Stanisław KRAWCZYK*

SUPPLY STRATEGY DEVELOPMENT IN PRODUCTION ENTERPRISES

Abstract: The process of supply is one of the main fields of formulating and executing logistics assignments. These assignments are formulated at the managing and operational levels. The development of concepts concerning the standards of product manufacturing indicates that the process of supply should become a part of a company's strategy. The paper, presents some concepts of identification of a supply strategy as a part of a company's master strategy. The classification of production elements and the market condition analysis are the start point for formulating supply strategies. The development of a supply strategy, which is only a segment of a company's strategy, requires a detailed analysis of different connections in the producing network and the system of delivery. In the author's opinion, the process of developing a supply strategy requires the identification of needs and the specification of policy connected with the requirements of marketing strategies for the products manufactured.

Keywords: strategy, relationships with suppliers, materials classification.

1. Strategy and its significance

The notion of strategy was introduced in the management science vocabulary as late as in the 1950s (Camponovo 2006). One of the first definitions, referred to practically all company management handbooks, was formulated by Chandler (Chandler 1962). In his approach, *strategy is the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals*.

A thorough analysis of the strategy concept was carried out by Mintzberg, who concluded that in practice the word has five separate meanings, that of a: plan, ploy, pattern, position and perspective (Mintzberg 1990). Among modern approaches, an interesting formulation is one presented by Johnson, Scholes and Whittington: *Strategy sets direction and potential for long-term organizational changes, aimed to achieve advantage in a changing environment through its configuration of resources and competences to satisfy shareholders' expectations* (Johnson *et al.* 2005).

* Wrocław University of Economics, Wrocław, Poland

In the comprehensive overview of definitions presented by Weseloh, Gibcus and Kemp, and Camponovo (Weseloh *et al.* 2003), nearly all views on strategy are based on references to attributes of a production enterprise, which renders them hard to use in regard to projects implemented by an arbitrary community, including individuals. The author believes that the concept of strategy should be perceived in more universal terms, to make it applicable for any justified situation. To this end, the author suggests the following definition of strategy:

Strategy is a set of binding, long-term *arrangements* addressing a distinct community intent on carrying out an adopted and accepted mission, which the community comes to perceive as overruling guidelines, independent of transitory influence, and referring to the aims, procedures and tasks, as well as rules for assigning resources supporting the execution of those tasks. Such arrangements may take the form of general ideas and action recommendations or in the form of particular statements detailing the recommended actions.

Theory of management distinguishes strategies of general significance, applying to the development of a company as a collective entity, referred to as normative strategies and typically expressed as sets of ideas for further refinement and crystallisation; and strategies of functional type, closely related to organisational structures in business and functional dimensions.

In this paper we confine ourselves to the latter type, and more specifically, the following three interrelated functional areas:

- product manufacturing,
- distribution,
- procurement of production resources.

2. Strategies of production and distribution

In regard to the sphere of product manufacturing, a range of strategy identification approaches are used. In logistics analyses, of particular interest are strategies applying to methods of obtaining information on product demand, as well as the resulting arrangements relating to methods of manufacturing and distribution of the product.

Based on the above aspects, one can distinguish the following basic strategies of production (Arnold 1998):

Engineer to order – commissioned order requires a separate product design or substantial alterations in an existing product, with resulting need to place separate orders for materials and components. Such strategy is employed in companies that offer comprehensive products tailored to individual requirements of the customer. From logistic viewpoint, the most essential arrangement is to decide which production elements can be produced within the company, and which must be subcontracted and purchased from external sources.

Make to order – product designs are available, and customers are familiar with the product range on offer. Product manufacturing is initiated after the customer places an order. The product is typically manufactured using standard components, or with customising alterations based on individual orders that do not require separate procurement procedures. From logistic viewpoint, the essential arrangements apply to the time needed to service the order.

Assemble to order – the product is assembled from standard components that may be stocked to be composed to order, with the customer exclusively choosing among available optional components. Products may be partially preassembled. The final form of the product is prepared after receiving the customer's order with detailed list of components to be used. Streamline execution of orders typically requires a certain degree of production standardisation and considerable modularisation of components. Of great importance is also The decision on the venue for the final assembly is also of great importance. Nowadays, customers and more often require the product to be assembled on site, i.e., where it is to be operated/utilised.

Make to stock – the manufacturer prepares products based on demand forecasts and places them in stock. Customers purchase off the ready selection of inventory, through standard purchase transaction, with no margin to decide on a final form of the product. This type of strategy is strongly connected with a distribution strategy, as it requires a careful selection of distribution channels, logistic operators and other arrangements, including the forms of servicing product delivery.

3. Role of material classifications in supply strategies

Supply strategies are determined by the arrangements pertaining to the concepts of manufacturing and distribution of the product. Consequently, one cannot implement a supply strategy without prior arrangements in regard to a marketing strategy and product manufacturing strategy. If products are made to stock, the fundamental premises for supply strategy involve technological aspects, such as choice of materials, as well as economic ones – the cost.

In the case of other production strategies, supply functions require suppliers' ability to supply their products, as well as the purchaser's ability to set supply conditions. Consequently, supply strategy analysis requires certain degree of logistic considerations. The above aspects are well presented by Chen, Paulraj and Lado (Chen *et al.* 2004):

The term *strategic purchasing* refers to long-term concepts of material management oriented to securing the availability of resources. In particular, strategic purchasing is responsible for selection and development of the suppliers, improvement of the relationship between the buyer and the supplier, coordination of the cooperation between the companies, and creation of trust. Strategic purchasing enables efficient cross-functional communication between the companies.

Kraljic, in his recognition and interpretation of standard classifications ABC and XYZ, postulates an alternative method for classifying purchased materials as basis for strategic arrangements for supply.

Within the general framework of setting up supply strategies, Kraljic proposes a four-stage approach involving the following (Kraljic 1983):

1. Classify all the purchased materials or components in terms of profit impact and supply risk.
2. Analyse the supply market for these materials.
3. Determine the overall strategic supply position.
4. Develop supply strategies and actions plans.

Based on practical observations, Kraljic postulates that establishing a supply strategy requires careful determination of profit impact of all individual materials purchased, as well as of risk of purchase.

Impact on the final business result is established on the basis of the size of purchases, their percent shares in the product cost and their significance for product marketing value expressed as sales revenue.

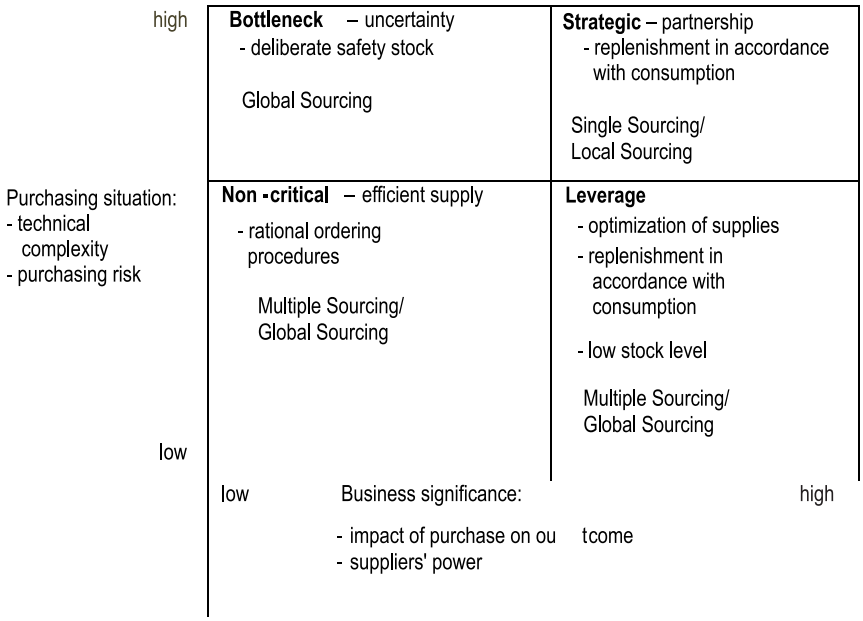

Fig. 1. *Suggestions for strategy choices based on Kraljic's classification*
Source: (Baumgarten 2004)

In relation to risk of purchase, one should take into account the technological complexity of purchased materials, limitations to suppliers' operations and shipping execution, competition of purchasers and perturbations on supply markets.

Figure 1 presents the overview of classification and suggestions for basic strategic arrangements.

Further elaborations of Kraljic's concept suggest that analyses of supply strategies should in particular involve the notion of **strategic items**. Due to the role of strategic items in product manufacturing and degree of processing involved, the term *strategic* is carried over to the supplier relations.

Those relations are typically based on **cooperation**. Relations with suppliers should take the form of partnership that warrants stability and reliability. Both cooperating parties should be well aware of their role in creation of product value. In the case of strategic items, it is advisable to conduct a careful analysis for choosing, or rather selecting the most appropriate supplier.

As far as the strategy for purchase of **bottleneck items** is concerned, it is essential to establish supplier relations that minimise the supply risk. This notwithstanding, one should also seek potential for standardisation of materials used or consider the use of substitute materials. It is advisable that operational planning should provide for stocking bottleneck items in order to avoid potential supply delays.

Purchase of **leverage items** that influence the production outcome with no substantial risk of supply, it is advisable to prepare a thorough analysis of supply market to use one's leverage position to the best effect. Suppliers may be sought after in geographically distant regions. To obtain the 'effect of scale', it may prove useful to set up cooperation with other companies that procure items from the same supplier, as the bulk order may substantially reduce price per unit and limit the cost of supply logistics.

In regard to **non-critical item** purchase strategies, one should consider the following recommendations (Hug 2000):

- purchase procedures should be as simple as possible,
- lengthy administrative procedures and extended logistic operations should be avoided,
- it is advisable to base the purchase on product catalogues, if possible,
- online purchases and specialist services (outsourcing) should be explored to full potential, to avoid unnecessary transaction costs that significantly increase the acquisition cost.

The importance of classification for the development of a strategy was analysed in the research conducted by Caniëls and Gelderman on the sample of 250 companies, in relation to the following (Caniëls, Gelderman 2005):

- overall business strategy of the company,
- supply market situation and related risk of purchase, as well as,
- production capabilities and long-term cooperation abilities of the supplier.

Research confirmed the viability of Kraljic's classification in formulating supply strategies, but also brought up some important considerations in regard to classification principles and recommended actions, thus referring to earlier observations of Gelderman and van Weele (Gelderman, van Weele 2003).

Let us briefly consider the most important observations concerning the formulation of supply strategies based on Caniëls and Gelderman's studies, with the premises of classification as such unchanged.

The most notable factor here is the distinct shift towards maintaining relations with suppliers.

A. Strategic items

1. **Maintain strategic partnership**
   If contract parties perceive mutual advantage, balance of interests and benefit of improved cooperation, if they trust each other and are interested in improving the product, it is advisable to support and maintain such strategic partnership in the form of long-lasting cooperation. Basic arrangements here should involve quality requirements, reliability and accuracy of supplies, as well as clear distribution of tasks in product development. Such cooperation will most likely result in cost reduction.
2. **Accept a locked-in partnership**
   If the procurement conditions are not favourable, with the supplier imposing inconvenient shipment terms, while the purchaser cannot withdraw from trade agreements due to patents or the monopolistic position of the partner, it is advisable to adopt the strategy of a locked-in partnership to satisfy the minimum acceptable level of needs.
3. **Terminate a partnership**
   If the conditions imposed by the supplier are unacceptable with no prospect of improvement, it is advisable to reduce the level of involvement, up to a termination of partnership. Alternative sources of supply should be explored as early as possible. It must be remembered that alternative solutions are likely to present new challenges and that some impediments are unavoidable in the period of transition.

B. Bottleneck items

4. **Accept dependence, reduce negative consequences**
   In the case of procuring materials on terms dictated by the supplier, basic arrangements should concentrate on adjusting one's plans to supply conditions. To satisfy the need of reliable access to key materials, it may be advisable to set up a suitable policy for stocking or strive to arrange consignment-type agreements for supply.
5. **Reduce dependence and risk, find other solutions**
   Parallel to adopting the strategy of accepting dependence, it is advisable to explore alternative solutions, such as finding an alternative supplier or altering material specifications to replace bottleneck items with standard ones. The final arrangement should satisfy the need for reduced dependence and risk.

C. Leverage items

6. Explore buying power

In relation to leverage items, strategic arrangements should explore the full potential of purchasing power to win the most profitable conditions of supply. As confirmed in practice, the fundamental form of supplier selection is the tender procedure, typically for short-term arrangements. The strategy should involve principal selection requirements with regard to the supplier and the shipment process. These include: pricing requirements, quality assurance and reliability of supply.

7. Develop a strategic partnership

If the percent share of procured items in the overall product value is considerable and of great economic significance to the company's results, practical approach typically involves development of partnership relations with the supplier. Such solution is recommended when the supplier is willing to participate in product development and contribute to product servicing.

D. Non-critical items

8. Pool purchasing requirements

Servicing of standard products should be as undemanding as possible. The most notable aspects here are the logistic and administrative arrangements in servicing of shipments. It is recommended to introduce standardisation of service and optimisation of shipment procedures, in particular through consolidation and standardisation of shipments. It is also advisable to look for suppliers able to provide a group of items (Olsen, Ellram 1997).

9. Individual ordering, efficient processing

It is recommended to select a group of supplies that may be processed at minimal administrational strain trough contractual agreements, to be called for as the need arises.

4. Logistic aspects if supply strategies

The strategy concepts presented above were based on central elements, such as product, market, suppliers. However, accounting for the fact that supply strategies are developed mainly at production companies with territorially dispersed structures (often on the global level), the successful strategy should also involve arrangements of an organisational nature.

Quintens, Pauwels and Matthyssens accentuate two additional elements that should be accounted for in the phase of strategy development; these are (Quintens *et al.* 2006):

- configuration of organisational structures involved in purchasing and principles for coordination of supply decisions,
- degree of standardisation of purchases.

By accounting for organisational aspects of supply process, the authors postulate that strategy should be analysed through four interconnected components:

1) organisational structure and resulting competences;
2) standardisation of purchasing process seen as a process of:
   – exploring the market of supplies and earmarking potential suppliers,
   – selecting the suppliers,
   – negotiating and signing agreements,
   – maintaining relations with suppliers and controlling the supply process;
3) standardisation of purchased items;
4) standardisation of workload of units involved in supplies.

Taking into account the structure of responsibilities and delegation of powers in decision-making, Matthyssens and Faes distinguish four characteristic types of coordination in supply strategies (Matthyssens, Faes 1997):

1) coordination through the unit that shows the highest demand for a given material or group of materials;
2) coordination through the central unit;
3) formation of regional centres to coordinate purchases for units within the region;
4) formation of profit centres with delegated power to make supply-related decisions.

5. Process of formulating a supply strategy

Setting up a strategy is hardly ever a one-time, complete and all-inclusive act. A strategy develops as a result of two confronting tendencies: one with dominant need for stability, and the other being a result of ever-changing requirements of the environment. Strategic arrangements are, in fact, a way to secure stability of company operation in the context of environmental fluctuations that are not always predictable and controllable.

Unfortunately, the literature provides but few guidelines to help develop a good approach to strategy formulation. Interesting suggestions can be found in (Krampf 2000). His concept is formulated on the basis of observations made in the automotive industry, which clearly shows in the terminology used.

In Krampf's view, shaping up a strategy involves six stages (Krampf 2000):

Stage 1. For planned (or already manufactured) products one should prepare lists of materials as a sheet of modules or systems for which strategic decisions are to be made.

Stage 2. This stage involves analysis to address the question: which of the required modules and systems should be manufactured in-house and which are to be purchased externally. This is a stage of strategic outsourcing decisions.

Stage 3. Based on historical data, classifications of ABC and XYZ type are made to help establish the supplier selection policy.

Stage 4. At this stage, review of potential regions of supply should be performed. In particular, comparative analyses of local and global supply sources should be carried out, with regard to economic aspects and logistic requirements.

Stage 5. Conclusions drawn at the fourth stage should be supplemented by analysis of the number of suppliers to guarantee infallibility of the supply stream. In particular, a comparison of a single vs. multiple suppliers should be performed, considering the issue whether a source can supply one or more of the products needed.

Stage 6. Last stage involves the final selection of a supplier and determination of the type of relations.

Based on practical observations and interviews with managers responsible for purchasing processes, the author believes that the Krampf's concept presented above should be supplemented by observations made by Caniëls and Gelderman.

The suggested strategy formulation scenario is shown below:

1. Assume that the analysis is based on a group of selected production components essential for manufacturing the final product.
2. After preparing the list of production components, they should be grouped into following sets:
   - elements produced in-house,
   - elements purchased externally,
   - elements subject to further consideration whether to produce them in-house or purchase from external suppliers.
3. Using a make-or-buy analysis for elements of the third set, prepare a list of elements for purchase.
4. The subset of elements to purchase is analysed against a list of potential (or former/current) suppliers and divided into two general groups:
   A. elements with supply conditions considerably influenced or dictated by the supplier,
   B. elements that offer the benefit of purchasing power.
5. Regardless of the former division, compile a list of production elements deemed strategic. The author believes that assigning the label of strategic item should be based on neither high purchase risk nor high financial value, since neither of these is considered useful in strategy formulation. In practice, technological attributes are analysed and used as basis for attributing the label of strategic items.

   Without challenging the importance of aspects formulated by Kraljic, practical application seems to favour the attributes suggested by Barney, i.e. (Barney 1991):
   - not substitutable, and
   - imperfectly imitable.

Another suggestion, resulting from the suggested definition of strategy, is to label as strategic those elements that are used as basis for adjusting and selecting other components. Such adjustment may result from the nature of adopted technology or marketing research. Thus, strategic elements of production are superior to other elements.

6. For strategic elements, a suitable purchasing strategy should be adopted. If the elements belong to group A, i.e. supplier-dependent, a partnership strategy should be applied. It must be noted that, in this approach, group B includes elements referred to in Kraljic's matrix as leverage items. For group B elements, a strategy of thorough analysis and careful choice of a supplier should be employed.
7. Subsequently, specification of standard elements should be prepared; this relates to elements that are readily available on the market, especially those that are in suppiers' standard product offerings. For these elements, strategies recommended by Caniëls and Gelderman should be adopted.
8. A special analysis is required for group A elements that are not deemed strategic. Kraljic's matrix refers to those as bottleneck items. Caniëls and Gelderman's recommendations are well suited for identification of a purchasing strategy for such elements.
9. Preliminary strategies for purchasing elements of each group should be verified against viability of supply execution, from the viewpoint of logistic processes supporting the production process in the framework of adopted strategies of production and distribution.
10. Based on above analyses, formulate arrangements relating to supplier relations and set up the supply system.

The ABC and XYZ classifications employed in Kraljic's concept may support the analysis of the sets of purchased elements. It must be noted, though, that standard recommendations formulated on the basis of such classifications are not so important in practice as the literature suggests. One can clearly perceive a significant shift from statistical analysis of overall sets of purchased elements towards significance and development of suitable relations with suppliers.

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