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Consideration of Strategic Implications in Global Sourcing Processes

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Abstract

Global Sourcing is becoming more and more important, and many manufacturing companies in developed countries procure direct materials from low-cost countries in Asia or East-Europe. A key reason for Global Sourcing is the expected cost savings for the buying company. The decision-making in Global Sourcing is yet rarely based on profound holistic analyses or long-term strategic implications of this Global Sourcing intention. The objective of this paper is to develop an application-oriented model targeted at industrial practice for Global Sourcing decisions and their strategic implications (e.g. supplier development needs, logistics, hidden costs). The research is accomplished according to action research principles in close cooperation with four Swiss companies from the medical technology, mechanical, electronics and plant engineering industry.

1. Introduction

Global Sourcing and Global Supply Chain Management are gaining more and more importance. From a European perspective Asian and East European supply markets are nowadays often in focus. The key reasons for these Global Sourcing initiatives from the buying perspective are:

- Market access, e.g. the possibility or simplification of market access in a special country through a supplier in this specific country,
- Cost advantage, e.g. low labor or production costs,
- Logistics aspects as for example the proximity to a customer and short lead-times,
- Legal aspects, e.g. the necessity of local content, concessions or allowances,
- Tax issues or subventions,
- Or technological aspects; e.g. some special technologies or materials are only available in some specific supply markets.

Often the buying company has due to these reasons only a limited choice of potential suppliers. Also plant manufacturer (e.g. power plant or steel plant manufacturer) have due to the size of many of their procurement objects (e.g. big and heavy components) only a limited flexibility of a supplier choice as the supplier has to be located nearby to the construction site. The Global Sourcing offers obviously many chances and proponents of Global Sourcing report significant savings after the supplier's qualification. On the other side risks and long-term consequences of such Global Sourcing initiatives have to be considered carefully. This is often not done in daily practice of industrial companies as some studies show (see Kinkel et al. 2004, Niederkorn 2005).

Often procurement decisions are seen from a limited perspective within the buying company, e.g. focusing predominantly on a low purchasing price. Further consequences like long lead-times (e.g. through container transport), limited flexibility in the production or a higher demand of man-power in different departments of the buying company (e.g. due to engineering, production and logistics coordination issues) are often not anticipated or considered by the buying company. This may result in high risks for the buying company and additional hidden costs. Procurement managers are often challenged to select suppliers for specific, partly technologically complex

goods as there is in most companies a lack of transparency concerning costs and the awareness of the strategic implications related to a supplier selection decision within a Global Sourcing activity.

Many approaches deal about the supplier selection and supplier selection criteria (e.g. de Boer et al. 2001; Degraeve et al. 2000; McIvor et al., 1997; Wagner, 2003). Most of these approaches incorporate Global Sourcing aspects only insufficient as they consider mainly local or regional procurement decisions. According to Quintens et al. 2006 “research remains silent on whether the drivers of global purchasing fit with the strategic ambitions of the firm”. From this viewpoint an enhancement of the strategic procurement process for Global Sourcing projects is important which incorporates the long-term or strategic implications from the buying perspective. Focusing on these issues, the objective of this paper is to present an enhanced strategic procurement process and to present important strategic implications which have to be considered during the strategic procurement and Global Sourcing decisions.

The paper is organized as follows: Chapter 2 describes the methodology and research design. The strategic procurement process in a global context is described in chapter 3 while chapter 4 discloses important strategic implications within the Global Sourcing context followed by a discussion and outlook in chapter 5.

2. Methodology and research design

The research is accomplished in close cooperation with four Swiss companies from the medical technology, mechanical, electronics and plant engineering industry. The methodology is based on action research (Ulrich and Hill 1976) and the Systems Engineering approach (Haberfellner and Daenzer 2002). For developing the enhanced strategic procurement process model for

Global Sourcing and analyzing the strategic implications of a Global Sourcing initiative we used the Systems Engineering (SE) approach. SE is a problem-solving methodology (planned procedure) for designing and configuring systems, especially those of a socio-technical and complex nature. SE includes the system thinking for the integral comprehension and structuring of the complexity, and the procedural model for systematic, objective-oriented problem solving as well as various techniques and methods as tools. The first step consists of a detailed situation analysis (System delimitation, strengths/weaknesses analysis, opportunities/threats analysis). We analyzed within this step the literature and state-of-the art of the strategic procurement process of direct materials and the long-term implications of Global Sourcing projects in the Swiss industry involving the industrial partners. Based on the situation analysis, the objectives and requirements for strategic procurement and a reference process were formulated, especially taking the needs of the industrial SME partners into account. Different concepts and methods for the strategic procurement reference process (based on the state of the art research) were analyzed, which were later evaluated according the objectives.

3. Enhanced strategic procurement process for Global Sourcing activities

The enhanced strategic procurement process model focusing on global sourcing and eliminating the abovementioned shortcomings of traditional strategic procurement processes focusing on local or regional procurement is shown in figure 1. Enhanced processes within this model are mainly the definition of global production and sourcing network strategy, the definition the structure of the global production and sourcing network, the organizational design of the supplier relationship management, the design adaptation and the prototype manufacturing and ramp up production. As accompanying general processes for the whole strategic as well for the operative

procurement processes were added the Risk Management and the Total Cost of Ownership processes.

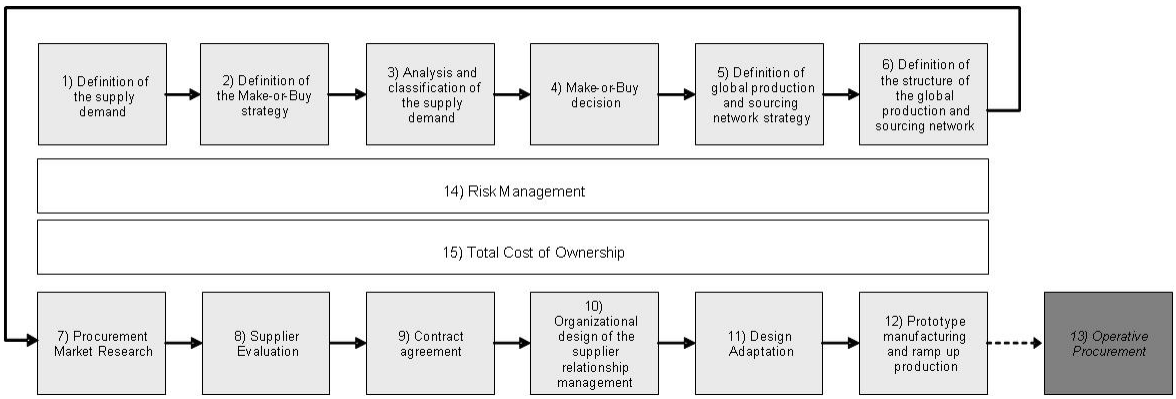

Figure 1: Proposal for a Reference Process for Global Sourcing (strategic procurement perspective)

The enhanced strategic procurement reference process model for global sourcing consists of the following main processes:

1) Definition of the supply demand: the definition of the supply demand (procurement objects) is based mainly on the analysis of the product-market combinations and the according sales forecasts. Within this step it will be analyzed, among other factors, what kind of products should be available for which markets and what kind of design adaptations are necessary for these specific markets. Based on this analysis and the sales forecast, the supply demand can be roughly defined.

2) Definition of the Make-or-Buy strategy: the definition of Make-or-Buy strategy is a crucial strategic decision that has to be based on the core competencies of the company and the corporate strategy (Arnold 1999; Picot 1991). The result of this process step is a criteria catalogue. These criteria are later applied in the analysis of the demand to decide whether the

demand should be bought (Buy strategy) or be produced within the own company or a subsidiary (Make strategy). While the determining the criteria for the catalogue the strategic implications (see chapter 4) should be carefully embraced.

3) Analysis and classification of the supply demand: an analysis of the supply demand will be performed within this step. Most companies have to deal with a larger number of different objects - different parts, product components and materials which have to be either produced or bought. It is therefore important to cluster the variety of these different components. In theory and practice, a lot of different approaches can be found. Most common are portfolio techniques or enhanced procurement analysis frameworks (see e.g. Geldermann and van Weele 2001; Bensaou 1999; Nellore and Taylor 2000). This structuring and classification allows an overview of the supply demand based on a clustering of the different parts and components and a positioning of the cluster groups, e.g. within a portfolio. Clusters can be for example plastic parts, screws, iron cast parts or electronic components. The analysis of the supply demand as well the positioning within the portfolio or another analysis framework should be done in teams involving professionals from logistics, production, design, procurement and quality management (material group management) (Wildemann 1999).

4) Make-or-Buy decision: based on the analysis and the classification of the supply demand and the definition of the Make-or-Buy strategy, a decision has to be made which parts of the supply demand should be bought or made. This decision can be supported for example by a portfolio based on the criteria of the Make-or-Buy strategy and be based on the positioning of the cluster groups within this portfolio. It is important that the Make-or-Buy decision is not only based on financial aspects, because of important long-term implications resulting from this decision.

5) Definition of global production and sourcing network strategy: within this process step the criteria for planning of the global production and sourcing network are defined. This step is a crucial process element for global sourcing due to the different and raised requirements when sourcing globally compared to sourcing locally or regionally. Important aspects of the definition of the global production and sourcing strategy are (see also chapter strategic implications) for example the need for local content (e.g. through legal restrictions), the product image from a customer perspective, costs, lead times (e.g. due to container shipping), quality issues, flexibility of production, or a company's existing hub- or other global logistics strategy. Further aspects can be deduced form the macroeconomic analysis of the different regions and countries (e.g. technology cluster regions, education level, expected university graduates, taxes, inflation, expected exchange rates, infrastructure, tariff and policy changes and laws).

6) Definition of the structure of the global production and sourcing network: based on the definition of global production and sourcing network strategy, the ideal production locations and sourcing regions are defined in this step. An as-is analysis of the sourcing and production network has to be performed and a comparison between the ideal state and existing network is done. According to this comparison, concrete steps are deduced. Restrictions, e.g. involving existing suppliers, have to be considered. The evaluation of these restrictions is of importance due to the fact that it may for example be interesting for a European company (buyer) to choose a Chinese supplier for the products designated to the Asian market. This may result in conflicts with existing European supplier for the same products / components who could in return end the common development (cooperation) with the European buyer. The result of this process is a long-term strategic plan that describes which components should be sourced from which region or country, or which components should be produced at which production site.

7) Procurement Market Research: this step consists of the systematic search for information about procurement markets and potential suppliers. The procurement market research is of great importance due to the quick changes in economical aspects and technical issues. The aim of the procurement market research is to prepare the supplier evaluation.

8) Supplier Evaluation: the supplier evaluation consists of obtaining detailed information about specific suppliers for specific components. This evaluation is performed bottom-up. Of a long list of potential suppliers, a few suppliers will be preselected and then evaluated in detail. This detail evaluation is often performed in form of supplier audits. This task can be time-consuming and extensive, so normally the detail (in-depth) supplier evaluation will be limited to 2-3 suppliers. For Global Sourcing, special evaluation criteria may be added for the supplier evaluation compared to the evaluation of local suppliers (e.g. compliance with social standards, Intellectual Property Right Protection, reliability of the supplier).

9) Contract agreement: after selecting one or more suppliers, the prices and product specifications, the modalities of payment and delivery terms for the components or procurement objects are fixed.

10) Organizational design of the supplier relationship management: usually the suppliers will be supported by and / or lead from the procurement office at the buyer's location. The aim is controlling the supply and operational performance, e.g. controlling the ramp up production, the delivery of the procurement objects, the quality of the supply and supporting the supplier in cases of problems. In the context of global sourcing, this long-distance organizational design is often insufficient. The supplier relationship management should be organized or supported locally.

This can be done through decentralized sourcing offices near the supplier's site or through independent sourcing offices allowing for a close control and reasonable support of the supplier.

11) Design adaptation: adaptation of the design for the local procurement markets. From a procurement perspective it may be interesting to adapt the design of the procurement object for a better use and utilization of the local capabilities (e.g. using the cost advantage due to low labor cost which may result in a re-design of the procurement object / product by lowering the automation degree or using a different production techniques that is preferred by the supplier).

12) Prototype manufacturing and ramp up production: this process aims to support the prototype and ramp up (first series) production. This process is in the context of local or regional procurement often controlled by the design department. In the context of global sourcing this task should be mainly controlled by the (local) sourcing organization, ideally located near the supplier site and allowing a closer cooperation.

13) Operative Procurement: the operative procurement process follows the strategic procurement process and aims to get the procurement objects in the right quality, at the right time and at the right price. According to the discussion and analysis with our partners, the operative procurement process in the global sourcing context does not differ much from the local or regional sourcing in the home country. For a detailed description of the operative procurement processes, see for example (Luczak et al. 2000).

14) Risk Management: Risk management strongly gained importance in the last years, generally in financial and business management, and more specifically in supply chain management. All process steps should be included in an overlapping risk management process. It supports the management of strategic risks regarding make-or-buy decisions and increases the robustness of a

global production and purchasing network. On a tactical level, it supports the selection of the right suppliers by taking risk factors (e.g. as part of a total cost of ownership analysis) into account. On the operational level, it helps coping with fluctuations in quality and delivery by supporting a robust sourcing planning. Further details about Risk Management within Global Sourcing activities or Supply Chain Risk Management can be found e.g. in Oehmen 2009 or Ziegenbein 2007.

15) Total Cost of Ownership (TCO): For analyzing purchasing costs, different concepts can be consulted and have been developed in academia and through practice. There are approaches that include e.g. opportunity costs as well as volatile costs, but also non-monetary criteria such as risks (e.g. Schoenherr et al. 2008; Smytka and Clemens 1993). For a broader understanding of the costs related to a procurement decision, several approaches have been developed, including life cycle costing, total cost of ownership (TCO) or transaction cost analysis (TCA) etc. Within this paper and the reference process the concept of total cost of ownership (TCO) is consulted. Total Cost of Ownership (TCO) can be defined as an estimation of all direct and indirect costs associated with a specific procurement object over its entire life cycle. An integral TCO approach is of big support for the Make-or-Buy decision and the supplier evaluation (ex-ante) as well for the supplier development and supplier controlling in the operative procurement (ex-post). Even if TCO is a well-known term in the scientific community and some approaches have been developed (see Degraeve et al. 2005; Ellram 1995, Carr and Ittner 1992), no viable integral models are known for Global Sourcing activities which are in use in daily business. For more detailed information about TCO in Global Sourcing initiatives, see Bremen at al. 2010.

The above described process steps of the strategic procurement process have to be considered in an iterative way. Also, in practice not every described process step is of the same importance in

every procurement or supply case. It may be that some processes have already been performed or the information is already available, especially for products which are already on the market.

4. Strategic implications of Global Sourcing

Within several of the above described process steps, strategic implications of Global Sourcing initiatives have to be accurately considered and investigated. The systems delimitation of Systems Engineering offers a good possibility to structure and to discuss important aspects and possible company-specific strategic implications of Global Sourcing projects involving different departments of the buying company. Figure 2 shows an example of such an analysis of influences and long-term implications.

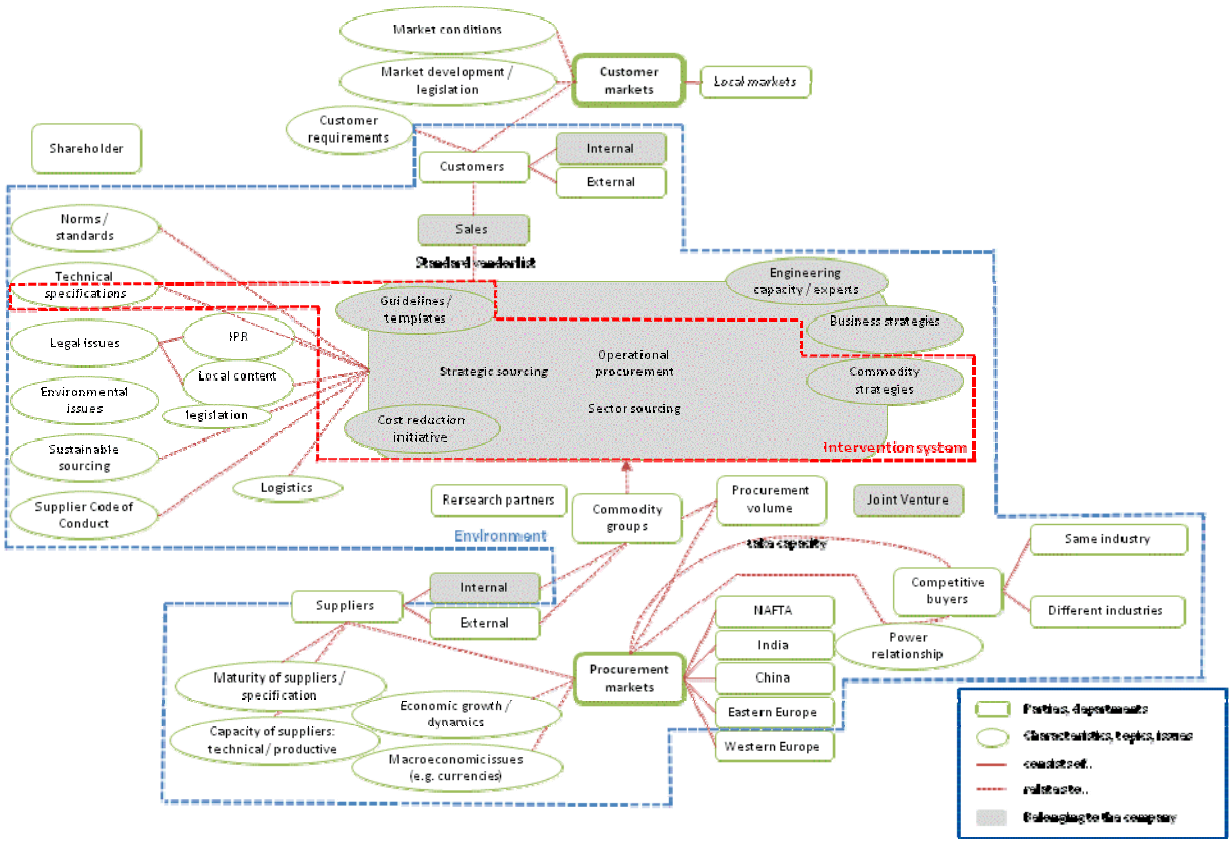

Figure 2: System delimitation of a Global Sourcing project (simplified example)

In the following important strategic implications of Global Sourcing projects are listed and described which should be taken into account during the strategic procurement processes:

Procurement volume: within the sourcing project the distribution of the procurement volume to different suppliers has to be investigated. The buildup of a new supplier in another country may reduce the dependency risk. The buying company becomes less dependent from one supplier if having a second source. The exposition risk to a special region may be reduced when having another supplier in another area (e.g. geographical risks like earthquakes, political risks). A disadvantage of a second source in another country may be that due to the split of the purchasing volume of the specific procurement object additional costs may arise due to lower procurement volumes for each of the suppliers and a weaker bargaining position as a result. Also interdependencies to other procurement object groups have to be taken into account, e.g. if the supplier supplies several procurement object groups.

Power relationship: within the supplier evaluation the power balance has to be evaluated. An imbalanced power relationship with a strong supplier may pose problems for the buying company in critical situation (e.g. capacity shortage for certain products / procurement objects). The evaluation of the buyer-supplier power balance has to be controlled regularly. Especially Asian suppliers may be able to grow quickly due their advantageous domestic sales markets and the domestic clients with high growth rates. This may lead to situations where Western companies, esp. small and medium sized companies are due to their low procurement volume and their small lot sizes not interesting anymore from a supplier’s perspective.

Acceptance of the suppliers by customers and employees: here the question is how customers will react to a new global supplier. It may be that suppliers from specific countries are seen in a

critical way, e.g. for Supplier Code of Conduct (SCC), quality, ecological or image issues. Besides the acceptance from the customer's side the acceptance by the employees of the buying company has to be ensured. Some departments or employees may see the (new) global supplier as a burden or even as a competitor. Here the supplier choice has to be discussed with the different stakeholders within the buying company, e.g. besides the procurement also the engineering, production and logistics. A Global Sourcing can on the other hand also be used as sales argument towards customers, e.g. showing that the buying company is able to optimize with the new suppliers or able to use new cost or technological potentials.

Cooperation: it has to be checked if an adapted buyer-supplier relationship can be set up with a new global supplier according to the importance of the procurement object group. It may pose problems to set up an excellent relationship with a supplier who has a very different cultural and language background; expensive travel and coordination meetings may be the consequence. Within the buying company people with suitable cultural and language abilities have to available in this case. Also the cooperation with the existing suppliers has to be checked. The existing supplier may see a new global supplier as stimulation but he could also see this new situation as a reason to end the relationship with the buying company.

Supplier development: within the buying company qualified and motivated people for the supplier development have to be present. Generally Global Sourcing will prove to be time-consuming due to long travel distances, time lags and probably language issues. Besides the need for people in the procurement department also people from engineering and production have to available for example in order to support prototype production, ramp up or adaptation of the design to local needs.

Logistics: for the buying company a new global supplier has many consequences. On one side lead times may be reduced (e.g. if the supplier will be used to supply markets or customers in his region). If the procurement objects will be brought back to the customer's location (e.g. from China to a European production location or European hub), long lead times are often the consequences, especially when air freight or combined sea-air freight are not feasible. Flexibility loss in the own production or assembly may be an important consequence of this long lead times. Another consequence is often a higher inventory at the customer's site in order to cope with potential delays or quality problems.

Quality / certificates: some industries require special specifications (e.g. in the medical industry). A supplier in a specific country may accelerate the approval for the component or product of the buying company. But a new global supplier choice may also result in complex and time-consuming new approval procedures.

Financial issues: a supplier in a specific country can reduce the currency risk or currency influence (e.g. through a natural hedging). Currency issues can lead on the other side also to higher costs than initial planned. This may be on the procurement object level (currency in which the supplier is paid) but also to other costs like transport costs (for example if linked with the US-$).

Legal aspects: The most important legal aspect for the supplier decision is often the Intellectual Property Rights (IPR) issue. Global Sourcing projects for procurement objects with critical background (e.g. specific technological know-how, core competencies) have to be seriously evaluated (e.g. legal situation of the specific country and supplier's reputation). Other important

legal issues are warranty and liability, esp. if the procurement object has an important function for the final product (e.g. for safety or follow-up costs in case of failure).

5. Discussion and outlook

The challenge for most industrial companies and especially small and medium-sized enterprises is to include these implications in Global Sourcing projects. In some cases this will happen implicit or intuitively. A systematic procedure will help to avoid problems. The above described enhanced strategic procurement process combined with a checklist and system delimitation including the strategic implications proved to be a good and holistic approach. Evidently the task for the procurement department becomes more laborious on the short term, esp. due to the fact that many strategic issues have to be considered which have to be discussed with different stakeholders within the company. On the long-term a systematic and holistic approach in the strategic procurement can and will avoid many long-term problems with advantages for all the stakeholders.

6. Acknowledgements

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