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Competence Based Taxonomy of Supplier Firms in the Automotive Industry

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1. Introduction

In the last 15-20 years companies went through a series of heavy economic blows in Hungary: first, the paternalistic state disappeared and they had to start to manage themselves and their own capital. Second, the collapse of the Russian industry forced most of them to find new markets for their products in order to survive. Third, the accession to EU brought competition much closer to them than ever before. Although a lot of companies disappeared during these years and even more were founded, we can say, that they have to improve themselves continuously to adapt to the changing conditions in order to remain competitive. Thus competitiveness is and was a focal issue in the Hungarian economy.

Today, with the accession to EU, the key to competitiveness for Hungarian companies is to what extent they are able to join European or even global supply chains. How can they discover the requirements of various customers and how can they improve their internal operations to fit these requirements? These are very general questions, but the answers are different company by company. We believe, however, that there must be some general patterns behind the scene, which might be useful for companies to know how to position themselves in the supply chain.

Several OEMs have started business in the automotive industry in Hungary and in the neighbouring transition economies providing chance for Hungarian suppliers to join their supply chains. Furthermore, due to the intense global competition and the matured stage in the life cycle in automotive companies supply chain management practices are vital. That is why we selected this industry as the basis of our research.

We believe that similarly to portfolio models which segment suppliers, we can build taxonomy on various customer values and supplier competences. Our paper discusses this focal question by using a general model of competitiveness for a series of interviews from the Hungarian automotive industry. In this paper we concentrate on the competence side of the model and use interviews as an empirical base.

The structure of our paper is the following: first we go through the relevant literature. Next the model of competitiveness and our research method is introduced. Then we describe the cases shortly and analyze the information we got. Finally our taxonomy is developed and conclusions are drawn.

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2. Literature review

Firm competitiveness, as defined by Chikán et al (2002) is “the basic capability of perceiving changes in both the external and internal environment and the capability of adapting to these changes in a way that the generated profit flow guarantees the long term operation of the firm”. Firm competitiveness in this broad understanding is basically a function of two factors (Gelei, 2004): customer value and core competences.

Customer value is defined from a customer point of view. It includes the aspects that are important for the customer in relation to the supplier. Since customer value is a very broad term, researchers usually split it into different dimensions. The most accepted approach in operations management is to speak about value dimensions as sources of competitiveness (Chase, 2001), such as price, quality, flexibility, reliability or service. Important to emphasize that these dimensions are identified from a customer aspect by the supplier answering the question what the customer wants from me. There are less well-known approaches, however. Their common feature is the supplier aspect they use. Mandják & Durrieu (2000), for example, group value dimensions on transaction, partnership and network levels. They argue that customer values are different when suppliers simply fulfill transactions, when they have to manage their partners or when they have to manage a whole network of companies. Walter et al (2001) speaks about direct and indirect value dimensions. Direct value dimensions are formulated through direct partnerships, while indirect value dimensions are realized beyond the given partnership involving other business partners. For example, volume dimension is a direct value dimension, which refers to the volume generated by the given customer, providing for the supplier to reach the breakeven point. Market dimension, on the other hand, is an indirect value dimension providing reference for the supplier leading to further market opportunities and orders from other customers. Finally, Möller & Törrönen (2003) use the dimensions of efficiency, effectiveness and network. Efficiency relates to the supplier’s financial, profitability aspects, effectiveness relates to customer requirements and satisfaction and network relates to partners and wider stakeholders.

In our opinion value dimensions are elements through which value generation for the customer can be realized. Customer values are defined by the customers (consciously or unconsciously) and suppliers have to understand these values in order to provide a product and service package which customer expects and respects.

The second factor of firm competitiveness is the sum of resources and capabilities that makes a firm able (capable) to create and deliver what is expected by the customer.

The resource based theory of the firm (Penrose, 1959; Wernerfelt, 1984) and, inspired by their views, the resource based strategic management (Hamel – Prahalad, 1990, Grant, 2001) interprets firms as complex sets of resources and capabilities and considers them as the source of firm competitiveness. Although we are aware that there are other approaches to explain competitiveness, such as the industry structure view (Porter, 1980) which considers industrial factors as the bases of competitiveness, or the less known relational view (Dyer & Singh, 1998; Dyer & Nobeoka, 2000), which describes how partnerships can create relational rents which cannot be easily copied by competitors, we stay with the resource based view as we are looking for factors providing competitiveness from inside the companies. In the resource based theory the distinction between the terms “resources” and “capabilities” is fundamental. Grant (2002) defines resources as individual inputs of operations like capital equipment, human resources, intellectual capital, and so on. Teece et al. (1997), on the other

hand, differentiate between factors of production and resources. According to them factors of production are undifferentiated inputs available in disaggregate form in different factor markets. Resources are also different assets of a company, but they have already some firm-specific content.

Both interpretations have a basic common feature, namely these resources do not create value on their own. In value creation processes these resources need to be coordinated and managed. Nelson & Winter (1982) emphasize that the permanent and matured patterns of coordination and management activities constitute routines. Definite sets of resources and the connected routines are defined as capabilities (Grant, 2002).

A third basic term of the resource based approach is competence. Authors of the CLM (Council of Logistics Management) research program called "World class logistics" (1995) interpret "competence" at a high level of abstraction. A company can possess different competences. Core competences are subsets of resources and capabilities that are fundamental to satisfying customer expectations (value dimensions) and consequently firm's performance (Hamel & Prahalad, 1990). Distinctive competences are those, where firms are particularly good relative to their competitors.

In our paper we also consider competence as a higher level building block of firm competitiveness, than resources and capabilities.

Thus firm competitiveness is in our understanding a function of two factors:

- To what extent a company can identify value dimensions that are important for their customers?
- To what extent is a firm able to successfully develop those sets of resources and capabilities (or competences) that make it able to create and deliver the identified important value dimensions?

In the following section of our paper we discuss the critical point of connection between these two sides.

3. Model

The model is an instrument for analyzing the internal structure of firm competitiveness. This model is summarized in Figure 1 below. On the basis of our model, the fit of customer expectations and core competences will determine the level of competitiveness. If customer expectations in any respect cannot be fulfilled by the supplier then the customer will look for substitution, or alternatively, makes attempt to teach the customer how to provide that value. In any way, the supplier is not competitive at the moment. Also, if the supplier has specific competence not required by its customers, then that competence does not help the company to stay in that particular business.

Today in B2B relations the features of delivered products are usually just the preconditions of future business. As customers have different and very detailed requirements and suppliers can provide specific packages, potential partners have to meet and know each other to identify the level of fit. Fairs, exhibitions, customer-supplier meetings, references can serve that purpose. Customers there get to know both the products provided and the providers themselves. Customer audits give further insight into the capabilities of suppliers which make sure the expected value would be provided for customers.

However, even if there is a fit at the moment, it can change over time as customers can increase their requirements or suppliers can build new capabilities and thus can provide more valuable packages.

The purpose of our interview based research is to discover closely related packages of customer value dimensions and core competences that are required to create them. According to our hypothesis automotive suppliers can develop and possess different type of such packages. Along the concrete sets of packages we create taxonomy of automotive suppliers.

In this paper we concentrate on the competence part of our model and will discuss customer value issues only as suppliers think about it.

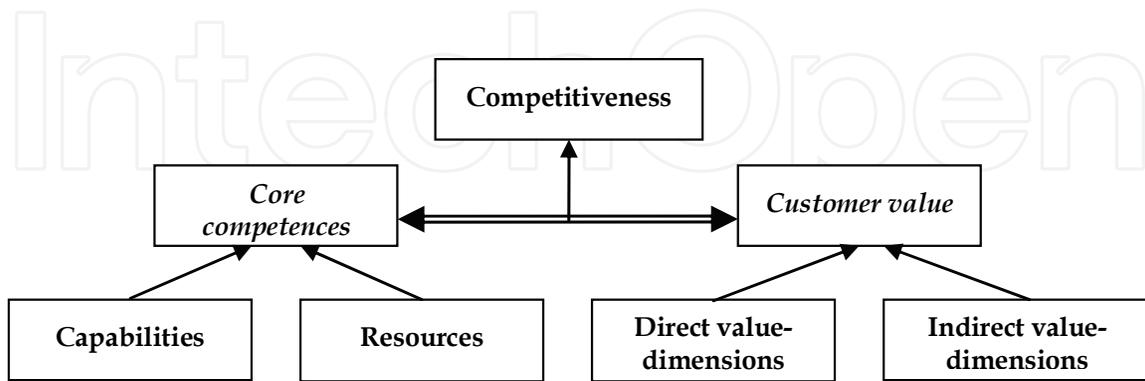


Figure 1. The buildup of firm competitiveness (Gelei, 2004)

4. Case selection

The research is based on multiple interviews, twenty one altogether. The automotive industry was selected because supply chain management is the most developed in the automotive industry. Due to its global nature, networking is one of the primary sources of competitiveness (Senter - Flynn, 1999). Actors of Hungarian automotive supply chains are interviewed to capture both expected customer value dimensions by customers and supplier core competences, including their understanding about the required value dimensions. Thus, the unit of analysis is the business unit in Hungary, even if we had to consider the global company background during the analysis.

Since our purpose is to find different service packages related to different customer requirements we strived for diversity (Stuart et al., 2002). Our first aspect was to go back to companies which took part in previous research (see Demeter et al, 2004). The reason for this is threefold. First, in that research we went through different levels in two supply chains which can assure the required diversity. Second, we can use additional information about the participating companies from the previous research. Third, we can see the progress these companies made in the last three years, which can help to identify important capabilities.

Seven of the 10 companies in our sample belong to this group. The other three companies came into the picture on various ways, but practically randomly: we found one of them on the internet, one of them on a conference and the third one is a supplier of another company in the sample. Four additional companies refused to take part in the research due to the lack of time, to ownership problem, to confidential purposes and to the lack of interest.

Depending on company size, the role in the supply chain and the availability of time the number of interviews varied from 1 to 4 by company. The length of interviews also varied between 45 minutes and 3 hours. The interviews were semi-structured and some additional documents were also collected from companies. The positions of interviewees are also diverse. We asked the managing director in case of one interview at a company.

Additionally, purchasing managers, sales managers, quality assurance people, a finance manager, and manufacturing engineers were asked for the interview. The most important characteristics (a fantasy name for the company based on the product they make, the number of employees, ownership, supply chain position, and interview information) are summarized in Table 1.

<i>Cases</i>	<i>Number of employees</i>	<i>Ownership</i>	<i>SC position</i>	<i>Number of interviews</i>	<i>Interviewees</i>
Jet	2800	Global	Tier 1	4	Quality, purchasing, sales and logistics managers
Vision	720	Global	Tier 1	1	CEO
Precision	393	Global	Tier 2	1	CEO
Nozzle	230	Local	Tier 2	2	Logistics and purchasing managers
Seat	860	Local	Tier 1 / 2	2	CEO, production manager
Cable	650	Local	Tier 1 / 2	4	Production, logistics, customer relations and finance managers
Pipe	150	Local, family	Tier 1	1	CEO
Bowden	50	Local, family	Tier 1	3	CEO, manufacturing engineer, quality manager
Sealing	30	Local, family	Tier 2	1	CEO
Plastic	15	Local, family	Tier 3	2	CEO, HR manager

Table 1. Case characteristics

First, we describe the cases shortly. Next the capabilities and resources are collected from the interviews. Finally, we try to find discriminating factors in order to make our taxonomy.

5. Case descriptions

Case "Jet" company is a subsidiary of a large Japanese multinational producing fuel supply systems (jets) in diesel cars. As a Japanese subsidiary it is very strong in production. 10% of the employees come from Japan and work with Hungarian engineers together to introduce new models in production, and to work intensively with suppliers in solving problems. Job rotation and cross-functional team working is commonplace. Product design takes place in Japan at the parent company. The head of each department is Japanese in order to keep consensus and understand cultural background of the parent. Consensus based decision making, however, slows down processes. Quality engineers are assigned to customers due to different requirements. Internal information systems are integrated; however, they are not integrated globally. They have a very thorough supplier and employee selection process, and they not refuse any company at the first sight. Training and education is very strong.

Case "Vision" company is a subsidiary of a German company producing mirrors and lamps (the vision system). The production facility is new, technology is transferred gradually. The

subsidiary won two quality prizes. They brought up their supplier's employees in house; teaching the manufacturing culture of lean to them then outsourced that part of production. They have no warehouse, JIT delivery is usual. They have a logistics centre, however, near to one of their customers. They segment their suppliers clearly. Information technology is developed; they use globally integrated software, and issue kanban orders electronically. The parent company plans to replace product design to the subsidiary in the close future. The subsidiary makes improvements on the basis of customer audits.

Case "Precision" is a division of a subsidiary of a Canadian multinational company producing large precision parts and components. The division is very proactive, seeks continuously to make improvements. They plan to design a complete module in the close future, make improvements in automation and autonotation (jidoka) as well as in the logistics system. They rely heavily on multinational background by using the global engineering database, dividing tenders among the subsidiaries, and providing the capital as needed. The division builds strong relations with customers and suppliers, work closely together in new product introduction and problem solving. Group work is usual, fast feedback to employees is normal. Employee selection and initial training is very thorough.

Case "Nozzle" is a dynamically growing Hungarian company producing nozzles, hoses and connections, pipes, valves. They have strong product development skills compared to other suppliers. Now they target to develop a new pump in collaboration with a Hungarian university in order to have their own complete module. Since they did not find a good supplier of plastic moulding they built a factory, bought the necessary technology and do it themselves. Besides, they invest in logistics. They continuously feel the pressure of customers to increase capacity and deliver more and more products. Sometimes they are told to use a given supplier but usually they are free in supplier selection. They keep close contacts with customers and suppliers and consider trust as important. Case 10 is their supplier since the beginning. They have integrated information system and usually communicate electronically.

Case "Seat" used to produce complete seats but now they deliver only parts to it. In the last two years they completely renewed themselves: they have new, experienced management, downsized the company, and introduced centralized global purchasing, customer specific sales and lean management. All of these efforts were made in order to increase efficiency. They deliver JIT from their warehouse near to the customer. They do not plan to be more involved in product development.

The main business of Case "Cable" is machine building but they deliver cables and some engine parts to the automotive industry in order to get contacts there. They produce their own machinery and target to deliver machinery directly to OEM factories. They deliver cables in sequence and engine parts just in time. They cross-finance the preparation phase of automotive projects from their machine building business.

Case "Pipe" grows very dynamically. The key to their automotive business is a new manufacturing technology developed but not patented yet. They produce pipes to cooling systems. The main driver is the CEO who got into the automotive business due to his strong problem solving skills. The palette of businesses is very diverse. They use developed IT, take part in electronic auctions, operate CAD system. They just built a new factory. The CEO and his team are very active in seeking new customers. They are customer, quality and process oriented. The CEO is open to speak with the last employee if needed; he himself brings up the future production manager.

Case "Bowden" is a small family owned business delivering Bowden to OEM. The company places high emphasis on quality management. They won the best supplier prize more than ones. They have CAD system and they are able to suggest technical changes in the product. They make changes on machines and able to construct their own machines. They are ahead of relocation because of the lack of space. The company entirely depends on the owner and his father. The owner is the chair of the association of part supplier companies in Hungary.

Case "Sealing" produces rubber products, eg. sealings to Case "Jet". They make large efforts to raise money from grants for their investments. They enlarged their factory, bought new machines in the last two years and plan further significant investments. They actively try to find other businesses in order to reduce risk. They are able to receive drawings in autoCAD and contribute unofficially to product development through information exchange. The owner attends conferences and himself delivers products to the customer. The whole company relies on him.

Case "Plastic" is a very small family owned company of long personal relationship with Case "Nozzle" producing small plastic parts. They have some new and some old machines to work with in a new facility. They are not able to get new customers and orders although they have the required quality certification. They have some problems with documentation, the customer helps them. They have a small program to manage their business and able to communicate through e-mails. They were unsuccessful in winning grants for investments.

6. Case analysis

During the case analysis we assumed that companies more or less understand the customer value so they develop capabilities which can help them to fulfil customer requirements. Actually, this assumption is a basic one in quality certificates. Of course, sometimes there is a time lag between recognizing a value dimension and developing capabilities to satisfy the customer. But in this case companies usually start to work on this weakness.

First, we collected all the resources and capabilities that we found in the interviews. Next, resources and capabilities were grouped. In our terminology these groups can be considered as competences. Since we are looking for values provided for the customers, Porter's (1985) value chain concept seemed to be appropriate to put logic behind the collected competences. The most important competences through the value chain, grouped as primary and supporting activities, the connected capabilities and resources are shown in Table 2.

After collecting capabilities we thoroughly went through the cases and identified the level and kind of competences that the companies have. Comparing the cases we found the following discriminating and common competences and resources (Table 3).

6.1 Discriminating factors

Product design competence. Multinational companies use different strategies. Case "Jet" makes product development in Japan. Case "Vision" strives to replace product design to the subsidiary where the product is manufactured. This latter might be explained by the relatively high customization requirement of the products. In case of "Precision" product development initiatives come from inside the subsidiary but supported by globally developed engineering database. Case "Nozzle" is the only Hungarian company which targeted to develop its own product with the clear objective to become tier 1 supplier. Important to see that while Case "Jet" and "Vision" has its own products (although

Primary activities (competences)			
<i>Product design</i>	<i>Production and its development</i>	<i>Logistics (in and out)</i>	<i>Marketing and sales</i>
Capabilities			
Engineering knowledge (understand and solve construction problems) Cooperation with partners in design Manage ramp up die production in place	Lean production (use cells, robots) Manage technology Engineering knowledge (read drawing, discover problems) Preventive maintenance High quality products development Manufacturing and technology development	Warehouse logistics, inventory tracing Keep contact with suppliers and customers (call down, delivery) - Kanban, JIT, JIS, delivery	Customer specific customer relations Diplomacy in negotiations Informal relations with customer representatives (cards, flowers)
Main resources			
Internet based databases for engineering solutions	Machines Measuring devices Experts Facilities (clean, air conditioned)	Software, Barcode equipments	- Databases
Supporting activities (competences)			
<i>Strategic management</i>	<i>HRM</i>	<i>Purchasing</i>	<i>Information management and communication</i>
Capabilities			
Get new business Several legs - stability Shape company culture consciously Proactive view Outsourcing decisions Global organization solutions Kaizen Fit to ever changing requirements - Cross-functional teams	Motivating employees Employee selection Feedback to employees Training and education	Supplier relation management Centralized purchasing Global purchasing Supplier selection and evaluation system Supplier audit Supplier segmentation	Maintain information flow Information exchange with partners (EDI) Communication Quality assurance system (documentation) Write applications for grants Prepare presentations for customers
Main resources			
Leaders Employees Devices to detect changes (Attend conferences)	employees	IT hardware & software ERP EDI AutoCAD fax, phone	IT hardware & software, ERP EDI AutoCAD Fax, phone

Table 2. Competences, capabilities and resources collected from the cases

developed elsewhere), it is only an objective yet at Case "Precision" and "Nozzle". These latter companies consider product development as a tool to reach higher place in hierarchy.

Case "Seat" is a counter example for product development competence. It developed neither its product nor the process in its existing projects. Thus in new projects it found itself in tier 2 position instead of tier 1. It produces now only the parts of the module that it produced before, since the customer decided to make the module in house.

Case	Product/ technology innovation	Quality certificate	Proactive/ reactive view	Several legs strategy (beside automotive)
Jet	Global product, local technology adaptation	ISO-TS 16949	Globally proactive	No
Vision	Global product, local technology adaptation	ISO-TS 16949	Globally proactive	Yes (electronics)
Precision	Global/local product/technology development	ISO-TS 16949	Globally and locally proactive	Yes (electronics)
Nozzle	Local product/technology development	ISO-TS 16949	Proactive	Yes (parts in cosmetic equipments)
Cable	Technology development, (new products not in automotive)	ISO-TS 16949	Proactive	Yes (machines for agriculture and automotive)
Seat	Technology adaptation	ISO-TS 16949	More proactive than before	No
Pipe	New technology invented	ISO- 9001:2000	Proactive	Yes (very diverse)
Bowden	Technology development	ISO-TS 16949	Less proactive	No
Sealing	Technology adaptation	ISO- 9001:2000	Less proactive	Not yet
Plastic	Nothing	ISO- 9001:2000	Reactive	Yes (construction)

Table 3. Some important discriminating and common factors

Production (technology) development competence. All but one company are able to make changes in their technology to adapt it to new products or to changing conditions. Die production in place (Case "Nozzle", "Seat", "Bowden", "Sealing") can fasten this adaptation process. Case "Plastic" use the technology as it is.

Strategic management competence

Proactive strategic view. We found four companies which had a very clear view on where they want to go. Due to the strong vision they have, they do not wait for the customer, but do what they think they need in order to step forward. Case "Precision", and "Nozzle", as discussed before, place high emphasis on own product development. Case "Cable" is special since they consider automotive delivery as a tool to become a direct supplier of automotive machinery. They realized, first they have to make potential customers know who they are. Case "Pipe" builds on the extremely strong problem solving skills of the

owner. They have just started in the automotive industry due to a new technology they developed. This company realized that the only chance to become an automotive supplier if they have a much better offer (price) than anyone else. So they decided to develop a new technology. This technology can reduce the energy cost of production from 100% to 8% which results in huge savings. The common in all these cases that they are not satisfied with their current position. Case "Precision" and "Nozzle" want to become tier 1 instead of tier 2, case "Cable" want to get closer to potential customers of their core product, and case "Pipe" wants to become a stable automotive supplier.

Lack of capital. There are strategies among Hungarian companies to handle this problem. Some of them cross finance the preparation stage of automotive projects from other businesses. Those who have several legs can use this policy. Several legs strategy reduces the risks and help to step dynamically. Other companies involve external funds through grants or by partnerships, but it is important to see that state support grants are very slow and can help only those who can pre-finance their projects. The lack of capital prevents companies from product design.

6.2 Common factors

There are some competences which can be detected at each company (they are the qualifying criteria in the automotive industry). Of course there are differences in the level of the competence.

- *Manufacturing competence:* all the involved companies have relatively high manufacturing competence. All of them have ISO standards which regulate physical, administrative, information and problems solving processes. Although there are differences in the level of the certificate, but all of the companies reaches the ISO 9001:2000 level.
- *Information management competence:* even the smallest company has internal databases and electronic connection (but not EDI) to the customer.
- *Marketing and sales competence:* Customer relations are managed carefully at each company. In larger companies customer specific organizations help closer contact, while at smaller companies usually the owners themselves are responsible for these contacts.

Some important factors are summarized in Table 3.

7. Develop taxonomy

The developed taxonomy and some of our preliminary findings related to it are summarised in Table 4. Important to emphasize that the types build on each other which means that higher levels include all the capabilities available at lower levels.

7.1 Capacity based suppliers

These suppliers provide resources for production. Build the factory, buy the necessary equipment and employ people who can execute the required tasks. They do what the customer wants but do not make proactive steps. Even these companies have to have quality certificate since ISO-TS 16949 does not let suppliers into the system without this standard. Capacity based suppliers keep close contact with their customers in order to make

them satisfied. They have integrated database but have very limited communication abilities electronically.

<i>Type of suppliers</i>	Capacity based	Adaptation based	Innovation based	System and innovation based
<i>Cases</i>	"Plastic"	"Seat", "Cable", "Pipe", "Bowden", "Sealing"	"Nozzle"	"Jet", "Vision", "Precision"
<i>Product – service offering</i>	Capacity	Product and technology knowledge	Innovation	Supplier network and innovation
<i>Core competences</i>	Production	Technology and minor product adaptation	Strategic innovation competence	System competence: coordination, logistics and innovation competences
<i>Some important capabilities</i>	High quality product, integrated database, customer relations	Die production in place, some proactive view	Own product design	Global organization, supplier segmentation, logistics management

Table 4. Supplier taxonomy

7.2 Adaptation based suppliers

Some level of proactive thinking can be detected in these companies. For example, although they are not involved in product design, they get the engineering drawings with autoCAD and they make suggestions for minor changes in the product before or during serial production. These suggestions are informal but sometimes are listened to. Moreover, they are able to change the available technology to make it fit better to the requirements. Not all of them, but the majority is able to produce its own dies which make these companies more flexible and cost efficient. Some of them offer to increase value added in the product.

7.3 Innovation based suppliers

The main competence of these companies, that they have their own product design. This requires a very clear strategic thinking, strong engineering knowledge and capital to invest in new product development. Innovation based suppliers need not only understand the current customer requirements but have to know in which direction they have to develop the product. The only one case we found shows that finding appropriate partners can help to reduce the risks and costs of investment.

7.4 System and innovation based suppliers

These companies are multinational and they utilize this global feature. They use their resources globally; for example, they develop the products in a strong engineering centre or in close collaboration with the customer on the required geographical area. They share

experts who travel to the subsidiary if needed. They share engineering databases to adapt products and technology faster. They have very strong financial background, which make them flexible in reacting to any customer needs. They are module suppliers. They have strong logistics capabilities to organize supplier deliveries. They segment their suppliers and apply global purchasing.

8. Discussion

Companies can change place in this taxonomy. The best signal that they want to do that is the level of proactive thinking. Also, the lack of proactive thinking can lead to step back. Company 6, for example, lost its position as an innovation based supplier since it did not make efforts to make improvements in seat design. The build-up and characteristics of supplier types are summarized in Figure 2.

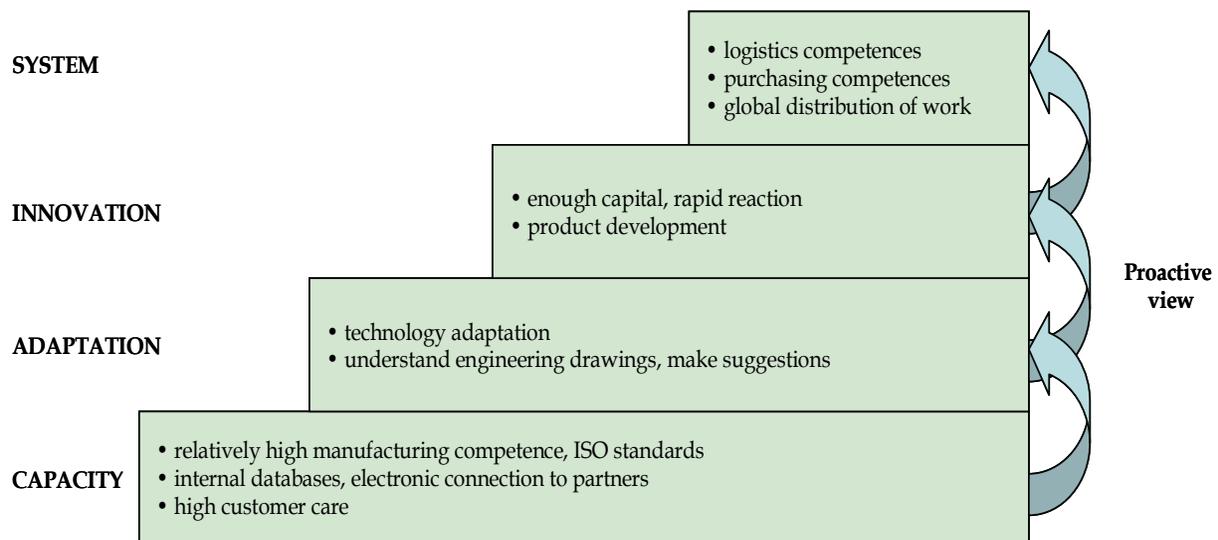


Figure 2. The most important competences of supplier types

Our taxonomy has close relations to other typologies. For example, the classical pyramid structure (eg. Senter, R. & Flynn, 1999) which categorize companies as tier 1/2/3 suppliers have clear linkages to our categorization. Tier 1 suppliers usually belong to the group of system and innovation based companies, they are the so called integrators. Tier 2 companies belong to either adaptation or innovation based groups. Tier 3 and down usually belong to adaptation or capacity based groups. However, that categorization is not based on capabilities that companies have, but on their position in the supply chain. If we look at our cases, Case 3, 7 and 8 are not on the place expected. A capability based approach is provided by Kamath & Liker (1994) who group companies on the basis of their involvement in product development and categorize companies as partner, mature, child or contractual companies. That typology, however, concentrate on innovation based capabilities only. The closest categorization to ours is that of Haffmans & Weele (2003). They use three groups: those who a) carry out processes, b) supply their own product, or c) compose modules and systems. Compared to ours, group a) is equivalent to the capacity or adaptation groups, group b) fit to our innovation based groups, but also involved in the system and innovation group, and group c) partly matches our system and innovation group but those companies have innovation capabilities, as well. We believe that based on the categorization of Kamath

& Liker we have to make difference between those who make contributions to product design (child) and those who just simply do what is requested (contractual). Furthermore, those who belong to group c) have the innovation capabilities, as well.

9. Conclusion

Our paper discusses how local supplier companies in global supply chains can be competitive. We applied a general model of competitiveness for Hungarian automotive supplier companies using information of 21 interviews. On the basis of understood customer values, plus supplier resources and capabilities taxonomy was developed, which help companies to decide in which direction they should improve their capabilities. We identified four supplier types: a) capacity based, b) adaptation based, c) innovation based and d) system and innovation based companies.

Our taxonomy is a useful instrument both from theoretical and practical point of view. Building on and synthesising the findings of two important management research areas – the customer value approach and the research based strategic management - will give a clearer understanding of and a deeper insight into firm competitiveness. The supplier types suggested will also help supplier companies in the automotive industry to analyse their strategic position, development possibilities and formulate viable strategies.

Although companies in our research operate in Hungary, they are parts of global supply chains often exporting their products. Thus, based on literature and our experiences, the generated taxonomy is usable all around the world in the automotive industry. However, the automotive industry has a specific supplier structure, and much more global than other industries. Thus the taxonomy itself is applicable only in this industry. On the other hand, the model of competitiveness and the process applied to collect capabilities is very general and widely applicable anywhere.

In this paper we analyzed only the competence part of our model assuming that suppliers are familiar with the requirements (the customer value) they face. Detailed analysis will be required in the future to consider the customer value part more deeply, as that part must be the starting point for suppliers. Since our results are based on some interviews we consider this taxonomy as preliminary. We plan to develop a survey to collect information more systematically. Also, based on the model and process we will analyze other supply chains (such as FMCG) to find the competence structures there.

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Traditionally supply chain management has meant factories, assembly lines, warehouses, transportation vehicles, and time sheets. Modern supply chain management is a highly complex, multidimensional problem set with virtually endless number of variables for optimization. An Internet enabled supply chain may have just-in-time delivery, precise inventory visibility, and up-to-the-minute distribution-tracking capabilities. Technology advances have enabled supply chains to become strategic weapons that can help avoid disasters, lower costs, and make money. From internal enterprise processes to external business transactions with suppliers, transporters, channels and end-users marks the wide range of challenges researchers have to handle. The aim of this book is at revealing and illustrating this diversity in terms of scientific and theoretical fundamentals, prevailing concepts as well as current practical applications.

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