VERTICAL INTEGRATION OR OUTSOURCING?
SYSTEMATIZATION OF FACTORS DETERMINING THE LEVEL OF INTEGRATION OF SUPPLY CHAIN

Aistė Saruliene1, Mantas Vilkas2
1Kaunas University of Technology, Lithuania, a.saruliene@gmail.com
2Kaunas University of Technology, Lithuania, mantas.vilkas@ktu.lt

Abstract

The decisions made by organization on whether to perform particular function or to buy it from the subcontractors are considered from perspectives of customers demands satisfaction, of shareholders needs satisfaction and adoption conditions. The factors, which have influence for customer’s demands satisfaction, define the capability of the organization to stay competitive: instability of market demand which requires uneven production capacity; the demand for wide assortment of products; the demand for price decrease; the demand for creation of added value by using exceptional competency of another enterprise The factors, which have influence for shareholder’s needs satisfaction, are influencing the method of investments pay back: the need for decrease of investment to short-term assets: raw material, work input, resources of finished goods, equipment; the need for increase assets turnover; the need for decrease investments to long-term assets; the need for increase of value of shareholders by disposing of long-term investment and making short-time investment; the need for decrease business risk by disposing long-term investment; the need for decrease business risk by accumulating exceptional competency; no need for protection of intellectual property The stronger these factors are shown, the more purposeful is to use the structure of vertical integration of organization to subcontracting. The weaker these factors are shown the more purposeful is to use the structure of vertical integration of organization. Items, there are described the factors which could be treated as conditions : capabilities and possibilities of control and management of information; capabilities and possibilities of development of strategic control and management; capabilities and possibilities of exact formulation, documentation and transfer of requirements to product or service to partners of supply chain; market had quite a number of suppliers.

Keywords: supply chain, outsourcing, vertical integration, level of integration.

Introduction

All organizations are interrelated in various configurations of supply chains. They are related by different supply chain structure and integration levels. Some organizations decide to do everything by themselves when purchasing other supply chain members or developing the analogical function within their organizations (vertical integration).

Other organizations decide outsource specific functions and engage with suppliers in contractual relationships. The governance structures and contractual arrangements firms can enter into could vary on the level of integration. Organizations with their supplier could establish joint venture or become equity partner (virtual integration), or they may engage in long-term relationship (strategic alliance), or they may just buy goods or services by short term contracts (arms-length integration).

The decisions made by organization on whether to perform particular function or to buy it from the subcontractors are considered from various perspectives. Prevailing trend of economic research literature is on assessment of transaction costs influencing these decisions (Williamson, 1973, 1991). Capabilities evaluation approach is the basic factor influencing such decision, which is considered in business and management field. If a function or activity possesses strategic significance, it shouldn’t be outsourced despite present cost differences (Prahalaad & Hamel, 1996; Marino, 1996; Teece et al., 1997; Boguslauskas & Kvedaravičienė, 2009). Hayes et al. (2005) add that organizational coordination requirements, strategic control and risk as well as the requirement to protect intellectual property are the basic factors with capabilities, influencing different organizations integration levels into supply chains.

The influence of transaction costs on organizational decision for adoption level of integration is traversed properly; however different authors in business and management area indicate distinct factors that make influence over the supply chain members’ decision on level of integration. Still, those factors are not structured enough, especially the trend of their influence, i.e. if the value of identified factor is rising – will the organizations be under pressure to adopt vertical integration or to develop short one time transactions using partnership with another members of supply chain. As mentioned, this has been not identified yet. Consequently, the objective of the article is to systemize factors which make influence over the supply chain.
members’ integration level (vertical integration or outsourcing) and to assess the directional impact of each factor. The method used to accomplish the objective of the paper is literature review.

Theoretical contributions of the article: systematized factors determining decisions of supply chain members regarding the level of integration in accordance with satisfaction of demands of customers and shareholders and determined singleness of these factors. The results of the research are important practically because they are giving concentrated analysis of factors and their singleness to organizations’ managers striving for decision if it’s worth to buy the activity or to perform it themselves.

The article consists of two chapters. In the first chapter these concepts are defined using operational definition for the purpose of the article: supply chain, integration, integration levels. The chapter ends with literature review on factors influencing organization’s decision to outsource an activity or to vertically integrate. There are systemized the factors what have influencing such decision and grounded the direction of their influence is identified in the second chapter. The article ends with conclusions.

**Supply chains and level of their integration**

A supply chain is a network of coherent and interrelated organizations which is jointly managing, controlling and developing flows of materials and information from supplier to customer (Christopher, 2005). Supply chain consists of network of organizations having own place in incoming and outgoing relations which connects different processes and activities that are creating value to end user in form of product or service.

Integration of organizations is a development of cooperation, union of business partners (Hougaard & Bjerre, 2002). Partners are interested in success of each other because the part of their business depends on prosperity of partner’s organizations as a part of supply chain. More clearly integration is described by Lawrence & Lorsch (2002): integration is the use of joint forces in striving for implementation of commonly set objectives of enterprises as business partners. The following will be founded on this description of integration.

Analyzing character and the level of integration of enterprises scientists usually examine types of structure of enterprises; accentuate the basic theoretical reasons of their origin and advantages of the formations. Different authors in the field of business and management differently name the levels of integration of organizations. Analyzing these levels we are appealing on four basic levels of integration of management structures of enterprises’ activity accentuated by Hayes et al., (2005):

- **vertical integration.** Organization is an effector of every activity related to production of product or service and selling them to wholesaler or even to definitive customer. Organization doesn’t use services of subcontractors;
- **virtual integration.** Participants of supply chain are related by long-term engagements, partners are using consultations and competencies of each other in formation of strategies, in development of joint activities, or even are controlling a part of partner’s business;
- **strategic alliances.** Participants of supply chain are related not by one-time engagements but by short-term or even long-term ones. Both parts express mutual interests or even interest in development of relationship;
- **arms-length or short-term contracts (keeping the distance of “arms-length”).** Organization concludes one-time contracts with suppliers or subcontractors. This level of cooperation is considered as trade intercourse.

Researches performed to date affecting decisions of organizations regarding activity to buy or to perform the activity by itself could be assorted into three groups. Foremost, it’s a tradition of transactions costs’ study. Second big group under research is related with theory of organization’s capabilities. Third group is all other authors who concretized one or another factor affecting the decision of participants of supply chain to buy some activity or to perform it by itself.

Theory of transactions’ costs is based on assumption that markets and organizations are alternative tools in order to create a package of related transactions. It depends on relative efficiency of every type if the package of transactions will be created through the market (activity will be bought) or through organization (activity will be performed using own forces). Input of signing and performing of complex contracts is changing, depending on human decision makers related with transaction in the first place and the second, on objective market characteristics. Theory of transactions’ costs explains environment factors and human factors that explain circumstances under which contracts of unexpected requirements will be too expensive to contract. Having faced such difficulties and having evaluated the risk caused by contracts the organization
can decide to give market a wide berth and to use hierarchic forms of organization. The environment factors mentioned are uncertainty and small amounts (not many suppliers of the service). Human factors are bounded rationality and opportunism. Besides, there exist derivative conditions called narrowness of information and systemic effect called atmosphere. Emerging situations where market uncertainty comes into play together with bounded rationality and opportunism appears with small amounts, the costs of transaction will be especially high because it’s complicated to predict every circumstance. Therefore there is possibility the organization will make a decision to perform a potentially marketable activity itself and vice versa.

Authors emphasizing capabilities approach, state that in order to answer outsource or vertically integrate, organization need to assess resource constrains and the limits of its organizational and operating capabilities. Capability is an activity organization can do better than its competitors (Porter, 1995). More specifically, capability is the strength or proficiency of a bundle of interrelated routines or processes for performing specific tasks (Peng et al., 2008). Hayes et al (2005) identify three reasons why capabilities are important. First, in some cases vertical integration is not possible because of significant financial resources, which would be required to make the activity. Second, no company can do all things well. Company must assess if specific activity constitutes strategically important capability. If not, such activity must be outsourced. Third, the time required to build or acquire a certain capability can also impose „hard“ constraint on company’s vertical integration strategy.

As mentioned transaction costs and capabilities are the main factors many authors of management and economics are in agreement with, influencing decision of organizations to buy or to perform the activity Snieska & Draksaite, 2007; Boguslauskas & Kvedaraviciene, 2008; Anica-Popa, et al 2010). Other authors identify single factors important to this decision. Hayes et al. (2005) also state that other factors are important beyond capabilities: necessity to coordinate strategic control and risk, need to protect intellectual property. Abebe (2007) states that decision of participants is determined by following factors: increasing of capital turnover, shortening of time of order performance, increasing flexibility. In comparison of model of vertical integration with more or less integrated model of supply chain the main differences are being accentuated by Kim (2000) that can be transformed into factors under study :

- flexibility of capacity. Producing capacity of organization having vertical integration are constant, contravening market requirements. On the contrary, contracting is followed by flexible producing capacity;
- structure of demand. Organization having vertical integration due to limited capacity is forces to perform the activity in environment characterized with higher competition. Organization having virtual integration that extended network of integration of supply chain widely may become a monopolist, oligopoly. In that case the organization will be functioning in the market with distortion of competition and will have more possibilities in comparison with the enterprise having vertical integration;
- influence of decisions. Income of organization having vertical integration usually is constant because sales depend on constant production capacity. Increase or part of profit could be reached only by decrease of costs. Income of virtually integrated organization increase by increasing demand because production capacity isn’t limited. In this case part of profit increases by decreasing costs and increasing demand.

There are the main directions of research about factors influencing organization’s decision to outsource or to vertical integrate were reviewed in this chapter. The reasons will be systemized and theirs direction will we decided in the next chapter.

Factors determining decisions of participants of supply chain regarding integration level

Previous chapter described supply chain, concept of integration, levels of integration and discussed the factors determining organization’s decision to integrate the activity or to buy it from suppliers. In this chapter factors identified will be systematized supplementing them and their direction will be set. All factors identified and their direction are presented in Table 1. The rest of the article would be devoted to grounding of these factors.
Success or organizations depend on their capabilities to understand and satisfy present and predictable demands and expectations of present and predictable customers and other parts concerned with minimal costs. The basic parts concerned of organization are customers, employees of organization, shareholders, suppliers and partners. The factors determining the decisions of supply chain participants regarding the level of integration will be analyzed regarding the striving to satisfy the demands of these basic parts concerned of organization:

1) demands of customers;
2) needs of shareholders.

1. Satisfaction of customers’ demand is necessity to hold the present customer and to attract the new one. The basic objective of marketing is to acquire and to hold the customers. Recently markets became more sensitive in regard to terms, change of products or service assortment, prices. Only suppliers’ flexibility in regard to terms and range are supposed to be competitive. The quality of customers attendance became an essential mean of differentiation of suppliers concerning tendency of switch to goods market.

1.1. Satisfaction of customers demand in regard to terms. Big part of goods in the market is characterized by uneven demand because of the seasons and other factors. Product’s accessibility to user becomes the decisive factor of demand. The lack of goods in the stock can induce the change of brand even in the markets loyal to the brand. In order to hold the customer enterprises need to supply the quantity of

Table 1. Factors determining decisions of participants of supply chain regarding level of integration, in accordance with causality

<table>
<thead>
<tr>
<th>Part concerned/ Conditions</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Customers</strong></td>
<td>The stronger the factor the less purposeful vertical integration of an activity</td>
</tr>
<tr>
<td>1. Market is characterized by instability of demand due:</td>
<td>1. The need for decrease of investment to short-term capital:</td>
</tr>
<tr>
<td>- production characterized by seasons;</td>
<td>- by decreasing investment to raw material and wage;</td>
</tr>
<tr>
<td>- real demand exceeds predicted one and there is a lack of production capacity;</td>
<td>- by decreasing investment to resources of finished goods and disposing of resources of finished goods at all.</td>
</tr>
<tr>
<td>- the demand for compensation of order’s fulfillment time deficit by production capacity.</td>
<td>2. The need for decrease of investment to long-term capital:</td>
</tr>
<tr>
<td>2. The demand for wide assortment of products.</td>
<td>- by decreasing investment to equipment;</td>
</tr>
<tr>
<td>3. The demand for decrease of price.</td>
<td>- by decreasing investment to buildings.</td>
</tr>
<tr>
<td>4. The demand for creation of added value (by using the competency or the best producer).</td>
<td>3. The need for increase of assets turnover.</td>
</tr>
<tr>
<td>2. Shareholders</td>
<td>4. The need for increase of shareholders’ value by increasing assets turnover and the profit from short-term investment.</td>
</tr>
<tr>
<td>1. The need for decrease of investment to short-term capital:</td>
<td>5. Decrease of business risk by decreasing investment.</td>
</tr>
<tr>
<td>- by decreasing investment to raw material and wage;</td>
<td>6. Decrease of business risk by avoiding localization of long-term investment in specific geographical region.</td>
</tr>
<tr>
<td>- by decreasing investment to resources of finished goods and disposing of resources of finished goods at all.</td>
<td>7. No need for protection of intellectual property.</td>
</tr>
<tr>
<td>2. The need for decrease of investment to long-term capital:</td>
<td>8. No need for investment in long-term perspective and to increase value of shareholders in such a way.</td>
</tr>
<tr>
<td>- by decreasing investment to equipment;</td>
<td>Conditions for adoption of outsourcing</td>
</tr>
<tr>
<td>- by decreasing investment to buildings.</td>
<td>1. There are many suppliers in the market.</td>
</tr>
<tr>
<td>3. The need for increase of assets turnover.</td>
<td>2. Organization has capability and possibility to control and coordinate information in all chain of supply.</td>
</tr>
<tr>
<td>4. The need for increase of shareholders’ value by increasing assets turnover and the profit from short-term investment.</td>
<td>3. Organization has capability and possibility to develop and manage strategic control in all chain of supply.</td>
</tr>
<tr>
<td>5. Decrease of business risk by decreasing investment.</td>
<td>4. Organization has capability and possibility for exact formulation, documentation and transfer of requirements to products or service to partners of supply chain.</td>
</tr>
</tbody>
</table>
goods satisfying demands even this amount doesn’t correspond with enterprises’ production capacity. This rule is necessary in striving to increase competitiveness of enterprise as supplier. Attraction of new users also influences the demand of production capacity of enterprise. Virtual integration of supply chain by using production capacities of subcontractors is perfect way in order to balance the supply and demand in increasing competitiveness of production capacities timely:

a) to reach required amounts of production capacity despite production capacity required is characterized by seasons, unevenness;
b) to reach required amounts of production capacity over due time in that case when real demand exceeds predicted one;
c) to compensate order’s fulfillment’s time deficit by switching the base in the system of lever of supply and demand balancing towards production capacities, i.e. by shortening order’s production time. In such a case amount of the order can be divided into few parts and accommodated in such a manner when each part is produced by different subcontractor. Thus production time could be shortened, gain in time can also be used to compensate time deficit due stray or weak places in supply pipeline. This way is more efficient than compensation of time deficit by resources because it helps to avoid the risk due imprecise prediction of resources and other investment to resources and storage.

1.2. Satisfaction of customers demand in regard to different assortment. Many users are interested to work only with few suppliers of the good because this makes easier management of interrelationship, risk and trust. The most appreciable are supplier proposing wide assortment because that enables to avoid costs of transaction, knowing well the supplier allows decreasing the risk, expedience and possibility to increase the level of integration between partners occurs.

The enterprise having received the customer’s order, especially constant customer, and having no technical possibilities to fulfill the order has to consider the possibility to fulfill it by using subcontractor’s industrial technology. This will form the spectrum of enterprise’s possibilities in regard to user and will increase standing of enterprise as competitive partner striving and capable for satisfaction of all demands of the customer.

1.3. Satisfaction of customers demand in regard to lower price. Lower price in many markets gives a competitive advantage. The most profitable competitors in any industry are trying to produce with lowest costs. Striving to stay profitable enterprises are looking for ways to decrease inputs. In many cases enterprises having structure if vertical integration aren’t flexible for quick decrease of input and product’s price because implementation of changes in such enterprise require some time, but outsourcing (virtual integration, strategic alliances, short term) gives various possibilities for price decrease:

a) to decrease the price, to use the production of subcontractor producing particular product with lowest price in the local market;
b) to decrease the price by changing geographical region anytime. The base of this tendency which becomes more and more popular is cheap labor in some countries of developing economics.

Selection of localization can be the most important dilemma influencing activity results.

1.4. Creation of added value of product. Customers and end users become more sensitive to added value than before. Competitive advantage is described as capability of enterprise to give more value to user than competitors because advantage of product value gives oneness in comparison with proposals of competitors. Virtual integration gives additional possibility for creation of added value by giving the orders to the best producers and to use the competency of “the best in the activity “.

The following factors could be accentuated influencing decisions of participants of supply chain regarding the selection of level of integration that also are influencing satisfaction of customers’ demand:

• instability of market demand which requires uneven production capacity;
• the demand for wide assortment of products;
• the demand for price decrease;
• the demand for creation of added value by using exceptional competency of another enterprise.

2. Satisfaction of needs of shareholders: increase of profitability, increase of efficiency of use of capital, decrease of business risk, creation of intellectual property. In many cases enterprises striving for increase of profitability and efficiency of capital are increasing the margin. The increase of margin influences the increase of price of product on sale. Such decision isn’t acceptable in order to increase current assets by selling goods on market characterized with big supply. More efficient use of assets will be in the case the
assets of enterprises will be forced to work more intensive or they are decreased without decrease of current assets.

2.1. To decrease investment to short-term capital by decreasing expenditure of resources management. Fifty and more percent of production enterprise’s short-time capital consists of resources. This is big part of assets purposeful decrease of which could be use effectively in increase profitability of enterprise’s assets accelerating enterprise’s assets turnover. In order to decrease those constant assets the services from outside could be used:

a) to decrease investment to raw material and input. Buying a service of production or specific technical units required for product’s production instead of producing this shortens production time, time of investment of resources to assets, i.e. client’s money return over shorter period because subcontractor pays for production or part of raw material and enterprise pays only agreed period. Thus, time of period “money – money” is shortened in such a way. By using subcontract possibility occurs to increase enterprise’s assets turnover by shortening periods time and increasing the number of investment periods and avoiding expenditure for resources related to stocking and accounting, administration and ageing, decrease of quality, small stealing and insurance;

b) to decrease investment to resources by disposing resources of finished goods at all. When enterprise creates flexible supply chain in regard with production capacity, order period time, price of product possibility occurs to dispose predictable sales when impossible to avoid the part of unsold production but to work according the concept “pull” when sales are planned according specific order of customer. In such case resources are replenished with raw material and finished goods using the concept of „delivery just in time“ and knowing all goods will be sold.

2.2. To decrease investment to long-term assets. Vertical integration requires maximal investment to equipment. Outsoursing (virtual integration, strategic alliances, short term) creates perfect possibility to minimize investment to equipment. Investment to other long-term capital can be decreased too by using production capacities of subcontractors because decreases the need for production premises.

2.3. Decrease of business risk by decreasing investment and avoiding localization of long-term investment in specific geographical region.

Vertical integration gives perfect possibility to increase an efficiency of capital usage and decrease investment and this decreases business risk. Especially business risk is decreased by shifting from method of predictable sales according to which it’s impossible to avoid the part of unsold production planning sales to method of planning “pull” when sales are planned according the specific order of customer and knowing all goods will be sold.

Over recent period of time the tendency of increase of wages and prices of electricity, gas is dominating in countries of East Europe. Without investment to equipment and buildings the quicker possibility occurs to relocate the main activity of enterprise into other geographical regions characterized by more cheap labor and other more cheap resources. Possibility not to concentrate all capital in one place also decreases business risk.

2.4. Accumulation of exceptional competency by specializing in specific activity. Up-to date concepts of management make state that basic factors determining competitiveness of organization will be determined by organization’s production capacities and competency, capabilities. Enterprise having vertical integration is performing all activity itself has perfect possibilities to accumulate an exceptional competency especially when:

a) product is characterized by intellectual property;

b) market has only few suppliers.

2.5. Increase of shareholders’ value by decreasing turnover of assets and receiving profit from short-term investment. Enterprise having vertical integration increases value of shareholders with accumulated part of profit, implementation of new investment. Enterprise having virtual integration has possibility to use unlimited capacity increasing assets’ turnover and profit in such a way. In this case enterprise had possibility to increase value of shareholders by using significantly lesser investment and to receive increase of profit right off.

Following factors determining decisions of participants of supply chain regarding selection of level of integration that also influence satisfaction of need of shareholders could be accentuated:

- the need for decrease of investment to short-term assets: raw material, work input, resources of finished goods, equipment;
- the need for increase assets turnover;
the need for decrease investments to long-term assets;
the need for increase of value of shareholders by disposing of long-term investment and making short-time investment;
the need for decrease business risk by disposing long-term investment;
the need for decrease business risk by accumulating exceptional competency;
no need for protection of intellectual property.

It’s necessary to evaluate possibilities of organization to enter long or short term contracts. There some conditions exist that require to be implemented striving for successful development of activity by supply chain.

3. Conditions for adoption of outsourcing.
It’s necessary for organization to be ensured that the changes chosen will be manageable and will increase the profit. Following conditions have to be ranked to the factors influencing decisions of participants of supply chain regarding virtual integrations and outsourcing:

• capabilities and possibilities of control and management of information;
• capabilities and possibilities of development of strategic control and management;
• capabilities and possibilities of exact formulation, documentation and transfer of requirements to product or service to partners of supply chain;
• market had quite a number of suppliers.

In summarizing the factors they can be grouped into two groups: factors determining decisions of participants of supply chain regarding integration level regarding to satisfaction of demands of parts concerned and regarding to conditions.

Conclusions

Accentuated factors that are influencing decisions of participants of supply chain regarding level of integration are following:

• instability of market demand which requires uneven production capacity; the demand for wide assortment of products; the demand for price decrease; the demand for creation of added value by using exceptional competency of another enterprise (these factors have impact to satisfaction of customers’ demand);
• the need for decrease of investment to short-term assets: raw material, work input, resources of finished goods, equipment; the need for increase assets turnover; the need for decrease investments to long-term assets; the need for increase of value of shareholders by disposing of long-term investment and making short-time investment; the need for decrease business risk by disposing long-term investment; the need for decrease business risk by accumulating exceptional competency; no need for protection of intellectual property (these factors have impact to satisfaction of shareholders’ need);
• capabilities and possibilities of control and management of information; capabilities and possibilities of development of strategic control and management; capabilities and possibilities of exact formulation, documentation and transfer of requirements to product or service to partners of supply chain; market had quite a number of suppliers ( these factors define conditions for adoption of outsourcing).

The stronger these factors are shown, the more purposeful is to shift from vertical structure integration of organization into outsourcing. The weaker these factors are shown the more purposeful is to use the structure of vertical integration of organization.

If shareholders are intended to profit from short-term investment and to increase it continually over short period it’s useful to use the model of virtual supply chain or even short-term transactions. However, if shareholders are intended to profit from long-term investment or are striving for protection of intellectual property then it’s useful to use the structure of vertical integration of organization.

References