (cf. Alt and Klein 2011):

First, IT innovations have led to the continuing creation of new EMs, such as Google’s AdWords Auction, and have extended the scope of products than can be traded on EMs. Moreover, EMs not only support dynamic pricing (auctions) but also dynamic customization of products and services, multi-criteria decision making, complex matching, negotiations and, in some cases, the pooling of demand. Technological advancements combined with market entrepreneurship have driven an extension of market coordination into a broad and diverse array of functional domains such as marketing or forecasting and industry sectors such as health care. Price-based coordination mechanisms have benefitted from reduced information and brokerage costs and from extended allocation efficiencies. Moreover, the research field of micro market design has contributed to the understanding of issues such as price building or auction rules. The potential complexity of product descriptions, i.e. digital representation of goods and services, has been extended directly and indirectly via recommendations and ratings by other firms.

Second, lower signaling costs shape new and improved market mechanisms. The future will see a stronger diffusion of flexible pricing in B2B electronic commerce with innovations in differential pricing (in revenue management, procurement, and supply chain coordination), and mechanisms for the evaluation of complex and multi-dimensional bids (Bichler et al., 2010). These features are not “one time” innovations, but will require constant reassessment and improvement. For example, market operators are in an unique position to monitor auctioning behavior and develop or adjust auction rules and parameters. In a first phase they cluster information from collected market data to distinguish various user types which are attributed characteristics and preferences in a second phase, which is used in a third phase by recommender systems to generate new sales opportunities (Bichler et al., 2010).

Third, technological innovation in standards and services adds value for B2B EMs. IT has facilitated transaction support, i.e. message standardization in the UN/CEFACT domain and other electronic data interchange agreements. Future integration concepts, such as service-oriented architectures require centralized platforms that support the publication, configuration, and management of services across multiple actors and systems. Among the solutions emerging in this domain are the Universal Service Description Language (USDL), Universal Description and Discovery (UDDI) and the Business Process Modeling Notation (BPMN). Ultimately, they will enable EMs to become part of more complex value systems by facilitating more complex configurations of services. Combining the software-as-a-service (SaaS) idea with the functionalities of application stores (from Apple, SAP or others), EMs might become the operating system of many value chains. While the business partners prefer standardized transactions and will advocate shared conventions for processes, services and data, the marketplace providers – in particular first movers – may prefer proprietary (back-end) solutions in order to achieve a competitive advantage over other providers.

Fourth, increasingly complex value systems will sustain the proliferation of B2B EMs. If economic production relies increasingly on flexibly coordinating products and services, classical sequential value chains will also become more
complex. In particular, the unbundling of products and services will require multiple transactions (and markets) to contract complex products or service bundles. This provides opportunities for intermediaries that configure, offer and monitor solutions that comprise products from various providers as well as marketplaces; but also challenges for decision makers to comprehend “complex trading environments and multiechelon markets” (Bichler et al. 2010, p. 688). Services pursuing a life cycle view of business relationships, which already exist in the area of financial advising, create individual solutions from a broad range of services including checking accounts, financing and insurances. Similar bundled services for mobility, computing services and the like are bound to emerge and will also involve the extension of electronic markets into new domains, such as maternity care, emission rights, and software apps. Thus, in the future there is likely to be a more interwoven landscape of distributed and cascading EMs with some markets acting as meta- or sub-markets. This scenario means that instead of just one platform, several platforms (o) emerge \[n:o:m\], whereby \(n, m, o > 1\). In this case the market platform faces competition from one or more other platforms. The intermediated topology of centralized EMs has the potential to reduce dependencies in value chains. In many industries, networked organization strategies have evolved where many actors participate and require coordination via a shared communication and collaboration infrastructure. Among the examples are energy intermediaries (e.g. smartwatts.de), travel intermediaries or corporate app stores.

Fifth, automatic or algorithmic trading will increase further. The increase of available information and the opportunities of ongoing trading in fractions of a second, in particular, in financial markets have led to high-frequency automatic trading which is controlled by highly refined mathematical models (algorithmic rules). Competition in these markets is driven by infrastructural advantages (faster communication lines and execution of orders), the ability to automatically digest increasing amounts of information, including political and economic news, as well as the quality of algorithms. Given the limited human control over the trading process, algorithmic trading is also called black-box trading and is seen as the cause of so-called “flash crashes”, sudden drops in market valuation that cannot be explained by external events. Moreover, it is seen as contributing to the volatility in financial markets. The notion of smart markets addresses the need to support human decision makers and regulators in increasingly complex market environments (Bichler et al., 2010).

Conclusions

We conclude with a set of questions:

Q: Do B2B EMs possess distinct advantages over other forms of economic coordination, i.e. hierarchies or networks?

A: In principle, yes. Markets are information and coordination intensive arrangements which benefit comparatively more than other forms. The effects do not occur automatically, but are the result of market design and regulation. Distinguishing between an institutional, functional and design perspective helps in identifying whether the positive effects prevail in a specific industry structure.

Q: Has IT extended the reach of B2B EMs?

A: Yes, IT has facilitated a wave of innovation in (electronic) trading and has made products and services marketable. EMs are an example of the profound transformation of trading (from local to global, from floor to algorithmic trading). There is likely to be an extension of market coordination in scale and scope, specificity and extension of market governance into the collaborative field. Yet the effects of extended market coordination are subject to design issues (security flaws). Moreover, EMs are continuing to transform B2B business ecosystems.

Q: Is there one “best” form of B2B EMs?

A: No, empirically there is an heterogeneous set of B2B market arrangements. Markets – traditional and electronic - address a wide range of problems of economic coordination depending on the market environment, trading partners and trade objects. The range of services is also an indication of different types of markets: while exchanges focus on the matching, collaborative marketplaces emphasize quite extensive services, such as collaborative planning, forecasting, and replenishment (CPFR) and product life-cycle management from design to recycling. This means
that markets need to be carefully designed in order to be able to deliver their expected benefits. Their design needs to be customized to address the specific needs of trading partners. Their benefits depend on the relations between the trading partners.

Q: Are there downsides of B2B EMs?

A: Yes, information asymmetry and uncertainty can prevail in an EM and thus lead to an increase in transaction cost. Markets do not automatically yield benefits, but their benefits are the result of careful technical implementation and prudent institutional rules and regulations. There have been significant security breaches.

Q: What is the “hidden hand” coordinating markets?

A: Market mechanisms have been designed to create an equilibrium between supply and demand. However, despite advances in information transparency, EMs may incur high transaction costs (and risks) if market participants succeed in increasing information asymmetries. However, regulators are facing a dilemma between unnecessary administrative and regulatory burdens and the risk incurred as a result of insufficient regulation and control. While “smarter” regulation may be called for, the limitations of setting productive rules in a global environment with regulatory competition and highly mobile and resourceful actors also need to be acknowledged.

Q: Does transaction cost economics provide a sufficient explanation of EMs?

A: No, overall, TCE provides helpful insights and explanations of the IT effects. TCE addresses governance choices and systemic efficiency gains. It shows that the level of transaction costs is subject to design decisions about the overall structure of the market and the various processes included in business transactions. However, it does not (aim to) explain strategic behavior of market providers and participants, such as hold ups, proprietary trading, or increasing information asymmetry.

References


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