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## Electronic Purchasing Consortia: a Procurement Direction for the Future?

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# **Electronic Purchasing Consortia: A Procurement Direction for the Future?**

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## **Summary**

In literature, there has been little empirical research investigation on purchasing consortium issues focusing on a detailed analysis of ICT-based procurement strategies. Based on the exploration of academic literature and a survey on e-Marketplaces / procurement service providers (PSPs) in the automotive and electronics industry sectors, an overall statement is proposed: Effective participation in electronic purchasing consortia can have the potential to enhance competitive advantage. Implementation therefore requires a clear and detailed understanding of the major process structures and drivers at the e-Marketplace / PSP level of analysis.

**Keywords: E-Procurement, Electronic Purchasing Consortia, Demand Aggregation, Supply Chain Management**

## **Educator & Practitioner Summary**

Electronic purchasing consortia are still in their infancy and research is still in conceptual and theoretical flux. These realities indicate the necessity for further empirical analysis by conceptualising major process structures and drivers at the e-Marketplace/ PSP level of analysis, which is addressed at academics and purchasing professionals alike.

## **Introduction**

Strategic management of global procurement operations has become an increasingly important research issue. One of the main reasons is the concentration on core competencies at the company level, which led to a significant increase of sourcing activities. Therefore, procurement savings can hold significant business value and impact on profit. However, organisations can have negotiated to the lowest procurement price available according to volume. It then becomes necessary to look at other possibilities, such as forming purchasing consortia. According to Hendrick (1997), a purchasing consortium is “*a formal or informal arrangement, where two or more organisations, who are separate legal entities, collaborate among themselves, or through a third party, to combine their individual needs for products from suppliers and to gain the increased pricing, quality, and service advantages associated with volume buying*”. Essig (1999) notes that a purchasing consortium may be just one

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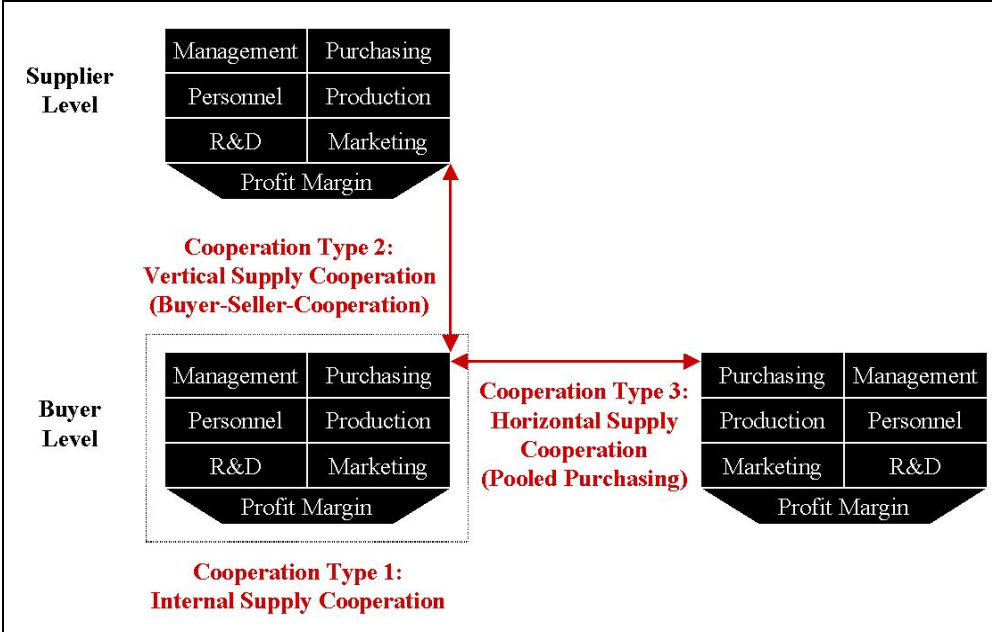
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element of a supply strategy and may be combined with other effective sourcing strategies such as global sourcing, single sourcing, system sourcing, among others. Within the policies and strategies, Arnold (1996) states that three types of co-operation can be differentiated in supply management. He defines a purchasing consortium as a horizontal supply co-operation and this he calls the third type of co-operation in supply management (see Figure 1).

**Figure 1: Types of Co-operation in Supply Management**



Source: Derived from Arnold (1996), p. 1359.

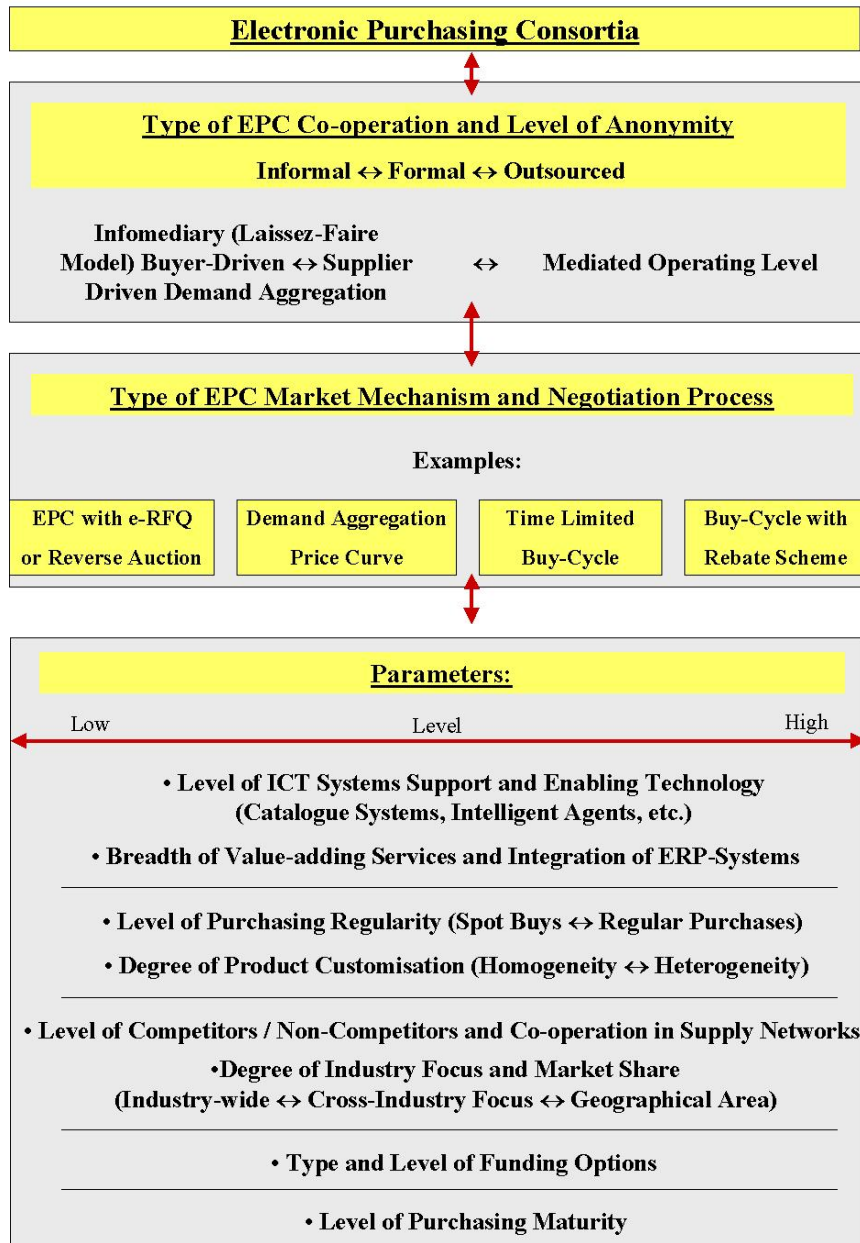
In the literature however, there has been little empirical research investigation on purchasing consortium issues focusing on a detailed analysis of ICT-based procurement strategies. Electronic purchasing consortia (EPC) facilitate purchasing organisations, to a varying degree, to electronically conduct tasks that are necessary for the management of demand aggregation of two or more legal entities, and provide Internet-based communication infrastructures. While research to purchasing consortia is rather well developed (e.g. Arnold, 1996; Essig, 1999; Hendrick, 1997; Quayle, 2000; Vigoroso, 1998), limited attempts have been made to focus on the electronic procurement aspect in this field. Most approaches in literature concentrate on e-Marketplaces and e-Procurement in general, but do not refer to purchasing consortia. Only Corsten and Zagler (1998) have proceeded with an action research project to electronic purchasing consortia. However, their study did not include important research issues such as e.g. the empirical level of EPC adoption with regard to industry sectors’ structures and anti-trust limitations, a categorisation of EPC management structures and scope, revenue models, etc. that are explained and elaborated on in more detail in the following.

**Theory Background**

Pooled sourcing strategies are not a new concept. However, they have existed in the public sector, where co-operative purchasing has been practised in non-profit institutions for more than a century. Due to the concentration on core competencies, the trend of industrial enterprises concerning the formation of strategic demand aggregation alliances started mainly in the last two decades and is described as consortium purchasing (Essig, 1999). However, the theoretical foundation for EPC is more complex, going well beyond the field of purchasing.

As stated by Amit and Zott (2001), no single strategic management theory can fully explain the value creation potential of e-Business. They note that rather, an integration of the received theoretical perspectives on value creation and a multi-perspective approach is needed, as “(...) *virtual markets broaden the notion of innovation as they foster new forms of collaboration among firms (rather than merely new products or production processes) and involve new exchange mechanisms and unique transaction methods*”. An integration of strategic management theories is required to situate EPC in literature. The resource-based theory (e.g. Barney, 1991) and the positioning stream (e.g. Porter, 1985) to competitive advantage have not addressed issues where industrial firms have not as such developed critical resources and capabilities but in co-operation with other firms. This theoretical perspective suggests that competitive advantage can also be developed through inter-firm co-operation and links. That is why the theory of strategic networks and alliances (e.g. Gulati, 1998; Jarillo, 1988), which are based on a continuum between market and hierarchy, is very relevant to EPC as a further paradigm to competitive advantage. Corsten and Zagler (1998) state that electronic purchasing consortia may exploit synergetic potentials of economies of scale and scope (e.g. Montgomery and Wernerfelt, 1988) without the diseconomies of increased transaction and communication costs (e.g. Williamson, 1975). EPC as hybrid co-operation form can effect economies of scale and scope and are based on the model of transaction and production cost theory. Symbiosis is the driver and a prerequisite for successful consortia (Essig, 1999). However, the effects are diminishing with increased asset specificity. The literature review on the network and synergy concept can provide a theoretical foundation why electronic purchasing consortia are formed. Rozemeijer (2000) argues that synergy is all the new value that can be added through organisation and the structure of interrelationships between independent units. However, EPC theory requires to integrate virtual structures in strategic alliance networks and virtual organisation (e.g. Bakos and Treacy, 1986; Malone et al, 1987), dis- and reintermediation (e.g. Wigand and Benjamin, 1996) as well as e-Procurement strategies (e.g. Gebauer and Zagler, 2000) to fully explain EPC. Traditionally, lack of integration and communication infrastructures were regarded as one of the biggest barriers preventing the adoption and success of purchasing consortia. Electronic purchasing consortia, as a network enabler, can potentially offer a more efficient communication infrastructure with lower transaction costs (Corsten and Zagler, 1998). Electronic support can eliminate some inefficiency related to purchasing consortia. Metamediaries such as e-Marketplaces and procurement service providers can enable firms to adopt effective e-Procurement systems. Replacing expensive EDI solutions governed by only one buyer in a closed system, low entry costs, fast return on investment and protection of existing EDI investment, recent developments in XML-programming, are all reasons for the transformation of the supply chain into a network by Internet technologies (Richmond et al, 1998). However, Knudsen (2002) points out that there are still some uncertainties as to how the purchasing departments’ overall performance can be improved by e-Procurement. E-Procurement solutions and concepts are very diverse and have many different meanings. De Boer et al. (2002) note in that respect that the potential merit of those various e-Procurement concepts, such as electronic catalogue systems and software, electronic auctions, intelligent agent applications, electronic marketplaces, etc., seems largely undisputed (e.g. Croom, 2000; Smelzer and Ruzicka, 2000). However, with regard to the wide range of solutions available, many firms still struggle with assessing e-Procurement suitability for their purchasing processes and mainly adopt a ‘wait and see’ approach. Moreover, there is no one best way to organise for purchasing synergy and to improve inter-organisational demand aggregation and purchasing co-ordination practices. Therefore, a first classification and categorisation of EPC structures and drivers was investigated for this paper (shown in Figure 2).

**Figure 2: Classification of Electronic Purchasing Consortia**



There is a great variety in EPC approaches to achieve purchasing synergy. Thus, the figure probably cannot provide a complete picture, but a valuable starting point for further research on EPC. Approaches can range from voluntary informal EPC co-operation among purchasing firms to more formally managed co-operation structures (e.g. the laissez-faire model, in which a procurement service provider or e-Marketplace can act as a lead source for purchasing organisations and suppliers and provides product information, specifications, among others) as well as to outsourced solutions (i.e. the mediated operating model, in which a third-party negotiates or aggregates demand on behalf of buyers or suppliers). The level of anonymity between the EPC partners is a varying parameter that is closely related to the co-operation type. When search costs, asset specificity and the benefits from long-term relationships are low, buyers and sellers are more likely to interact with virtual anonymity, as is the case in highly liquid commodities markets. Another classification involves the type of EPC market mechanism and negotiation processes: It was found that several EPC trading and aggregation

models exist that can range from EPC with electronic requests for quotation (e-RFQ) or reverse auctions to pre-production demand aggregation price curves (i.e. multiple buyers can electronically aggregate their orders around a supplier's pre-set and pre-production shipping date at the expense of additional inventory costs for purchasing organisations), time limited buy-cycles (i.e. prices continually amend in pre-set increments and time-frames as new group orders are electronically placed), buy-cycles with rebate schemes (a rebate is granted once the total number of purchasers has been electronically finalised) to full-service third-party intermediaries (although, by definition per se, they do not clearly fall into the EPC continuum between market and hierarchy). At the same time, the EPC market mechanisms are linked to parameters, which include, but are not limited to, the level of purchasing regularity, product customisation, breadth of value adding services, level of co-opetition, that require to be researched more closely in the following.

## **Research Methodology**

The research methodology follows a positivistic approach in order to assess the overall statement: Effective participation in electronic purchasing consortia can have the potential to enhance competitive advantage. Implementation therefore requires a clear and detailed understanding of the major process structures and drivers at the e-Marketplace/ PSP level of analysis. Therefore, the analysis of the overall statement presents issues such as

- Industry sectors, anti-trust limitations and take-up of electronic purchasing consortia.
- The level of awareness and importance of electronic purchasing consortia and further customised services.
- Management structures, trading mechanisms and scope of EPC.
- Revenue models for electronic purchasing consortia.
- Level of benefits and drawbacks of electronic purchasing consortia.
- Critical factors in creating and managing electronic purchasing consortia.
- Relationship between ROI and the use of electronic purchasing consortia and reverse auctions.

An online survey instrument for e-Marketplaces and procurement service providers was implemented with both forced-choice and open-ended text questions and pre-tested among academics and practitioners. Questionnaires were electronically sent to 124 international active e-Marketplaces and procurement service providers in the automotive, electronics and closely related industries (e.g. metals, plastics). Reasons for the choice of the sectors derive from the background that both industries are pioneers and advanced in supply chain management and e-Procurement. Organisations in the automotive and electronics industries streamline the infrastructure around the logistics chain and synchronise order processing and assembly. Due to a consolidation phase and decrease in the population of e-Marketplaces / PSPs, 22 of them had terminated their operations and the population was reduced to 102 e-Marketplaces / PSPs. The procedure to achieve a sufficient response rate and to obtain non-respondents' data was an integrative process. First potential respondents were contacted four times during the first response period by e-Mail. Next, non-respondents in the surveys were contacted by phone and were interviewed on the level of current and future EPC implementation. This process could provide the grounding for a non-respondent analysis. 34 e-Marketplaces / PSPs were willing to provide data to these two questions, but could not be motivated during the phone calls for full survey participation. Non-respondents were finally contacted up to four attempts by phone so that the full-survey coverage increased to a final response rate of 42% (i.e. 43 responses). 24 e-Marketplaces / PSPs were not at all interested

in the research. This response rate can be considered as very satisfactory in comparison to other survey research. The non-response analysis from the 34 participants did not reveal any significant differences and indicated that the pattern of responses was reflective of the sample frame. Additionally, surveys were tested for statistically significant differences in the responses of early and late returned surveys. Again, no significant differences were found, suggesting that the sample is representative for the population. The geographic distribution of response shows that most participation came from Europe, followed by the US. The participating e-Marketplaces and procurement service providers were relatively evenly distributed within the automotive and electronics sectors in this survey. All e-Marketplaces and PSPs were operated for profit; non-profit organisations did not participate in the survey.

## **Results**

Electronic purchasing consortia were offered by 19 of the total 43 participating e-Marketplaces and PSPs (44%). EPC are offered less in the automotive industry (39%) than in the electronics industry (65%) E-Marketplaces and PSPs that offer electronic purchasing consortia tend to be buyer-centric. Overall, e-Marketplaces in general provide electronic purchasing consortia only in limited cases. Only 27% of e-Marketplaces provide EPC in comparison to 82% of PSPs. The findings suggest that e-Marketplaces generally still have potential to develop and integrate EPC. PSPs as the main group of EPC providers appear that they are working together with a relatively small number of purchasing organisations in comparison to e-Marketplaces. From the survey, it was learnt that PSPs take advantage of semi-automatic or non-electronic communications tools as well that can assist in gaining purchasing managers' trust to participate in electronic purchasing consortia. Few EPC providers among e-Marketplaces offer consulting services to establish whether or not purchasing organisations would be generally willing to participate in EPC and to institute a certain level of trust between potential consortia members. The findings also suggest that PSPs, after having established an agreement to EPC, strongly support electronic implementation of RFX processes, e.g. conduct a reverse auction. This is one of the reasons why the authors have set up the definition of EPC in that they facilitate purchasing organisations, to a varying degree, to electronically conduct tasks that are necessary for the management of demand aggregation of two or more legal entities, and provide efficient Internet-based communication infrastructures. Other non-electronic communications might be necessary as well.

Currently, it was found that most e-Marketplaces concentrate on automating purchasing and order replenishment processes, whereas PSPs focus more closely on strategic procurement. E-Marketplaces still have the potential to integrate value-adding activities in strategic sourcing such as EPC. None of the industry consortia-led exchanges currently offer any electronic purchasing consortia. This appears worth noting because they would already have finished decisive phases of EPC such as finding partners, building up trust among the members and getting agreements in place. This finding can be explained in such a way that industry consortia-led exchanges are set up by the major industry players and therefore demand aggregation might not be able to proceed due to anti-trust limitations. 60% of electronic purchasing consortia providers have requested legal approval before implementing EPC. The average number of competitors against non-competitors in the consortium is approx. 25%. This finding confirms that anti-trust is a major consideration to electronic purchasing consortia and that is why electronic purchasing consortia today are mostly built by e-Marketplaces and PSPs for multi-sectoral consortia.

Overall, e-Marketplaces / PSPs specified that there would be an increase of take-up of electronic purchasing consortia from 44% to 61% and an increase in the offering of reverse auctions from 63% to 79% in the future. Moreover, e-Marketplaces / PSPs indicated a rise in the service provision of EPC and reverse auctions at the same time from 28% presently to 56% in future. This future growth clearly stresses the awareness of both electronic purchasing consortia and reverse auctions to e-Marketplaces and PSPs. In particular, e-Marketplaces seem to have realised the potential of EPC and reverse auctions and try to add this functionality in future. E-Marketplaces and PSPs that have implemented electronic purchasing consortia and reverse auctions regard them as an essential part of their functionality and business strategy. However, EPC providers also specified that EPC and reverse auctions are just one element of their overall service provision and support them with more functionality such as legacy system integration, tracking and tracing, among others. The majority of e-Marketplaces and PSPs seem to have realised the potential of more value adding services and generally plan to add functionality in future in order to avoid building one-off, single-sided functions. Overall, EPC providers today do not have generally more functionality than non-providers. E-Marketplaces and PSPs cited the lack of firm participation as critical to its service offerings. Other major drawbacks specified for electronic purchasing consortia are potential anti-trust issues and that company secrets are perceived by purchasing managers not to be kept confidential to competitors. Firms that collaborate, even with non-competitors, may fear that firms may be directly or indirectly provided with sensitive competitive information (Hendrick, 1997). A high degree of trust among all participants and a strong management support are considered as vital factors for electronic purchasing consortia. The statistical analysis identified that non-providers of EPC and reverse auctions seem to underestimate the critical factors involved in managing EPC. For suppliers, drawbacks cited mainly include that the increased transparency in EPC can result in lower margins and more pressure from purchasing organisations. That is why strong suppliers, especially of strategic items, may resist participating in EPC. Hendrick (1997) explains that by keeping the members of an EPC as separate customers, they can extract higher margins that could be negotiated by the group. While collaboration with suppliers and other companies is perceived by 95% of all e-Marketplaces and PSPs as it is getting more important in the future, e-Marketplaces / PSPs predominantly offer EPC solutions that focus on a rather transactional, arm's length buyer-supplier relationship. While e-Marketplaces and PSPs did not identify improvements in collaborative buyer-supplier relationships from EPC, they acknowledged benefits for supplier such as a quick access to large pools of buyers with lower sales costs and long-term business volume. Overall, EPC providers estimate the benefits of EPC on a higher scale and the drawbacks on a lower scale than non-providers. Having put EPC in practice, it seems that benefits can outweigh the drawbacks. Another factor to be taken into consideration is the product pooling potential: E-Marketplaces and PSPs generally estimate that 32% of their products could be pooled. Providers of EPC specify an average present product pooling of about 15% and acknowledge that there is still some potential to increase their average present pooling of products.

In terms of revenue models, providers of both electronic purchasing and reverse auctions do not charge solely suppliers at all. 50% of EPC providers charge only buyers; the other half charges both suppliers and buyers. Hendrick (1997) found that purchasing consortia have in most cases no direct fees and each member contributes expense coverage, time and effort about equally. For EPC, there seems to some shift to the payment of expenses based on a percentage of purchases and fees paid as a percentage of cost savings. One explanation for this finding can be that the fees paid, as a percentage of cost savings, can have more immediate benefits and ROI for purchasing organisations. Less financial risk can be involved



and outsourcing can take precedence. Providers of electronic purchasing consortia specify an average saving in purchasing costs of 12.4% with demand aggregation. With EPC, member companies have to invest an average of 7.0% of purchasing costs for setting-up and managing the electronic purchasing consortium. As a result, an average net saving of 5.4% and a ROI of 77% can be calculated for companies that participate in EPC. For reverse auctions, a higher ROI results: The average savings (in % of purchasing costs) for buyers in reverse auctions were 16.1%. The average buyer investment for reverse auctions (in % of purchasing costs) was 4.6%. The result is a net saving of 11.6% and a ROI of 254%. However, there usually is a cut off point or minimum amount to order to conduct a reverse auction effectively. Providers of reverse auctions specify that there should be an average minimum amount of EUR 51,000 of a specific product demand to run a profitable reverse auction. Providers of both EPC and reverse auctions claim to achieve average savings (in % of purchasing costs) of 28.5% by the combination of EPC and reverse auctions. The average investment (in % of purchasing costs) for both EPC and reverse auctions is 11.1%. Consequently, an average net saving of 17.4% and a ROI of 155% results by the combination of both reverse auctions and electronic purchasing consortia. Obviously, this tandem can achieve significant profit and ROI. With regard to the ROI, reverse auctions have a better potential than EPC. So far, there is no statistical validity that the more services are offered by e-Marketplaces / PSPs, the higher the general net savings in purchasing costs achieved with e-Marketplaces and PSPs. Presently, providers of EPC and reverse auctions seem to be quite satisfied and positive about electronic purchasing consortia and reverse auctions.

## **Discussion of Findings**

All in all the results demonstrate that, despite some scepticism and drawbacks, electronic purchasing consortia, it is perceived, will become more important in the future. The overall consensus is positive. New electronic metamediaries such as e-Marketplaces and procurement service providers have the potential to interpose themselves between suppliers and buyers by taking advantage of new types of economies of scale, scope and knowledge, enabled by the Internet.

However, the analysis into EPC process structures and drivers among e-Marketplaces / PSPs also reveals that major barriers exist to adoption: For example, legal limitations can evolve, which are, according to the trade commissions, amenable to traditional anti-trust analysis. Competition may be affected by monopsony or oligopsony buyer power. The further EPC extend beyond the 'safe harbour', which under EU guidelines is fixed at 15%, the greater the risk of a negative competitive effect. In the US, if less than 20 percent of a market is affected by an exclusive arrangement, the practice will likely avoid regulatory scrutiny because it falls within the antitrust safety zone. Anti-trust limitations can be one of the reasons why EPC are offered less in the automotive industry (39%) than in the electronics industry (65%). What differentiates the electronics industry from the automotive is higher volatile demand, more rapid inventory depreciation and a more dynamic character. The electronics industry is not as vertically integrated and concentrated as the automotive industry, which makes it a better candidate for EPC models. Potential anti-trust limitations are more likely to arise in the oligopsonistic automotive industry. For example, the consortia-led e-Marketplace Covisint specifies on its website: *"First, Covisint will not aggregate the purchases of one OEM with those of another OEM. Second, Covisint will not offer aggregated purchasing services for any automotive-specific parts or materials. Third, Covisint's future aggregated purchases of non-automotive specific parts (such as office supplies, cleaning supplies, etc.) will always be within the applicable competitive law guidelines in the market in which the purchases are*

*made.*” By forming EPC within Covisint, several OEMs would dominate the automotive purchasing share world-wide. Due to regulatory issues consortia of automotive manufacturers will not be allowed to pool their demand for production parts. Nonetheless, Covisint has taken a very conservative approach: Demand aggregation between OEMs and tier 1 suppliers (for e.g. raw materials) which is common practice in the automotive industry was also not integrated. EPC providers have to establish means by which the risks of collusion or anti-trust can be ameliorated, e.g. by erecting firewalls to prevent access by competitors to certain information or by implementing the use of nondisclosure or confidentiality agreements.

E-Marketplaces / PSPs also cited further challenges to EPC such as a not adequate training and education of purchasing managers in EPC, a low degree of information on change management and, rather self-critically, a lack of maturity in service offerings. E-Marketplaces and PSPs realised that they have to add services and functionality in future. Currently available EPC solutions are still some way from covering the entire spectrum of procurement requirements. It was also found that e-Procurement of complex modules with high asset specificity are more difficult to proceed by EPC because the parts are rarely sourced entirely on the basis of price, but on concept competition, supplier capabilities and in most cases single sourcing. Lapidus (2000) assumes that only 20% of sales in the automotive industry are commodity purchases, which would be more suitable for EPC due to their lower asset specificity. Some conflict with electronic purchasing consortia was identified in the concentrated auto industry, with its module structure, fierce competition and overcapacity and therefore take-up of EPC among e-Marketplaces / PSPs in this industry is relatively low. Effective participation in electronic purchasing consortia has the potential to enhance competitive advantage in the automotive industry, but this potential is limited due to the concentration of the sector (legal issues), cultural impediments and technical factors (modularised assembly). More horizontal integrated and fragmented industry sectors such as the electronics industry are better suited to adopt EPC. Moreover, the electronics industry with its high-velocity product cycles and swings in demand have aggressively embraced outsourcing, contract manufacturing and reintermediation, thereby contributing to the higher level of EPC implementation. However, e-Marketplaces / PSPs further specified that many purchasing organisations have not yet evolved to the stage where they are joining e-Marketplaces / PSPs in any significant numbers. They will have to overcome this fundamental hurdle before strategic sourcing teams are joining EPC and applying strategic leverage on the supply base.

## **Conclusions**

From the research, it is apparent that EPC, despite limitations, can be a valuable strategic tool worth consideration inside an integrated supply chain model. While dependant on industry sector characteristics, the model of electronic purchasing consortia can represent a strategic procurement direction for the future and is developing in an evolutionary rather than in a revolutionary manner. However, much work still needs to be carried out if the use of this type of electronic network is to be more widely adopted. Therefore, further research on EPC will be conducted by means of a second survey on a sample of 400 purchasing organisations in the automotive and electronics industry.

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