Development of the KPI Scorecard for supplier assessment

Andrei Podmoskovnov

Bachelor’s Thesis
May 2018
School of Technology, Communication and Transport
Degree Program in Logistics Engineering

Jyväskylän ammattikorkeakoulu
JAMK University of Applied Sciences
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Nowadays purchasing is one of the most important functions in companies. Many technological companies implement various purchasing and supplier management strategies in their operations. With proper utilization of the purchasing operations, a company is able to increase the effectiveness of its other operations and significantly cut the amount of costs. However, the management of the purchasing operations is difficult and can be executed with different methods. One of them is the KPI Scorecard for the assessment of suppliers.

The aim of thesis was to develop a KPI Scorecard for supplier assessment, which could be theoretically used in practice. The KPI Scorecard aims to highlight the important factors when selecting and evaluating suppliers. The thesis research had a theoretical character.

The work was carried out by collecting information from literature resources and articles. The required information was collected, analyzed and reported in the thesis document. After this, with the help of the collected information, the KPI Scorecard was created as an Excel document.

The created KPI scorecard combined information from different sources, and thus, it included several points of view. However, the practical approaches of scorecard development were not studied, and therefore, the application of the scorecard to actual operations might be difficult.

Nevertheless, the KPI scorecard is a good basic framework and with future development it could be a useful tool for measuring purchasing operations. In addition, if one wants to use the KPI Scorecard in practice, it is advisable to modify it according to each case and include special characteristics.

Keywords (subjects): purchasing management, product purchasing activities, supplier relationship management, supplier evaluation, KPI Scorecard

Confidential information must be marked clearly stating which appendixes are confidential and what the confidentiality is based on and how long the period of secrecy is.
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Table 9 KPI rate of collaborative work.

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1. Introduction

Purchasing activities are a very important part of the supply chain and crucial for the financial performance and logistics of a business organization. Today, many organizations are facing challenges in the proper implementation of the purchasing processes. One of these challenges is to provide an adequate selection of suppliers, who deliver materials or services from external resources. Indeed, the selection of a supplier is an important process, and it is very crucial to implement this process in a proper way. For example, the bad performance of a supplier might seriously influence the performance of the organization as well if they are not able to deliver products, materials or components on time or deliver the wrong amount of them. In order to avoid such situations, there are ways to evaluate suppliers and their performance. One of these ways is to use KPI (key performance indicator) Scorecards, which will sum up the required information about a supplier and help to analyze its performance with more solid evidences.

1.2 Objectives

The main objective of the thesis was to determine what information is the most universal and essential in the supplier’s assessment in product purchasing activities. Based on this information, the writer’s intention was to create a purchasing tool (universal KPI Scorecard) that could be, at least in theory applied to the practice of evaluating supplier performance and helping to select the proper supplier. Accordingly, the research questions were:

1) What is the most essential and universal information for the assessment of supplier when purchasing products?
2) How could the KPI Scorecard be composed of this information?

As a result, it was hoped that the thesis would provide an overview of supplier assessment and the define relevant information needed
considered for that. The KPI Scorecard created in the study could possibly be used in practice.

1.3 Limitations

The thesis is focused on theoretical study and did not apply it to any real company case. However, some of the information could be collected from those, who worked in purchasing for quite a long time. However, the aim of this was to only to support the theoretical part with this information and to reflect it on a company case. Furthermore, the thesis was mainly focused on the development of the KPI Scorecard for purchasing of products, but not services/investments etc. Finally, the thesis could be theoretically applied to real practical cases, and the developed technology could be theoretically used in practice. Nevertheless, application to real life would require further development for specific requirements.

1.4 Methods

The thesis included both qualitative and quantitative research methods to certain percentage of use. However, due to the nature of study, qualitative method were used more than quantitative. The reason if for this is the fact that the thesis mainly consists of information collected from literature resources, scientific articles and, in general, it has a theoretical base more than practical. In spite of the fact, that the research process include some parts with mathematics and calculation, the use of quantitative methods was questionable and thus they were not as the primary ones.

More information about the research methods used in this thesis are presented in the later chapters.
2. Theory

2.1 Purchasing and its importance.

According to Gadde and Hakansson (1993, 4), generally, the costs of a firm could be divided into three large primary groups as follows: wages of the employees, acquired (purchased goods) and other miscellaneous costs. During the years, the relation of these costs was heavily changing and resulting in giving higher priority to purchasing activities. In spite of the fact that Gadde and Hakansson’s study was published quite a long time ago, it is valid in showing how the importance of purchasing has been growing over the years. In detail, the study shows that from the year 1976 to 1990, the importance of purchasing as a function in a company has been growing rapidly. Gadde and Hakansson associate the fact of the rising importance of purchasing with another fact of the society becoming more and more developed and differentiated. Because of this development, the requirements for more complex and diversified products have been increasing, and therefore, it has been impossible to satisfy customer demands with the abilities of a single company. As a result, the role of purchasing has received strategic concern and become crucially important for the effectiveness of the firm. (See Figure 1)
Another important point that affects the importance of purchasing activities is the direct effect on the revenues of the company. According to Gadde and Hakansson (1993, 5), the amount of money that is saved on purchasing is directly resulted in the same amount gained in the profits of the company.

2.2 The role of purchasing activities in a company

As Gadde and Hakansson (1993) mention, purchasing has a very important impact on the competitiveness and profitability of a company. However, the purchasing activities also have another crucial strategic role, which is divided into three parts: the rationalization, development and structural role.

The rationalization role of purchasing activities is related to the reduction of company costs incurred in the different purchasing processes that occur in the operations. For example, it could be related to the optimization of the materials flow from other resources, identifying what needs to be purchased or when it needs to be purchased as well as to decisions related to the “make or buy” procedures. Sometimes, it may even be related to the involvement of purchasing in cooperation with the internal functions, such as production, design or research and
development. All in all, the rationalization role of the purchasing activities may appear in different forms, and as a result in would be focused on the cost reduction through the adjustment of different functions. (Gadde & Hakansson 1993, 8)

The development role assumes active integration of purchasing into the supplier’s activities. Despite the fact that many companies see purchasing in a passive position in relation to the suppliers, its active involvement may play a crucial role and lead to better advantages in the use of the resource. There are many solid reasons for involving the purchasing department in the development activities of the suppliers. For example, one of these reasons is that the ability to understand each other’s and the user’s requirements and implement them into the product is much higher when the purchasing department and suppliers are working in cooperation. The second significant advantage is the opportunity to save time. Working together with the suppliers may help to eliminate misunderstandings and, therefore, increase time efficiency and, potentially, save some money. (Gadde & Hakansson 1993, 9)

The final structural role described by Gadde and Hakansson (1993, 9-10) is related to the structure according to which a company manages its suppliers according to the structure of the markets. For example, this aspect includes such strategic decisions as working with only one supplier or establishing cooperation with a network of several suppliers. Moreover, it could structure the importance of purchases from the suppliers according to the amount of purchasing spending related to each supplier. Besides that, an important role may also be played by the geographical location of a certain supplier. Some companies may wish to have a supplier of important components closer than the ones that supply not so strategically important components.

To sum up, the three roles are very important elements of strategic decisions and the effect of the purchasing department on the company
operations. The proper adjustment of these activities is needed to ensure proper work and balanced operations in the whole company, and it may even influence the strategic business direction of the organization. All in all, the role of purchasing activities in a modern business is crucial for successful performance, and it has to be taken into consideration on the strategic level. (Gadde & Hakansson 1993, 10)

Figure 2 The strategical roles of purchasing.

2.3 Product purchasing

Nowadays, one of the most crucially important issues is the type of product purchased. It is a common consequence that a company purchases completely different types of products, for example, components, raw materials, equipment and services. Indeed, the type of the product purchased has a significant effect on the type of purchasing work done. Moreover, the industry in which business is done has a major influence on the type of purchasing activities. For example, in the industry of heavy equipment, the work of the purchasing department would be done differently from that in the industry of food production or when the company wishes to purchase cleaning services. (Gadde & Hakansson 1993, 14)
1) Major equipment

When purchasing systems or other heavy equipment, it is important to understand that this equipment would be in use for quite a long time, and therefore it would be good to consider its “lifetime cost”. In detail, lifetime costs mean the costs that will follow the use of this equipment, and usually, they might be greater than the actual price of this equipment. Moreover, this type of purchasing often includes the use of services, training of the personnel, spare parts, potential updates and renovation work of the equipment. The work for purchasing major equipment is usually performed in a project form, and the lifetime costs should be in the centre of the project. Additionally, another specification that is good to take into consideration is that purchasing that kind of equipment may really limit the actual “purchasing freedom” in the future because purchasing of such a complex system also determines which raw materials and maintenance products or services can be bought in the future. Accordingly, this kind of purchase puts the buyer into the system, which will determine the future developments. (Gadde & Hakansson 1993, 15)

2) Components

Purchasing of components is an important activity for manufacturing companies, since they are very often not able to produce all the components of the finished products themselves and have to use the services and product provided by external suppliers. When purchasing ready-made components, it is important to consider how these components could be subdivided in groups from the purchasing point of view. According to Gadde and Hakansson (1993, 15), they could be divided in the two groups: technical components and adaptation components, and both of these groups have to be treated specifically from the purchasing point of view.

Technical components are the details that are usually manufactured by large companies and purchased by the OEM (Original Equipment
Manufacturers). When purchasing technical components, it is very important to think about the function of the components themselves and about the function of the component in relation to the other functions of the final product. Accordingly, their purchasing process should be more complicated, and it requires the involvement of the purchasing, production, R&D and sometimes even the marketing department of the company.

Adaptation components are not very complicated from the technical perspective, but based on their name, it is understandable that they require some adaptation to the final product on the buyer’s side. For example, these could be plastic components or components that have to be processed before installation to the final product. Moreover, the purchasing of adaptation components is not very complicated and mainly involves only the production and design personnel. The common characteristic of these groups are that they both could be purchased in large volumes. (Gadde & Hakansson 1993, 15)

3) Raw and processed materials
Raw materials and similar materials that will undergo manufacturing or assembly processes are very important economic and physical resources from the purchasing perspective. There are many reasons for it. One of them is, for example, that raw and processing materials are often purchased from certain geographical or regional areas where their prices are mainly controlled by the international markets. Therefore, they fluctuate extremely according to the supply/demand cycles. In detail, when a certain raw material is purchased, the purchasing department has to take into account the potential decrease or increase of the raw materials’ price, or otherwise, it could extremely influence the profitability of the purchasing transaction. In simple terms, the firm could lose money due to the price fluctuation. On the other hand, the supplier may try to play an opposite role, and then, a conflict concerning the purchasing price may arise between the buyer and supplier.
Another element of raw materials purchasing is the volume. Usually raw and processing materials are purchased in large volumes, and very often there are leftovers. These leftovers might also have a negative influence on the financial performance of the firm, and accordingly, they should be resolved somehow. Very often, this problem is difficult to resolve between the purchaser and supplier. A final factor that should be resolved is the refinement process of the raw material. From the technical perspective, it is very important how the supplier has processed the material and how it should be processed by the purchasing party. This factor may have an effect on the manufacturing process in the purchasing side. (Gadde & Hakansson 1993, 16)

4) MRO Supplies
This category includes maintenance and repair supplies. For example, they could be glue, fastenings, seals, nuts/bolts for certain equipment, hand tool equipment and grinding tools. The availability of this items is usually very important for the purchasing firm, because it influences the operational rate, and it may have a negative effect on the manufacturing performance. However, it is very complicated to predict the demand of such items and plan the purchases accordingly because failures occur irregularly. The main aim of the purchasing procedure of these items is to determine the effective buying routine and not to take into consideration each purchasing decision separately because it will consume much more time. In detail, the purchasing function has to provide the required availability of maintenance and repair components. According to Gadde and Hakansson (1993, 17), it could be done with the help of standardization and limiting the range of products. Simply saying, it is better to develop a purchasing system that would handle orders in the same way rather than each order individually. Accordingly, many companies prefer to handle this purchasing of MRO in large volumes with a small frequency, which causes high availability and creates big stock. (Gadde & Hakansson 1993, 17)
All in all, product-based variations in the purchasing activities have substantial variation in the implementation of these activities. The difference in them is usually related to administrative, technical and supplier-market reasons. The variation is also true for all companies individually, and usually, the final purchasing decisions have very individual ways of implementation that are quite difficult to standardize to one universal solution. (Gadde & Hakansson 1993, 18)

2.4 Purchasing in technological companies

The type of purchasing function is determined not only by product type, but also by the type of manufacturing technology used in the firm. Indeed, the type of manufacturing technology used in company is crucial factor which determines the way purchasing department will function and what factor it will emphasize. This happens because purchasing department in technological companies is a link between production facility and supplier. Talking about purchasing activities in technological firms, it is good to distinguish the three types of manufacturing technologies: unit-manufacturing, mass production and process manufacturing. For example, unit-manufacturing technologies reside to ship’s marine production industry and this type of manufacturing technology gives the company the biggest freedom in planning of purchasing operations. Mass production, for example, is related to industry of electrical appliances and the scope of formulation of operations is more limited because the requirement for homogeneity is bigger. Process manufacturing reside to chemical industry and it has the least freedom in formulation of purchasing activities. (Gadde & Hakansson 1993, 19)

**Unit manufacturing purchasing activities.**

Unit manufacturing reside to the process, where company has to produce certain product only according to real sales order but no according to predicted demand that company wants to forecast. As an example, unit
manufacturing could be manufacturing of such products as complex heavy equipment such as CNC machines for some specific production operations or other special equipment, which was specially designed for certain needs of certain companies. Usually unit manufacturing is connected to the companies, which are operating in heavy industry sector, such as marine sector, mechanical engineering production, manufacturing of heavy electrical and automation equipment.

The role of supplier in unit-manufacturing companies is very important and it could be expressed in different angles. Ship manufacturer may require the particular components for the ship, for instance plating. While the producer of machinery such as excavator may require certain amount of specific ball bearing that would be installed in transmission. According to Gadde & Hakansson (1993, 20), the components suppliers are usually the most critical ones and have the most important roles, because the supply of proper components and elements for final assembly of the machine is critical for competitive advantage of such companies. According, Gadde & Hakansson (1993, 20) are considering that purchasing department usually needs to have two types of expertise of supplier evaluation and their performance evaluation. First type of expertise is resided to supplier, which have resources and capacity to design technological components, which will be the parts of final product. For successful implementation, the purchasing company needs to have close work in development and design tasks with supplier on early development and also it should implement the expertise work during the actual production process. Finally, it requires purchaser to implement reliable logistic system for accurate delivery and supply processes. Second type of purchasing work is related to the simple designed and produced components, that may seem to be not so important ones but actually they play important role in the functionality of final product. For example, it could be some routine and simple electrification components like some switches, simple sensors, small cables and copper wires etc. The purchasing expertise for these components is much simpler than for the first category and it could be easier to implement.
To finalize, it is good to understand that purchasing activities in unit-manufacturing companies with complex production technology need close cooperation with supplier and also requires the purchasing department to develop deep supplier relationships. (Figure 3) (Gadde & Hakansson 1993, 22)

![Figure 3. Purchaser/supplier cooperation in unit manufacturing companies.](image)

**Mass production purchasing activities.**

Mass-production manufacturing is usually resided to the manufacturing of quite simple components produced in huge batches. From point of view of technology, it is not really difficult to design and develop that product and moreover it is not the key point of their competitiveness. On the other hand, for successful implementation of mass-production technology it is very important to make focus on the efficiency and responsiveness of production processes, delivery and overall time-to-market of these products. Experts say it is almost impossible to achieve without good flow of materials and stable logistics support. These two factors are very important, and they are implemented through the qualified work of purchasing department. According to it, purchasing activity again plays important role in implementation of this procedure.

According to Gadde & Hakansson (1993, 23), purchasing in mass manufacturing companies serves as link between the supplier’s design, production and development and the same activities of purchasing firm
but it is critical for production planning and logistic purposes. Many purchasing companies in mass-manufacturing sector usually behave very aggressively to the supplier and requires high-demanded work from them. As an example, they do not only want to participate and design and quality procedures of supplier company, but also requires On-time delivery of components with high KPI. Very often, if the supplier is not able to cope with such kind of task and his KPI is below the required level, the purchasing company could penalize it and requires some compensation. Also, very often it happens so that a purchasing company is a big market player, while the supplier of mass-production components are small companies and accordingly it is very easy to control and influence of them for the big market leader. (Figure 4) (Gadde & Hakansson 1993, 24)

![Figure 4. Supplier - Purchaser relationships in mass-manufacturing.](image)

**Process manufacturing purchasing activities.**

Manufacturers in process-production industry are very dependent on the availability of raw materials for daily manufacturing process and also on the special equipment and service for this equipment if they want to be able to handle these raw materials. Thought, the purchasing of manufacturing equipment is more about unit-manufacturing purchasing, the purchasing of spare parts and maintenance services is usually regularly if the company wants to run their production somehow. So, this
process manufacturing is separated on two groups: purchasing go raw materials and maintenance services/spare parts and other service for production support. According to Gadde & Hakansson (1993, 25), the purchasing of raw materials is usually happening from international markets and the prices could significantly differ from day-to-day because of their stock value. That is why it is high financial problem for buying company to implement cost effective operations. Another problem is about logistics and demand on raw materials. Experts considers that very often the demand does not exceed the production capacities and that is why there are very often extra materials on stock which results in extra expenses. But, the shortages may also occur from time to time and they can cause bad effect on the company. For elimination of this problem, it is very common for the purchasing companies to buy the source of supplier materials and have constant availability to it, for example steel mill can own mines etc. On the other hand, raw materials purchasing is not that critical because of the type of purchased product. Raw materials are mostly homogenous, and, on the market, there are a lot of suppliers, who can offer the same product, so the opportunity to change is quite simple. Purchasing of maintenance services and spare parts may seem very simple daily routine at first time, but actually, it is very important because availability of the running machinery in process-manufacturing industry is very important. Also, service and spare parts costs often finalize in expenses that are even bigger than the costs of machinery itself, but the most critical point is the cost that could occur due to lost sales because of the machinery downtime. The purchasing of services and raw materials is mostly critical from financial point of view, because of reasons mentioned in the upper text. Though, the work of purchasing department is mostly about adjusting and analysing purchasing spend and optimizing it to allowable numbers. (Gadde & Hakansson 1993, 25)

2.5 Supplier strategies in purchasing

Strategy is very big definition and it used everywhere in our daily life. In overall, every company has clearly set goals and creates business strategy
in order to have it achieved but every department may take very different forms of actions that guide business to the final goal. For example, there could be marketing strategy, engineering strategy, sales strategy, purchasing strategy and it is very normal that they are working differently because they are leading to different goals. In the case of purchasing strategy, it is usually separated on small sub strategies and they could be: sourcing strategy, strategy based on purchasing spend or supplier selection strategy. Generally, strategy is characterized as set of actions the firm needs to do if it wants to achieve the goals. (Bossert & Radatz 2004, 9-11)

- Strategy of reducing time-to-market of product. This strategy is based on supplier selection where it is mostly important the availability of supplier to deliver product in shorter time than other supplier on the market and also to make sure that on-time-delivery of supplier is around high percent value, for example over 90%. The goal of this strategy is to deliver product on the market faster than competitors.

- Strategy of reducing inventories. Not having inventory today or having it in really small amount is beneficial for many companies because having inventories cost money. But it is very difficult to do if the delivery time of product is long. Avoiding inventory in many cases depends on the abilities of supplier to deliver product right at the time when it is needed or even deliver it continuously and straight using in manufacturing. Therefore, if the company wants to implement this supplier strategy they should analyse the ability of supplier to deliver product when it is need or Just in Time minimizing own inventory and using inventory of supplier.

- Strategy of close work in development with supplier. The goal of this strategy is to work closely with supplier in design and development of the product and finally create really high-quality, special product that will have string competitive advantage over other market players.
• Strategy is to work only with certified suppliers. In this sense it gives the supplier some freedom over product development. This strategy is usually done so that the supplier is tested by purchasing companies and examined over his certain qualities. Sometime these tests could be really hard, but when the supplier will complete them it gives him more freedom and benefits to work with the purchasing company. These benefits are: long-term contracts, cost rebates etc.

• Strategy is to improve the forecasting and provide supplier with detailed materials requirement schedules in short and long terms. Many companies believe that this practice could help to reduce costs and increase efficiency of production and logistics operations. Also, this strategy could be connected to strategy of inventory reduction because it helps to hold little amount of it.

• Strategy is to have relationship with suppliers whose work is certified by certain quality system. This strategy is very popular today, because many companies pay a lot of attention on quality issues. The fact that supplier uses some quality system tell about the quality of product it supplies, but also about the developed management policies utilized in the company because they are able to support this certain quality system. The quality system could be for example ISO 90001. (Bossert & Radatz 2004, 9-11)

The described strategies are resided to purchasing activities that connected to purchasing of product and not service. Accordingly, it is good to understand that another purchasing activity would be mostly using strategies defined in another way. (Figure 5) (Bossert & Radatz 2004, 9-11)
2.6 Psychology of supplier-purchaser relationships

In ideal situation the relationship between supplier and purchasing company should be two-sided and both parts should think about each other and place themselves on the place of opposite part. This practice could have positive effect on common work but sadly it is rare happens in practice.

In reality the majority of supplier-purchasing relationships is usually ruled by one side, the company who has the biggest power over business usually because of its size. Very often the purchasing company is ruling the relationships and placing strict rules about the delivery, prices, quality of products and overall type of work. If the purchasing company is big one, it is more possible will be the main player in the relationships and if the supplier does not want to do business with them, usually there are many another market companies willing to go for it. But of course, the situation could be the opposite one. For example, right after the contract making the supplier could increase prices for products. Of course, in respond to that action purchasing company will say that price could not be increased at any way and respond of the supplier would be that order could not be done. The purchasing company will certainly ask why it is so
and supplier will respond that under given product specifications some features of the product could not be implemented and so that there is need for price increase. (Bossert & Radatz 2004, 13)

These situations are very common to occur in relationships between supplier and purchaser and of course they negatively influence business. In the described situation the supplier from the beginning knew that it is impossible to manufacture the product with given specification, but if he would tell it in the beginning the company most probably will not receive the contract. In the same way, the purchasing company knows that it has power over supplier and it could state the rules while supplier will still try to adapt on them because contract is critical for them. Result of such relationships is loss of trust between supply chain and bad coordination. This leads to extra expenses, unpredictable situations and finally lost sales and money. Psychology of supplier-purchaser relationships is difficult, and it was examined from many angles, because balanced supplier relationship is critical thing for success in the majority of businesses. That is why, there is such practice as code of ethics between supplier and customer. The code is developed by ASQC Vendor-Vendee Technical Committee and the principle behind is about understanding the needs of two parts and setting the common goals for them with result in successful business. The code has 12 principles:

1) Personal behaviour. All functions of control/quality should involve no compromise from two sides.

2) Objectivity. All the rules made in contract should be respected by both parts. Legal points of contract could not be mis complied by any party.

3) Product definition and service. Purchasing company should give detailed product requirements to the supplier as well as supplier should give transparent conditions to the purchaser for avoiding possible intrust.
4) Mutual understanding. Open information flow about close work should be done from both sides. Companies must understand each other abilities, needs and capacities.

5) Quality evaluation. Constant quality evaluation should be done for successful relationship going and future improvement.

6) Product quality. Supplier in its turn should provide product which is fitted to the quality instructions provided by purchaser.

7) Corrective actions. If something went wrong, it should be responded with corrective actions for reaching the product and relationships quality goals.

8) Technical aid. Purchaser should give the technical help about product to supplier if it is needed. This helps to reach better quality.

9) Integrity. The companies should not overuse each other’s resources and services. Everything should be done according to contract.

10) Rewards. If the supplier is able to do the required service or product according to the contract, the purchasing company should support them with rewards and motivate to work better.

11) Propriety information. The companies should not break the rules of secrets and keep the information about each other inside their relationships.

12) Safeguard reputation. Companies should behave according to code of conduct and not take any illegal actions or action that could make worse reputation outside of their relationships.

(Bossett & Radatz 2004, 15).

2.7 Supplier Performance Measurement

Supplier performance measurement is a necessary activity of the whole Supply chain management. Generally, the main goal of supply performance measurement is to collect data about purchasing activities
effectiveness and using this data drive the work of purchasing department for achievement of better outcomes. (O’Brien & Jonathan 2014, 94)

Purchasing professionals as Gordon (2008) say that supplier performance management (instead of measurement) is “The process of evaluating, measuring and monitoring supplier performance and supplier business processes and practices for purposes of reducing costs, mitigating risk, and driving continuous improvement”. Really, the supplier performance measurement should involve the three important activities: it should try to measure supplier capabilities to give results, it should try to measure the results of supplier work, it should measure the common work of the supplier and purchasing company towards achievement of common goals. The last definition is quite good to describe the Supplier performance measurement. (O’Brien & Jonathan 2014, 94)

Every purchasing professional believes in fact that measurement is important thing and it could help to make better work of purchasing. Many companies have their supplier management systems. Usually this system is built in very different way because the company needs to measure different things in supplier performance and work of purchasing department. Really, common belief of purchasing professionals is that the best way to measure the supplier performance is using extensive tool. Usually this tool contains quite many “indicators” to measure, which resided to quite different areas of supplier work. Of course, in some way these indicators are aimed at making the supplier work as well as the work of purchasing department better. However, when choosing the indicators to measure supplier performance, three very important questions have to be placed: “how this thing could be measures”, “why to measure these things?”, “how measuring of these things could add value?” The choice of measurement indicator should be smart and should answer these three questions. All in all, measurement is important, but it is also important to measure right things really adding value to purchasing work. (Figure 6)

(O’Brien & Jonathan 2014, 95)
2.8 How to measure supplier performance

Measurement is not just about measurement. On the other hand, measurement must have clear goal, why it is needed. According to O’Brien & Jonathan (2014, 92), it is very easy to create measurement framework and di measurement activities, but it is difficult to do it in way to get effective routine and adequate results. Resources are one of the main assets in organization and measurement need to have it if the company wants to use it effectively. That is why any measurement activities should be done with clear goal in the mind and very important that this activity should add value. Accordingly, for successful measurement of supplier performance the company needs to measure and analyse the effectiveness of measurement.

There are different types of measurement systems. O’Brien & Jonathan (2014, 92) shows two examples of it: closed and opened loop measurement system. If the company wants to do some activity with supplier, get satisfied results and then implement the same activity, but this time with better results it should use the closed loop measurement system. This system consists of three steps and could be used in any company. The steps are: 1) Measure, 2) Feedback and review, 3) Improve.
and correct. The system is called loop because when the last step ends it continues from the first step again and again. The closed loop system is good for business purposes when the company wants to implement continuous improvement to its activities and always develop its business processes. (Figure 7)

![Diagram](image)

*Figure 7 Closed loop measurement system.*

1) Measure is to organize measurement activities, so it could measure proper things and add value to purchasing work.

2) Feedback and Review is to analyse the work in ex-step and define proper results of supplier and purchasing department work. Also, it means the analysis of measurement activity.

3) Improve and Correct is to act and make better the work in previous steps.

(O'Brien & Jonathan 2014, 93)

2.9 Approaches for supplier performance measurement

The main part of supplier performance measurement is related to the way of how performance is actually measured. Indeed, it is not enough just to have performance measurement activities in the industrial company, but
it is necessary to understand how these activities are implemented and how they are measured. Common belief is so that from the old times measurement activities are moving the economic progress forward. And this is true not only to economy. Engineering and scientific professionals are also developing their inventions by measuring and so on. However, when thinking about economy and more abstract things, the way of measurement performance is more difficult. For example, how to measure the effectiveness of the organizational strategy, or how to measure creativity of the marketing work, or how to do the measurement of performed research job. When thinking about such intangible things, building of the efficient measurement system becomes really difficult for some companies and professionals. In reality, it is even more difficult to create a system which will not only measure the purchasing and supplier activities, but also will add value. Therefore, management is challenging task. One more problem which comes here is that it is difficult to measure right things, because very often they are even more abstract. Professionals believe that good way to measure abstracts things is to compare them. And finally, for the successful work of the company it is good to measure important things such as: processes, people, customers, infrastructure, success of work, findings and of course work of supplier and purchasing. (O'Brien & Jonathan 2014, 97-98)

According to the O'Brien & Jonathan (2014, 98), the measurement of purchasing and supplier work is difficult because it is more about abstract. However, there are several ways how to do it:

**Top down measurement.**

The goal of top down measurement is to combine several important parts of company work: understand the goal company wants to achieve and develop this goal at each level, connecting strategic and operation work and providing measurement and feedback upwards. In this situation supplier performance is one of the important measurement and also
customer satisfaction and measurement of internal purchasing work. The actual measurement is done through the continuous feedback upwards. (Figure 8) (O’Brien & Jonathan 2014, 99)

![Balanced Scorecard Diagram](image)

**Figure 8 Top down measurement approach.**

The balanced scorecard

The goal of balanced scorecard is to concentrate on the factors which will make the company successful. Usually these factors are resided to different forms of financial performance indicators, but the goal of balanced scorecard is to determine all of them or the most important. Here the importance is in the world balanced, which says that no single factor can be the most important as it was thought in the industrial companies in the past. On the other side, it is collection of the most important factors, which could be show the successful way of working for the company when they are put together. According to Kaplan and Norton (1996), there are four main factors, which determine success of the company and which have to be measured if the company wants to be successful:

1) Financial – what is financial condition of the company and how it manages the financial operations. Also, how the company deals with the
stakeholders and what are numerical profitability measures (Earnings Before Income, Return on Investment, Depreciation, Purchasing Spend etc.)

2) Customer – How the company behaving themselves with customers. Also includes measures of customer satisfaction and market share.

3) Internal Business Processes – How the internal business processes support the other company’s goal in successful business, especially on customer satisfaction and financial performance.

4) Innovation Learning and Growth – How the company is able to create value by it is products and services delivered to the market. This also means that organization of the company must evolve with time and be able to improve itself and its products. (Figure 9) (O'Brien & Jonathan 2014, 100)

Figure 9 Balanced scorecard.

Of course, balanced scorecard is not only about organizational measurement. It could be also used to measure the other specific activities of the company. For example, purchasing activities or supplier performance. The important thing to understand about the scorecard is the principle of collecting important information to one place and having
it all on hand to make the analysis. That is why balanced scorecard could be easily used for measurement of other activities than only organizational measures. Indeed, the different forms of scorecards are used in supplier measurement business activities and actually many companies, which use this practice are consider it as a useful tool. (O'Brien & Jonathan 2014, 100)

2.10 Building measurement system

Finally, the most important question the purchasing manager has is how to build the measurement system. For successful implementation, it is good to ask several questions: what things to measure, what information to use, which targets to set, how to develop it in the future. All in all, the good measurement system should have focused goal that clearly says what the company is aiming for. When thinking about supplier evaluation, the best thing if this goal is clear understanding of the work done. According to O'Brien & Jonathan (2014, 109), the best way for measuring in this case is to use closed-loop system. It provides the measuring side with all required information and helps to answer the important questions. (Figure 10)

![Figure 10. Closed loop system.](image-url)
Another good thing to keep in mind is to understand why actually measuring systems fail. If the measuring side would be able to understand these simple rules and principles, it has a chance to avoid making the same ones.

Six common mistakes are:

1) Measuring wrong things
2) Measuring of too many things and loosing of focus
3) Outputs do not leading to proper actions that needs to be done.
4) Usage of inadequate data for measurement
5) Poor feedback activities
6) Punishment after measurement, supplier is trying to defend not to contribute

There exist many more rules, but the common ones are listed above. (O'Brien & Jonathan 2014, 110)

Five-steps building process.

The final thing to understand before building the supplier measurement system is the actual process, divided on five steps according to O'Brien & Jonathan (2014, 112) and represented in Figure 11:

1. Define the goals of supplier measurement system: basically, what the company what to achieve using system, what thigs to improve, what processes to run better and so on. Simply, why do the company need to have the system in use.
2. Find out and set the performance targets: this answers the question what requirements the purchasing company has to supplier, what principles the supplier should follow and what aims it has to achieve to satisfy the purchasing company.
3. Define Key Performance Indicators: one of the most important thigs is resided to the actual measurement aspect. What things to measure. This step is need for company to understand why exactly
these measures are used. It is very important to pay a lot of attention on this step because it influences the success of the whole measurement system.

4. Design the system: think and analyse how the company will collect essential information for key performance indicators. How the KPI will be produced and from which data they are built. How often information is collected is also good thing to have in mind.

5. Resulting actions: create a method how to do with the results. The measurement system has no sense if after it is build no actions are taken. Final step is also one of the most important since it show the directions for corrective actions. Without creation of detailed measures concerning outputs it is difficult to improve something.

2.11 Defining Key Performance Indicators

The important question what to measure is the key to building of success system. Each company has own things to measure and has to create indicators which are suitable for their operations. Thus, it is difficult to say what would be universal solution for everybody. However, it is still possible to find out the common rules which would be useful to take into
consideration for every purchasing company. (O’Brien & Jonathan 2014, 123)

According to O’Brien & Jonathan (2014, 123), there are six area which is useful to examine and find out key performance indicators from them. These areas are: 1) Financial performance, 2) Safety and Quality of products, 3) Delivery performance, 4) Effectiveness, 5) Assessment of supplier management system, 6) Relationships.

**Financial performance.**

Suitable financial performance is very important for purchasing function. It has direct effect on the profitability of the organization. That is why it is important to find KPI’s for financial performance.

A good example needed for every company could be:

1) Purchasing cost of goods. How the cost offered by supplier is in comparison to other costs on the market. It important not to purchase overrated goods with extremely high costs. This will badly influence purchasing performance. So, it is good to compare the offered costs to the actual market costs of goods. The KPI of it could progress towards target cost.

2) Cost of transaction. This tells how much actual cost of is having an order. It is very important to consider all the factor which form the final cost of the good. KPI used to measure is total cost of ownership.

3) Working capital. It is good when the working capital is small. Improvement of working capital through good work of purchasing department is good achievement. KPI is improvement of working capital.

**Safety and Quality of products.**

1) Quality of delivered finished goods. Has effect on the final product of the company. Good KPI would be Progress to the quality target of delivered goods.
2) Cost of poor quality. When measuring quality of goods, it is also important to measure how much the bad quality goods will cost to company. Good KPI would be Lost Quality Frequency Rate (LQFR) or Number of rejects.

Delivery performance.
1) On time delivery. It is important that goods are delivered on time in most cases. Of course, due to unpredicted events they cannot be always delivered on time, but in the most cases they could and must. KPI could be on time delivery rate.
2) Overall delivery improvement. It is very important to improve the delivery process. This could be reduction in lead time for example. KPI is progress to lead time reduction goals.

Effectiveness.
1) Decision making or responsiveness time. In successful business fast reaction is good advantage. If the supplier is able to react quickly on your requests, it gives you good advantage. KPI could be decision-making time.
2) Ability to handle unplanned orders. Business always goes in unpredicted way. Supplier as part of business process must be able to handle it. KPI could be Rate of unplanned orders fulfilment.

Assessment of supplier management system.
1) Corporate Social Responsibility compliance. It is very important to have ethics when doing business. Not only money is the target, but also social responsibility and ethical principles. KPI could be Progress towards Corporate Social Responsibility targets.
2) Accreditation to international standards and Quality systems. ISO 9001 Compliance for example says that quality management of supplier is on reliable level. KPI could be progress to supplier internal quality targets.

Relationships.
Relationships is difficult to measure and there could many important factors depending on the industry and company. However, the most applicable to general company are:
1) Flexibility in ordering process. Not to make purchasing company buying goods in big lots or setting high prices for quick purchases for example. This improve trust between both parties. KPI could be Relationships performance.

2) Information sharing. It is very important to understand the capabilities and processes of each other. This could well improve the total operational performance. KPI Could be Rate of requested information availability.

3) Willingness to contribution and collaboration. In successful business supplier should try to improve the common work as well the purchasing company. This will have positive effect on business. KPI Could be Number of suggested solutions or rate of collaborative work.

(O'Brien & Jonathan 2014, 127)

3 Research approach

3.1 Research methods data collection

Research

Research is an activity aimed to explore a certain area and produce knowledge. Therefore, the main aim of research is to generate knowledge of a certain topic, and it is very important that this knowledge has to be specific and new. The need for research arises usually when special information is required and there is no other way to find this information. Another important point is that research should give adequate answers and accordingly, it should be valid, based on previous research, give proper and reliable answers to the research questions and allow to make generalizations. (Dahlberg & McCaig, 2010, 13-14)

According to Braun and Clarke (2013, 3-4) there are currently two research approaches: qualitative and quantitative. The goal of both
The qualitative approach studies one or perhaps two topics maximum, but tries to investigate them for a deeper understanding, while quantitative research works with a big number of examples and studies the problem more widely. These methods work with different types of information: qualitative works more with information expressed in words and quantitative with information in numbers. Moreover, these methods use different ways to collect data. In addition, the way of data processing is also different: the quantitative method uses calculations and qualitative interprets words. In the end, these methods are used for different purposes. (Denscombe 2003, 231 - 233).

In this thesis work the qualitative research method was applied. Many experts say that it is difficult to use only one method, and quite often both methods are used in a specific research process. However, this thesis did not need to process any statistical information, so that the application of the qualitative approach was considered sufficient.

Data collection

There are many ways to search and collect data in research. Which method to choose depends on the research method and the study itself. In the quantitative approach, the data collection is usually done without communication or with a very small amount of communication with other people. In qualitative research, it is more important to contact other individuals. Examples of the data collection methods for qualitative research are:

1) Interviews
2) Literature
3) Observation
As this thesis had a theoretical goal, the data collection method used in the thesis was Literature. However, as the author works in the same area as the one that he wrote thesis about, observation could also be applied in this research.

3.2 Implementing research

The implementation of the study was done in a simple way because of its theoretical character. The aim of the study was to find and generate information that could be used in practice when assessing suppliers. However, the aim of this study was to create a KPI Scorecard that could be used for supplier evaluation and that was why it gave a practical solution. This solution was an Excel table summarizing the overall evaluation information. The table is an attachment to the thesis document.

The research process consisted of certain steps that were taken in order. Taking these steps in particular order was necessary in order to reach the results. The research steps were:

1) Finding resources.
2) Acquiring the required information
3) Writing the thesis document
4) Analysing the information
5) Finding the solution
6) Presenting the solution
7) Preparing the outcomes

The Scorecard solution was arrived at according to the five-step process described in Chapter 2.10. However, because the research had a theoretical goal, some of the steps were not really applicable to the case and that is why they were viewed as potentially applicable.
1. Define the goals of supplier measurement system: The goal for supplier measurement system in this case is to create a tool, which could be used when evaluating supplier performance in product purchasing activities.

2. Find out and set the performance targets. (theoretically applicable) According to the collected info the supplier should pay attention on the following work areas: 1) Financial performance, 2) Safety and Quality of products, 3) Delivery performance, 4) Effectiveness, 5) Assessment of supplier management system, 6) Relationships.

3. Define Key Performance Indicators: The KPIs are firstly discussed in part 2.11 and then they will be finally showed in KPI Score card solution in the part 3.3

4. Design the system. (theoretically applicable) The measurement system is evaluated as “Requested % performance vs Actual performance”. For the KPIs which could be measured with percentage value, the KPI would set some % out of 100% value for and using simple calculation it will show the actual value of supplier performance. If the actual value is more then requested, the performance is fine. Otherwise, actions needed. For some of the KPIs the value would be expressed in different measures, for example the decision-making time could be expressed in days.

5. Resulting actions. Theoretical point is not applicable to this case. If the KPI Card will be used the executing side will decide on this.

3.3 Presenting results

The KPI scorecard looks like this:
As it seen in the picture, the example KPI scorecard has different types of measurement. This is because not every KPI on scorecard could be measured by one measurement tool and that is why different tools have to be used. The KPI measures with good results are marked by green, the measures with not so good by yellow and bad performance is marked with red. Besides, each KPI measure has own table on a separate excel list where percentage is calculated. (Figure 12)

**Table 1 KPI Progress towards target cost measurement**

<table>
<thead>
<tr>
<th>Progress towards target cost</th>
<th>Actual purchasing cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Period</td>
<td>100</td>
</tr>
<tr>
<td>Previous period</td>
<td>110</td>
</tr>
</tbody>
</table>

This KPI is measured as percentage between purchasing cost of previous period and current period. If the percentage is positive, it means lower price and good progress. Otherwise, price is the same or higher which is bad. (See table 1)

**Table 2 KPI reduction in total cost of ownership.**

<table>
<thead>
<tr>
<th>Reduction in total cost of ownership</th>
<th>TCOO</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Period</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>-0,25%</td>
</tr>
<tr>
<td>1995</td>
<td></td>
</tr>
</tbody>
</table>
This KPI measures the total cost of ownership including all the activities required to get product. It measures in negative percentage. If it is negative, it means that the price is lower, and it is good KPI. Otherwise the price is not reduced, and it is bad score. (Table 2)

Table 3 KPI improvement of working capital

<table>
<thead>
<tr>
<th>Improvement or reduction of working capital</th>
<th>reduction in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC This Period</td>
<td>300000</td>
</tr>
<tr>
<td>WC Previous period</td>
<td>310000</td>
</tr>
<tr>
<td></td>
<td>3.23%</td>
</tr>
</tbody>
</table>

KPI showing the reduction in working capital. Positive percentage value shows good potential to improve. Otherwise, there is no improvement or improvement is low and it is bad score. (Table 3)

Table 4 KPI Progress to quality target of delivered goods

<table>
<thead>
<tr>
<th>Progress to quality target of delivered goods</th>
<th>Scraps in Quality %</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Period</td>
<td>4.00%</td>
</tr>
<tr>
<td>Previous period</td>
<td>3.00%</td>
</tr>
<tr>
<td></td>
<td>-33.33%</td>
</tr>
</tbody>
</table>

KPI measuring the progress in quality of the delivered goods. Measured in the scrap percentage of delivered goods in the previous and current period. (Table 4)

Table 5 Lost Quality Frequency Rate

<table>
<thead>
<tr>
<th>Lost Quality Frequency Rate</th>
<th>Cost of quality in euro</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
KPI measuring quality of delivered goods in the Lost Frequency Quality Rate. Measured in the euro which represent the total cost company is paying for poor quality. (Table 5)

Table 6 KPI On time delivery

<table>
<thead>
<tr>
<th>On time delivery</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>orders %</td>
<td></td>
</tr>
<tr>
<td>on time orders per period</td>
<td>87</td>
</tr>
<tr>
<td>All orders per period</td>
<td>100</td>
</tr>
</tbody>
</table>

KPI Measuring on time delivery. Orders delivered on time versus order which were late. KPI is measured in percentage. (Table 6)

Table 7 KPI Progress to lead time reduction

<table>
<thead>
<tr>
<th>Progress to leadtime reduction</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead time weeks</td>
<td></td>
</tr>
<tr>
<td>This Period</td>
<td>9</td>
</tr>
<tr>
<td>Previous period</td>
<td>9</td>
</tr>
</tbody>
</table>

KPI measuring the possibility to reduce lead time and perform operations faster. 0% result may me seen as positive as well, but the negative one would mean that lead time is higher, and this is bad score. (Table 7)

Table 8 KPI Rate of requested information availability

<table>
<thead>
<tr>
<th>Rate of requested information availability</th>
<th></th>
</tr>
</thead>
</table>
KPI measuring the rate of available information between supplier and purchasing company. Measured in percentage. Good score is 100 or around 100, less than 50 may be a bad score. (Table 8)

**Table 9 KPI rate of collaborative work.**

<table>
<thead>
<tr>
<th>Rate of collaborative work</th>
<th>amount of common meetings and briefings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted meetings</td>
<td>5</td>
</tr>
<tr>
<td>Requested meetings</td>
<td>5</td>
</tr>
</tbody>
</table>

KPI measures rate of collaborative work. Meetings and discussion together could be the mean to measure the KPI. Good score is 100 or around 100, less than 50 may be a bad score. (Table 9)

**Table 10 KPI Rate of unplanned order fulfillment**

<table>
<thead>
<tr>
<th>Rate of unplanned order fulfillment</th>
<th>unplanned orders %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accepted unplanned orders</td>
<td>5</td>
</tr>
<tr>
<td>All unplanned orders</td>
<td>5</td>
</tr>
</tbody>
</table>

requests in %

<table>
<thead>
<tr>
<th>Accepted documentation requestes</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>All documentation requestes</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>33,33%</td>
</tr>
</tbody>
</table>
KPI measures the amount of handled unplanned orders. Show the ability of supplier to handle unpredictable situations. Good score is 100 or around 100, less than 50 may be a bad score. (Table 10)

4. Conclusion

4.1 First aim of research

The goal of research at the beginning was to create KPI scorecard for supplier assessment. In the process of the thesis the needed information was found and KPI Scorecard was created. In parallel, some literature and articles were gone through and just basic good relevant info about purchasing activities and industry were also found. Accordingly, the beginning goal of research may be counted as reached and closed.

4.2 Findings

The thesis studied a lot of useful information about purchasing activities. First of all, it is good to say that presence of purchasing activities is very important for any enterprise. They help to manage costs of the company, control materials flow, outside manufacturing and also without them impossible to operate because purchasing is a link between one company and other companies. From the 1980 years the purchasing activities were concerned with bigger and bigger attention and companies were paying more and more money to develop purchasing department. Nowadays, purchasing department exist almost at any enterprise at some point not depending whether this enterprise operates in heavy industry, in service industry or even in some scientific sector. Purchasing activities could be operated and run very differently in different environment. For example, service purchasing, and product purchasing are different activities. Thus, they have some different insights and have to be operated in different ways.
This thesis was focused on the product purchasing and so it highlights 4 main area here: Major Equipment, Components, Raw and processed materials, MRO supplies. Thinking about industry type, this thesis was focused on heavy industry and mainly covered the purchasing activities, which are connected to Unit manufacturing, mass production and process manufacturing industry.

Purchasing has a lot of internal activities, but this research was focused on the supplier relationship management and measurement of supplier performance. Supplier relationship is critical for purchasing. It influences the whole work of purchasing department and it is the main driver. Relationship with supplier have to be planned and managed carefully from the beginning because it will have direct influence on operations in the future. If the supplier is not competent to deliver value, the work of purchasing would not be efficient. On the other hand, it will only make the operations of the enterprise worse and worse. Thus, it is good to choose supplier carefully from the beginning. In addition, it is important to be polite when establishing supplier relationship. It is very common situation nowadays that many companies treating their supplier bad, trying to push them to the result and not paying attention on their capabilities. The relationship has to be fair from both sides.

Nevertheless, if the purchasing company wants to be successful it is important to measure continuously supplier performance. Measuring is good technic to push the progress forward. However, it is difficult to implement. Very often the things needed to be measured are very intangible and it is hard to measure them. Other thing is that collecting data may be very challenging. That is why many companies could not implement the measurement systems in their operations.

There are different tools, which could be used for measurement for example Top-down measurement system and KPI Scorecard. This thesis was focused on only one tool KPI Scorecard. KPI scorecard holds all the
needed performance measures which could be used to evaluate suppliers. All the KPI Scorecards are different and it depends on the company and as well on the industry where company works. This thesis is focused on product heavy industry and that is why KPI scorecard of this thesis is focused on this area.

The important information areas for the KPI scorecard: are

1) Financial performance of supplier
2) Safety and Quality of products
3) Delivery Performance
4) Effectiveness
5) Supplier management quality system
6) Relationships.

The important KPI’s in these areas are: Progress towards target cost, Reduction in Total Cost of Ownership, Improvement/Reduction of Working Capital, Progress to Quality target of delivered goods, Lost Quality Frequency Rate, On time delivery rate, Progress to lead time reduction, Relationships performance, Rate of requested information availability, Rate of Collaborative work, Decision - making time (days), Rate of unplanned order fulfilment, Progress towards corporate social responsibility targets, Progress towards supplier internal Quality targets. Finally, these KPIs were composed into Excel and KPI card was built. The KPI Scorecard could be used in theory for some practical cases when evaluating suppliers.

4.3 Reliability of Research

The creation of the KPI scorecard was the main goal of this thesis. Although this goal was reached, the thesis could not be counted as perfect research. Of course, it has some disadvantages. One of them is because thesis was not completed for certain company which works in the industry, but on the other hand it was done theoretically. In theory it is very difficult to create KPI, which would be relevant in practice because
the creation of KPI card is individual for every company in the industry and it has to take insights of this company or industry into account. Despite the fact that relevant information was found, it could be impractical for real company case. Second point which could be done better is about theoretical part. The theory for research was only from the books and it was quite narrow. In ideal situation the bigger theoretical bank would give wider picture of the problem. One more things is that interviews were not used in this research and that is why the thesis again misses practical overview of the problem. Third point is about measuring technics in KPI scorecard. At this thesis measuring technics were very simple and they may not be really efficient in practice or they can miss important details. In real life purchasing professional are using very advanced technics to measure quality and supplier performance and get more adequate results.

5. Discussion

Application of thesis work is important point. Regarding this thesis how it was mentioned in previous parts, the result could be used in purchasing work. However, before starting the process of implementation to practice, it is good to evaluate the purchasing activities of the company. For example, the company which is going to apply this research for practical work may have some specific characteristics. If these characteristics are unknown and KPI scorecard does not count on them, the application of it may not be effective. That is why it is recommended to study purchasing activities and may be add some more features to the card.

The idea of thesis came to the author because he started to work in purchasing at some industrial company, which has huge variety of products and operates in many industries. During the work author has
found that in purchasing and sourcing no useful tools are utilized for supplier evaluation. Very often the selection happens intuitively, and the relationship are no developing. Thus, the idea to create such a tool seemed to be useful. However, it was not possible to make this thesis for the work place, so it was done theoretically.

The structural selection and development of supplier relationship is important, because it can improve all the activities of company in many areas: financial, logistics, production and so on. That will develop profitability of the company and strengthen market position. Evaluation systems may be applied to many activities in the company and not only to purchasing. When the company starts to evaluate its operations, its business and money start growing.
References


