

Improve supplier selection in the purchasing process

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<p>Abstract</p> <p>Nowadays, purchasing plays an increasing role in the organization. most companies have a large potential for professionalizing the purchasing process. A systematic approach to purchasing a policy can help to make this potential visible and accessible. The supplier selection in the purchasing process is a crucial part and has great influence in the following process. The objective of the research is to improve the supplier selection in the purchasing process, reduce the risk, and enhance the efficiency in the process.</p> <p>The research is carried out through the interview on the two companies and compare with the benchmarking Toyota, analysis based on the qualitative and the experience from the internship of the companies to know the current state of the purchasing process in supplier selection and improve from the key issues of it.</p> <p>Generally, the current state of the purchasing process is also constrained by the company business which may bring a slight difference in the state of supplier selection. However, that could not affect the key factor in the process. No matter the development stage of the company's purchasing, the standardized purchasing process is always necessary to make sure of the stable performance. And the profit of the long-term perspective in the supplier selection can bring low risk also the preliminary condition of the win-win development with the supplier.</p>		
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1 Introduction

1.1 Background

Currently purchasing takes an increasing role in the organization of the company and occupies a large percentage of the company's annual account payable, especially the manufacturing company. (Nihtilä, 2020) As a consequence of such far-reaching make-or-buy decisions, it is not uncommon for a modern industrial firm to spend more than half of its turnover on goods and services purchased from suppliers.

Many companies establish a proper strategy to ensure their competence and serve for the management of the purchasing task. The purpose of it is as a guideline for the implementation of daily purchasing activities. The procurement process is the control of the completion of the procurement task under strategic guidance, to do the right things through the regulation of the purchasing process. The purchasing process is one of the important of the output of the strategy to control most of the common purchasing tasks. That is also the reason for the different type of company has a distinguished working flow.

The basic of the purchasing process is, define specifications, select supplier, contract management, ordering, order follow up, and the evaluation. That is the fundamental structure of the purchasing task. The real purchasing process in the company will be more detailed in each step of the implementation. The role of the purchasing process is run through the purchasing task which entails supplier management, cost management, supply chain management, and quality management. (Nihtilä, 2020) The company's internal purchasing order will carry out through its regulated purchasing process. However, the objective in the purchase process and the actual result often existing the deviation, and the reason for it could be multiple aspects.

Generally, the purchasing department is dealing with a large amount of the purchasing order. And they required a standard rule to handle it in the same period time. Therefore, the improvement of the purchasing process will assist to improve the potential of purchasing and bring benefits for the company.

Supplier selection is an essential step in the entire purchasing process. The selected supplier will decide the following working result, the possibilities, the quality for the manufacture, the length of the cooperation period, whether required to find the new supplier to replace the target of the purchased good temporary. The type of relationship that the company can cultivate with the supplier, routine, leverage, key, or strategy. It is the best result to reach the win-win development with the supplier in a long-term perspective.

1.2 Objective

Purchasing has come to a spotlight as important. A certain number of the purchasing work is implemented through the purchasing process and it is essential in purchasing. The research is carried out through the explicit procurement processes of two author's internship companies with the interview on purchasing managers. Company A and Company B are similar fields of the car part manufacturing company. Benchmarking Toyota will be used as a case study to assist the research.

The objective of the research is to find out and define the core issues in the supplier selection process to make it efficient and risk-free. To analysis, the current state of the purchasing process, try to avoid the existing potential issues that could jeopardize the company's profit in the supplier selection stage from a long-term perspective. Give some of the solutions associates with the theoretical framework.

1.3 Limitation and scope

The improvement of the procurement process is a big direction, covering a wide range. This paper is based on improving the procurement process of the target company, and will mainly adjust the risk prevention and control to pre-event, which is the beginning of the process, the selection of suppliers

The research is based on the analysis of industrial purchasing, implemented through the interview of *company A* and *company B* the two manufacturing companies, and the case study of Toyota. The supplier selection process is investigated from the internship experience and Benchmarking will mainly base on secondary research. For company A include both direct and indirect supplier

And the scope of the thesis is mainly focused on the supplier selection and its improvement in the whole of the purchasing process. The research of the improvements is according to the problems from the current state of the purchasing process and the background of its business condition.

2 Literature review

2.1 Process improvement

2.1.1 What is the purchasing process

The purchasing process is by which an enterprise plans its procurement activities to achieve reasonable procurement and to ensure that the requirements are met. Its primary role is to obtain goods and services in response to internal needs. (CSMP & Tate, 2014)

The different activities within purchasing are interrelated and dependent on each other, and they can be organized in a process, where it is implied that they take place after each other in time (Weele, 2010). It is a guideline to control the implementation steps, from the mess to structured. Although different industries of the procurement process are different, the general procurement process is similar.

The nature of the purchasing process is a standardized working flow to select the proper supplier and carry out the transaction with them and evaluate the activities performed. The supplier selection in the purchasing process refers to carry out the procedure of developing the new supplier. It can include several basic steps in the bellowed table.

Basic steps	Purpose
Identified specification to the supplier	Requirements for the purchasing products
Identifying potential suppliers	Importance of new supplies
	Reasons for supplier qualification screening
	Supplier qualification screening process
	Creating a supply base
Information request to the supplier	Information about their goods or service

Table 1: The required steps supplier selection process (Damian, 2009)

In identifying potential suppliers, the importance of new suppliers can contain the superior in some way to a firm's existing suppliers like a novel production technology or streamlined process or structural cost advantage over existing suppliers. The supplier qualification screening includes a previous reference check, financial status check, whether it can meet the specification, the research, and development ability. The information request to the supplier generally makes one of three types of information, Request For Information (RFI), Request For Proposal (RFP), Request For Quote (RFQ). (Damian, 2009)

2.1.2 How can the process be improved

Improvement from the carry out of the purchasing process, there is not often an explicit purchasing strategy in place. The formulation of the purchasing goals is very rudimentary and intuitive. The value-added of purchasing function is considered to be securing the availability of the right materials and goods for production. (Weele, 2014, 69) The improvement of the purchasing process is often derived from the feedback or the complaints in the purchasing work.

Effectiveness cumulative saving	Time					
	Transactional orientation	Commercial orientation	Purchasing co-ordination	Internal integration	External integration	Value chain integration
	serve the factory	reduce cost	savings through synergy	Total cost of ownership	supply chain organization	total customer satisfaction
Activities	clerical order processing	commercial tendering negotiating approved supplier lists	commercial contracting global sourcing	cross-functional buying teams system integration vendoring rating	outsourcing ED/internet E-commerce Cost-model	customer driven activities contract manufacturing supplier development global supplier network
Dilemmas	initial purchasing control of purchasing Expenditure	supplier base management	contract management Ethics	communication and information	social resistance	internationalization HRM

Figure1: Purchasing and supply development model (Weele, 2010, 69)

The improvement of the purchasing process can be partly based on the situation and the current development stage. The different stage of the company matches a different type of enhanced requirements, which means the practical improvement of the business unit related to the development period. Furthermore, it covers the current state of the enterprise purchasing process and improves according to the specific problems lay.

The analysis of the improvement of the process can be made from customer needs, production service, supplier. This reflects the effect of the purchasing process in the organization.

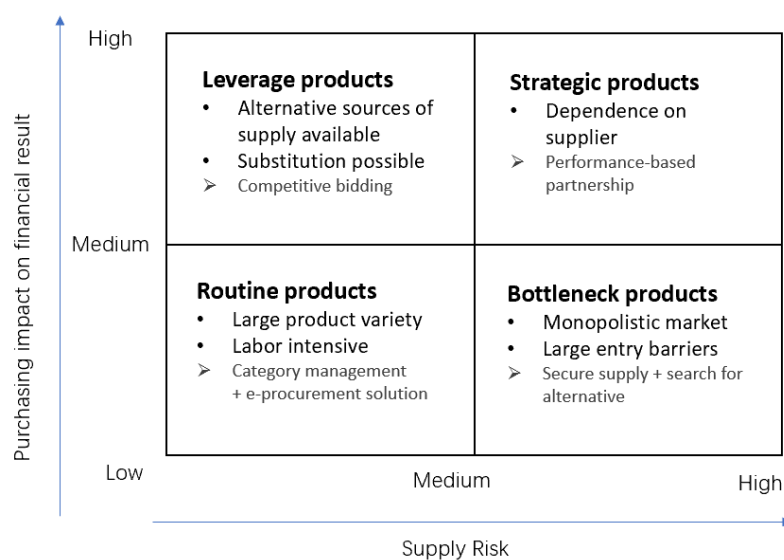


Figure 2: Product portfolio, strategies (Weele, 2010)

The product portfolio strategy will also help to identify the supplier relationship are expected to cultivate. Whether this type of product supply worth and necessary to establish a long-term cooperate partner. In this way, will need to consider the long term profitability selection criteria for the supplier, which means to do some adjustment on the quality, buying price, site evaluation to ensure the effectiveness of the supplier selection in the purchasing process and will bring the less risk in the following work of the purchasing process.

2.1.3 Process modeling

The first input of the model is a business need or requirement. The model is a critical component for effective business process management as it has an important point

in that defining the interfaces between the phases. (Ek, 2013) It refers that a clear definition of each phase's output is required as well as it is desirable to be able to track and trace the different activities throughout the process. The activities in one step should not start until a decision from the previous step tells it is all right.

(Weele, 2010)

Purchasing process models describe the design of the purchasing department or its function and the way it is linked to and configured within, the wider organizational design and business model. The example functions are like the purpose, management, management and teams, and coordination and control of activities and resources. (Lysons & Farrington 2006).

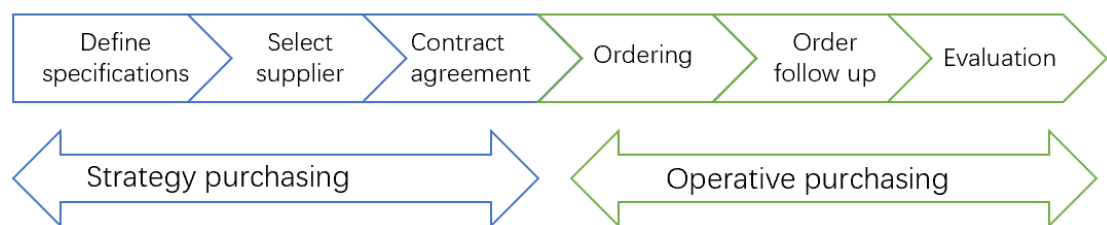


Figure 3: purchasing process steps (Nihtilä, 2020)

The purchasing process is made up of two parts, the strategic sourcing, and operative purchasing. Strategic sourcing is defined specification, select supplier, and contract management. Operative includes ordering, order follow up, and evaluation. In the purchasing model required for balancing the cost, risk, value.

2.2 Purchasing process

2.2.1 Role of purchasing

Currently, the real situation is most companies spend more than half of their sales turnover on purchased parts and services. Especially in the manufacturing company, purchasing occupies a large percentage. (Nihtilä,2020) After all, it entails all activities for which the company receives an invoice from outside parties. Consequently, it can help to ensure the company's short-term financial position and long-term competitiveness.

Purchasing tasks consist of supplier management, cost management, supply chain management, quality management. And the purchasing process through the whole work of the purchasing task. (ibid) The good purchasing process will help to establish efficient and constructive effectiveness in the purchasing task carried out. The management of the company's external resources in such a way that the supply of all goods, services, capabilities, and knowledge that are necessary for running, maintaining, and managing the company's primary and support activities are secured under the most favorable conditions.

2.2.2 Purchasing process steps

Define specification:

As the first step, the intention of it is to clarify a description for detailed requirements of goods or services and form parts of an invitation to supply or invitation for expressions of interest document. The process for requesting an invitation to supply should only commence after all requirements are clear and well-defined, which is to ensure that all potential suppliers have a clear guideline to follow. (Government of South Australia, 2019) The potential risk at the beginning is likely to cause a bigger problem in the following purchasing task implementation. These can be said to be the meaning of define specifications.

The order specification generally contains quality, logistics, maintenance specifications, as well as the legal and environment of requirements. The financial budget is also essential in the entire organization. Furthermore, these can also be designed into the details of the company's purchasing process according to the need. The order can be still be divided into two types, functional specification, and technical specification, which refers to the requirement for the functionality of the product and the technical properties and the characteristics of the products respectively.

In the quality specification, an important measurement can base on the technical drawing aspect, the measurement, tolerance, the materials, characteristics. The requirements in the testing are the properties of the material like hardness, Abrasion,

Heat conductance registration, evaluation, authorization, and Restriction of Chemicals testing concentration or dissolving of chemistry factors. The safety factor is also needed to take into consideration especially food safety, skin contact, protection.

The logistics specification entails volumes and lifecycle, the quantity produced is usually the determining factor in the target price. One time buys or the normal selection. Packaging specifications consist of consumer box, retail box, master box, the size, the material, the layout of the pallet. Labeling the method each product should be marked as the possible package supplier. Transportation type, inventory management specifications include location, order type, AVG batch sizes, Target Inventory Turnovers (ITO) Delivery Term (Incoterms 2020), Logistics Partner.

The role of this activity is to get a clear specification of the requirements to derivate what needs to do next. It is preliminary work and direction making for the following work task in purchasing.

Supplier selection:

The main objective of the supplier selection process is to reduce purchase risk, maximize overall value to the purchaser, and develop the general steps of the selection are determining the method of subcontract first. The fixed cost, the cost basis, the labor cost, and the period cost of the matter lead to. Secondly, screening of preliminary qualifications, drawing up bidders' list Information, analyzing the bids. Thirdly, prepare a request for quotation(RFQ). Finally, do the supplier selection. Supplier selection is carrying out in an efficient comparison.

The criteria of the supplier selection can include: (Ek,2013)

- Past performance: The performance history of the supplier in the financial, economic, social, organizational, and societal areas. (Taherdoost & Brard, 2019)
- Reputation: According to actual performance, suppliers gain their reputation which can be a valuable asset.
- Visit and appraisal: Both take time and can be expensive but it is a good way to assure quality.
- Third-party certification: Made by independent organizations, not connected to the buyer or supplier
- Evaluation of sample products: Normally done as an inspection when the goods have been delivered, and lead to acceptance or rejection from the buyer. To make a detailed inspection, the sample product evaluation assists to judge whether the product is suitable

The supplier selection process deploys an enormous amount of a firm's financial resources and plays a crucial role in the success of any organization. (Taherdoost & Brard, 2019) The purpose of the steps is to select the most suitable supplier for the company. The role of this step is to build a supplier base for purchasing working. Most of the time, find a new supplier will cost more energy than maintaining the supplier.

Contract management:

Contract management is a form of document to regulate and ensures that both parties meet their respective obligations in any procurement relationship. (purchasing&procurement center, 2020) The contract is used to make sure the legality of the business decision and control risks.

In the content of the contract always include the consensual prices and terms of delivery, terms of payment, penalty clauses and warranty conditions, other arrangements, insurance and safety regulations transfer of rights and obligations contracting out to third parties' confidentiality. The purpose is to meet the operational, functional, and business objectives required by the contract and provide a profitable interaction.

The process of management is necessary to include: (purchasing&procurement center, 2020)

- Managing service delivery
- Managing the relationship
- Managing the contract
- Seeking improvement
- Ongoing assessment
- Managing Change

To prepare the contract by its parts and agree with the contract with the supplier.

The role of contract management is mainly like risk control in order which covers serials of settlement to disputes

Ordering:

The purchase order is an important basis for the two parties to conclude a purchase contract. It includes important details required by the purchase, including the number of goods to be purchased, specifications, quality requirements, purchase price, delivery date, and delivery address, establishes the order routine, and invoicing address. (Weele, 2010).

Follow up:

For really critical purchases, the *advanced status checking* may be applicable. This is more time-consuming and means that the buyer makes on-site inspections to check the progress of ordered products. (Weele, 2010) The step of the follow up is a method for order handling to ensure order conditions and actual delivery meet the specified requirements, it is the process drive and follows up. It is between the ordering and evaluation. All the steps before finally receive the products and services of the purchasing are the work of the preliminary work of preparation to get consistent with the supplier and placing the order. If the purchasing task is divided by buying to place the order and receive the commodity. The step of the follow up can be a rather important link to connect the buying and receiving activities, especially with the large of the orders. Then the follow up would be significant to react to the variates changing situation.

The purpose with systematic PO follow up process company can: (Weele, 2010)

- Ensure the agreed terms and conditions are met
- Orders are delivered on time, correct quantity, quality, and price
- Enable sales
- If problems, they are noticed according to company follow up type
- Enables to make corrective actions
- It enables you to react to changes and follow contract terms in real-time
- Improves information sharing, communication

Exception expediting: buyer only takes action when the organization sends out signals of material shortages

Routine status check: preventing materials supply and quality problems –few days before promised delivery, the buyer contacts the supplier to confirm the delivery date

Advanced status check: for critical purchase parts –a detailed production plan will be handed over to the buyer and during the process, the buyer will carry out periodic checks

Evaluation:

Evaluation is to define the outcome after the new product is taken into production, which is a checking and conclusion procedure. The evaluation is to provide vital feedback for the purchasing work.

There are many concrete indicators to evaluate the cooperation with suppliers and their performance, the aspect of the task in this step entails: (Weele,2014)

- Compare reality to contract (claims, penalty clauses)
- Compare invoice with the original order
- Solve delivery issues
- Measuring supplier:
- Keep track of the supplier's quality, delivery record (on-time performance, lead time), competitiveness, and innovativeness.
- Decide on supporting KPIs (Key performance indicators)

The step of define specification and evaluation is mainly the unilateral work task of the company for information collection and organization. The other steps all need to communicate with the supplier part, which existing the two organizers of the information transmission. One of the very important factors in efficiency and effectiveness during the purchasing process is information transmission. Not only through the organization of the internal company also between the own company and supplier.

2.3 Risk management

2.3.1 What is the risk management

Generally, risk can be defined as the probability of an unwanted outcome happening. Not all the risk is obvious, actually many of it is existing potential and probability. And the control of the risk is to reduce the potential of the impacts and the probability. Risk management involves three key activities: risk analysis, risk assessment, and risk mitigation. (CIPS: Risk Management in Purchasing and Supply management)

- Identify the risk and source
- Establish the probability of occurrence
- Evaluate the impact of occurrence
- Investigate risk reduction options
- Deploy mitigating strategies and monitor against the plan

Unusually, before agreeing with an outsourcing partner, a careful risk analysis management must be made. These risk factors should be assessed based on two criteria: the negative impact on companies' financial performance or operations, and the likelihoods with which the risk factor probably would occur. (Weele & Raaij, 2014)

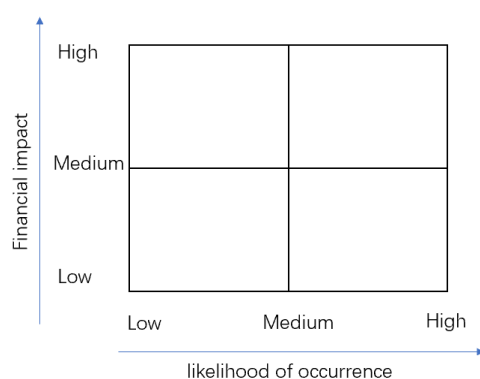


Figure 4: Risk matrix: systematic analysis of risk factors (Weele & Raaij, 2014)

Companies normally have a large amount of the purchasing order need to handle especially the middle or large model enterprise, which all will be implemented following the purchasing process. Therefore, a proper design of the process will assist to control the probability of the risk happening.

2.3.2 The important factor to manage the risk

Unavailability of qualified staff, the process' completing is highly dependent on the experience and knowledge possessed by the persons that are connected to the purchases of production equipment items.

Materials shortages, the purchased raw materials or semi-finished products will be used of the product manufacturing. The shortage of the purchasing inventory will delay the manufacturing also the cost of other types of inventory.

Take over of providers by competitors. As purchasing gets a more central role within companies, the objectives of this function are more and more connected to the companies' overall objectives. Those can, for instance, relate to cost-reductions, increasing the quality of products, or reducing lead times. Based on such objectives, purchasing management can choose to focus on different areas for action and adopt different strategies. (Weele, 2010) Purchasing is a sensitive department in the organization of the company. This impacts the potential risk performance by jeopardizing the company's profit by ceding the opportunity to others.

Financial problems at the provider, the supplier can be regarded as the extension part of the company's business. The financial problems in the supplier company will influence the manufacturing of their own company's purchasing goods, and affect the company's production plan.

The occurrence of unforeseen disputes, the unforeseen dispute is not often existing. However, the suddenly happen may bring a great effect on the business of the purchasing. The preparation allows the company to respond better.

The unwillingness of the provider to invest in technology, the development of suppliers can also be a crucial part of supplier management work. With the development of their own company, the corresponding or purchased products should also give the same level support.

Change of key management positions, which the risk produced by the internal organization of the company, also hard to solve immediately.

3 Methodology

3.1 Research target and question

The daily purchasing orders are handled following the process. The improvement of the purchasing process is believed to improve the potential of professionalizing purchasing management which is the significance of making the potential visible and accessible. (Weele,2014,73)

As mentioned in the literature review above, purchasing process improvement is taking from an implementation aspect, the explicit strategy may not often existing which is required to explore and discover the inspiration from the occurring or potential problem of real practical.

As a consequence, the research needs a specific business climate which is based on the existing procurement process status of A company and B company. The research on the improvement of the procurement process requires clear problem analysis steps to support and make the objective research more reliable.

RQ1: What is the current state of the process in the purchasing?

In the improvement of the purchase process, it is necessary to know what is being continuously improved, what is to be done, and what to improve. The improvement of the process is to improve efficiency, benefit, and reduce risks based on the original process. At this time, the analysis of the original process status is the prerequisite basis for process improvement.

RQ2: What are the key factors that affect process efficiency and risk management in the process?

The research to the current procurement of company A and company B, the status of the existing procurement process can be seen; the differences between the existing process and the expected results can be found, and the factors lead to the problem can be analyzed. The basic steps of the procurement process are similar. In many cases, the procurement processes of different companies are different even for com-

panies in similar production fields; therefore, the same influencing factors of the procurement process are not the same in every company. According to the upgrading stage of the current state of the procurement process, some influencing factors are important and some are not too important.

RQ3: How should the current process be developed to make it more efficient and risk-free

This part according to the listing key influential factors of the purchasing process above, to discuss the solution and put it into the real action.

3.2 Research method

3.2.1 The qualitative research

Qualitative researchers wanted to do justice to the research subject and be open-minded about what they would encounter in the field of research. (Boeije, 2010, 21). Two distinctions can be made concerning the research purpose. The first distinction is between research mainly aimed at description and research mainly aimed at understanding or explanation. The second distinction is between fundamental and applied research. (ibid, 27)

3.2.2 The observation, experience research

The observation is a notice or perceive something and register it as being significant. Watch someone or something carefully and attentively. (Oxford English Dictionary). To watch carefully, especially with attention to details or behavior, to arrive at a judgment. (Webster Dictionary)

Observation is not passively looking and listening. It requires careful, conscious, purposeful effort. Direct the attention to certain things, notice the particular elements, process the information, and determine the significance of the learning in specific questions. (Ross, 2018)

Observing human behavior is an important element of most user-research methods. The type of observation in user research entails usability testing, both observing and listening to participants as they attempt to complete tasks with a user interface. The

contextual inquiry, which means observing people in their natural environment, as they demonstrate their typical task. Naturalistic observation, the researcher attempts to observe one or more people unobtrusively, without interacting with them or interrupting and affecting their behavior. Shadowing, the researcher follows participants around as they perform their activities. Covert observation, similar to naturalistic observation; the researcher observes people without their knowing that they are being observed. Participant observation, a traditional ethnographic method in which the researcher joins a group and participates in their activities. (ibid)

The difference between these methods is the location of the observation, amount of interaction with the participant, proximity to the participant, participants' knowledge of being observed.

Planning an observation is to design the matter want to learn from the research. Observation involves more than simply going somewhere and passively looking and listening. The observation session can include time variety, the times of reviewing the same tasks, as well as the reflection, is needed also, reflect the matter that already observed and refine the focus for the remaining sessions. (ibid)

- Plan the goal of the observation
- Plan the research methods
- Plan the observation for what, who, where, and when
- Plan multiple sessions
- Conduct background research
- Determine the location
- Create an observation guide.

3.2.3 interview and analysis research

The interview method is a conversation with a purpose. Large amounts of relevant information about the experiences of others may be collected by directly questioning or talking to people.

The advantage of the interview can be widely to supplement and extend the knowledge about individual thoughts, feelings, and behaviors, meanings, interpretations, especially to the target of the professional people in the field.

Example of types of interviews for the research:

- 1) Brief survey
- 2) Extensive survey
- 3) In-depth interviews
- 4) Monologue, narrative, etc
- 5) Case study

There are two categories of interviews, the structured and the unstructured interview.

The characters of the structured interview:

- The key feature of the structured interview is in the pre-planning of all the questions asked.
- Structured interviews also allow for the exact replication of the interview with others.
- To an extent, it is possible to generalize what find out about the population from which the interview sample came.
- Questionnaires and surveys are common examples of structured interview tools.

The features of the semi-structured interview:

- A key feature of the semi-structured interview is in the partial pre-planning of the questions.
- Semi-structured interviews still allow for replication of the interview with others but are be less controlled.
- A great deal of qualitative research like grounded theory, thematic analysis, etc uses semi-structured interview material.

The advantage of the semi-structured interview can be the in-depth research is that much more detailed information than what is available through other data collection methods, such as surveys. The standardization of some of the questions can increase data reliability, the replication could be possible, the ability to ask some spontaneous questions is sensitive to participants' need to express themselves. It also provides a more relaxed atmosphere in which to collect information—people may feel more comfortable having a conversation with you as opposed to filling out a survey. (Woods, 2011)

3.2.4 Desk research

Desk research can be done from a desk, for example reading reports or looking for information on the internet. (Cambridge dictionary) Desk research is another name for secondary research. Desk research is not about collecting data, the role of it is as a user researcher carrying out desk research is to review previous research findings to gain a broad understanding of the field. (Travis, 2016)

Internal desk research, which can be treated as the most reasonable starting point of research for any organization. Much information could be generated internally within the organization as a course of a normal process. The main advantage here performance internal desk research is that it involves internal and existing organization resources to organized the collected data in such a way that it is not only efficient but also usable.

External desk research involves research done outside the organizational boundaries and collecting relevant information. These outsides resources are described online desk research is an incredible amount of data available online on the internet.

3.2.5 Benchmarking method

Benchmarking can be used to uncover hidden opportunities by putting it in a large of certain context to find out the distinguishment to implement best practices and create a competitive advantage of a learning process. There is a close relationship between a company's strategic objectives and how they benchmark performance. Here is a relationship relating to the benchmarking process to ensure a consistent result will be achieved over time.

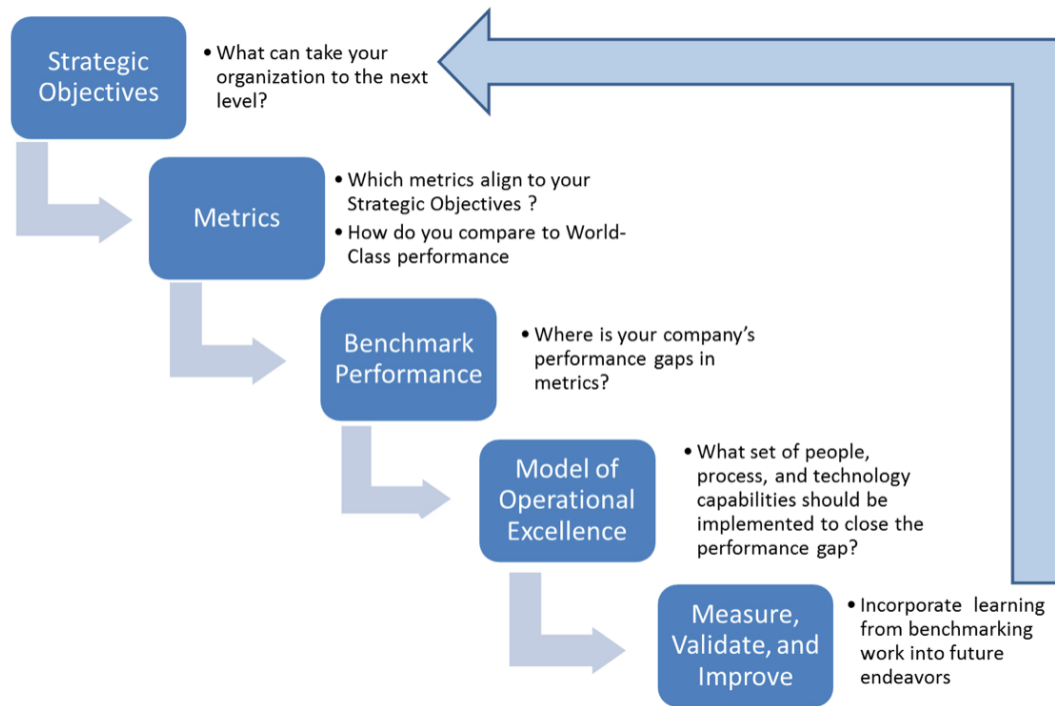


Figure 5: Benchmarking methodology (Littlefield, 2012)

The process benchmarking focuses on discrete work processes and operating systems. This form of benchmarking seeks to identify the most effective operating practices from many companies that perform similar work functions.

Performance benchmarking enables managers to assess their competitive positions through product and service comparisons. Performance benchmarking unusually focuses on elements of price, technical quality, ancillary product or service features, speed, reliability, and other performance characteristics.

Strategic benchmarking examines how companies compete. Strategic benchmarking is seldom industry-focused. It roves across industry seeking to identify the winning strategy that has enable high-performance marketing in its marketplace. Strategic benchmarking influences the long-term competitive pattern of the company. Consequently, the benefits may accrue.

Application and benefits of benchmarking research is a remarkably versatile business tool. Benchmarking is powerful because it can be applied to virtually every function in the companies. Moreover, the frontline manager is using it in many new and creative ways. The frequent application can be included: setting and reefing strategy as today's market is in a dynamic state of flux, consequently, important insight can be

gleaned by studying the experiences and competencies of others. Re-engineering work process and business system, continuous improvement of work processes and business system, strategic planning and goal setting, problem-solving, education and idea enrichment, market performance comparisons and evaluations, the catalyst for change. (E. Bogan & J. English)

3.3 Research implementation

The research is based on an interview from two real company's purchasing manager. The interview target is the two companies that the author had internship experience, therefore the interview from it will easier to understand and obtain empathy based on the former observation and working experience.

The interview is carrying out online with mobile for half-past one hour per company. The author prepares the question in advance and discusses with the purchasing manager from two company. During the interview, the author listening and recording to the purchasing manager's patiently answering each question and their thinking to the managed purchasing work and the purchasing process. Afterward, organize the note for analyzing.

The analysis of the interview will objectively according to the background of the company's business and to be rational to the difference of the enterprise climate. Next is through the qualitative method, from the subjective of the author to judge the existing recording, during which also associates the theoretical basis and information from desk research.

The desk research will be mainly carried out in the Toyota case study of the information collection. The qualitative will throughout the whole process.

This interview research mainly belongs to the semi-structured interview two interviews are carrying out in the former internship company. Both of the companies are car parts manufacturing company. This interview can give more information and remind the details that do not see during the author's internship period and the perspective of opinions that accumulate by a certain experience level of the manager. Through the observation and experience associate with the theoretical knowledge to

furthermore reflect and research the influence of the purchasing process and the steps in it.

Toyota's success has been well documented as an accepted fact. Both of the two interviewing companies are the car parts manufacturing company. Toyota can be used as a benchmark for comparison learning between the two companies. The research result is derived from the investigation and comparative analysis.

Toyota benchmarking

The research of the Toyota case study will be based on secondary research. To get the document from the existing analysis. The conclusions drawn from group representatives of different roles can be compared. Toyota can be the benchmark in the car manufacturing career, the management level, and the control of the purchasing also the degree of standardization can be learned.

Company interview

To research the two companies purchasing the current state, through the interview of two companies manager and then associate the experience and observation during the internship in the two companies. Get the state of the example companies purchasing and the process currently state. find and spotlight some of the common problems among the enterprise and can be generated conclude and expend it to a group of the specific problems, and not just limited to the character company that interview and research. Refined the problems to make it more valuable and et a clear direction of the problems solving and make it worthwhile to set the stage for the rest of the discussion

Conclusion

Apply the theory to the analysis of the actual operation process of the company, and combine the purchasing manager's perspective and ideas; To identify potential or existing problems with each company's procurement process. These problems will be combined with the actual situation of the company's management and operation to consider.

To analyze the two company's purchasing processes and find some of the problems of the potential capability that can still be improved and then discussed with the companies' manager to draw their viewpoint to the development of purchasing and the purchasing process.

To figure what is the problem that in the purchasing process, to analyze the source of risk produced, how does it affect the purchasing process. Then how to solve it and improve the purchasing process.

4 Case study

This case study is using both internal and external desk research based on the information provided by the Toyota official platform, without working experience at Toyota. Toyota is a large model car manufacturing company and does well in purchasing and supplier management. Therefore, it can be regarded as the benchmarking to do some comparisons and learning.

The purpose of the study is to use the given resource to find its spotlights and make some of the comparisons and analysis. The larger model manufacturing company always require a higher level of standardization and more depend on the management of the concrete process in purchasing, and a stronger power to regulate and control. This study is intended to find the way of Toyota's supplier selection process, how does it carry out in the working flow. The purpose of Toyota to set the requirements with its objectives.

4.1 Toyota introduction

Toyota is a Japanese car manufacturing company, was founded in 1926 by Sakichi. (Toyota industry corporation). Toyota's success is an accepted fact. Toyota has won an international reputation for its superior quality, ability to reduce costs, and ability to sell cars in the global market. By any measure, Toyota is a highly profitable com-

pany. Toyota makes billions of dollars in annual profits and has a cash hoard of \$2 billion-3 billion at any one time. Toyota's results must have something special. (Liker & Meier, 2011, 2)

Enterprise philosophy represents the belief of the enterprise and is the integration of the fine traditions of the enterprise in the process of sustainable operation and long-term development, to meet the requirements of The Times, formed in the practice of employees. The corporate philosophy is manifested in the group's ideas, beliefs, values, moral standards, psychology, and other aspects. Once formed, it is not easy to change and has a long continuity and structural stability.



Figure 6: Five Values (Toyota industries corporation, n.d.)

Five Values that form an action guide for the employees to enforce the basic philosophy. The “Five Values” were assembled as an “action guide” for the employees of Toyota Industries. Every one of the employees is to think for themselves and determine, “What concrete action should be taking and how should change?” They will then share these thoughts, and by also sharing a similar set of values they will aim to promote the future development of Toyota Industries.

Business partner

Toyota respects their suppliers, dealers, and other business partners, and work with them through long-term relationships to realize mutual growth based on mutual trust.

Whenever they seek a new business partner, they are open to any candidates, regardless of nationality or size, and evaluate them based on their overall strengths.

Toyota maintains fair and free competition following the letter and spirit of each country's competition laws.

Toyota product parts group of the purchasing are summary as:

- Foundry parts
- Die-casting parts
- Cutting parts
- Stamping parts
- Sheet-metal parts
- Rubber and resin parts
- Electrical components
- Materials (Ferrous/Non-ferrous)
- Industrial greases and chemicals
- Machinery and equipment
- Tools and jigs
- Others

4.2 Toyota purchasing process

Supplier selection in the purchasing process

Toyota gives a specific policy to each of the supplier selection to the business segments. The requirements of the supplier selection are slightly different because of the function and usage of the purchased goods. Here are the criteria supplier selections for the list of each segment. Toyota gives detailed requirements and expectations for supplier qualification and product quality of each material of the purchasing.

Toyota classifies direct purchasing products into three main groups and several subgroups. The first table illustrates the main purchased products in automobile, textile machinery, other segments, and the conditions for the supplier selection to each subgroup of the main purchasing items.

Business Segment		Main Purchasing Items	Recruitment Requirements
Automobile	Vehicles	<ul style="list-style-type: none"> • Automobile press parts, resin molding parts 	1. Suppliers that possess the know-how and technology to provide us with low cost molded resin parts in small quantities
	Engines	<ul style="list-style-type: none"> • Engine parts for automobiles and industrial vehicles (aluminum cast items, die cast items, cast and forged items, sintered items, seal parts, rubber hoses, metal bushing, electrical equipment, pipes, resin parts, pumps, combustion system devices, press items, core forming parts, etc.) 	<ol style="list-style-type: none"> 1. Suppliers that can provide competitive, low cost, high quality automobile and industrial vehicle engine parts, and can also adhere strictly to volume and delivery date requirements. 2. Suppliers that can utilize unconventional materials and methods to reduce the weight and cost of parts.
	Car Air-Conditioning Compressors	<ul style="list-style-type: none"> • Car air-conditioning compressor parts 	1. Suppliers that can provide pressure-resistant, airtight, aluminum die cast parts, ductile cast iron products, resin parts (insert mold parts), press parts, bolts, springs, and bearings, etc.
	Car Electronics	<ul style="list-style-type: none"> • Electronic components, PCBs, etc. 	1. Suppliers that can provide electronic components and PCBs at low cost and in small quantities, and also have experience with in-vehicle systems.
	Stamping Dies	<ul style="list-style-type: none"> • Parts for press dies 	1. Suppliers that can provide small cutting parts for press dies at a low cost and in a short delivery time.

Table 2: Automobile parts purchasing and the requirements for supplier selection

Textile Machinery	<ul style="list-style-type: none"> •Cutting and processing items for textile machinery parts (lathes, milling machines), cast and forged items, etc. •Can manufacturing equipment 	<ol style="list-style-type: none"> 1. Suppliers that can machine process various products in small quantities at low cost and then deliver them quickly. 2. Suppliers that can machine process finished, ready-to-use, individual service parts at low cost and then deliver them quickly. 3. Suppliers that can do small lot SUS box welding
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Table 3: Textile machinery part purchasing and the requirements for supplier selection

	Factory Equipments	<ul style="list-style-type: none"> • Can making equipment, machine processed parts, etc. 	<ol style="list-style-type: none"> 1. Suppliers that can provide (high precision processed) individual parts for machine tools at a low cost and in a short delivery period (within 10 days).
Others	Corporate Head quarters	<ul style="list-style-type: none"> •Steel, recycled aluminum bullion, new bullion, low pressure items, oil, paint, industrial chemicals, etc. •Machinery, jigs, processed items, etc. •Cast materials(corks, ferro silicon, silicon manganese, etc.), recycled aluminum blocks, work accessories for factories (work gloves, stretch film, ear plugs, etc.) 	<ol style="list-style-type: none"> 1. Suppliers that can provide steel, non-ferrous, and other general secondary materials at a low cost and in a short delivery period. 2. Manufacturers that can provide jigs, tools, and other single items at a low cost and in a short delivery period. 3. Foreign suppliers that can steadily provide cast materials, recycled aluminum blocks, and factory parts at a low price.

Table 4: Other parts purchasing and the requirements for the supplier selection

Toyota does well in the defined specification. The supplier selected requirement is regulated by the classify of the purchasing items. The supplier recruitment in Toyota lists the corresponding condition of each group item, it can be concluded as:

- Define the specification of the products
- Know-how and technology
- The delivery period, the delivery capability assurance
- Low-cost structure of the process
- Experience level with the in-vehicle system

Toyota supplier selection process description

At Toyota Industries Corporation, the procurement activities are based on fair business practices to realize amicable relationships and mutual benefit.

Toyota Industries Corporation is involved in a wide range of business fields and procures the parts, materials, and equipment for these many different businesses from suppliers all over the world. Along with requiring Toyota's suppliers to provide quality items at a low price and promptly, Toyota cooperates with them to promote environmental preservation and meet the other demands of society. Besides, Toyota takes a long-term view of their relationships with suppliers to realize an amicable relationship of mutual benefit based on fair business practices.

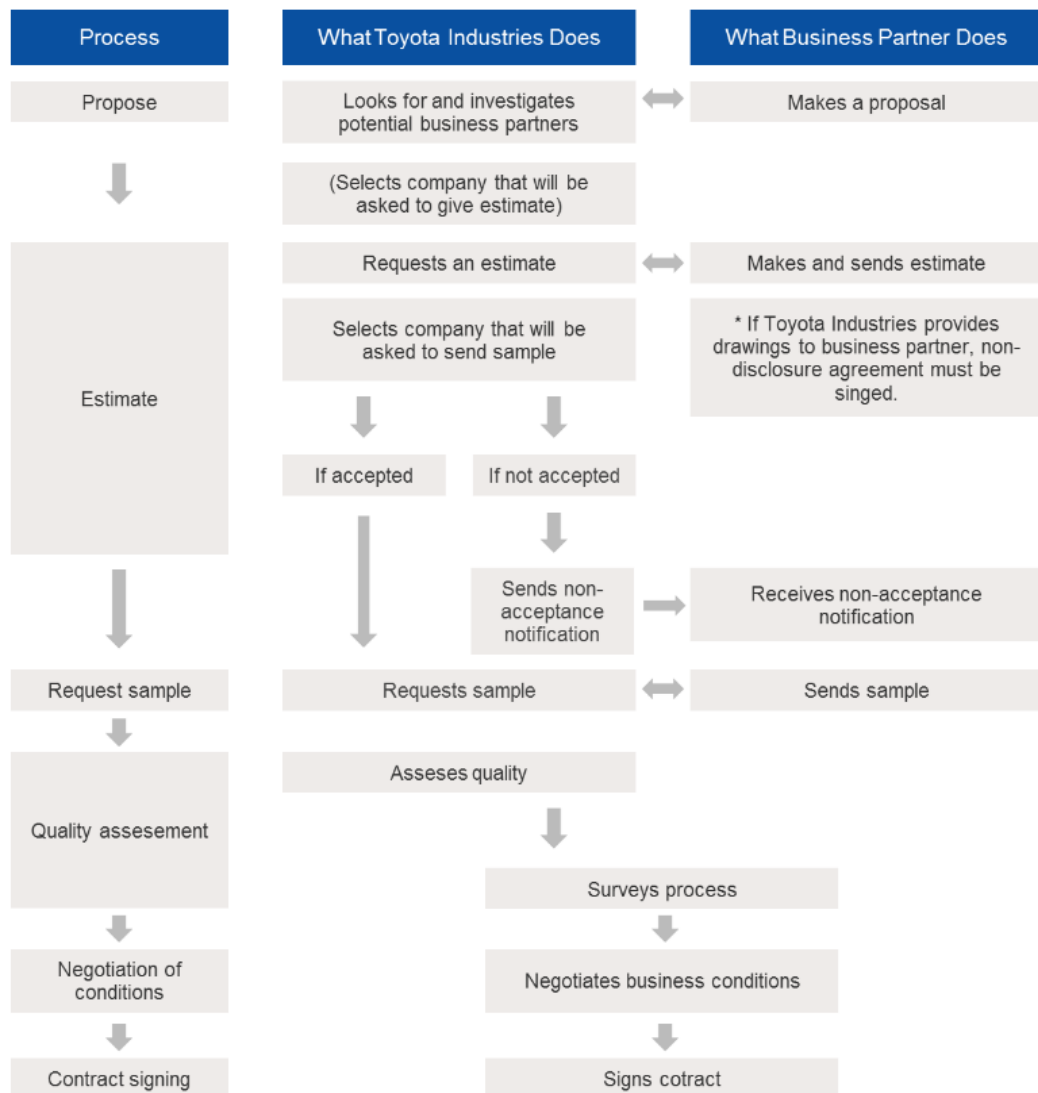


Figure 7: Toyota flow chart of the purchasing process (Toyota industries corporation, procurement)

In Toyota's procurement process management, Toyota has invested generously in supplier partnerships. Toyota has a rigorous selection and selection process for suppliers, who must prove that they are capable of gradually integrating into the partnership network. Toyota in the selection and cooperation of suppliers; Toyota will value the good work done by its suppliers, and it will not break up with them in pursuit of cheaper alternatives. (Liker & Meier, 2016, 257)

4.3 Analysis

The research of the Toyota purchasing process should not only be based on the process structure also realize more about the Toyota model and the purchasing management.

Toyota shows the basic operative purchasing process in the supplier selection.

Toyota classifies and lists the group of purchasing products. The criteria for each product can be slightly different to ensure to meet the need of the manufacturing and organization.

The matters that lead Toyota to do these investments, give up the lower unit price of purchasing to try to find out, and cultivate long-term supplier relations would be complex issues. Firstly it could be a problem factors, the second is the engineering design of products and processes, the third is a precise and sensitive production system; the materials management and inventory can help to the speculation of the purchasing, even if production means more than just reducing inventory, it exposes problems for employees to solve. Toyota extends this system and its fundamental philosophy to its suppliers. A supplier is an extension of an assembly line and wastes anywhere in the value stream, from raw materials to delivery, must be eliminated. The third is that Toyota requests to innovate. And finally is that Toyota realized that the overall financial condition of Toyota enterprise system was determined by the financial condition of each part of the enterprise system. Toyota needs strong, powerful suppliers to contribute to its overall system. (Jeffrey & David, 2016, 257)

This is the concept of Toyota's supplier selection and management in its purchasing process. Nowadays, many companies pay more attention to the single cost deduction, and the criteria for the product quality are just meet the standards of quailed which would be enough, which are a little limited to the short-term priority. In this way, they are hard to select a proper supplier and reach win-win development with them, also hard for the next stage of the development with the supplier. The result of this situation would often need to find new suppliers compared with Toyota. This kind of working step for the supplier selection in the purchasing process should be problematic. Moreover, it is a relatively hidden issue that can't find out directive as it

needs a long periodic and an overall perspective to reflect. On its own, such a supplier selection method is not wrong, but taking a long-term development perspective will indeed bring a great loss to the company's profits and limit the improvement of procurement potential.

4.4 The benchmarking result and conclusion

Purchasing is rather significant to Toyota, Toyota allows its suppliers to do their own thing, but only based on facts. Nor will Toyota take a hands-off, hands-off approach, which places a high value on the reliability of its components and the quality of its products.

The reason is that when suppliers are forced to offer low prices to win bids, they must find ways to make money. The first is to charge for required engineering design changes or any special services, or the supplier may reduce the investment in the process to a minimum. (Jeffrey & David, 2016, 282)

Instead of aiming to be a low-cost carmaker, Toyota aims to produce vehicles that are reasonably priced and that customers think are good value for the money. Toyota's philosophy suggests that the philosophy of price reduction should not be a one-way pursuit of the lowest cost. The definition of target cost should mean that the supplier must ensure that the supplier's cost leaves a profit margin for itself in the part price paid by the customer.

What matters most is that a lot of work needs to be done to make the ability of suppliers to match the internal strength of the company. But it's also worth it. The huge benefits from this approach far outweigh the short-term cost savings from the pursuit of cheapness. (ibid, 259).

Toyota's purchasing process places a great emphasis on supplier selection. A suitable supplier is the best. In the purchasing process, it entails not only the internal of the purchasing department also the follow up steps receiving and payments. The accidental problems to be solved should be trouble and suddenly, what matters most is to try to transfer the potential risk to the beginning at the purchasing process and the supplier selection would be a vital part. The conceptual of the supplier selection will derive to the particular operation in the steps of the supplier selection method

and the criteria of supplier audit. The conditions of the supplier should be associated with the company's long-term development goal.

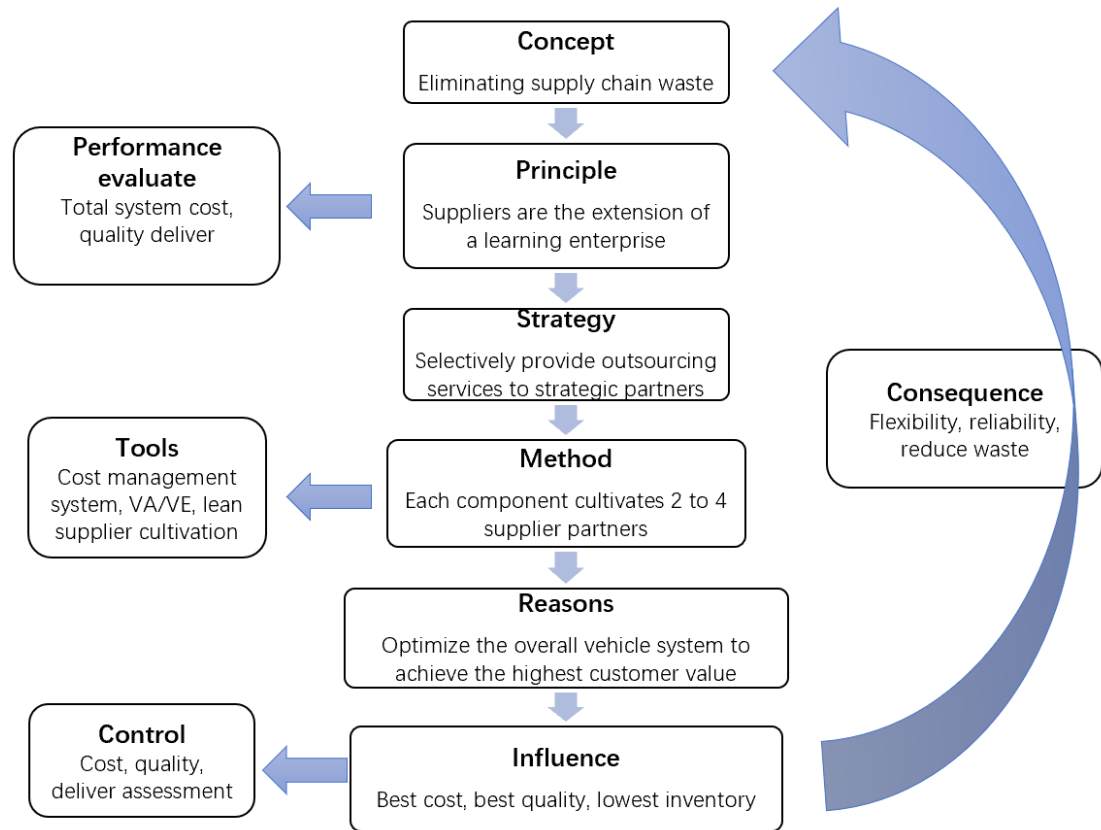


Figure 8: Toyota lean purchasing supply chain process (Liker & Meier, 2016, 283)

5. Company interview

5.1 The current state description

Both of these two company can belong to the middle model of enterprise in domestics, however, are a different position.

For many middle model company. The purchasing process state can be relatively simple, and not very standardized. The design of the purchasing process is mainly based on the amount of price, or just for this factor.

5.1.1 Company A

Business introduction

Company A is a subsidiary of Company AX. It was founded in 1999. It's a company that makes auto parts, the main products of the company are: carbon steel and aluminum-magnesium alloy cylinder assembly, silencer assembly, dry powder fire extinguisher assembly, cylinder modular process assembly, medium and thick plate punch welding parts, and brackets, etc., the process technology involved is stamping, welding, assembly, mechanical processing and so on.

Company A is a subsidiary of company AX has 26 holding companies and wholly-owned subsidiaries in all. The business of the company involves in the manufacture and sale of whole vehicle and parts. The business of the company involves in the manufacture and sale of whole vehicle and parts. The branch company of *Company AX* is with a slightly distinguished business scope.

The management organization of purchasing in *Company AX* belongs to decentralization management, different from the following interview company *Company B* which belongs to centralization management. They empower the molecular company and do not have too many constrain to each branch unit. There will also be some priority given to the sharing of resources between the molecular companies and the cooperation between the supplying resources. Based on the model of the company and development requirements in the current state, *Company A* has put large attention on technology research and product quality development.

The purchasing process description

The purchasing process in *Company A*, give the concrete process of raw materials purchasing, the enterprise purchasing mainly purchases materials needed for production and inventory. Some of the non-productive procurement which is not very significant or with the small batch of the purchasing and not in regularly purchasing even not through the purchasing process and will be hand over to the required department itself.

And the design of the purchasing process is mainly constraint to the internal working steps and the steps for the implementations to the information transmission in the internal. The purchasing process is like the business guidance function.

After the ordering, the purchaser will go to the supplier production site to evaluate the delivery. Before the receiving, the purchaser always leaves a safety time to informed the supplier again and wait for their reply to ensure everything goes well before or to or take urgent remedial action.

Supplier selection description

The supplier selection in *Company A* is mainly using the location near supplier resource, the far location supplier is relatively less. The advantage of this situation is that delivery problems are relatively simple and easier to control. The reason for this also attributes to the density of the near location supplier resource for the auto companies or the auto car company.

Most of the purchasing process materials are belong to direct purchasing and less percentage of indirect purchasing. For this indirect of the purchasing, they sign the open contract if the supplier performs well also cooperation is good they will automatically continue supplier cooperation and contracts.

The supplier selection of *Company A* entails, an invitation for bids which mostly applied to indirect supplier selection, the customer introduces, which refers to the customer reliable to the certain company and recommended to *Company A*. They seldom find the manufacturing supplier through an online platform, as the location advantage of the supplier and customer, and part of the suppliers are also the subsidiaries of the *Company A* they can prioritize the advantages of resource integration.

For the new supplier development, the first steps are to ask for the new supplier business license, to check the company's basic information, they also need the supplier's credibility indicators, and the financial statement especially the balance sheet. Before the final decision of the supplier, the purchasing department will consist of a team to examine in the factory of the supplier. The team member is constituted of partly members of the technology center and purchasing to cooperate with the inspection work.

One character of the purchasing process in the purchasing part is that a certain group of the purchaser are good at technique, and few of them are come from the company's technique center to assist the quality control of the purchasing.

The purchasing process of this company is to focus on the implementation of staff in the internal information transmission, the decision making power is to concentrate on the manager of the departments. The purchasing process is paying attention and main energy to the quality and technique aspect, the professional of the purchasing ability is not typically conspicuous. However, cannot simply judge the purchasing organization process and attribute it to the bad one, as it possesses the typical advantage for its business model and climate. Therefore the improvement of the purchasing process is a comprehensive and complex thing as it needs to consider varier aspects of the factors.

5.1.2 Company B

Business introduction

Company B, founded by an American company, a Chinese company, was formally established in 2004. *Company B* is the headquarter and possess 18 branch companies. *Company B* is a strategic supplier of automobile seat of *Company C*, which is mainly engaged in the research and development, manufacturing, sales, and service of an automobile seat and its parts. They are concentrate on the Integrated management and control of the molecular company also pay attention to supplier resource sharing. All the molecular companies of *Company B's* are of the same business scope, producing car seats.

Purchasing process description

The current state of the purchasing process. The example purchasing process for the headquarter indirect purchasing process. The indirect purchasing process represents one small purchasing process. The purchasing process for indirect and directive purchasing is different. There are also the headquarter purchasing process, factory, or subsidiary purchasing process.

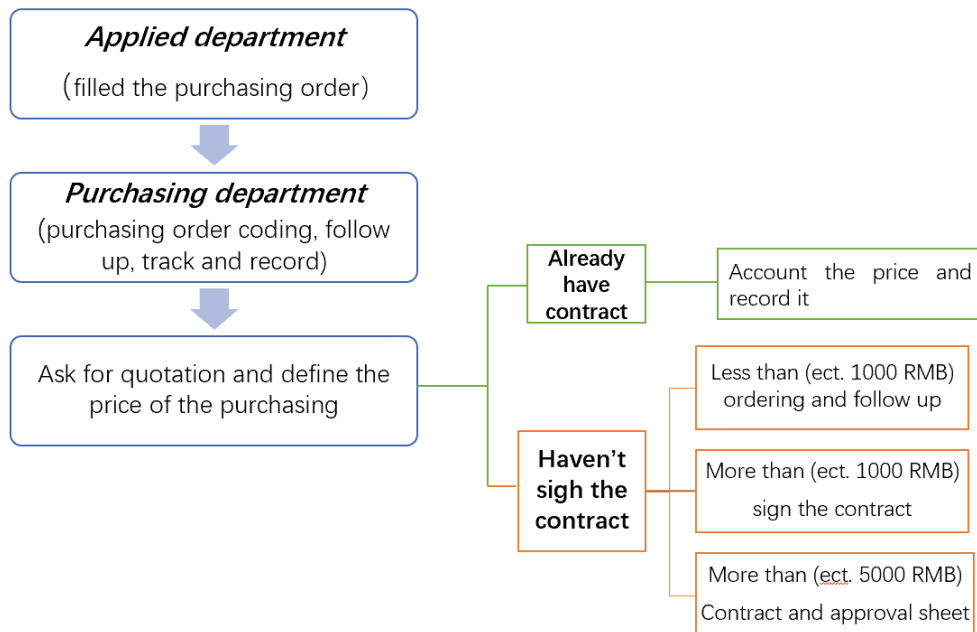


Figure 9: *Company B* indirect purchasing process

Here the list is a basic structure of Dongfeng Lear's indirect purchasing. Different departments will make a request for supplies and fill out a purchase order, then it will hand over to the purchasing department. The purchasing department will be coding the purchase order to facilitate the management of which include tracing and following up, the principle of the coding is similar to the coding of the material. The coding should be required that can identify the subsidiaries with headquarter and the distinguished department.

After that is to ask for a quotation. In this step are existing the two situations, use the existing supplier, or to find a new supplier. Most of using current supplier situation is based on the open contract that signs with the supplier before, these kind of contract are responsible by purchasing department and many of these contract time limit is around 2 to 3 years which also reflect this kind of the purchasing is regular purchasing with leverage suppliers. To find a new supplier is often recommended by the applied supplier or they need to find at least 3 suppliers to compare. In this time the signed contract belongs to the closed contract, which refers to a one-time contract and the time limit is around one year.

The following process is designed and classified according to the price of the transactions in a purchase order or the budget. The price in the graph is an example, it is regulated by the practical company's strategy and operation and financial

capability. For instance in the flow chart, if the purchasing process is less than 1000 RMB, then the purchasing order will be sufficient and do not need to sign the contract. If more than 1000 RMB, the contract will a compulsory item. If the price is not only more than 5000 RMB not only the contract is required but also the approval sheet to this purchasing.

The indirect purchasing is relatively special which possess relative includes a large amount of service purchasing. The purchasing order price will ask to include the budget of the purchasing. The small amount of the purchasing will often decide by the required department.

Furthermore, the company will give arrange a different level of control according to the amount of purchasing. Here is only an example of the amount criterial, the practical amount of criteria will be decided by the company, and the strategy.

The purchasing approval always is QCDD, evaluate the quality, cost, delivery, technique.

Receipt	Goods and materials acceptance sheet
Refers to an acceptance certificate	Receipt of fixed assets
	Rating service acceptance form

Figure 10: Procurement receiving acceptance process

As the purchasing include products or the service thus the different receipt form. The goods acceptance sheet is the basic is to illustrate the receiving goods. The receipt of fixed assets, and the evaluation of supplier services like in time delivery no matter the reason for the delay, the quality of the batch product or the service.

Payment	Purchase order
Provide the payment application sheet	Invoice provided by supplier
	Contract
	Supplier approval certificate
	Quotation
	Receipt

Figure 11: Payment conditions and implement process in purchasing

Purchase order, invoice, a receipt is the necessary information for the application of the payment. The contract, supplier approval certificate, and the quotation is required according to the transition price which set for the different degree of regulation and verifies. All of the payment sheets refer to the certified information to the next department to verify.

Supplier selection description

The indirect purchasing in Company B, one of the principles for purchasing is low cost. The supplier's number is huge compared with the production purchasing suppliers.

Generally, the supplier selection needs to compare at least three companies to prove the selected supplier is relative the best, which can represent a good option. The supplier comparing the quality and diversity of the products however that should be decided according to the specific purchasing goods. Another selection of the method of the supplier selection can be decided directly by the general manager which means the supplier is excellent in the industry.

Current purchasing process state

The purchasing process of a company is constrained and affected by so many business factors in the company. The comparison with *Company A* and *Company B*

are list in the following table. The purchasing function is always strongly orientated on operational and administrative activities. (Weele, 2010, 68)

	Company A	Company B
Position	Factory purchasing	Headquarter purchasing
organizaion in procurement	Decentralization	Centralization
Purchaing range	Both direct and indirect	Indirect
Responsibility	Ensure the factory operation	Control to the subsidirasy and the whole purchasing system
Types of the product	Auto parts	Auto seat

Table 5: Difference in purchasing in *Company A* and *Company B*

The factors that could affect the purchasing process

- The position of the company
- The products of the company sell
- The model of the company
- The management of an organization in the purchasing
- The Location range for the purchasing process

There are also the headquarter purchasing process, factory, or subsidiary purchasing process. These purchasing process could also be slightly different, and the role of it is distinguished. A factory is to maintain its normal operation, mainly for direct purchasing, the subsidiary purchasing includes both direct and indirect purchasing. The headquarter can be a control of the whole system and uniform the basics of the standard in each business purchasing process. The objective is the orientation of the purchasing process made and implementation.

The products of the company sold decide the purchasing orientation and influence the requirement, method, strategy to the purchasing process.

The type of purchasing products can be roughly classified into direct and indirect according to the connection with the operation. The purchasing process for indirect and direct purchasing is different. The supplier selection is tended to longer cooperation than indirect purchasing. In both of the two companies tend to sign the open contract with the reliable production supplier or the regular requirements purchasing. In this way, it can be found that the supplier selection should take the disposed of cooperation time with the supplier into consideration and to adjust the criteria and level of the supplier ability evaluation.

The organization in the purchasing includes the centralized, decentralized, and hybrid structure of the organization. These types of organizations mainly affect the information transitway in the detailed purchasing process.

5.2 Interview analysis and result

The perspective of the purchasing managers is specific to their own working company. There exist the relative conspicuous distinguishment on it between the two companies, however, those are suitable for the current state of the company's situation which entails the leadership, business condition, the responsibility range of the department, the organization structure in purchasing. The suggestion from *Company A* tends to guarantee the factory operation purchasing process. *Company B* is headquartered perspective to the whole purchasing system control.

Company A (non-print sources, personal communication)

- ◇ The comprehensive ability of the purchaser
- ◇ Supplier evaluation and conclusion is significant.
- ◇ The standardized purchasing process is rather necessary.
- ◇ Broken the bottleneck of the resource Chanel

Company B (non-print sources, personal communication)

- ◇ The professional purchasing ability of employees is essential
- ◇ Simplify the procurement process while effectively controlling the procurement process and to improve the efficiency
- ◇ The standardized purchasing process to mitigate risk and regulate personnel
- ◇ Pay attention to the EHS when doing the supplier selection
- ◇ Moving from solving and managing problems and risks to forecasting and more risk aversion.

5.2.1 Key factors

The purchasing process is based on understanding and recognizing the methods and ways of working. There are some key factors that essential in the process of supplier selection, which are needed to pay more attention and scrupulously treatment to it no matter the difference and the model of the company.

The financial condition of the supplier is an important factor in the supplier development potential evaluation as it is a crucial indicator to make sure the supplier's normal operation which means that relatively low risk for make long relationship with the supplier. The cost structure is for analysis of the profit of the supplier. Supplier within the real profit in the transaction, the risk in another part of the charge or quality charge be relatively low, the transaction is more transparent. EHS could be a crucial risk factor which worth to arouse many company's attention. From the perspective of the risk management mentioned in the 2.3.1, it can belong to the high financial risk with the medium or low probability of occurrence. The supplier site audit is to ensure the EHS, the operation of the supplier as well as to reduce the risk of delay products.

Risk

- The financial condition for supplier
- the cost structure of the supplier products
- EHS
- Supplier site audit
- Human risk
- The most proper supplier

It is perceived that unusually the consideration should associate with risk factors and the efficient factor. As efficiency will be a large obstacle in a longterm perspective of the development and it will gradually become the potential risk for companies and jeopardize the company's profitability.

Efficiency

- A standardized purchasing process
- The research and development ability of the supplier
- The profitability of the long-term perspectives

The not so important means compare to the core factors, and it is the result in comparison. Moreover, there is a certain range for not essential factors for each company.

Not so important in the supplier selection

- The location of the supplier
- The quotation of the supplier, mainly the single buying price.

The effect of the key factors in the selection process

The key supplier can be regarded as the extended part of the company's, and the financial condition will directly be influenced by the operation. The supplier's financial condition can seriously affect product delivery capability, product quality, and innovation input.

Human risks include many uncertainties factors, such as the professional ability, error in working is inevitable even with the low probability and this is directly relevant to the management level. Therefore, standardized purchasing is necessary to establish no matter in what type of company's. The standardized procedure can be used to regulate the employee's working and avoid the risk.

The EHS refers to the environment, health, safety. It establishes a systematic preventive management mechanism. The EHS condition of the supplier should be qualified, that is vital. No matter the level of other capabilities for the supplier, the unqualified EHS could take a great risk, and only time will tell.

A supplier site audit is a very important link in the process of potential supplier evaluation, new product development, production part approval, supplier system

development, problem analysis, and solution, etc. Enterprise operation is a big system, all links are closely linked and influence each other. For a manufacturing enterprise, any details of the site can be seen.

One thing that needs to take care of is that, although it is a good thing that the supplier's comprehensive capability is excellent, it does not mean the best or most proper for the company. What matters most is that company should be careful about the service level can gain from the supplier which means the supplier's business attention put on the company, which is essential for the company intends to cultivate the key of strategy such as the long-term cooperation supplier. The actual activity implement in the step of the purchasing process can add one more task of evaluation for the company's' cooperation business occupied percentage in supplier company to guarantee the best of service quality attention.

The audit to the research and development capability of the supplier is for the sake of supplier development in the following stage of the company's operation. It is means the preliminary condition for cultivating the key supplier.

The target is ensuring that the employee behaviors are consistent with the objectives and strategies of the organizations. Through the specification of the procurement process to constrain and realize the specification of procurement personnel.

The standardized procurement process to control procurement operations can reduce and avoid the risk in the purchasing process, which includes the personnel risk and corporation risk. About the standardized, standardization does not mean be sure to follow the rules and work according to the rules; Inhibit the creation and will of the purely mechanical act. The meaning of standardization is, without standardization, there is no improvement in operation law; Standardization is the basis for continuous improvement. The establishment of standardized procurement processes and procedures is the key to ensure stable performance. Only when the standardization process is stable can creative continuous improvement strategies be implemented. (Liker & Meier, 2016, 105)

The current purchasing process state of many manufacturing companies in the short-term perspective for profitability. The supplier selection is only based on the low price and quality which can result in the potential in the long-term and drive up the

total cost from a long-term perspective. The figure below shows the traditional supplier selection and management model.

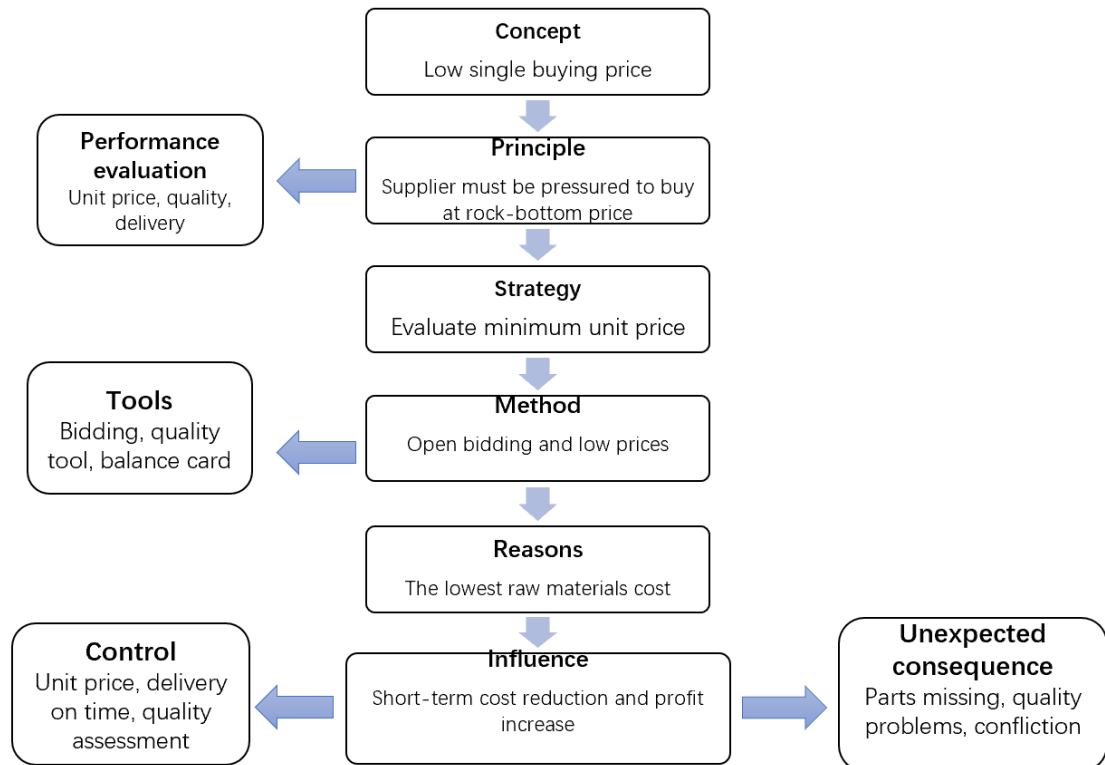


Figure 12: traditional purchasing supply chain model (Liker & Meier, 2016, 284)

Cost reduction efforts should not be limited to a single-track pursuit of the lowest cost in vendor selection. The outcome of the pursuit should be the set target cost, not just the target price; The target cost means that the supplier must ensure that the supplier's cost leaves a profit margin for itself in the part price paid by the customer. (Liker & Meier, 2016, 282)

5.2.2 Summary of improvement needs

The supplier audit can be a rather important part of the selection of the supplier. Then the criterion of carrying out a better supplier audit will bring the safety and the satisfying result of the quality of supplier selection to companies. The target in the supplier should be transferred just from the quality, low price, the short-term profit to a longer development.

The large wide range of the supplier database can support a better supplier resource and assist to find a better supplier which more proper to the company's cooperation with it. In this way, the company needs to make sure the adequate of the suppliers,

which means to break the bottleneck of the supplier resource. The company has to set certain requirements for a potential supplier: it can be a supplier's location, reputation, costs, capacity, and financial stability. However, it is also extremely essential for a company to identify what factors are the core ones as those criteria depend on the company's needs and business field (Beliaevskaia, 2017, 40) which needs to consider associate the business condition by the requirements steering in this stage and the development later.

The step follows up is the methods for Order handling. The function and the purpose are ensuring order conditions and actual delivery meet the specified requirements. Exception expediting, routine status check, an advanced status check can be all used in the follow-up. Outsourcing is a method, by specialization, by a division of labor, by sharing responsibility. Moving from solving and managing problems and risks to forecasting and more risk aversion.

Through the perspective of the supplier management: entails the tasks of managing supplier audit, managing contract, supplier relationship management. The supplier relationship management includes new supplier development, maintaining existing relationships, and end supplier co-operations. In this way, the impact of the selected supplier does not stop only these steps, the effect runs through the work of supplier management. Consequently, do not neglect of supplier design and development capability assessment.

During the two company's interview noticed that no matter the model or the organization of the company. The supplier development is a conspicuous issue, which decided the relationship of the company, it is the fundamental factor to establish a long-term relationship and to develop to the key or strategic supplier. The ideal purpose of the relationship is to get a win-win outcome and development. Hence, the supplier should possess the sufficient ability to support the later on development and product to upgrade. The comprehensive level of ability of supplier and customer should match or else it should be trouble when the supplier can't provide the customer the satisfied product upgrade to meet the customer requirements, then the customer has to face the urgent choosing, end the co-operation relationship with the customer and to provisionally. Supplier review needs to be multi-faceted, and do not Limit to product quality and purchase price.

5.3 Improve purchasing process

Improve purchasing process is to give some action correspond to the key factors mentioned previously and further suggestions for the improvement of the procurement process of A company and B company. Transfer the analysis and requirements to implemented action to avoid the problems in the process.

The purchasing product should be classified, furthermore to classify the product-related supplier. The different targets supplier should correspond to the distinguished treatment with the carry out working flow. The concept can be traced from Toyota's lean management too. To reduce energy waste and decrease the management cost, increase the efficiency and effectiveness of the process implementation. Below is the general principle for the supplier type classification.

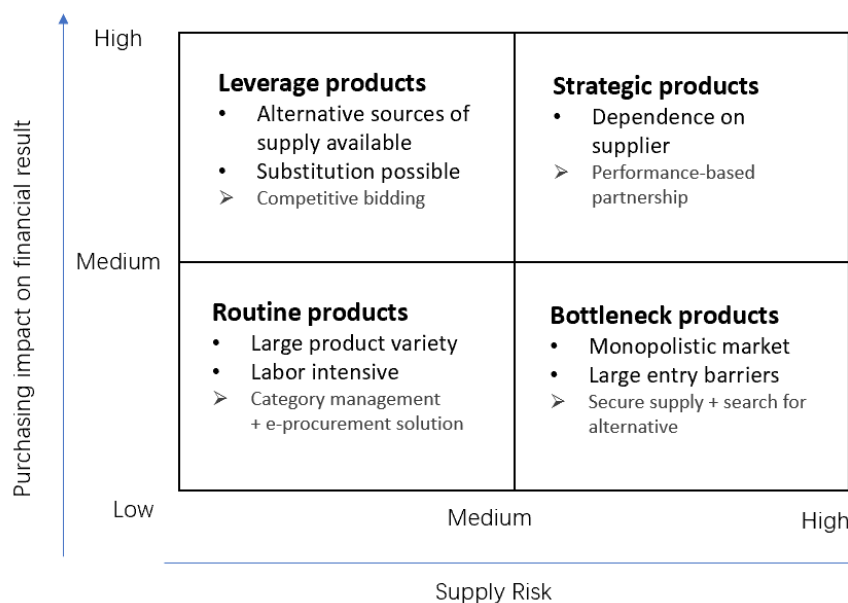


Figure 13: Supplier portfolio (Weel, 2010)

The dependency on the routine supplier can be relatively low. To slightly reduce energy on this group of suppliers thus the process can be simplified. Outsourcing can be taken into consideration while the cost is reasonable.

The leverage supplier representative of the high cost of products, the law in public bidding can be taken into action to appropriately reduce the cost.

The strategic supplier is suitable to establish long-term cooperation with the supplier, therefore the supplier selection needs to be more strict, the corresponding selection process could be relatively comprehensive to ensure the future development of the supplier.

For the bottleneck supplier, the customer usually is more active. Focus on using standardized products, monitoring orders at all times, and optimizing inventory levels to find alternatives and potential suppliers wherever possible.

Supplier financial condition risk control

A good financial situation is a prerequisite for risk control. If the supplier's finances have problems and potential risks, the supplier's company may have capital chain problems and affect the production of products and the supply of services, and further affect the company's receipts and the quality of goods. If the supplier's company is bankrupt due to financial problems in the future, such as a financial break, the company may need to urgently find a new supplier and at the same time also need to face higher costs.

To avoid the possibility of financial risk, a financial statement can be asked for the selected supplier. It can help the company to evaluate the financial condition of the supplier company and assist the decision making.

The function and significance of the financial statement for the outer user can be:

- Count and evaluate the solvency of the company, to define the corporate credit ranking
- Analyze and forecast the operation of the capital market
- Conduct negotiations based on the financial statements

In the supplier selection, the balance sheet can be available to the financial condition assessment. The balance sheet can mainly reflect the asset of the company and the statement of a business's assets, liabilities, and owners' equity, which can help companies to evaluate the asset structure and solvency of suppliers to furthermore speculate the financial flexibility.

The cost structure of the supplier products

Direct costs include labor attributable to the production of the product and the materials utilized in the product. The relationship of these elements to the value of the product is obvious. Indirect costs include many categories of overhead. While some overhead is essential to the operation of any business, how overhead applies to a given product in aggregate form or at the unit level is frequently difficult to establish. These decisions and the extent to which such costs are considered reasonable is always the province of judgment. (Michael & Lee & Alan, 2006)

To analyze and evaluate the structure of the quotation provide by the supplier and judge whether it is reasonable, how is the profitability space for the supplier. The best situation is that it can share the benefit with the supplier and reach win-win development.

Supplier site audit

The purpose of the supplier site audit is to observe the supplier crisis management also the backup plan in person. Effective evaluation is suggested by observing a supplier program management strategy, which means that a supplier's experience in managing complex programs is important to de-risking the supply base. The involvement of the complex program management strategy is believed to help for the understanding of the supplier's capabilities rationally. (Arbor, 2019) Supplier design capability is especially important to adapt to the development of the client company in the later stage, which should be taken into consideration as a key factor for the important prospective supplier. The supplier site audit can be furthermore evaluated through the establishment and implementation of employee KPIs. The degree of company regulation and standardization can more directly reflect the company's management level, which also proves that undue risks are unlikely to be increased.

With the purpose in mind, the explicit indicators of review criteria for the supplier site can be concluded and distributed as (InstructionsJF-PU-05, Revision, 2014)

1. Customer satisfaction
2. Quality system
3. Business system

4. EHS and risk management
5. New product development
6. Purchasing and supplier management
7. Production control and planning

6. Conclusion

6.1 Current state of purchasing processes

Company A has a relatively simple structure of the purchasing process. The supplier selection part is less attention to other aspects besides the quality and cost. There is fewer risk occurrence for *Company A* now. However, there has been a bottleneck in development currently.

Company B pays attention to purchasing process management and implements centralized procurement management. It has a slightly complex purchasing process that causes low efficiency. Some of the distinguished types of purchasing go through the same working flow, which reduces efficiency and takes away the energy from partly more important purchasing.

Toyota as a benchmarking company has a relatively advanced supplier selection process management system. The good method in the current state of Toyota supplier selection is always based on a long-term profit principle. Toyota emphasized establishing long-term cooperation with the supplier. Toyota has a very clear definition of product category and supplier selection requirements

6.2 Key factors to ensure efficiency and risk management in the purchasing process

The factors are the financial condition of the supplier, supplier EHS site audit. Many of the factors are not unfamiliar in the selection of the supplier, the real problem is the understanding of these factors, whether the company achieves their goals on these controlled crucial factors, and methods for the proper action in the purchasing process.

The main factors are distributed into the risk and efficiency aspect. In the purchasing process, the risk occurrence probability and impact on finances could be more conspicuous at the end of the purchasing process, and the action of the solution might be negatively handled. The transfer of the inspection of the operative process to the strategic process of the supplier selection procedure could be necessary.

Beside it, the main thing is a product should be classified and the target of the supplier selection should be treated differently with distinguished attention. The strategic group of suppliers is better to establish the long- term cooperation with them and reach win-win development. Furthermore, the distinguished type of the target supplier standardized the purchasing process which will help to control and management

In conclusion, all the key factors may also lead to the state of the problem in the supplier selection process that is the dependency on the purchasing process. Especially the audit links in the process, which needs many different levels and department of the employee to evaluate and that could be the issue. All the inefficient factors will also bring risk in the long term period. If the implementation of the process should always rely on the leader or other specific group of the person that could not be a good process. It should be simple and available to execute. Besides the technical aspect, the efficiency of information transfer in the purchasing process can be concluded to the crucial of the efficiency enhanced. Defining the action that could gain the required information in a high efficiency is necessary.

6.3 Development plan

There are so many actions that can be done in the supplier selection of the purchasing process for improvement. The complex of the process will usually reduce efficiency, especially in the complex audit procedure of the supplier selection, therefore the audit staffs can be limited to a certain number to ensure the efficiency and the number of the reviewers can be ruled according to the risk for example like the total price of the purchasing as the standard. Besides that, a standardized process must be designed. The standardized purchasing establishes, because it is to

ensure stable performance, and regulate the employee from the content of the work in the purchasing process, no matter what type of company is needed.

The supplier selection process is also required to be classified. Companies need to define what kind of product that demands long-term cooperation establishing. For this type of supplier, the company should consider the compatible ability of the supplier. Companies should regard the selected strategic suppliers as an extension of their product and technical capabilities. Suppliers must be able to innovate in product design and production capabilities and work closely with the company throughout the product development process. These are more important than short-term low prices.

7 Discussion

The way purchasing is performed today is not sustainable for the long term and holds only as long as the required knowledge and experience are possessed by the one who conducts the purchase. (Ek, 2013) The paper aims to improve the company's purchasing through the supplier selection enhanced in the process. The expectation of the result is both objective and possess a certain degree of applicability. Therefore the research implement through the investigation meant of two manufacturing companies, and the comparison with benchmarking, and the objective of the research is considered achieved.

The desk research can be attributed to the flexible and cost-effective and low threshold of condition. Reduce the limitation of not being able to personally experience the practice in research

The result of the improvement area for the financial aspect, category management, and target supplier defined, the long-term cooperation target identified and selection, supplier site inspection. The good thing could be that is suitable for the company currently.

The improvement of the purchasing process is often derived from the feedback or the complaints in the purchasing work. It means that when the issues in process implementation are obvious will easier to find out the improvement direction in the

next stage, which could be attributed to the required aspect. The action can be to do the right thing. What matters most then is how to do the things right, which can be referred to as the analysis of the business climate both related to the theoretical framework to make sure the right direction of the implement.

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References

Ann Arbor (2019, May 24). Five Risk-Reducing Questions to Ask During a Supplier Site Audit

<https://medium.com/@industrystar/5-risk-reducing-questions-to-ask-during-a-supplier-site-audit-5e7bdf49e2cb>

Beliaevskaia, Mariia, 2017, *Ensuring adequate supplier selection*. (Bachelor's thesis) Jack University of applied science, School of Technology, Degree Programme in Logistics Engineering.

CSCMP and Wendy Tate, 2014, the essential concepts of purchasing and supply management

<https://www.informit.com/articles/article.aspx?p=2165644&seqNum=7>

Christopher E. Bogan and Michael J. English, Benchmarking for best practices: winning through innovation adaption

<https://www.best-in-class.com/bestp/domrep.nsf/insights/chapter-1-benchmarking-best-practice-book?>

Damian Beil, 2009, *Supplier selection*, Stephen M. Ross School of Business

http://www-personal.umich.edu/~dbeil/Supplier_Selection_Beil-EORMS.pdf

David Travis, 2016, desk research, what, why, and how, user focus

<https://www.userfocus.co.uk/articles/desk-research-the-what-why-and-how.html>

Desk research Methodology and techniques, MSG

<https://www.managementstudyguide.com/desk-research.htm>

Hamed Taherdoost, Aurelie Brard, 2019. *Analyzing the Process of Supplier Selection Criteria and Methods*

<https://www.sciencedirect.com/science/article/pii/S2351978919303555>

Hennie R. Boeije, 2010, Analysis in qualitative research

http://xueshu.baidu.com/usercenter/paper/show?paperid=432ac110ae9f3aa68c1e94b2205f2c39&site=xueshu_se

Jim Ross, 2018, the role of observation in user research, UX matter

<https://www.uxmatters.com/mt/archives/2018/09/the-role-of-observation-in-user-research.php>

Maria Ek, 2013. *Standardizing purchasing processes Increasing purchasing efficiency for production process equipment at Höganäs Sweden AB (master thesis)*, Lund University, Department of Industrial Management and Logistics Division of Engineering Logistics

Martin Woods, 2011, Interviewing for research and analyzing qualitative data: An overview, School of Health & Social Services Massey University

<https://pdf4pro.com/cdn/interview-methods-interviewing-for-research-and-aa3d8.pdf>

Michael E. Smith, Lee Buddress, Alan Raedels, 2006, *The Strategic Use of Supplier Price and Cost Analysis*, 91st Annual International Supply Management Conference, May

<https://www.instituteforsupplymanagement.org/files/pubs/proceedings/ifsmith.pdf>

Purchasing&procurement center, 2020, Contract Management Process – Key Points and Activities

<https://www.purchasing-procurement-center.com/contract-management-process.html>

Totoya industries corporation, history

<https://www.toyota-industries.com/company/history/index.html>

Totoya industries corporation, philosophy

<https://www.toyota-industries.com/company/philosophy/index.html>

Totoya industries corporation, procurement

<https://www.toyota-industries.com/company/procurement/index.html>

What is the type of purchasing, publishyourarticle.net. Retrieved 2015,05,27

<https://www.publishyourarticles.net/knowledge-hub/cost-accounting/what-are-the-types-of-purchasing/369/>

Weele, Arjan J. van, Kirjoittaja, 2014, Purchasing & supply chain management: analysis, strategy, planning, and practice

Government of South Australia. (2019). writing procurement specifications guideline, 2019

<https://www.education.sa.gov.au/sites/default/files/writing-procurement-specifications-guideline.pdf?v=1564979949>

Jutta Nihtilä (2020) purchasing process; the role of purchasing task responsibility; course lesson materials

Jackson warehousing system, Instructions JF-PU-05, Revision 2014.12.1, *Supplier On-Site Assessment Instructions*

http://www.jacksonwws.com/docs/uploaded/jac/Misc/JF-PU-05_Supplier_Audit_Form.pdf

Appendices

Interview questions of Company B purchasing manager:

1. What is the current purchasing state of Company B?
2. Do the purchasing process of directive purchasing and indirect purchasing are similar in Company B?
3. For the company's production procurement, will there be a procurement team organized by the staff of the technical center to participate in the supplier review or product quality inspection?
4. For the supplier audit, will it be designed exactly in the working purchasing process between the steps of define specification and supplier selections?
5. What kinds of problems do you think exist in the purchasing process?
6. What kind of potential risks or the effect may be brought by these factors for the purchasing process?
7. What is the plan of the company to improve the purchase process?
8. What do you think to improve the working efficiency through the carry out of the purchasing process?
9. Besides the automation level of office software and the technical aspects, do you think to improve the efficiency of information transmitting and management of organization-level is necessary?
10. The effect of the standardized purchasing process on the company?
11. How to improve the steps of supplier selection and follow up in the purchasing process to try to avoid or reduce the risk and cost?
12. What is your own opinion of the purchasing improvement in your company?

Interview questions to the purchasing manager of Company A:

1. What is the current situation of the Company A procurement process?
2. Supplier selection process?
3. Are productive and unproductive procurement processes the same? What is the biggest difference in the process is in that part?
4. Is the tendering part of the product procurement process? Is bidding only for long-term suppliers? Is there any control over the number of tenders?
5. For production procurement, will there be a dedicated procurement team such as the technical center?
6. Is the supplier audit in the procurement process? What is included in the supplier review for the new supply check-in?
7. Are there any problems or factors in the procurement process that may cause risks in the procurement process or affect efficiency?
8. How to provide efficiency in the procurement process?
9. How to improve the selection of suppliers in the procurement process?
10. Are material planning, storage, etc. part of the procurement process? How does this failure affect procurement?
11. What is the impact of a standardized procurement process on the company?
12. How to carry out the purchase price control in the purchasing process?