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GAZI UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCE

MASTER
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SUPPLIER SELECTION CRITERIA AND
THEIR INFLUENCE ON OPERATIONAL PERFORMANCE

MAHMUD AMİNO

BUSINESS ADMINISTRATION DEPARTMENT
PRODUCTION MANAGEMENT PROGRAM

JULY 2018



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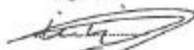
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DECLARATION

I declare that this research is my original work and has never been submitted to any other university for assessment or award of a degree.

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MAHMUD AMIN

13 / 07 / 2018

SUPPLIER SELECTION CRITERIA AND THEIR INFLUENCE ON OPERATIONAL PERFORMANCE

(Master Thesis)

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ABSTRACT

It's obvious through global competition that firms aren't self-sufficient in raising their performance. Several factors developing the performance of firms are effective. One of these factors is the supplier selection. Supply chain offers a great competition advantages in consumer-oriented firms. Supplier selection represents process of the businesses' description of their suppliers, evaluating them and also making contracts with the one who they deem suitable. Supply chain is significant for industrial firms as well as for all businesses. This study looking for answers to the question "do criteria for selecting suppliers have influence on the operational performance in Automotive spare parts firms?" Based on the research problem, this study targets to set the criteria for suppliers selection and also to measure the impact of the criteria on the firms' operational performance. Due to cost, delivery time, and quality, this research was conducted in OSTIM industrial zone of Ankara. Selecting 115 firms in the above mentioned zone through simple random sampling, 175 participants were given a questionnaire through face to face interviews. The questionnaire is composed of three sections. Section one contained questions on demographic information while section two included 5-pointed Likert type questions developed on basis of the cost, quality, and delivery time the criteria set in relation to supplier selection. In the last section too included 5-pointed Likert type questions developed on basis of the product quality, price and customer service the sub-variables which choose to measure firm's operational performance. The data were collected in the period between March-April 2018. Descriptive statistics, correlation analysis, ANOVA analysis and multiple regression analysis were applied in data analyzing. It was found in result that the supplier selection criteria had 10.4% positive impact on the firm's operational performance.

Science Code: 118706**Key Words:** Supplier selection, operational performance, Automotive spare parts, cost, quality, delivery time, customer service**Page Number:** 65**Supervisor:** Prof. Dr. Abdullah Ersoy

TEDARİKÇİ SEÇİM KRİTERLERİ VE ONLARIN OPERASYONAL PERFORMANSINA ETKİSİ

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ÖZET

Küresel rekabette firmaların performanslarını arttırmak için kendi kendine yeterli olmadıkları bellidir. Firmaların performansını geliştiren çeşitli faktörler etkili ve bu faktörlerden biri tedarikçi seçimidir. Tedarik zinciri, tüketici odaklı firmalarda büyük rekabet avantajları sunmaktadır. Tedarikçi seçimi, işletmelerin tedarikçilerinin açıklamalarının sürecini, bunları değerlendirerek ve uygun gördükleri kişilerle sözleşme yapmalarını temsil etmektedir. Tedarik zinciri, tüm işletmeler için olduğu kadar endüstriyel firmalar için de önemlidir. Bu çalışma, “Otomotiv yedek parça firmalarındaki tedarikçi seçim kriterleri operasyonel performansına etkisi var midir?” Sorusuna cevap aramaktadır. Araştırma problemine dayanarak, bu çalışmanın tedarikçi seçimine yönelik kriterleri yani maliyet, zamanda teslimatı ve kaliteyi firmanın operasyonel performansı ölçmek için kullanılmaktadır. Bu araştırma Ankara'nın OSTİM sanayi bölgesinde gerçekleştirilmiştir. Basit rastlantısal örnekleme yoluyla yukarıda sözü edilen bölgedeki 115 firmanın seçilmesiyle yüz yüze görüşme yoluyla 175 katılımcıya anket uygulanmıştır. Anket üç bölümden oluşmaktadır. Birinci bölümde demografik bilgilerle ilgili sorular yer alırken ikinci bölüm'de tedarikçi seçimine göre belirlenen kriterler, maliyet, kalite ve zamanda teslimat temelinde geliştirilen 5'li Likert Ölçeği tipi sorular yer almıştır. Son bölümde, firmanın operasyonel performansını ölçmeyi tercih eden alt değişkenler, malın kalitesi, fiyat ve müşteri hizmetleri bazında geliştirilen 5-ölçekli Likert tipi sorular yer almıştır. Veriler Mart-Nisan 2018 arasında toplanmıştır. Veri analizinde tanımlayıcı istatistikler, korelasyon analizi, ANOVA analizi ve çoklu regresyon analizi uygulanmıştır. Sonuç olarak, tedarikçi seçim kriterinin firmanın operasyonel performansı üzerinde %10.4 olumlu etkisi olduğu bulunmuştur.

Bilim kodu: 118706

Anahtar Kelimeler: Tedarikçi seçimi, operasyonel performans, Automotiv parçaları, maliyet, kalite, zamanda teslimat, müşteri hizmeti

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TABLE OF COTENTS	Page
Abstract.....	IV
Özet.....	V
Acknowldegments.....	VI
List of Tables	X
List of Figures.....	XI
List of Abbreviations.....	XII
Chapter One: Research Framework	
1.1. Introduction.....	1
1.2. Research problem.....	1
1.3. Research objectives.....	2
1.4. Importance of the research.....	3
1.5. Research hypotheses.....	3
1.5.1. Main hypothesis.....	3
1.5.2. Sub-hypotheses.....	3
1.6. Research model.....	4
Chapter Two: Purchasing Overview	
2.1. Introduction.....	5
2.2. Scope and definition of purchasing management.....	5
2.3. Purchasing management history.....	6
2.3.1. Period 1: The early years (1850–1900).....	6
2.3.2. Period 2: Growth of purchasing fundamentals (1900–1939).....	7
2.3.3. Period 3: The war years (1940–1946).....	7
2.3.4. Period 4: The quiet years (1947–Mid-1960s).....	7
2.3.5. Period 5: Age of materials management comes (Mid-1960s–Late 1970s).....	8
2.3.6. Period 6: The global era (Late 1970s–1999).....	8
2.3.7. Period 7: Supply chain management (The Twenty-First Century).....	8
2.4. Objective of purchasing management.....	9
2.5. Purchasing department's relations with other departments.....	9
2.5.1. Warehouse department & Purchasing department.....	10
2.5.2. Production department & Purchasing department.....	10
2.5.3. Marketing department & Purchasing department.....	10
2.5.4. Financial department & Purchasing department.....	11
2.5.5. Design department & Purchasing department.....	11
2.6. Purchasing cycle and procedure.....	11
2.6.1. Recognition & description of needs.....	12
2.6.2. Transmission of needs.....	12
2.6.3. Supplier selection to satisfy the needs.....	12
2.6.4. Contracting with the accepted supplier.....	13
2.6.5. Following up with the supplier.....	13
2.6.6. Receiving and inspecting materials.....	13
2.6.7. Payment and closure of the case.....	13
2.7. Conclusion.....	13

Chapter Three: Supplier Selection Overview

3.1. Introduction.....	15
3.2. Type of vendors and suppliers.....	15
3.3. Importance of supplier selection.....	16
3.4. Supplier selection criteria.....	17
3.4.1. Price.....	17
3.4.2. Performance assessment.....	18
3.4.3. Quality system assessment.....	18
3.4.4. Delivery performance.....	18
3.4.5. Manufacturing.....	18
3.4.6. Business criteria.....	18
3.4.7. Long-term relationship.....	18
3.4.8. Information technology.....	19
3.4.9. After-sales service.....	19
3.4.10. Supplier location.....	19
3.4.11. Financial stability.....	19
3.5. Process of supplier selection	19
3.5.1. Step 1: Product Analysis.....	20
3.5.2. Step 2: Suppliers Identification.....	20
3.5.3. Step 3: Suppliers Evaluation.....	21
3.5.4. Step 4: Supplier Selection.....	21
3.6. Strategies of supplier selection	21
3.6.1. Single or Multiple Supplier.....	21
3.6.2. Outsourcing or Insourcing Supplier.....	23
3.7. Supplier evaluation systems	23
3.7.1. Categorical method.....	24
3.7.2. Cost-ratio method.....	24
3.7.3. Linear averaging method.....	24
3.8. Conclusion.....	25

Chapter Four: Performance Overview

4.1. Introduction.....	27
4.2. Scope and defining of performance.....	27
4.3. Performance measures.....	28
4.4. Factors affecting on performance.....	29
4.4.1. Internal factors.....	30
4.4.2. External factors.....	30
4.5. Operational performance measures.....	32
4.5.1. Cost.....	32
4.5.2. Quality.....	32
4.5.3. Delivery.....	32
4.5.4. Flexibility.....	32
4.5.5. Customer service.....	33
4.6. Criteria of the effective performance measurement	33
4.7. Performance control process.....	34
4.7.1. Implementation of the measurement system.....	34
4.7.2. Qualification/ Measurement.....	34
4.7.3. Comparison of measurement results.....	34

4.7.4. Optimization potentials Identification.....	34
4.7.5. Selection of corrective actions.....	35
4.7.6. Implementation of corrective actions.....	35
4.8. Conclusion.....	35
Chapter Five: Analysis of Suppliers' Performance	
5.1. Background of Automotive industry in Turkey.....	37
5.2. OSTIM industrial zone overview.....	39
5.3. Research methodology.....	39
5.3.1. Data collection methods.....	39
5.3.2. Data analyzing methods.....	39
5.4. Research sample.....	40
5.5. Data Analyzing.....	40
5.5.1. Demographic characteristics.....	40
5.5.2. Reliability.....	41
5.5.3. Normality test.....	42
5.5.4. Correlation analysis.....	42
5.5.5. Regression analysis.....	43
5.6. Discussion and recommendations.....	46
REFERENCES.....	49
APPENDICES.....	55
APPENDIX A1.....	56
APPENDIX A2.....	60
CURRICULUM VITAE.....	65

LIST OF TABLES		Page
5.1.	Demographic statics.....	40
5.2.	Reliability test.....	41
5.3.	Kolmogorov-Smirnov test.....	42
5.4.	Correlation analysis.....	42
5.5.	ANOVA table for H_1 hypothesis.....	44
5.6.	Coefficients table for H_1 hypothesis.....	44
5.7.	ANOVA table for H_{1_1} hypothesis.....	44
5.8.	Coefficients table for H_{1_1} hypothesis.....	45
5.9.	ANOVA table for H_{1_2} hypothesis.....	45
5.10.	ANOVA table for H_{1_3} hypothesis.....	45
5.11.	Coefficients table for H_{1_3} hypothesis.....	46



LIST OF FIGURES**Page**

1.1.	Research model.....	4
2.1.	Purchasing management history.....	6
2.2.	Purchasing management relationships.....	10
2.3.	Purchasing procedure.....	11
3.1.	Process of supplier selection.....	20
4.1.	Characteristics measurement of management level.....	28
4.2.	Factors affecting on performance.....	29
4.3.	Performance control process.....	34
5.1.	Locations of automotive production sites in Turkey.....	37



LIST OF ABBREVIATIONS

Shortcut	Description
CNC	Computer Numerical Control
CM	Categorical Method
CRM	Cost Ratio Method
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
GE	General Electric
HVACS	Heating, Ventilating & Air Conditioning Systems
LAM	Linear Averaging Method
OP	Operational Performance
PM	Purchasing Management
RFID	Radio Frequency Identification
R & D	Research & Development
SC	Supply Chain
SCM	Supply Chain Management
SPSS	Statistical Package of Social Science
SSC	Supplier Selection Criteria
VA	Value Analysis

CHAPTER ONE

RESEARCH FRAMEWORK

1.1. Introduction

All business of all types, whether industrial, commercial or service, undertake the procurement process to provide their required materials, products and equipment to implement their activities. This requires an independent department that implement purchasing process by searching for the best and most suitable sources of supply, whether internal or external, and choosing it to obtain their need in the right quality, price, quantity and time.

Supplier selection process is important part of purchasing management activities because an appropriate supplier selection ensures that the organization obtains the products and needs of the desired quality, and at the required time, especially in unexpected increase in demand for a product. Also, at the competitive price that helps increase the competitive position and profits of the firm, considering that the supplier seems as a strategic partner and competitive advantage source.

Having a good and long-term relationship with suppliers contribute to reducing costs of the organization and thus achieve an increase in profitability and rely completely on the supplier and trusting him without need to check the purchases after every purchase or verification of quality etc., because the good supplier being committed constantly to the required quality and also at the punctual delivery, furthermore; give important and useful information on changes in markets.

This study endeavors to examine supplier selection criteria and their influence on the operational performance. In the most of previous studies many important criteria were tested as independent variables such as cost, quality and on-time delivery. On the other side, operational performance variable was tested through many sub-variables like the firm's price, product quality and customer service.

1.2. Research Problem

One of the most important problems in operations management is finding suitable suppliers who can be relied to provide the organizations needs at the best price, in the desired quality, and on the time to provide distinctive services to customers and achieve a competitive advantage to improve their performance and increase their profits.

Also, scarcity of the resources have led to the difficulty of organizations getting the desired quality, and the inability of these sources to covering unexpected situations for instance high demand for limited production capacity or limited financial resources etc., and the difficulty of having long-term relationship with suppliers.

So, this study should answer several questions that help to formulate clear and comprehensive understanding of supplier selection process:

- Do Turkish firms rely on specific criteria for appropriate supplier selection?
- Do supplier selection criteria have an influence on Turkish firm's operational performance?
- Do Turkish firms rely on scientific methods in the trade-offs process between available suppliers?
- Does the mental image of the resource in Turkish firms play a role in choosing it as a supply source?
- Does participation in information and non-exploitation behavior among supplier and Turkish firms play a role in establishing a long-term relationship between them?

To address the above research questions, a few hypotheses are developed. Details of the hypotheses development are discussed further in chapter five. The main data analyses as well as the testing results of the hypotheses enable possible answers to cover the content of the questions above.

1.3. Research Objectives

It is generally accepted that in selecting the right supplier to meet organization goals and objectives, it's important to investigate the criteria that impact supplier selection in the firms. Thus, this research objectives are as follows:

Firstly, to identify the stages of supplier selection process and specifications of the optimal supply source. Secondly, to identify the purchase methods and why firms prefer to choose a domestic purchase or import resources from the external supplier. After that, to determine what gains firms can make from appropriate supplier selection process, either by reducing the purchasing cost and by ensuring that the required quality and service are met. Finally to examine supplier selection criteria influence on firm's operational performance.

That will help to look into the internal and external criteria which relate to supplier selection. In aims to achieve the above objectives, hypotheses have been proposed to guide this study direction.

1.4. Importance of the Research

Previous studies have endeavor to examine the relationship between determining variables which influence supplier selection and business performance (Tracey and Chong, 2001). In selecting the appropriate supplier, many studies have critically examined criteria such as product quality, price, supplier relationship management, delivery, decision making tools and techniques (Hokey Min, 1994), (Wu Bei et al., 2006), (Weber, 1991).

From a theoretical perspective, this study has sought to further the understanding of these points and add new knowledge to supplier selection field. It identifies critical criteria which lead to supplier selection and understands how the supplier selection affects an organization's business performance. So, this study importance can be present as:

The evolution of communication and transport processes have led to multiple supply sources and the complexity of the trade-offs process between these sources, which has made it more important to choose the appropriate supplier. Also, supply source importance and its role in supporting the organization's competitive position through improving input materials quality and improving the working environment, so the organization can serve its customers better.

Moreover, lack of implement of the scientific methods of purchasing and the evaluating suppliers process adversely affect the efficiency and effectiveness of the other departments activities in the organization, because of the interdependence and integration between purchasing management activities and the other departments activities. Finally this study might be of good reference for business practices or future studies.

1.5. Research Hypotheses

1.5.1. Main Hypothesis

H1: Supplier selection criteria are positively related to Turkish firm's operational performance.

1.5.2. Sub-Hypotheses

H1₁: Supplier selection criteria (cost, quality, on-time delivery) are positively related to Turkish firm's price.

H1₂: Supplier selection criteria (cost, quality, on-time delivery) are positively related to Turkish firm's product quality.

H1₃: Supplier selection criteria (cost, quality, on-time delivery) are positively related to Turkish firm's customer service.

1.6. Research Model

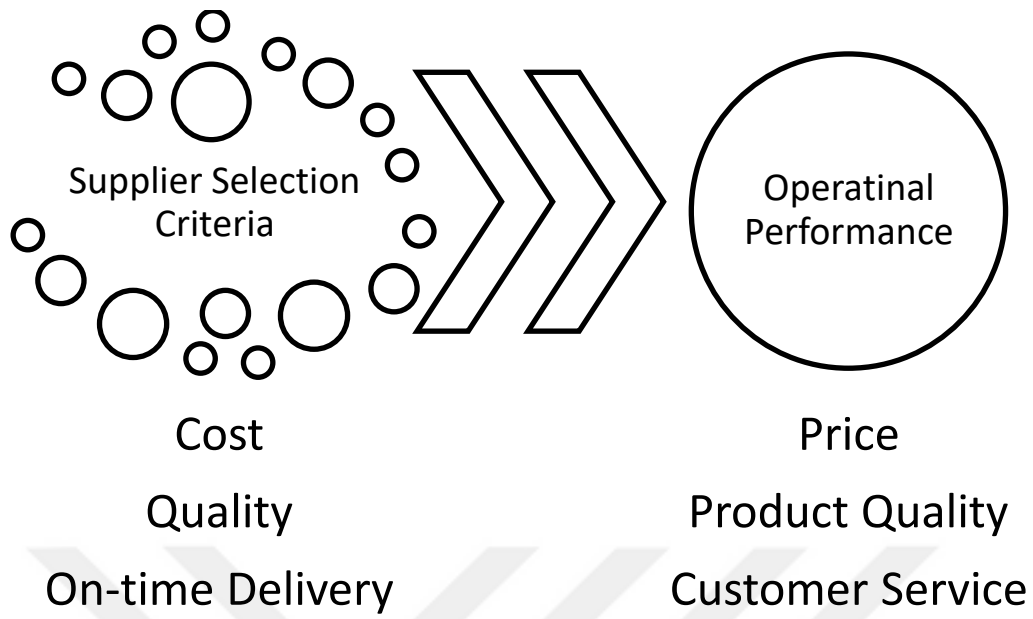


Figure 1.1. Research model

CHAPTER TWO PURCHASING OVERVIEW

2.1. Introduction

In the approach for extraordinary business competitive environment, business organizations are relying more on their supply chain as a competitive advantage source. Suppliers play strategic roles in organizations and are significantly engaged in creating a competitive advantage with their actions having a positive influence on the organizations' performance (Jabbour, 2009).

In order to contest effectively and survive in the worldwide market, firm needs to develop operational strategy to ensure that they preserve and establish relationship with a suppliers competent network as well as extract high value from these relationships. To create a network and maintain it and to improve the capabilities that are necessary for the buyer firm as well to meet its increasingly competitive challenges, the buying firm may need to engage in supplier selection process (Kivite, 2015).

Seven main processes in supply chain which are: order fulfillment, customer relationship management, demand management, product development, manufacturing flow management, customer service management, commercialization and procurement are performed to satisfy consumer desired in the most efficient way (Zhang, Song, & Huang, 2009).

Since coordination and collaboration between the members of supply chain have a crucial impact on success of supply chain, one of the most important activities in supply chain management is supplier selection. Evaluation of the candidate supplier's performance and selection some of candidates as a strategic partner are crucial process which can impact all of supply chain performance. The process of strategic decision-making involves assessment of intangible and tangible criteria as well to select the right suppliers with multiple aims. Hence, supplier selection issue maybe consider as a multi-criteria decision issue.

2.2. Scope and Definition of Purchasing Management

We need to recognize the differences between purchasing management and supply chain management. Purchasing management can be defined as a functional group (A formal entity on the organizational chart) performs many activities include identification and selection of supplier, buying, contracting and negotiation, supplier measurement & improvement, procurement systems development and supply market research etc. to ensure that it transmits high value to the firm.

On the other side, The Supply Management Institute refer to supply chain management as following: the identification, access, acquisition, positioning and resources management and related capabilities a firm needs or potentially desired in attainment of its strategic goals and objectives.

So supply chain management is not just another new name for purchasing management but a more inclusive concept. Think about supply chain management as a progressive and supercharged version of basis purchasing management (Monczka et al., 2011: 11).

2.3. Purchasing Management History

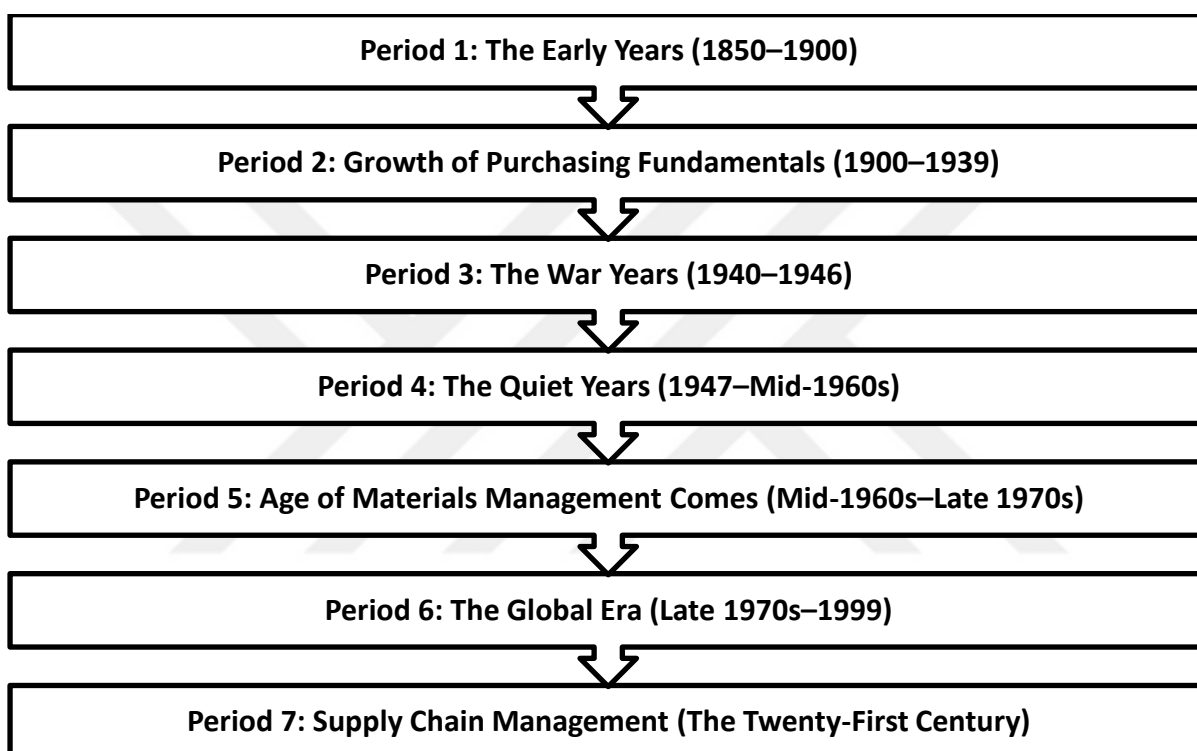


Figure 2.1. Purchasing management history

2.3.1. Period 1: The Early Years (1850–1900)

The highest attention in and development of the purchasing during the early years happened after the 1850s. During this period, the American railroads growth made them one of the important forces in the economy. Railroads were dynamic to the country's ability to transmit goods from the more developed Eastern and Midwestern markets to less developed Southern and Western markets. By 1866, railroads of Pennsylvania had given the purchasing duty a departmental status, and that was headlined under supplying department title.

A few years later, the head purchasing agent at the railroads of Pennsylvania reported directly to the president of the railroads. The purchasing duty was an essential contributor to the firm performance that the chief purchasing manager had top managerial. The railroad industry growth dominated the early years of purchasing development. Main contributions to purchasing history during this period consisted of the early recognition of purchasing process and its contribution to overall company profitability.

The late 1800s signalled the first organizing of purchasing as a separate company's duty requiring specialized expertise. Before this period, this separation did not exist status (Monczka et al., 2011: 23).

2.3.2. Period 2: Growth of Purchasing Fundamentals (1900–1939)

In the next period the industrial purchasing function began appearing with growing regularity out of the railroad trade journals. Engineering magazines in particular focused attention on the need for qualified purchasing personnel and materials specifications development. This era also witnessed the development of basic purchasing procedure and ideas. Purchasing importance was gained during (World War I) because of purchasing role in obtaining vital war materials. The central focus of the purchasing during this period was on raw material procurement versus buying semi-finished or finished goods (Monczka et al., 2011: 24).

2.3.3. Period 3: The War Years (1940–1946)

World War II introduced a new period in purchasing history. The emphasis on gaining required (and scarce) materials during the war effected in the growth of purchasing interest. A conducted study during this period showed that about 76% of all purchases demands didn't contained a specifications or brand stipulation. This suggested that other departments in the firm recognized the role of purchasing agent in determining sources of supply (Monczka et al., 2011: 24).

2.3.4. Period 4: The Quiet Years (1947–Mid-1960s)

Articles began appearing during this period describing the practices of various companies using staff members to collect, analyze, and currently data for purchasing decisions. One of the primary private firms to establishing the commodity research department to provide short- and long-term commodity information was Ford Motor Company. Ford also established a purchase analysis department to give buyers assistance on product and price analysis.

The postwar period witnessed development the technique of value analysis (VA) that pioneered by GE in 1947. General Electric's approach focused on evaluation of which materials or changes in specifications and design would reduce overall product costs.

The affirmation during the postwar years and also throughout the 1960s was on customer demands satisfaction and the growing of industrial market needs. Furthermore, firms faced constant competition and had access to plentiful material conditions which historically have decreased the aggregate importance of purchasing (Monczka et al., 2011: 25).

2.3.5. Period 5: Age of Materials Management Comes (Mid-1960s–Late 1970s)

The mid of 1960s attended a dramatic development of materials management concept. Although importance of materials management was grew during this period, the historical origins concept's date back to the 1800s, when US railroads were organized under materials management concept during the latest half of the 19. century. They combined related functions like purchasing and receiving, then inventory control and stores under one person authority.

There was a widespread agreement about the primary aim of materials concept and the functions which might fall under the materials umbrella. The materials management overall aim was solving materials problems from an overall system viewpoint more than the individual functions viewpoint. The several functions which might fall under materials umbrella include materials planning and control, inventory planning and control, materials and purchasing research, procurement, incoming traffic, receiving, incoming quality control, stores, materials movement, and scrap and overflowing disposal (Monczka et al., 2011: 26).

2.3.6. Period 6: The Global Era (Late 1970s–1999)

In this period the spread and rate of technology change was unprecedented, with product life cycles being shorter. Also, the ability to coordinate the activities worldwide purchasing by using international data networks as well as World Wide Web (via intranets) was emerged.

This strong competitive period witnessed the growth of supply chain management. Now, more than ever, firms started to take more arranged view of managing the products, funds, and information flows from the suppliers through final consumers. Managers began to view supply chain management as a way to satisfy intense cost and other improvement pressures (Monczka et al., 2011: 27).

2.3.7. Period 7: Supply Chain Management (The Twenty-First Century)

The purchasing management and supply chain management today reflect a growing emphasis concerning the suppliers importance. Suppliers relationship is shifting from an adversarial approach to an approach more collaborative with selected suppliers.

Supplier development, supplier design involvement, use of the full-service suppliers, total cost supplier selection, long-term supplier relationships, strategic cost management, enterprise systems (enterprise resource planning, or ERP), shared databases and also integrated Internet linkages are seen as a ways to create new value within the supply chain. However, newer concepts continue to emerge, including enabling the innovation in supply base and managing risks of a global supply chain.

The history and evolution of purchasing management and supply chain management provides an appreciation for the growth, development, and increased stature of the profession over the last 150 years. Each historical period has contributed something unique to the purchasing development, including the events that have shaped today's emphasis on supply chain management (Monczka et al., 2011: 27).

2.4. Objective of Purchasing Management

The essential goals of the purchasing management department are materials and needs acquisition, that can be called the 5R_s of purchase management:

- the right quality
- the right time
- the right price
- the right quantity
- the right source

From last keys we can find the goals of purchasing management as following:

1. Buy at the best price , consistent with desired quality and service.
2. Maintaining high inventory turnover, by minimizing excess storage, carrying the costs and inventory losses occurring due to damaged, obsolescence and pilferage.
3. Maintain supply continuity, preventing the flow interruption of goods and services to customers.
4. Develop and maintain a good suppliers relationship to create a suppliers attitude and desire furnish the organization with new ideas, products, and better prices and service.
5. Achieve a great degree of cooperation and coordination with the other departments (Kumar et al., 2008: 79-80).
6. Reduce purchase risk and raising the overall value to the buyers (Osman, Ali & Yusuff, 2008).

2.5. Purchasing Department's Relations with the Other Departments

As the purchasing department carries out procurement and supply operations for helping and service of the firm and its other departments, it is closely relevant to the rest of the departments such as production, marketing, finance, warehouse, .. etc. The success of any of these departments is related to success of the others in doing their work good.

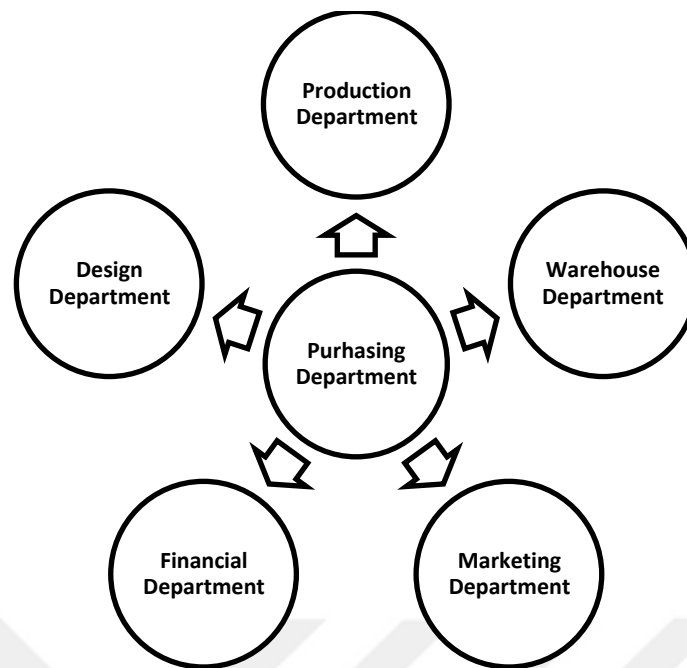


Figure 2.2. Purchasing management relationships

2.5.1. The Relation Between Warehouse Department and Purchasing Department

It is known that purchases are initiated at the request of warehouse management, when the volume of materials inventory be low, purchasing department receives a detailed and accurate report on different types of the inventory to avoiding any error in purchases. Given the great relationship that exists between these two departments, most organizations combine them into one department (حجازي وجواد, 2008: 121).

2.5.2. The Relation Between Production Department and Purchasing Department

The Success of production management depends on the purchasing management performance, in terms of its ability to supply the raw materials in the right quantity and the right quality and at the right time, so any error occurs in one of these three elements have a clear influence on the production processes (حجازي وجواد, 2008: 121).

2.5.3. The Relation Between Marketing/Sales Department and Purchasing Department

The relationship here refers to that the organization seeks to satisfy its customers. The marketing department must provide a report to purchasing department that includes the desires of the consumers about the materials that will be purchased. Some organizations mix these two departments into one department and are called commercial management (حجازي وجواد, 2008: 122).

2.5.4. The Relation Between Financial Department and Purchasing Department

The first task of financial management is to provide the necessary funds to purchase materials and needs, and here we find lots of coordination between these two departments, the purchasing management provides a report on the planned purchase size and maximum times for provision, and receive funds to perform this process (حجازي وجواد, 2008: 122).

2.5.5. The Relation Between Design Department and Purchasing Department

The design department determines the required materials with the appropriate specifications and quality. Also it provides technical assistance and advices to the purchasing management when purchase materials with high technical specifications and also during inspection process. While the purchasing management provides information on production methods and what has been developed by other organizations and changes in the market on the products of the competing organizations (النداوي, 2010 : 70).

2.6. Purchasing Cycle and Procedure

Typically, depending on the purchasing nature, environmental practices etc. the purchasing procedures may differ substantially. However, purchasing procedures can to have a kind of standardization across the world and thus a professional purchasing system does show the following steps that eventually constitute a purchasing cycle:

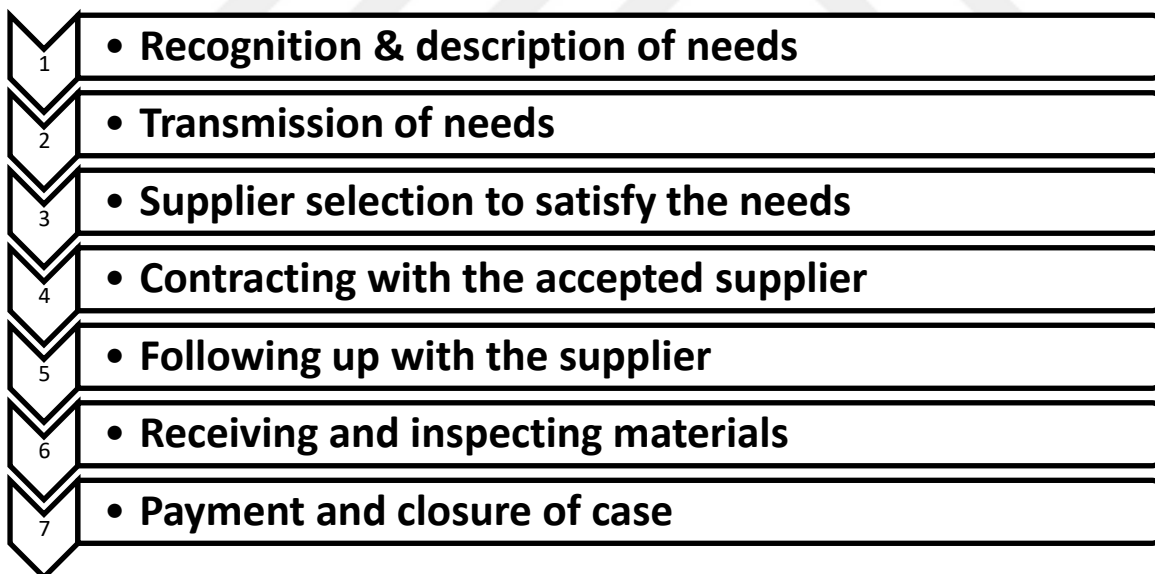


Figure 2.3. Purchasing procedure

2.6.1. Recognition & Description of Needs

The purchase process begins with identification and definition of individual or department desired in the organization, and then satisfies it either by transferring from a department to other or take it from warehouses. The Purchasing department must cover transfers and expect the needs before it occurs (عقيلي وآخرون, 2004 : 15).

The Recognition of needs also means not waiting until needs appears, but assessing the need before it occurs. The badly described need is costly to the firm in several ways:

- The lost time spent on reviewing the description of needs to buy again.
- The risks of issuing the purchases order and losing cost of issuing the supply after finding that the required need is not correct.
- Implications of issuing the purchases order and shipping goods from the supplier and arrival to the firm and then discovered that the description was not true (المصري, 1998 : 17).

2.6.2. Transmission of Needs

It means determine the quality specifications and conditions that should be met in the required needs. The importance of this step that according to the specifications, purchase manager can choose the suitable supplier who has ability to provide the required needs (عقيلي وآخرون, 2004 : 16).

2.6.3. Supplier Selection to Satisfy the Needs

The choosing process depends on whether the needs is purchased periodically or purchased for first time. In the first situation, the purchasing management usually has records that include a list of suppliers already dealt with and full information about prices, quality, etc.

In the second situation, the purchasing management should conduct a comprehensive search of the suppliers who deal with the required needs and collect complete information regarding their prices, products quality, the facilities they provide and their reputation in the market.

Once potential sources of supply have been identified, the purchase department choose between them to select the appropriate supplier based on selected criteria by the organization (عقيلي وآخرون, 2004 : 17).

2.6.4. Contracting with the Accepted Supplier

After selecting the suitable supplier and approving its prices and offers, the final agreement is agreed upon to supply the required needs. A supply order is like a contract between selected supplier and the organization. The supply order usually includes: Product specification, brand, shipping terms, method of payment, how to supply the needs, delivery dates, delivery place, etc. (عقيلي وآخرون, 2004 : 19).

2.6.5. Following Up with the Suppliers

It is known that any delay in the arrival of purchase order from the specified date agreed upon with the suppliers will have a negative impact on the firm performance. Therefore, it is important to follow up through continuous contact with the suppliers to remind them of the delivery date and to know if there is any adjustment by them.

In fact, the follow-up process is done only on non-typical and high-value needs, but it is logical to follow-up if the delaying cost or cost of not receiving the needs in the required place is higher than follow-up process (عقيلي وآخرون, 2004 : 22).

2.6.6. Receiving and Inspecting Materials

Here, the orders are received from the supplier by the carrier and will be checked to ensure safety in terms of number and weight and no damage during transport to remove the responsibility of the carrier, and then confirm the quality needs on all of it or just a sample, at the end of this step make a report and informing the suppliers (عقيلي وآخرون, 2004 : 24).

2.6.7. Payment and Closure of Case

When the goods be received in satisfactory condition, the receipt be checked before it be approved for payment. The receipt will be checked to know that if goods were as duly authorized to the purchase, they were duly ordered, they will be priced as per the agreed terms, the quantity and quality of orders as well, the calculations are arithmetically correct etc. (Kumar et al., 2008: 84).

2.7. Conclusion

The importance of managing suppliers to firms' operation is widely stated in the purchasing management literature. It has been recognized as one of the most significant management functions for achieving long-term competitive advantage. As competition increase in global markets, firms face more huge challenges and obstacles in improving their performance (Prajogo et al., 2012).

In the most industries, raw materials and products parts have the essential share in the overall manufacturing cost and take the toll rise about 70% of the total manufacturing cost (Ghodsypour et al., 1998).

In recent years, the purchasing duty has been deemed as a strategical key by many managers to realize competitive advantage positioning. Correct pricing of suppliers' products in the process of purchasing activities is possible with proper evaluation of suppliers. Co-operation with suppliers that don't meet the required criteria will increase the costs of the firm (Arıkan ve Küçükçe, 2011).



CHAPTER THREE

SUPPLIER SELECTION OVERVIEW

3.1. Introduction

In current competitive world, a firm's success doesn't rely only on its performance, but also many other different factors those help to this process. One of those factors is suppliers, which should work cooperatively with the firms (Osman & Demirli, 2010).

(Aissaoui et al., 2007) stated that: "the most important purchasing decisions are obviously selecting and maintaining close relationship with a few, albeit credible and high-quality suppliers, in order to minimize products cost while maintaining good product quality and customer services". Thus, firms try to work with supplier(s) who can supply good quality of products, acceptable cost and flexibility in terms of changes in orders.

Supplier selection account as a one of the classic research areas in purchasing management. (Weber & Current, 1991) defines supplier selection as a process by which organizations identify, evaluate, and contract with suppliers.

For many years, the supplier selection traditional approach has been to choose suppliers solely on the basis of price. However, as firms learned that the sole focus on cost as the only criterion for supplier selection isn't efficient, they have transformed to a more comprehensive multi-criteria approach. Recently, these criteria have become increasingly complex as environmental, social, political, and customer satisfaction concern has been gathered to the traditional factors of quality, delivery, cost, and service. The recognition that a well-selected set of suppliers can make a strategic change to an organization's ability to provide continuous improvement in consumer satisfaction lead the search to new and better ways to evaluating and selecting the suppliers (Pal et al., 2013).

There are different approaches to evaluate suppliers have been followed over years inclusive reverse auctions, offline competitive bids and direct negotiation. However, before evaluating suppliers, firms should determine whether to use single source or multiple sources (Chopra and Meindl, 2013).

3.2. Types of Vendors and Suppliers

Suppliers are fundamental to any business, and the processes of identifying and choosing suppliers is both relevant and important. Sometimes suppliers contact the purchasing organization through their sales representatives, but often more, the buyer needs to locate them either at the wholesale showrooms, trade shows and conventions, or through trade journals, buyer directories and industry contacts (Bello, 2003).

Suppliers could be separate into four common groups: manufacturers, distributors, independent craftspeople and finally importation sources:

- The first group is the manufacturer who most of the retailers purchasing through the organization salespeople or the independent representative who handle goods of the several different firms. Prices from these sources usually lowest, except if the retailer's location makes the shipping freight expensive.
- The second group is the distributor who are known as a wholesaler, jobber or broker too, distributor buy in quantity from many manufacturers and warehouses the products for sale to retailers. Although distributor price are greater than manufacturers, they can provide retailers with small demands from a various manufacturers. A lower freight invoice and speed delivery time from a close distributor often recompense for the greater per-item cost.
- The third group is the independent craftspeople who are exclusive distributors of distinguished creations frequently given by these independent craftspeople, who sell through representatives or at trade shows.
- The last group is the importation sources in which many retailers purchasing a foreign products from a local importers, who operate like a local wholesaler. Or, depending on the organization's knowledge with overseas sources, they might want to import products (Lesonsky, 2001).

3.3. Importance of Supplier Selection

The correct supplier selection is a paramount factor for success for service or manufacturing businesses. This is because it will affect the customer satisfaction whilst significantly reducing the cost, as well as improving the company's competitive abilities (Abdul Rahim, 2013: 57). We can present supplier selection important as following:

1. Good supplier is an invaluable resource to the organizations requiring their products or services.
2. Suppliers are making a direct contribution to an organization's success and can therefore assist their customers with product development, value analysis, and on the right time delivery of the required quality level.
3. The suitable suppliers are the key to obtaining the appropriate quality level, on time, at the best price, the necessary technical support level and the desired service level (Dobler et al, 1996: 212).
4. Supplier performance has a direct effect on manufacturing performance. As supplier performance increases, the manufacturing performance of being supplied firm should increase as well (Tracey and Vonderembse, 2000).

3.4. Supplier Selection Criteria

In the literature, some of researchers defined many important criteria in the selection process. (Dickson, 1966) addresses 23 selection criteria as crucial factors in supplier selection issue. So he identifies quality, price and delivery as the most critical factors among these factors.

Following to Dickson's work, (Weber, Current, & Benton, 1991) reviewed 76 articles were published between 1966 and 1991, they concluded that net price of goods, quality and also delivery time are the most applied criteria.

Also, (Cheraghi, Dadashzadeh & Subramanian, 2004) show that a significant change could be observed in the prorated importance of various crucial success factors with the raise of competition and globalization after 1990's. Furthermore, they stated that the consistency, reliability, long-term relationship and flexibility are new four crucial criteria deemed in the supplier selection process.

(Sen, Basligil, Sen & Baracli, 2008) propose a framework for defining of supplier selection criteria by examining possible quantitative and qualitative criteria addressed by earlier studies according to firm's strategies. They indicate that firms can display different purchasing behavior in vary circumstances and determinate the significant supplier selection criteria for a firm's purchasing strategy which reduce the comparisons number and the related computational effort.

(Ho, Xu & Dey, 2010) rank the priority of supplier selection criteria as follows: quality, delivery, price/cost, manufacturing capability, service, management, technology, research & development, finance, flexibility, reputation, relationship, risk & safety and environment. They mentioned that the quality and lead time delivery have become important rather than the price and also the traditional assessment approach, which is a selection of supplier based on only the lowest price, is not effective anymore in this competitive supply chain.

The supplier criteria don't have the same weight for all kinds of companies. Other types of criteria have also come into this arena because of increasing attention on global purchasing and supply chain management (Bedey et al., 2008: 109). According to previous authors and studies we can present the most common criteria as following:

3.4.1.Price

The supplier should be able to offer a competitive prices. This doesn't necessary mean the lowest price. It is one that considers the supplier ability to offer the necessary goods in the required quality and quantity as well, at the desired time, as well as any other wanted services (Arnold et al., 2008: 202).

3.4.2. Performance Assessment

This criterion gives the buyer a hint of the potential performance of various suppliers that are available on the market. It is divided into the shipment performance, delivery and cost of the suppliers (Sevкли et al., 2007).

3.4.3. Quality System Assessment

This criterion gives a background of the supplier's quality planning, quality assurance, management commitment, inspection and control. The quality issues are important when it comes to both the buyer and the supplier's production. If the quality is poor at the supplier it will also affect the buyer in a negative way. It could be in terms of lack of goods or dissatisfied end customers (Sevкли et al., 2007).

3.4.4. Delivery Performance

Delivery performance of currently supplier is fairly evaluated if good records exist of the delivery promises, actual receipts and few modifications have been made on an informal basis (Assiamah, 2009: 22).

3.4.5. Manufacturing

The manufacturing criteria are important when they come to the knowledge of production capacity. The buyers need to know if the potential supplier could manage a peak in demand for example. Furthermore the maintenance of lead time, storage, production development and if the suppliers are up to date when they come to production are the other sub criteria (Sevкли et al., 2007).

3.4.6. Business Criteria

The sourcing company will get a background of the suppliers business in this criterion. The criteria will provide information about the supplier's reputation, location, patents, and technology capabilities (Sevкли et al., 2007).

3.4.7. Long-term Relationship

The strategic relationship with supplier can be defined as a long-term relationship between an organization and its suppliers (Li et al., 2006). It's playing a crucial role in authorizing the organization to respond to the unpredictable changes happening in the business environment (Hoyt and Huq, 2000).

3.4.8.Information Technology

Sharing information amongst companies become a more important issue. This criterion determines suppliers ability to communicate and connect with the buyer. The sub criteria within this criterion are Radio-Frequency Identification (RFID), Electronic Data Interchange (EDI) and internet using in order to communicate and connect with each other (Sevкли et al., 2007).

3.4.9.After-Sales Service

If the product is a technical nature or likely to need replacement parts or technical support, the supplier should have a good after-sales services. This should include a good service organization and inventory of service parts (Arnold et al., 2008: 201).

3.4.10.Supplier Location

Sometimes it's desirable that supplier be located nearby the buyer, or maintain an inventory locally. Because a close location helps shorten delivery times and means emergency shortages can be delivered quickly (Arnold et al., 2008: 201).

3.4.11.Financial Stability

This is important so much because buyers prefer profitable suppliers since they're interested in continuity and time delivery. A supplier with cash-flow problems will have difficulty paying his or her bills and consequently in obtaining materials; his or her delivery times and possibly product quality will probably suffer. A supplier who becomes insolvent can be as big an embarrassment as a customer in similar difficulties (Assiamah, 2009: 22).

3.4. Process of Supplier Selection

The common phrase of the supplier selection process may include supplier identification, requesting information from supplier, setting the contract terms, negotiation with supplier, and supplier evaluation. The process differ from organization to other (Lysons & Farrington, 2006).

However, supplier selection process can be divided into four steps by (Hedderich et al., 2006) as following:

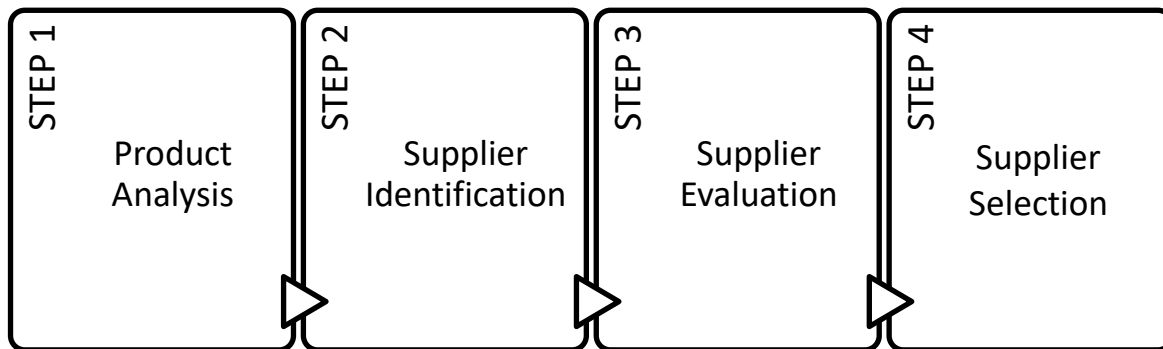


Figure 3.1. Process of supplier selection

3.4.1. Step 1: Product Analysis

Analyzing the product contents and the competitors' offerings within the same industry are included in the process. A product content analysis usually includes: labor content, cost saving potential, purchase volume, demand pattern, and product.

3.4.2. Step 2: Suppliers Identification

Researching the most suitable suppliers is a part of organization's purchasing strategy. This process shall utilize all means available, including trade directories, trade associations, trade exhibitions, logistic operators and cyberspace (i.e. the Internet).

Reliable information collection account as a good start leading to success. The company shall make a list of potential suppliers through available searching channels:

- Mouth-to-mouth experience: Meaning the valuable information you can obtain from your relatives, friends, colleagues, logistics operators or even competitors who have related experiences.
- Trade exhibitions and fairs: This channels offer a perfect opportunity to connect and communicate with various suppliers and to compare their offerings. However, it is not a time efficient channel since they happen so rarely, especially with your product specification.
- Trade directories.
- Professional trade associations.
- Local department of commerce: It usually maintains up-to-date lists of names and addresses of companies under specific product catalogues.
- The internet search engines: Local websites or international websites that provide supplier information.

3.4.3. Step 3: Suppliers Evaluation

In this step start to shorten the potential suppliers list based on information collected and interactions with those suppliers. During this process, companies can filter suppliers through analyzing published information, contacting suppliers through phone interviews or mail/email questionnaires, requesting product samples, and/or visiting suppliers' facilities. It's very important phase for buyers and suppliers to develop more interests toward each other, also to have a more realistic picture a possible long-term business relationship.

3.4.4. Step 4: Supplier Selection

The last step is making the selection decision based on collected data and audited during the supplier evaluation process. Either the selection of assessment criteria and implementing an effective selection method are crucial parts in successfully choosing appropriate suppliers.

3.5. Strategies of Supplier Selection

There are multiple different strategies that companies can utilize to select their supplier but the most essential strategies that firms should take decision and choose are comparing between: Single or multiple supplier, Outsourcing or Insourcing supplier. So we will present it as following:

3.5.1. Single or Multiple Supplier

Much discussions have taken a place concerning number of the suppliers who a company should use. One of this discussion is the multiple suppliers side, which involves using two or more number of suppliers. The other is the single supplier policy, which involves using just one supplier to supply a lot of materials.

The target of both policies is to provide the organization with the best value of a supplied lot of materials. Many attributes contribute to the value which the buyer receives. They include risk, quality, material price, total cost, delivery, reliability, and services such as design capabilities, productivity improvements, research & development (Benton et al., 2010: 72).

It's also important to differentiate solo supplier and single supplier. Solo supplier is basically due to scarcity of suppliers (i.e. there is only a supplier, such as monopolist), whereas single supplier is having selected one supplier among many of them (Burt, et al., 1996).

We can present the single supplier advantages as following:

- The major debate in support of single supplier are that, with the high volumes certainty, the supplier can offer lower cost per unit and also increase the communication and collaborative to make win-win relationship between sellers and buyers.
- Naming a particular source as the single supplier and providing it with 100% of contract requirement reduces in great way the uncertainty that supplier will lose the business to another competitors. With this contract warranty, the supplier is more willing to change its operating method in order to accommodate the buying organization.
- By reducing duplication in operations such as setup, single source of materials should be able to offer lower cost per lot compared to multi-sources.
- Spreading fixed cost across a higher volumes should result in an accelerated learning curve.
- Collaborative and communication is enhanced between the buyers and sellers with a single supplier agreement because of the fewer number of people who involved when compared to multiple suppliers (Benton et al., 2010: 73).

On the other hand, multiple suppliers have several advantages too as following:

- The main arguments for multiple suppliers are competition and assured supply. It is ordinarily believed that the competition between suppliers for similar materials will lead costs down as suppliers compete against each other. This sense of competition is exist at the root of American thoughts because competition is the foundation for capitalism and the backbone of Western economic theory.
- Multiple suppliers also can warranty an undisrupted materials supply. If something wrong happened with one supplier, for instance a strike or a main breakdown or until a natural disasters, the other source (s) can cover the slack to provide all the needed materials without a disruption.
- Multiple suppliers also can provide other benefits such as improved supplier appraisal effectiveness and market intelligence.
- Contact with many suppliers will allow a company to keep abreast with new developments and new technologies as they emerge across the field. In addition, greater contact with suppliers will raise the effectiveness of evaluating a supplier's ability and progress by comparing cost and production data from among suppliers (Benton et al., 2010: 73).

3.5.2. Outsourcing or Insourcing Supplier

Internal sources are mainly aim at the internal production or buying from a subsidiary of firm. internal source is the rational option if a company has the available capacities because it allows for full control over its goods development and manufacturing. Also, it maintains its independence from the suppliers, enabling integral control over its manufacturing process and also supply chain. Also, using internal capabilities is a good strategy to avoid the unlikely events of firm secrets being by accident detected to the competitor if a supplier works for various consumers (Gold, 2017: 4).

In contrast the outsourcing, is defined as an act of purchasing goods or services from an external source. (O'Connell, 2005). There are various advantages in outsourcing, such as reducing cost in general resulting from economies of scale, specialized investments and expertise and possibility of greater concentration on the core competence while avoiding peripheral operations (Anderson, et al., 1986). On the negative side the controlling over the operations involved would be reduced; also, less flexibility would exist to react upon unpredictable changes in requirements (O'Connell, 2005).

The problems with outsourcing depend on type of the outsourced items or services and their importance; in different cases for example the purchased goods lack high quality or good delivery whereas for fundamental services there would be a great potential threat entailing development of new competitors in the market.

3.6. Suppliers Evaluation Systems

Supplier assessment is defined as the evaluating of suppliers capability and performance as compared with the other similar firms for purpose of providing the necessarily input to the purchaser company in the long run and also to improve the purchaser company's performance (Talluri and Sarkis, 2002).

In this definition supplier performance means a supplier's demonstrated ability to meet the buyer's requirements, and supplier capability refers to a supplier's potential which can be leveraged to the buyer's advantage in the long range (Sarkar and Mohapatra, 2006).

Three kinds of the supplier evaluation systems were used: the categorical method, also the cost-ratio method, and finally the linear averaging method. In general, the leading factors in determining which system is the best are implementation facility and the system overall reliability. It should be noted that the results interpretation from any of these systems is a matter of purchasing management judgment (Benton, 2007).

3.6.1. Categorical Method

The categorical method includes assorting each supplier's performance in particular areas which defined by a list of pertinent performance variables. The purchasing management develops a list of performance factors for each supplier, then keeps track of each area by allocating a "grade" in simple terms, like "satisfactory," "neutral," and "unsatisfactory". At frequent meetings between the purchasing management and supplier, the purchasing management inform the supplier of its performance.

The categorical method is a simple and informal system in the meaning of detailed performance accomplishments or shortcomings aren't measured. The advantages connected with fulfilling this sort of evaluation method are that it can be performed almost immediately and is the least expensive of the three systems stated here. This method's main disadvantage is its dependence on the judgment of its users. With this method, there isn't concrete supporting data (Benton, 2007).

3.6.2. Cost-Ratio Method

This method evaluates the supplier performance by utilizing standard cost analysis. The overall cost of each materials purchasing is calculated as the selling price plus purchasing management's internal operating cost connected with the quality, delivery, and service elements of purchase. Calculations involve a four step approach:

The first stage is determining the internal cost connected with quality, delivery, and service. Next, each element is converted to a cost ratio, which expresses the cost as a percentage of value of the purchase. Third stage is to sum the three individual cost ratios (quality, delivery, and service) to obtain a total cost ratio. Finally, the total cost ratio is used to supplier's quoted unit price to get the net adjusted cost numbers.

The net adjusted cost number is applied as the essential for performance comparison among other suppliers. The best supplier is selected as the one with the lowest net adjusted cost. The major advantage of cost-ratio method is that the results are cost oriented. However, the associated costs must be known. Therefore, the cost of implementing this method may be expensive when compared to the categorical method. Moreover, this method doesn't take into regard other aspects of the supplier performance (Benton, 2007).

3.6.3. Linear Averaging Method

This method perhaps the most commonly applied evaluation method. Certain quantitative performance factors are applied to evaluate supplier performance. The most ordinarily used factors in products purchasing are quality, delivery, and also price, although any one of these factors stated maybe given more weight than others.

The first stage is to give suitable weight to each performance factor, such that the overall weight of each factor added up to 100. For instance, quality might be given a weight of 50, service a weight of 35, and price a weight of 15. Assignment of these weights is a judgment matter and purchasing management priority. These weights are subsequently applied as multipliers for individual ratings on each of the three performance factors. After weights have been assigned, ratings of the individual performance factor are determined. This is done by summing the scores for each factor. The third stage is to double each performance factor rating by its respective weight as a percentage. Finally, the results from stage three are added to give a numerical rating for each supplier (Benton, 2007).

3.7. Conclusion

Choosing the suitable supplier is always a hard mission for purchasing management. Suppliers have several strengths and weaknesses, that require accurate evaluation by the buyers before classification that gave to them. So, each decision needs to be combined by trading-off performance of various suppliers at every supply chain phrase (Liu & Holl, 2000).

Selecting wrong supplier can cause significant financial, operational and managerial losses for firms. The supplier shouldn't only remain engaged in an activity but also understand the objectives, mission and culture of the firms. In addition to these qualifications, the supplier should incorporate features that will enable technological innovation, consumer satisfaction and quality improvement (Yüzügüllü, 2011: 3). Because in recent competitive world, a supplier should offer more than just parts that meet the specifications.

In supplier selection decisions, two issues are of particular significance. One is what criteria should be used, and the other, what method can be applied to compare suppliers (Liu, 2010). The complication of selection processes depend on size, business type and revenue of purchasing department, the total costs involved in purchasing, and how often the purchase is to be repeated (Davidrajuh, 2000).



CHAPTER FOUR

PERFORMANCE OVERVIEW

4.1. Introduction

To compete in the global markets, organizations strive to make the outstanding performance. And evaluating an appropriate performance is a key role in company's success. For this reason, performance measurement has obtained a huge amount of interest, because it has a significant impact on performance themselves.

The suitable performance measures lack will result to failure in meet consumer needs. And this result causes the firm's low competitiveness and induce the low profit businesses, if bad performance measurement is remaining. It's commonly believed that a well-extracted metrics can maximum the chances for success by inspecting the whole process of the company environment. And the performance measurement result delivers company's competitive advantage through fixing the company's defects.

In manufacturing companies, operational performance has an essential impact on the product cost, product reliability, and cycle time etc. So the manufacturing performance measurement remains a significant subject in the recently studies (Hwang et al., 2014).

4.2. Scope and Definition of Performance

(Norton & Kaplan, 1992) believed that the traditional financial performance measurements are not valid for required today's businesses anymore. Therefore, they consider that operational measurements of management are needed when dealing with consumer satisfaction, internal processes and activities directed at improvement and innovation in the organization, which lead to future financial returns.

Manufacturing performance, which encompasses part of the operational performance previously mentioned, is commonly applied in the operations management field. This type of results take into consideration the company's performance in reaching its basic objectives, that is, productivity, quality and service (Moriones et al., 2002).

Performance was defined as follows the ability to use an organization's resources efficiently and effectively (Daft, 2000: 12). On the other side, operational performance has been defined as the process of measuring the action efficiency and effectiveness. Effectiveness mentions to the range to which consumer requirements are met, whereas efficiency refers to how economically to organization' resources are used when providing consumer satisfaction.

Operational performance traditionally discussed from the side of priorities of strategic operational competition in the manufacturing industry. Competition priorities are a crucial operational dimension for any supply chain in achieving external or internal consumer's satisfaction. Competition priorities is planned for processing and creating the supply chain (Krajewski et al., 2010).

4.3. Performance Measures

Performance measures are defined as a certain quantitative representation of a process, capacity or result considered relevant to the performance evaluation (Hatry et al., 1990). Performance of organizations is measured by achievement or otherwise of the organizations' set goals and objectives (Tom et al., 2010 : 4).

Performance indicators are indices that transpose business strategy to the operational level, also allow for alignment between the upper management and shop floor operators (Bititci et al., 1997). The essential objective of these indicators is to measure how close the firm is to the targets decided by the businesses and operational strategies (Neely et al., 1997).

Generally, there are many hierarchy levels in the firm's management components that can be divided to operational, tactical and strategic levels which are various by its duties and positions etc. Upper management in strategic level needs financial measures for management level decisions. But down management located in tactical and operational levels and employees need to operational measures in order to the daily business (Sillanpää and Kess, 2012).

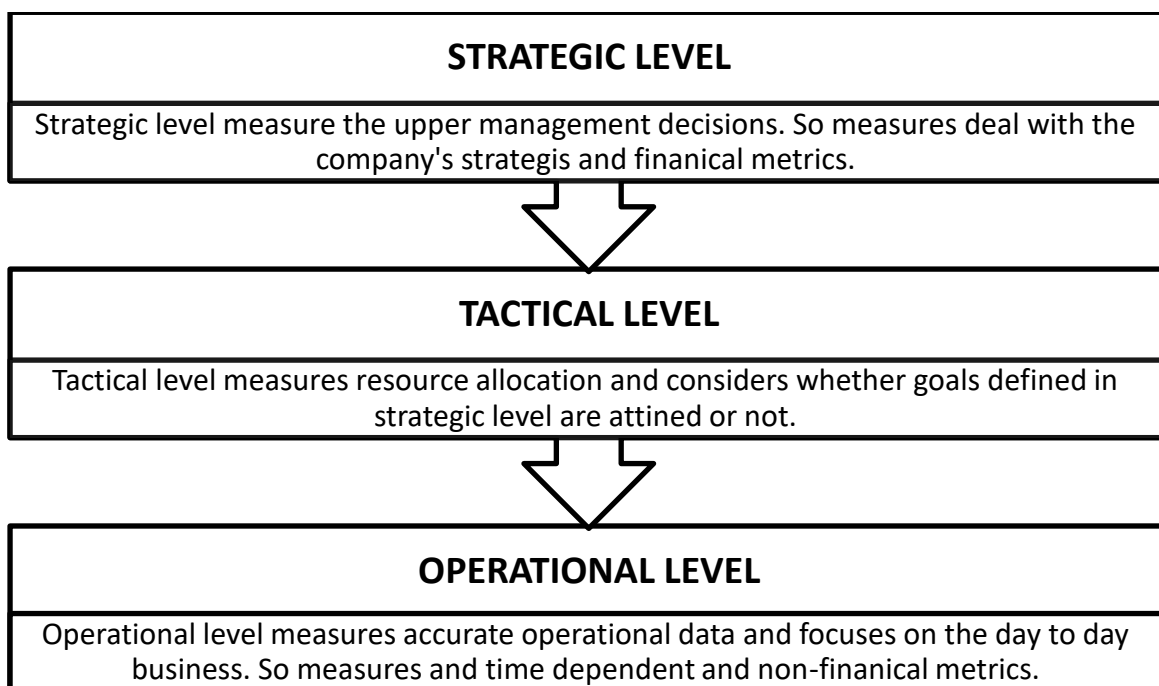


Figure 4.1. Characteristics measurement of the management levels

(Gunasekaran et al., 2004) attend the metrics in each management level concerning the manufacturing process:

- **Strategic Level**

Quality level, perceived value of the product, cash flow, suppliers pricing, capacity, total of cash flow time, costs saving, net profit vs productivity ratio, customer level, variation against budget, rate of return on investment, order cycle time, accuracy of the forecasting techniques and finally master production effectiveness.

- **Tactical Level**

Defect free rate, schedule, customer service satisfaction, lead time, customer query time, flexibility, capacity utilization, orders entry method and Range of products too.

- **Operational Level**

Incoming stock level, effectiveness of scheduling techniques, work in progress, finished products in transit.

4.4. Factors Affecting on Performance

There are vary factors that can influence on the firms performance, both internal and external, will be dividing into two main factors:

INTERNAL FACTORS	
<ol style="list-style-type: none"> 1. Technical factors 2. Organizational Structure 3. Human Resources 	
EXTERNAL FACTORS	
<u>INDIRECT AFFECT</u> <ol style="list-style-type: none"> 1. Political factors 2. Economic factors 3. Social factors 4. Technological factors 	<u>DIRECT AFFECT</u> <ol style="list-style-type: none"> 1. Competition between existing firms 2. Risk of entry of potential competitors 3. Threat of alternative goods 4. Suppliers negotiating power

Figure 4.2. Factors affecting on performance

4.4.1. Internal Factors

The internal factors are the various variables that result from the interaction of internal elements of firms which influence on their performance. This factors the management can be controlling them and make changes that allow for increasing their positive effects or minimizing their negative effects. The factors which can be under the control of firm are as following:

1. Technical Factors

Which are the different forces and variables that are related to the firm's technical parts and include in particular:

- Technology type that used in actual functions or used to process information.
- Proportion of reliance on machines compared with the employees number.
- Organization design in terms of stores, fittings and machinery.
- Compatibility between the products of firm (goods/service) and the customer desires (مزهودة, 2001: 94).

2. Organizational Structure

It determines degree of the specialization and also the labor division between units and individuals, the administrative levels number, who follows each person and their dependents, what their powers and responsibilities are, and how their units and divisions are coordinated (المنظمة العربية للتنمية الادارية, 2009: 16).

3. Human Resources

These are the different forces and variables that effect on using the human resources in the firm and include:

- Structure of the workforce.
- Selection and employment system.
- Training and development.
- Wages and rewards system.
- Performance evaluating systems (المنظمة العربية للتنمية الادارية, 2009: 19).

4.4.2. External Factors

It means set of constraints, changes and attitudes that fall outside the control of firm (مزهودة, 2001: 91), and thus may directly or indirectly affect the organization activities and decisions. Factors that indirectly influence on the firm include (العدلوني, 2000: 203):

1. Political Factors

The organization's relationship to political variables, including political decisions like wars, coups and the ban on the activity of some organizations.

2. Economic Factors

Including interest rates, unemployment rates, wage trends, inflation rates, energy availability and its cost, etc.

3. Social Factors

Population composition, geographic distribution, consumption patterns, level of education, etc.

4. Technological Factors

Including R&D expenditure rates, development of communications and information systems, new inventions and others that contribute to solve business problems through modern technologies.

External factors that directly influence on the performance and decisions of firm are (محمد مرسي, 2003: 151):

1. Competition Between Existing Firms

It reflects the competition strength between existing companies within industry, where competition points out to the competitive strife between companies in an industry to gain a bigger market share.

2. Risk of Entry of Potential Competitors

Potential competitors are those firms that aren't competing in the industry currently but have an ability to compete if they desire.

3. Threat of Alternative Goods

Alternative goods represent those goods that look different but satisfy the same needs and desires.

4. Suppliers Negotiating Power

They mean the firms that provide input in the industry such as raw materials, services, equipment, etc. The impact of suppliers depends on the following factors:

- The weakness of alternative goods that a buyer can access.
- Suppliers location.
- Distinguish the supplier's goods by providing the firms with the most important inputs in its business activities (العارف, 2003: 176).

4.5. Operational Performance Measures

Operational performance measurements based on most of previous studies adopt five main elements in the manufacturing industry which covers quality, customer service, delivery, flexibility and cost (Rahman et al., 2010).

4.5.1. Cost

Cost means the needed payment to produce product. Workers productivity, production cost and reduction in inventory is utilized in operational performance measurements in manufacturing industry (Chavez et al., 2013). While according to Williams C., workers productivity is the cost or amount of the working hours wanted to produce per unit of outputs. In other word, the lower the labor cost utilized to produce an output, the higher the workers productivity.

4.5.2. Quality

Quality means the goods/service ability to meet the consumer's demands and satisfaction (Heizer and Barry, 2011). In operational performance measurement, quality was discussed in the form of goods performance, goods endurance and goods acceptance within the limit of design specifications.

In manufacturing industry, goods durability usually being measured by consumed time to produce outputs. The longer it takes for a goods to last or the longer it takes for it to be malfunctioned, the higher the durability of goods. Therefore, companies always measure product durability through the average time in between production (Rahman et al., 2010).

4.5.3. Delivery

Product delivery means the time taken for a products to be delivered to the customer. Reduction of lead time, faster delivery than the competitors and on time product delivery to consumer had been used to measure operational performance in manufacturing industry (Chavez et al., 2013).

4.5.4. Flexibility

Production flexibility has been defined as how far the manufacturing operation respond to the continual change of orders number, type and characteristics of produced product. Flexibility also allows the firms to react instantly to the change in markets for instance in responding to competitors and consumers and in decreasing the waiting time between the product orders and product delivery (Williams, 2013).

4.5.5. Customer Service

It refers to a company's ability to meet needs and desires of the consumer. Perfect customer service is a critical marketing part for firms. It's the firm's ability to consistently overrun of its customer's expectations (Wreden, 2004: 49).

The major purpose of customer service metrics is to measuring how the suppliers are serving (or not serving) the firm. Customer service has been extremely distinguished and one of the important competitive advantages (Hausman, 2000).

4.6. Criteria of the Effective Performance Measurement

Many important criteria can be presented for the effective performance measurements as following (Hwang et al., 2014: 50):

1. The measure should relate between each of the strategy, fulfillment, and value creation. Also the measure should refers to comprehensive performance of the activities. Performance measurements take into consideration the inclusive firm's activities. To achieve that, measure should aligns all the activities from businesses to operations.
2. The measures should include pertinent intangible and non-financial performance dimensions. In general, especially in the upper management level, the financial measures are utilized to measure the performance or the organization. But on the point of lower management level's view, there are some aspects which interested with intangible performance for instance, effectiveness of scheduling, measures related to human resources etc. and these non-financial measures are also significant factors required to manage the firm's activities.
3. The measures should capture adequately the reality. As the firm's environment circumstances are dynamic status, measures may be obsolete. That prevent the performance measuring effectively. Therefore, measures should show the current firm's environment circumstances.
4. The measure should be measurable and observable as well which have quantitative terms. This criterion guarantee that measures can be utilized to analytic method.

In summarized, measures must be intuitive, simple, and also easy to evaluating the performance. Moreover, measures have to be pervasive that represent to the system circumstance.

4.7. Performance Control Process

Some of essential steps of the performance control process as studied are:

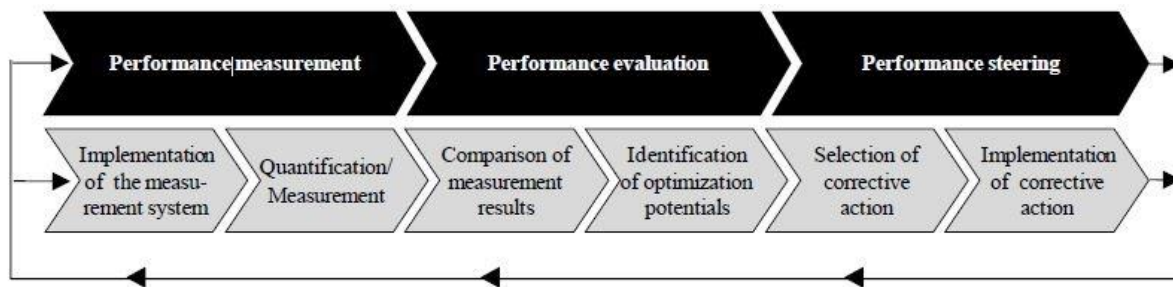


Figure 4.3. Performance control process

Source: (Gebert, Konstantin Gregor Kilian, 2012: 3)

4.7.1. Implementation of the Measurement System

Standards are, by definition, simply the criteria of performance. Standards are the chosen points in a whole planning program at which performance is measured. Standard elements form accurately worded, measurable objective and are essentially important for control.

In the industrial firms, standards could involve production goals and sales, safety records, work attendance targets etc. But in the service industries, standards might involve a number of time consumers have to wait in queue at a bank or even the number of new customers attracted by a reorganized advertising campaign.

4.7.2. Qualification/ Measurement

The performance measurements against standards should be done on a forward looking bases and thus that deviation may be detected in advance of its occurrence and be avoided by suitable actions.

4.7.3. Comparison of Measurement Results

It's an easy but significant stage in the process of control. It includes comparing the measured results with standards that already set. If the performance matches the standards, managers might suppose that "everything is under the control". In such a case managers don't have to interfere in the firm's operations.

4.7.4. Optimization Potentials Identification

Some deviations are possible in all the activities. However, the deviations in significant part of business needs to be more urgently corrected as a compared to the deviations in insignificant parts. Management should use critical point control and management by exception in such areas.

4.7.5. Selection of Corrective Actions

This step becomes substantial if the performance falls lower of standards and the analysis refers that corrective action is in demand. If standards are suitably drawn and if means are available to decide what subordinates are doing exactly, actual or expected performance evaluation is completely easy. But there are some activities for which it's hard to develop accurate standards, and also too many activities which are difficult to measure.

4.7.6. Implementation of Corrective Actions

The corrective actions may include a change in an activity or more of firm's operations. Control can detect unsuitable standards and in this situation, the corrective actions may include a change in the original standards more than a change in the performance.

4.8. Conclusion

The most effective measurement systems assess the performance in complete length of the firm's purchasing function, from the suppliers through internal processes to the customers. The measures are separated in five major categories which include cost measures, quality measures, time measures, supplier performance measures and finally consumer satisfaction measures. The metrics which are utilized in the performance measurements should be those that indeed capture the substance of purchasing function performance. Suppliers can have important impact on the manufacturer's performance through their contributions to the cost reduction, new products design and even enabling constant improvement of the quality (Monczka, Trent & Callahan 1993).

A firm's ability to best avail performance potentials within buyers-suppliers relationship has been a crucial success factor in securing the competition and improving firm's comprehensive performance (Gebert, 2012: 122).

Metrics assignment to the most valid places should be through a measurement system. Measurement targets should amount to the function goals and selected metrics should achieve a balance between financial and non-financial measures which can help in making decision for effective performance measurement. The performance of purchasing function encompasses the financial performance and market performance. Business profitability is a justification of its good performance and loss is a justification of weak performance. Profits refer to a good operational performance (Lawson et al., 2009).

Finally, effective performance evaluation generally requires determining reference values to correctly identify performance gaps and optimization potentials (Fisher, 1995).



CHAPTER FIVE

ANALYSIS OF SUPPLIERS' PERFORMANCE

5.1. Background of Automotive Industry in Turkey

The positive growth of Turkish automotive industry was been started in the 1950's with the approach to counterweigh the big import volumes. By the late of 1960's, this industry acquired an increasing momentum when the first joint enterprises with foreign car manufacturers were founded. firms like Fiat, Renault, Ford continued that successful investments until the recent time.

During the 1990's, as other international manufacturers such as Honda, Mercedes-Benz, Toyota, Hyundai and Isuzu combined to the market, Turkey quickly became an automotive production base which not only serving one-time development of the industry but further catching long-term development options.

Recently, Turkey has a distinguished automotive sector, proving real growth in the past. All players involved, including local authorities and the government, are participating in creating conditions to increase output in the future.

At the end of 2007, the Turkish automotive industry's production capacity exceeded 1.3 million vehicles, making it the 16th-largest automotive manufacturer in the world and one of leading production bases in Europe. In 2010, Turkey is Europe's 3rd largest light commercial vehicle manufacturer, the 6th largest truck manufacturer, one of the largest sales markets for trucks and the 9th largest passenger car manufacturer.



Figure 5.1. Locations of automotive production sites in Turkey

Source: (Ministry of Economy Report, General Directorates of Exporting 2017)

We will keep going to introduce details but this time with our main section of our study which is spare parts production in Turkey.

More than 500.000 vehicles are sold in Turkey every year, that creating a great order for parts and component, also for replacement parts and spare. This creates a basis for a powerful spare trade and industry platform. local production of parts and components ranges from various products of motor and engine parts to electrical equipment and automobile glass, etc.

In 2017 the spare parts manufacturers total number in Turkey was about 4000. And about %30 of those companies have international quality certificates (ISO 9000, QS 9000, ISO 14000 etc.) and 70 % of these are small and medium sized enterprises, supporting some strong industrial zones all across Turkey. The number of foreign investors in the spare parts sector is about 200. Most of world leaders in this sector have joint-ventures with Turkish firms. The parts and components industry is essentially focused in the Marmara region around Bursa. Beside Bursa, Istanbul, İzmir, Kocaeli, Ankara, Konya, Adana and Manisa are home to many other significant manufacturing sites.

The spare parts sector's export volume reached US\$ 8.9 billion for the year 2016. The Turkish spare parts industry produces almost all parts and components. At present, the local parts and components production consists of:

- Complete engines and engine parts
- Chassis parts and spare parts
- Radiators forged and cast parts
- Heating, ventilating & air conditioning systems (HVAC systems)
- Electrical equipment and illumination systems
- Power trains, Batteries
- Brake and clutch parts and components
- Design and engineering services
- Hydraulic and pneumatic systems
- Suspension systems
- Security systems and safety parts
- Rubber and plastic parts
- Castings and forgings
- Batteries
- Auto glass
- Seats

Perhaps most importantly, compared to rival countries, Turkey has the most developed supply chain potential. Turkish suppliers create a financially strong network which is experienced in international cooperation, and flexible in terms of meeting the requirements of various quality systems. The supply industry exports annually to 180 countries, with the value of these exports reaching about 185 billion USD.

We will specific this study by applying it on the firms that located in Ankara city, more specific in OSTIM industrial zone which we will talk about it in the next passage*.

5.2. OSTIM Industrial Zone Overview:

OSTIM was founded in 1967 and is located in Ankara, the capital city of Turkey, with 5000 Micro & SMEs which are being included in 100 several sectors producing approximately 10.000 various goods and employing rather than 50.000 employees. Total land of OSTIM is 5.000.000 m².

These 5.000 manufacturing firms in OSTIM operate on a wide range of products such as machinery, equipment, spare parts, etc. to use in different sectors as medical, national defense, construction, automotive industries, agriculture, mining etc. The production facilities of these 5.000 manufacturing firms in OSTIM zone range from casting, die-casting, molding, forging, cutting, pressing, welding, metal treatment, CNC processing etc.

5.3. Research Methodology

5.3.1. Data Collection Methods

This research utilized a questionnaire survey to collect the primary data for analysis. The questionnaire was distributed to responsible people in purchasing position in Turkish automotive parts in Ostim zone in Ankara city. The questions of the questionnaire were prepared according to previous studies with regard to selected supplier evaluation criteria and sub-criteria of operational performance.

The questionnaire consisted of three parts: 1) demographic information; 2) Criteria of supplier selection which are cost, quality and on-time delivery; and 3) sub-variables of operational performance which are price, product quality and finally customer service. Respondents were requested to indicate how agree each of the 34 listed question is on a 5 point Likert-type scale, where (1) indicated strongly disagree to (5) absolutely agree.

5.3.2. Data Analyzing Methods

In this study SPSS 19. (Statistical Package of Social Science) program was applied to analyze the survey data. After that demographic data was analyzed and the descriptive statistics results as Frequency, Mean, and Std. deviation were presented. Then, For testing

* Most of this information has gotten from Ministry of Economy Report which prepared by General Directorates of Exporting 2017.

the Reliability Cronbach's Alpha test was used. For testing the normal distribution Kolmogorov-Smirnov Z test was used.

Moreover, Multiple Regression analysis was applied to analyze the effect of supplier selection criteria on every sub-variable of operational performance. Finally, Correlation analysis was applied too for testing if there is a relationship between the variables or not.

5.4. Research Sample

The sample of this study included (115) Automotive spare parts firms in OSTIM industrial zone in Ankara city. (175) questionnaires were distributed in the period between March and April 2018 on the Administrator at many positions associated with purchasing process in those firms. The questionnaire final form was as follows:

For supplier selection criteria's variables items from 1 to 7 measuring the cost, items from 8 to 13 measuring the quality, items from 14 to 18 measuring the on-time delivery. On the next section for operational performance's variables items from 1 to 7 measuring price, items from 8 to 11 measuring product quality and finally items from 12 to 16 measuring customer service.

5.5. Data Analyzing

5.5.1. Demographic Characteristics

Table 5.1. Demographic Statics

	Category	Frequency	Percentage
SEX	Male	135	77.1%
	Female	40	22.9%
AGE	24 – 29	38	21.7%
	30 – 39	66	37.7%
	40 – 49	53	30.3%
	50 and more	18	10.3%
EDUCATION	High school	32	18.3%
	Institute	29	16.6%
	University	102	58.2%
	Postgraduate	12	6.9%
POSITION	Operation/Purchasing Manager	40	22.9%
	Warehouse Officer	37	21.1%
	Administrator	33	18.9%
	Accountant/Financial Manager	43	24.5%
	Other	22	12.6%
EXPERIENCE	Less than 2 years	18	10.3%
	2 – 4 years	59	33.7%
	5 – 8 years	63	36%
	More than 8 years	35	20%
Total		175	100%

According to the statistical table we can notice that:

Male rate bigger than female rate and that's normal in this kind of industrial firms. For age, we can see that adults have the biggest present more than youngsters because most of firms prefer to go to recruiting people with an experience not new graduated people. For education, more than a half of study sample have a university certificate and that's related with our last explanation which is firms go to recruiting an educational people with good experience to do all their duties perfectly.

Also for position, we can notice that most of firms give purchasing responsibility to financial and operation managers because they play a significant role in this process. Finally for experience, the people who have a good experience more than 4 years taking the highest rate and that's improve our explanation before about the industrial firms which recruiting people with good experience to have success in their duties.

5.5.2. Reliability

For testing the reliability of this study's data we used Cronbach's Alpha test, it's value must be between 0 and 1, and the acceptable value statistical must be more than 0.6 . The Cronbach's Alpha test results and descriptive statistics results for our variables were as follows:

Table 5.2. Reliability Test

Variable	Cronbach's Alpha	Mean	Std. Deviation	Variance
SUPPLIER SELECTION CRITERIA	-	3.1808	.64063	.410
Cost	.701	3.1363	.68337	.467
Quality	.806	3.1876	.82304	.667
On-time Delivery	.683	3.2457	.77056	.594
OPERATIONAL PERFORMANCE	-	3.4832	.54438	.296
Price	.826	3.2400	.77690	.604
Product Quality	.669	3.3629	.76502	.585
Customer Service	.695	3.6137	.65446	.428
Total	.877	-	-	-

According to the statistical table we can notice that:

Cronbach's Alpha test values were between 0.669 and 0.826, those values it's acceptable because it's more than 0.60 . Also, the table present Mean, Std. Deviation and Variance of the study variables and according to it we can notice that the smallest variance is customer service's variance and its value 42.8% which means there is no critical different between participators answer. Moreover, mean variables value is between 3.13 and 3.61, which means questionnaire participators generally agree with the survey questions.

5.5.3. Normality Test

For testing the normality distribution we used Kolmogorov-Smirnov Z test, if Sig. value was more than 0.05 that's mean we can't reject hypothesis that means distribution is normal and if it's less than 0.05 that's mean we reject hypothesis and the distribution is not normal. The test results were as follows:

Table 5.3. Kolmogorov-Smirnov Test

	Cost	Quality	On-time Delivery	Price	Product Quality	Customer Service
N	175	175	175	175	175	175
K-S Z test	1.335	1.264	1.239	1.080	1.206	1.212
Sig.	.057	.082	.093	.194	.109	.106

According to the statistical table we can notice that Sig. value for all the variables is more than 0.05 and that's mean we can't reject hypothesis that means distribution is normal.

5.5.4. Correlation Analysis

For testing if there is relationships between the study variables or not we applied Correlation analysis and also, we can know how strong these relationships are as follows:

Table 5.4. Correlation Analysis

		Cost	Quality	On-time Delivery	Price	Product Quality	Customer Service
Cost	Pearson Correlation	1	-	-	-	-	-
	Sig.	-					
	N	175					
Quality	Pearson Correlation	.822**	1	-	-	-	-
	Sig.	.000	-				
	N	175	175				
On-time Delivery	Pearson Correlation	.492**	.365**	1	-	-	-
	Sig.	.000	.000	-			
	N	175	175	175			
Price	Pearson Correlation	.170*	.200**	.474**	1	-	-
	Sig.	.025	.008	.000	-		
	N	175	175	175	175		
Product Quality	Pearson Correlation	.068	.076	.013	-.034	1	-
	Sig.	.373	.319	.863	.658	-	
	N	175	175	175	175	175	

Customer Service	Pearson Correlation	.198**	.177*	.210**	.455**	-.058	1
	Sig.	.008	.019	.005	.000	.444	-
	N	175	175	175	175	175	175
** Correlation is significant at 0.01 level							
* Correlation is significant at 0.05 level							

According to the table we can notice that:

There is relationship between the cost and quality and it's strong relationship because Pearson value is 82.2% . Also that, there is relationship between the cost and time delivery which is middle and its value 49.2% and between the cost and price but here it's weak because Pearson value is 17% . Moreover, there is relationship between the cost and customer service but it's also weak and its value 19.8%.

We can also find a relationship between the quality and on-time delivery and it's middle with value 36.5% . There is relationship between the quality and price and also between the quality and customer service and both of this relationships are weak because Pearson value are 20% and 17.7% . Also we can notice the relationship between time delivery and price which is middle and its value 47.4% and relationship between time delivery and customer service which is weak because Pearson value is 21% . Finally, there is relationship between price and customer service which is middle and its value 45.5% .

5.5.5. Regression Analysis

The most popular form of the linear regression analysis is multiple regression. As predictive analysis, multiple regression used to clarify the relationships between a dependent variable and more than independent variable. Here we can notice that the independent variables may be categorical or continuous.

Regression residuals must be distributed normally. Also, a linear relationships are supposed between dependent and independent variables. We can find three major uses for multiple regression analysis as follows:

Firstly, it could be used to identify strength of the impact which the independent variables have on the dependent variable. Then, it may be used to prediction effects of changes. That means, multiple regression analysis helps to understand how much the dependent variable will change when the independent variables change. Finally, multiple regression analysis foresee trends and the future values.

When choosing the model for multiple regression analysis, another significant regard is the model fit. Adding the independent variables to a multiple regression model will raise amount of the explained variance in the dependent variable (generally expressed as R^2). Thus, inserting a lot of independent variables without theoretical justification may lead to an over-fit model.

For testing our hypotheses we used multiple regression analysis to know if there is impact between the independent variables and dependent variables as follows:

For the main hypothesis in this study H1 stated that there is an influence to supplier selection criteria on Turkish firm's operational performance.

Table 5.5. ANOVA Table for H1 Hypothesis

H1	N	R	R ²	ANOVA	
				F	P
	175	.323	.104	20.149	.000

According to the statistical table we can notice that Sig. value is less than 0.05 and that's mean we accept H1 hypothesis. So there is an influence to supplier selection criteria on Turkish firms' operational performance. R² value is 10.4% and that's mean supplier selection criteria in this study explain 10.4% from the change of operational performance in Turkish firms.

Table 5.6. Coefficients Table for H1 Hypothesis

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	2.609	.199	-	13.143	.000
Supplier Selection Criteria (X)	.274	.061	.323	4.489	.000

Based on calculated t-value (4.489) in the table we can notice that it's bigger than t-value (1,96) and Sig. (p < 0.05), so the variable is significant. The Std. error of this regression coefficient captures how much uncertainty is associated with this coefficient. Thus, the multiple linear regression model would be as follows:

$$\hat{y}_i = 2.609 + 0.274 X_i$$

(Std. Error) 0.199 0.061

Now in the same way we can test the sub-hypotheses and we can start with H1₁ hypothesis stated that there is an influence to supplier selection criteria (cost, quality, on-time delivery) on Turkish firm's price.

Table 5.7. ANOVA Table for H1₁ Hypothesis

H1 ₁	N	R	R ²	ANOVA	
				F	P
	175	.500	.250	19.047	.000

According to the statistical table we can notice that Sig. value is less than 0.05 and that's mean we accept H₁ hypothesis. So there is an influence to supplier selection criteria (cost, quality, on-time delivery) on Turkish firm's price. R² value is 25% and that's mean supplier selection criteria explain 25% from the change of price in Turkish firms.

Table 5.8. Coefficients Table for H₁ Hypothesis

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	1.813	.268	-	6.754	.000
Cost (X ₁)	-.337	.142	-.297	-2.377	.019
Quality (X ₂)	.237	.110	.251	2.152	.033
On-time Delivery (X ₃)	.533	.077	.528	6.927	.000

Based on calculated standardized Beta values in the table we can notice that on-time delivery has the strongest impact on the firm's price, then quality criterion and latest the cost. Also, Sig. values (p < 0.05), so the variables are significant. The Std. error of this regression coefficient captures how much uncertainty is associated with this coefficient. Thus, the multiple linear regression model would be as follows:

$$\hat{y}_i = 1.813 - 0.337 X_1 + 0.237 X_2 + 0.533 X_3$$

(Std. Error) 0.268 0.142 0.110 0.077

For H₁₂ hypothesis stated that there is an influence to supplier selection criteria (cost, quality, on-time delivery) on Turkish firm's product quality we can test it as follows:

Table 5.9. ANOVA Table for H₁₂ Hypothesis

H ₁ ₂	N	R	R ²	ANOVA	
				F	P
	175	.079	.006	.358	.783

According to the statistical table we can notice that Sig. value is more than 0.05 and that's mean we reject H₁₂ hypothesis. So there is not an influence to supplier selection criteria (cost, quality, on-time delivery) on Turkish firm's product quality.

Finally for our last hypothesis H₁₃ stated that there is an influence to supplier selection criteria (cost, quality, on-time delivery) on Turkish firm's customer service.

Table 5.10. ANOVA Table for H₁₃ Hypothesis

H ₁ ₃	N	R	R ²	ANOVA	
				F	P
	175	.210	.044	7.966	.005

After applying multiple regression between supplier selection criteria (cost, quality, on-time delivery) and firm's customer service the results showed that the cost and quality variables were insignificant. Therefore, we have had to apply simple linear regression only between on-time delivery variable and firm's customer service. Thus, we changed H1₃ hypothesis to be there is an influence to on-time delivery criterion on the firm's customer service.

According to the statistical table we can notice that Sig. value is less than 0.05 and that's mean we accept H1₃ hypothesis. So there is an influence to on-time delivery criterion on Turkish firm's customer service. R² value is 4.4% and that's mean on-time delivery criterion can explain 4.4% from the change of customer service in Turkish firms.

Table 5.11. Coefficients Table for H1₃ Hypothesis

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	3.035	.211	-	14.414	.000
On-time Delivery (X ₃)	.178	.063	.210	2.822	.005

Based on the calculated results Sig. values ($p < 0.05$), so the variable is significant and the Std. error of this regression coefficient captures how much uncertainty is associated with this coefficient. Thus, the simple linear regression model would be as follows:

$$\hat{y}_i = 3.035 + 0.178X_3$$

$$\text{(Std. Error)} \quad 0.211 \quad 0.063$$

5.6. Discussion and Recommendations

The following are the major findings of this research:

With regard to the sex composition and age the research shows that 77.1% of respondents are male and 68% of them are between 30 - 49 years old. Also, with regard to the education level, experience, and position the research shows that 58.2% of respondents are university graduates and 36% of them have experience in their position between 5 – 8 years respectively. Finally, 24.5% of firms give purchasing process responsibility to the financial managers.

There is relationship between the cost and quality, on-time delivery, price and customer service. Also we can notice a relationship between the quality and on-time delivery, price, and customer service. Moreover, there is relationship between the time delivery and price as well as customer service. Finally, there is relationship between price and customer service. Each of those relationships are changing from weak to strong.

With regard to the original hypotheses, after testing, this study shows firstly H1 hypothesis stated there is an influence to supplier selection criteria (cost, quality, on-time delivery) on Turkish firm's operational performance. This hypothesis has been accepted and the criteria tested have 10.4% impact on operational performance to automotive spared parts firms in OSTIM zone. Secondly, H1₁ hypothesis stated that there is an influence to supplier selection criteria (cost, quality, on-time delivery) on Turkish firm's price has been accepted as well and cost, quality and time delivery criteria have 25% impact on automotive spared parts price. Thirdly, H1₂ hypothesis stated that an influence to supplier selection criteria (cost, quality, on-time delivery) on Turkish firm's product quality has been rejected which mean this study criteria have not had any impact on automotive spared parts quality. Lastly, after testing H1₃ hypothesis the results showed that two variables were not significant which forced us to use simple linear regression for this hypothesis and change it to be there is an influence to on-time delivery criterion on Turkish firm's customer service and was accepted and this influence rate was 4.4% .

Based on the majority of automotive spared parts firms in OSTIM zone, which were small and medium enterprises and don't have good organizational structure, we can understand why the firms give the purchasing responsibility to the accountants or financial managers.

We can provide recommendations to industrial firms as follows:

Firstly, firms should use the provided information of suppliers to improve their goods quality and specifications. Also, firms should make a strategic partnership with suppliers and establish long-term relationships with them in order to ensure mutual trust in various issues. Moreover, firms should realize that supplier selection processes are one of the most significant obstacles which they can face, and that it's important to keep working to develop and choose the appropriate suppliers according to the market changes.

Based on the finding, a conclusion can be drawn that the decision of supplier selection for firms and multiplicity of criteria makes the selection process difficult as it will affect the firm's performance. The overrun on cost, quality and time delivery in each firm is caused by the weakness in supplier selection strategy where the methods are not applied accordingly. Thus, the goal and objective of supplier selection method is proposed as a guide because it has standard criteria to help the decision maker in order to make an informed decision.



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APPENDICES

APPENDIX A1

A Questionnaire

First Section: Demographic Information

Please mark your answer in the boxes (X).

1-Sex:

Male Female

2-Age:

24 – 29 30 - 39 40 - 49 50 and more

3-Education:

High School Institute University Postgraduate

4-Position:

Operation/Purchasing Manager Warehouse Officer Administrator
 Accountant/ Financial Manager Other

5-Experience:

Less than 2 years 2 - 4 years 5 - 8 years More than 8 years

Second Section: Supplier Selection Criteria

Mark the following issues in the supplier selection criteria (Cost – Quality – Delivery Time) according to their degree of importance in terms of your facility (1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: absolutely agree)

		1	2	3	4	5
1	Our facility needs can be bought from our suppliers at an affordable cost compared to the needs of competitors.	1	2	3	4	5
2	Our facility is ready to pay higher cost to get after-sales services that our suppliers offer	1	2	3	4	5
3	Our facility uses large quantity strategy in the purchasing to benefit from supplier quantity discounts	1	2	3	4	5
4	The most important thing to our facility is cost of purchases	1	2	3	4	5
5	Our facility doesn't inspect the purchases because we trust our suppliers	1	2	3	4	5
6	Our facility uses sample testing method to decrease inspection cost	1	2	3	4	5
7	Our suppliers responsible on transit our purchases to the facility and pay the transit cost	1	2	3	4	5
8	For our facility quality is the most important criteria to select the suppliers	1	2	3	4	5
9	Our purchases always correspond with the required specifications	1	2	3	4	5

10	Our facility choose the suppliers who have a quality certification from government resources	1	2	3	4	5
11	Always there is a connection between our facility and suppliers to have new information about the quality and any change could happens to the raw materials	1	2	3	4	5
12	Our suppliers give our facility a warranty to retrieval any defective materials	1	2	3	4	5
13	Our purchases contain on a low percentage of defective or damaged	1	2	3	4	5
14	Our suppliers delivery our needs quickly	1	2	3	4	5
15	Our suppliers have an ability to cover suddenly and unexpected demands	1	2	3	4	5
16	Our suppliers deliver our needs in the time without any delayed	1	2	3	4	5
17	Our suppliers rarely be late for our needs delivery	1	2	3	4	5
18	Our facility sometimes can make time of delivery earlier	1	2	3	4	5

Third Section: Operational Performance

Mark the following issues in the facility's operational performance (Goods Price – Goods Quality – Customer Service) according to their degree of importance in terms of your facility (1: strongly disagree, 2: disagree, 3: neutral, 4: agree, 5: absolutely agree)

		1	2	3	4	5
1	Our goods price is low comparing with the competitors	1	2	3	4	5
2	Suppliers has reduced our goods cost	1	2	3	4	5
3	Our facility incurs minimum costs in manufacturing	1	2	3	4	5
4	Our facility incurs minimum costs in distribution	1	2	3	4	5
5	Our facility incurs minimum costs in marketing	1	2	3	4	5
6	Our facility incurs minimum costs in inventory management	1	2	3	4	5
7	Our facility incurs minimum costs in waste management	1	2	3	4	5
8	Our goods quality level is appropriate to the market needs	1	2	3	4	5
9	Our facility care about goods quality until if it costs more	1	2	3	4	5
10	Our facility receive minimum complaints on our goods quality	1	2	3	4	5
11	Rewarding suppliers' performance has improved our product quality	1	2	3	4	5
12	Our contracts manager is easily contactable	1	2	3	4	5
13	Any problems/set-backs are communicate to our customers quickly and effectively	1	2	3	4	5
14	Our facility offers goods delivery service to our customer	1	2	3	4	5
15	Our facility always offer After-sales service	1	2	3	4	5
16	Our facility offers financial support service like installment goods sales	1	2	3	4	5

Anket Formu

I.Bölüm - Genel Bilgiler

Bu bölümde cevabınızı lütfen kutucuklara (X) şeklinde işaretleyiniz.

1- Cinsiyetiniz:

() Erkek () Kadın

2- Yaşınız:

() 24 – 29 () 30 - 39 () 40 - 49 () 50 ve üzeri

3- Öğrenim Düzeyiniz:

() Lise () Enstitü () Üniversite () Lisans üstü

4- Ünvanınız:

() Operasyon / Satın Alma Yönetici () Depo Görevlisi () Yönetici
() Muhasebci / Mali Müşavir () Diğer

5- İşletmenizin faaliyet süresi (yıl):

() 2 yıldan az () 2 - 4 () 5 - 8 () 8 ve üzeri

II. Bölüm - Tedarikçi Seçim Kriterleri

Tedarikçi seçim kriterleri (Maliyet – Kalite – Zaman Teslimatı) çabalarında yer alan aşağıdaki konuları firmanız açısından önem derecesine göre işaretleyiniz. (1: Kesinlikle katılmıyorum, 2: Katılmıyorum, 3: Ne katılıyorum ne katılmıyorum, 4: Katılıyorum, 5:Kesinlikle katılıyorum)

		1	2	3	4	5
1	Firmamız ihtiyaçları rakiplerin ihtiyaçları ile karşılaştırıldığında uygun bir maliyetle satın alınabilmektedir.	1	2	3	4	5
2	Firmamız satın aldıktan sonra hizmetler karşılığında yüksek maliyeti kabul edilmektedir.	1	2	3	4	5
3	Firmamız miktar indirimlerinden yararlanması büyük miktarlarda satın alma stratejisine bağlıdır.	1	2	3	4	5
4	Firmamız ihtiyaçları alırken en çok önemsendiği konu malın fiyatıdır.	1	2	3	4	5
5	Firmamız ihtiyaçları teslim aldığı anda kontrol etme gereği duymaz, çünkü tedarikçilerimize güvenmektedir.	1	2	3	4	5
6	Firmamız test ve muayene maliyetini düşürmek için örnekleme yönteminden faydalanarak alınacakları incelemektedir.	1	2	3	4	5
7	Tedarikçilerimiz, alınan malın taşıma işlemlerinden ve işlemlerin maliyetlerinden sorumludur.	1	2	3	4	5
8	Firmamız için tedarikçi seçiminde en önemli kriter kalitedir.	1	2	3	4	5
9	Firmamız alınacak ürünler istenilen özelliklerdedir.	1	2	3	4	5
10	Firmamız devletten onaylanmış kalite belgesine sahip tedarikçileri seçmektedir.	1	2	3	4	5

11	Firmamız tedarikçiler ile kalite ve ürün tasarımındaki değişiklikler hakkında bilgi edinmek için sürekli iletişim içindedir.	1	2	3	4	5
12	Firmamıza tedarikçiler firmamızın kusurlu alımları için güvence sağlamaktadır.	1	2	3	4	5
13	Firmamızın alımlarında kusurlu veya hasarlı mal oranları düşüktür.	1	2	3	4	5
14	Tedarikçiler siparişlerimizi hızlı bir şekilde karşılamaktadır.	1	2	3	4	5
15	Tedarikçilerimiz firmamızın acil ihtiyaçlarını karşılama yeteneği vardır.	1	2	3	4	5
16	Tedarikçilerimiz, firmamızın alımlarında herhangi bir gecikme olmadan zamanında teslim etmektedir.	1	2	3	4	5
17	Tedarikçilerimiz nadiren satın aldığımız ihtiyaçların teslimatı için geç kalırlardır.	1	2	3	4	5
18	Firmamız alımları bazen daha önce teslimat yapabilir.	1	2	3	4	5

III. Bölüm - Firmanın Operasyonel Performansı

Firmanın operasyonel performansı (Fiyat – Ürün kalitesi – Müşteri hizmeti) çabalarında yer alan aşağıdaki konuları firmanız açısından önem derecesine göre işaretleyiniz. (1:Kesimlikle katılmıyorum, 2: Katılmıyorum, 3: Ne katılıyorum ne katılmıyorum, 4:Katılıyorum, 5: Kesinlikle katılıyorum)

		1	2	3	4	5
1	Bizim mal fiyatı rakiplerimiz ile karşılaştırıldığında düşüktür.	1	2	3	4	5
2	Tedarikçilerimiz malımız maliyeti düşürmesinde rol oynamaktadır.	1	2	3	4	5
3	Firmamız imalatta asgari maliyet dayanmaktadır.	1	2	3	4	5
4	Firmamız dağıtımda asgari maliyet dayanmaktadır.	1	2	3	4	5
5	Firmamız pazarlamada asgari maliyet dayanmaktadır.	1	2	3	4	5
6	Firmamız envanter yönetiminde asgari maliyet dayanmaktadır.	1	2	3	4	5
7	Firmamız atık yönetiminde asgari maliyet dayanmaktadır.	1	2	3	4	5
8	Mallarımız kalitesi pazar ihtiyaçlarına uygundur.	1	2	3	4	5
9	Firmamız, maliyet daha fazla olmasına rağmen kalite ile ilgilenmektedir.	1	2	3	4	5
10	Firmamız, mal kalitemizden minimum şikayet almaktadır.	1	2	3	4	5
11	Tedarikçilerimiz performansını geliştirmesinin sayısında, malımız kalitesi geliştirilir.	1	2	3	4	5
12	Sözleşmelerizin yöneticimize kolayca ulaşılabilir.	1	2	3	4	5
13	Herhangi bir sorun / geri dönüş, müşterilerimize hızlı ve etkili bir şekilde iletişim kurar.	1	2	3	4	5
14	Firmamız müşteriye mal teslimatın hizmeti sunmaktadır.	1	2	3	4	5
15	Firmamız daima satış sonrası hizmet vermektedir.	1	2	3	4	5
16	Firmamız taksitli mal satışları gibi finansal destek hizmeti sunmaktadır.	1	2	3	4	5

APPEDIX A2

Sample Frame

NO	Firm's Name	Address
1	Aksoy Civata Hirdavat Otomotiv Tic. Ltd. Şti.	Alinteri Bulvarı 1257. Sk. (eski 359.) No: 27 Örnek San. Sit.
2	Aktif Oto Cam	1174. Sk. (eski:6.) Dış Kapı: 23-25 Ostim OSB
3	Altaş Şaft Balans Yedek Parça Ltd.Şti.	1171. Sk. (eski: 3.) No: 24 Ostim OSB
4	Alyıldız Şaft Balans Ltd. Şti.	1181. Sk. (eski: 11.) No: 55 Ostim OSB
5	Aydın Oto Elektrik	1230. Sk. (eski: 42.) Çemişgezek İş Merkezi No: 26/C Ostim OSB
6	Aypar Yedek Parça Otomotiv Mak. İnş. İth. İhr. Tic. ve San. Ltd. Şti.	1154. Sk. (eski: 214.) No: 17 Kuruçayırılı San. Sit.
7	Akbulut Pompa	1244. Sk. (eski: 47.) No: 10 Ostim OSB
8	Akedi Ltd. Şti.	Adalararası Sk.
9	Aydın Lastik Satış ve Servis Hizm. Ltd. Şti.	100. Yıl Bulvarı Dış Kapı: 88-90 Ostim OSB
10	Anadolu Rulman Ltd. Şti.	1180. Sk. (eski: 10.) No: 69 Ostim OSB
11	AR Radyatör Otomotiv Ticaret Ltd. Şti.	1173. Sk. (eski: 5.) No: 4 Ostim OSB
12	Ahmet Doğan Tanker İmalat. San. Tic. Ltd. Şti.	1182. Sk. (eski: 12.) Dış Kapı:8 Ostim OSB
13	Başkent Motorlu Araçlar Ltd. Şti.	Bağdat Cad. No: 372 Ostim OSB
14	Başkent Oto Koltuk San. Tic. Ltd. Şti.	1202. Sk. (eski: 31.) No: 115 Ostim OSB
15	Başkent Otopost Tic. Ltd. Şti.	17. Cadde (Alinteri Bulvarı) No: 29/A Ostim OSB
16	Bektaşoğlu Otomotiv	1154. Sk. (eski: 214.) No: 24 Kuruçayırılı San. Sit.
17	Birliksan Otomotiv Teks. İnş. Tur. Nak. Mak. Ltd. Şti.	Bağdat Cad. 1167. Sk. (eski: 212.) No: 4 /3 Kuruçayırılı San. Sit.
18	Başkent Çadır Sanayi ve Tic. Ltd. Şti.	1169. Sk. (eski:1.) Dış Kapı: 56 Ostim OSB
19	Başkent Treyler Karasör Sanayi	1244. Cad. (eski: 47.) No: 54 Ostim OSB
20	Beriş Makina Araçüstü Ekipman Sanayi	1200. Sk. (eski: 29.) Dış Kapı: 9-11 Ostim OSB
21	Canoğlu Balata Ltd. Şti.	1234. Sk. (eski: 57.) No: 103 Ostim OSB
22	Cepa Celebcioğlu Metal San. Paz. A.Ş.	Bağdat Cad. No: 373 Ostim OSB
23	Coşkun Treyler San. Tic. Ltd.	1234. Sk. (eski 57.) No: 72 Ostim OSB
24	Cömertler Damper San. Ltd. Şti.	1169. Cad. (eski: 1.) No: 84-86-88-90 Ostim OSB
25	Çelik İş Karter Karasor	1201. Sk. (eski: 30.) No: 80 Ostim OSB
26	ÇMS Makina İml. Ltd. Şti.	1233. Sk. (eski: 56.) Dış Kapı: 36 Ostim OSB
27	Çağdaş Oto (Otokar) Servisi	1200. Sk. (eski: 29.) No: 66-68-70 Ostim OSB
28	Çiftçiler Motor Yenileme San. Tic. Ltd. Şti.	1168. Sk. (eski: 211.) No: 2/B Kuruçayırılı San. Sit.
29	Demiray Karasör Met. San. Tic. Ltd. Şti.	1235. Sk. (eski: 58.) No: 63-65 Ostim OSB
30	D.A. Kızılırmak Optik Otom. San. Tic. Ltd. Şti.	1169. Sk. (eski: 1.) No: 30 Ostim OSB
31	Darbazlar Motorlu Araçlar San ve Tic. A.Ş.	Uzayçağı Cad. 1154. Sk. (eski: 214.) No: 3 Ostim OSB
32	Demir Reklam Oto Mamülleri Yedek Parça Satış Ve Ser. Hiz. San. Tic. Ltd. Şti.	100. Yıl Bulvarı No: 104 Ostim OSB

33	Dizayn Makina İml. ve Müh. San. ve Tic. Ltd. Şti.	Enerji Cad. No: 1 Ostim OSB
34	Doğan Elektrik	1180. Sk. (eski: 10.) Bosna İş Merkezi No: 36/G Ostim OSB
35	Doğuş Balata Debriyaj Otom. San. Paz. ve Tic. Ltd. Şti.	1180. Sk. (eski: 10.) Dış Kapı: 37 Ostim OSB
36	Dörtkol Taşıt Yedekleri San. ve Tic. Ltd. Şti.	Uzayçağı Cad. 1308. Sk. (eski: 78.) Ayık İş Merkezi No: 82/B-6-7-C4 Ostim OSB
37	Durukan Oto San. Tic. Ltd. Şti.	1169. Sk. (eski: 1.) No: 6/1 Ostim OSB
38	Denksan Silindir Kapak Yenileme Ltd. Şti.	C Blok 1134. Sk. (eski: 230.) No: 17 Keresteciler San. Sit.
39	Emtis Endüstri Makina Tesis Tasarım İml. İnş. San. Tic. Ltd. Şti.	Kocasinan San. Sit. 1183. Sk. (eski: 13.) Dış Kapı: 35 Ostim OSB
40	Endermak Mak. Yedek Parça Metal Oto. İnş. Nak. San. ve Tic. Ltd. Şti.	1181. Sk. (eski: 11.) Dış Kapı: 29-31-33 Ostim OSB
41	ER Tanker Tank Damper ve Dorse İmalatı	Ahi Evran Cad. No: 97 Ostim OSB
42	Erdal Damper ve Karöser San.	1245. Cad. (eski: 45.) No: 20 Ostim OSB
43	Ergün Makina ve Hird. Ltd. Şti.	1176. Cad. (eski: 8.) No: 11 Ostim OSB
44	Egepar Motorlu Araçlar Ltd. Şti.	Kuruçayırılı San. Sit. 1153. Sk. (eski: 210.) Dış Kapı: 15 Ostim OSB
45	Elparsan Otomotiv Tic. Ltd. Şti.	1168. Sk. (eski: 211.) No: 15 Kuruçayırılı San. Sit.
46	Emrah Otomotiv San. ve Tic. Ltd. Şti.	1153. Sk. (eski: 210.) No: 13 Kuruçayırılı San. Sit.
47	Emse Mühendislik AŞ.	1253. Sk. (eski: 355.) No: 5 Örnek San. Sit.
48	Engin Oto Aksesuar	1169. Sk. (eski: 1.) Armağan İş Merkezi No: 102/6 Ostim OSB
49	Ercan Yaşar Otom. San. ve Tic. Ltd. Şti.	1154/1. Sk. (eski: 213.) No: 7 Kuruçayırılı San. Sit.
50	Eser Oto Boya	1201. Sk. (eski: 30.) No: 16 Ostim OSB
51	Eлтаş Makina Eln. Tic. A.Ş.	1246. Sk. (eski: 31/A.) Cevat Dünder İş Merkezi Dış Kapı: 25 İç Kapı: 128 Ostim OSB
52	Eser Makina Metal Kalip Elekt. Hird. Boya San. ve Tic. Ltd. Şti	1203. Sk. (eski: 32.) No: 61 Ostim OSB
53	Enkar Ltd. Şti.	1201. Sk. (eski: 30.) No: 7 Ostim OSB
54	Gözde Karasör	1202. Sk. (eski: 31.) No: 87 Ostim OSB
55	Gülersan Yağlama Cihazları San. Tic. Ltd. Şti.	Alinteri Bulvarı No: 1/24 Gül-86 San. Sit.
56	Güven Karasör İmalatı	1169. Sk. (eski: 1.) No: 80 Ostim OSB
57	Genç Özel Otomotiv San. ve Tic. Ltd. Şti.	1157. Sk. (eski: 217.) No: 10 Kuruçayırılı San. Sit.
58	German İş Otomotiv. San. Tic. Ltd. Şti.	1168. Sk. (eski: 211.) No: 23 Kuruçayırılı San. Sit.
59	Gökçimen Motorlu Araçlar San. ve Tic. Ltd. Şti.	1169. Sk. (eski: 1.) Armağan İş Merkezi No: 102/14-15 Ostim OSB
60	Göktaş Şaft Balans ve Oto Tamir Basık Servisi Tic. Ltd. Şti.	1173. Sk. (eski: 5.) No: 14 Ostim OSB
61	Göztepe Oto Elektrik	1246. Sk. (eski: 31/A.) Cevat Dünder İş Merkezi No: 25/71 Ostim OSB
62	Güleryüz Kaporta	1235. Sk. (eski: 58.) No: 138 Ostim OSB

63	Gedikoğlu Metal Elarabası ve Eksoz İml. İth. İhr. San. Tic. Ltd. Şti.	1172. Sk. (eski: 4.) No: 26-28 Ostim OSB
64	Göker Hidrolik Mekanik Makina Otomotiv Yedek Parça San. ve Tic. Ltd. Şti.	1201. Sk. (eski: 30.) No: 99-101-103 Ostim OSB
65	Görgülü İnş. İth. İhr. San. ve Tic. Ltd. Şti.	1180. Sk. (eski: 10.) Dış Kapı: 25 Ostim OSB
66	Hazelser Dış Tic. İml. İth. İhr. ve Taah. Ltd. Şti.	1182. Sk. (eski: 12.) Dış Kapı: 16 Ostim OSB
67	İlvan Oto Elektrik	1173. Sk. (eski: 5.) No: 24/B Ostim OSB
68	Kiran Rulmancılık Tic. San. Ltd. Şti	Ahi Evran Cad. No: 84/P-1 Ostim OSB
69	Kuzey Otomotiv San. ve Tic. Ltd. Şti.	Uzayçağı Cad. 1431. Sk. (eski: 78/3.) Ata İş Merkezi No: 4 Ostim OSB
70	Kayacı Otomotiv San. ve Tic. Ltd. Şti.	1171/1. Sk. (eski: 3/A.) No: 22 Ostim OSB
71	KTS Kaya Torna Spiral San. ve Tic. A.Ş.	1185. Sk. (eski: 17.) No: 46 Ostim OSB
72	Lider Kepçe San. Tic. Ltd. Şti.	1182. Sk. (eski: 12.) Dış Kapı: 18 Ostim OSB
73	Mak-San Otomotiv San. Tic. Ltd. Şti.	Kuruçayırılı San. Sit. 1156. Sk. (eski: 216.) Dış Kapı: 12 Ostim OSB
74	Mert Kazan Sanayi	1233 Sk. (eski: 56.) No: 64 Ostim OSB
75	Mesay Otomotiv San. ve Tic. A.Ş.	Bağdat Cad. 1154/1. Sk. (eski: 213.) No: 1 Kuruçayırılı San. Sit.
76	Metsan Silobas San. Tic. Ltd. Şti.	Cevat Dünder Cad. No: 46-48 Ostim OSB
77	Muammer Karasör San. Tic. Ltd. Şti.	1202. Sk. (eski: 31.) No: 1-3 Ostim OSB
78	Mert Dizel Pompa ve Enjektör Ayar Servisi	1201. Sk. (eski: 30.) Ticaret Han İş Merkezi No: 2/1/C Ostim OSB
79	Mitsu Otomotiv Mak. Taşıma San. Tic. Ltd.	1169. Sk. (eski: 1.) No: 28 Ostim OSB
80	Nam Oto Amortisör Taş Ve Emlak San. Tic. Ltd. Şti.	1234. Sk. (eski: 57.) No: 73-75 Ostim OSB
81	Nuh Damper ve Dingil Sanayi ve Tic. Ltd. Şti.	1175. Sk. (eski: 7.) No: 6-8 Ostim OSB
82	OTS Otomobil taşıma Sistemleri Otomotiv Makina Sanayi ve Tic. Ltd. Şti.	1308. Sk. (eski: 78.) Ayık İş Merkezi Dış Kapı: 82/D İç Kapı: B1 Ostim OSB
83	Ostim Akü	100. Yıl Bulvarı No: 7 Ostim OSB
84	Opak Otomotiv Tic. Ltd. Şti.	Uzayçağı Cad. No: 15 Keresteciler San. Sit.
85	Osmanlı Otomotiv Mot. Araç San. Tic. Ltd. Şti.	Kuruçayırılı San. Sit. 1156. Sk. (eski: 216.) Dış Kapı: 24 Ostim OSB
86	Özeralp Otomotiv İnş. San. Tic. Ltd. Şti.	1153. Sk. (eski: 210.) No: 25 Kuruçayırılı San. Sit.
87	Özcanlar Lastik San. ve Tic. Ltd. Şti.	Alinteri Bulvarı No: 8-10
88	Öz-De Hidrolik Pnömatik Tic. Ltd. Şti.	Alinteri Bulvarı No: 18 Ostim OSB
89	Özdemir Karasör Tic. Ltd. Şti.	1201. Sk. (eski: 30.) No: 40 Ostim OSB
90	Özsan Treyler İml. İnş. Nak. ve Met. San. Tic. Ltd. Şti.	1174. Sk. (eski: 6.) No: 1-2 Ostim OSB
91	Öztürk Şase Tamirhanesi	1202. Sk. (eski: 31.) No: 29 Ostim OSB
92	Öztürk Treyler Nakliyat San. Tic. Ltd. Şti.	1200. Sk. (eski: 29.) No: 107-109 Ostim OSB
93	Özdemirler Rekor Hortum İş Mak. Otom. Yed. Parç. Alım-Satım San. ve Tic. Ltd. Şti.	1153. Sk. (eski: 210.) No: 7/A Kuruçayırılı San. Sit.

94	Pejoser Otomotiv Tur. Taş. İnş. Gıda Temz. Teks. İç ve Dış Tic. Ltd. Şti.	1130. Sk. (eski: 233.) No: 20 Keresteciler San. Sit.
95	Reis Oto Yed. Par. Aksesuar Bak. San. ve Tic. Ltd. Şti.	1153. Sk. (eski: 210.) No: 9 Kuruçayırılı San. Sit.
96	Sayılganoğlu Otomotiv San. Tic. Ltd. Şti.	1181. Sk. (eski: 11.) Dış Kapı: 50 Ostim OSB
97	Startek Otomotiv	1167. Sk. (eski: 212.) No: 17 Kuruçayırılı San. Sit.
98	Selin Otomotiv San. ve Tic. Ltd. Şti.	1156. Sk. (eski: 216.) No: 20-22 Kuruçayırılı San. Sit.
99	Şengün Teknik Akaryakit Cihazları Tamir Bakım Servisi	1257. Sk. (eski: 359.) No: 35/A Örnek San. Sit.
100	Tanış Otomotiv Mam.Yedek Parça Satış Servis Hiz. Ltd. Şti.	1171. Sk. (eski: 3.) No: 4 Ostim OSB
101	Tema Metal San. ve Tic. Ltd. Şti.	1235. Sk. (eski: 58.) Dış Kapı: 92 Ostim OSB
102	Tedsan Tekin Mak. Dişli San. ve Tic. Ltd. Şti.	100. Yıl Bulvarı 1233. Sk. (eski: 56.) No: 32-34 Ostim OSB
103	Tepe Conta Otomotiv San. ve Tic. Ltd. Şti.	1174. Sk. (eski: 6.) No: 20 Ostim OSB
104	Tipisan Otomotiv Yan San. ve Tic. Ltd. Şti.	1182. Sk. (eski: 12.) Dış Kapı: 9-15-17 Ostim OSB
105	Tüzün Kardeşler Makina San. Tic. A.Ş.	1201. Sk. (eski: 30.) Dış Kapı: 70-72-74 Ostim OSB
106	Üstün Oto Servis Otogaz Dönüşüm Sistemleri	Alinteri Bulvarı No: 172 Ostim OSB
107	Üçler Damper	1230/1. Sk. (eski: 42/A.) No: 19 Yeni Ostim San. Sit.
108	Üçler Hidrolik Pnömatik İş Mak. İml. İç ve Dış San. Tic. Ltd. Şti.	1235. Sk. (eski: 58.) Dış Kapı: 40 Ostim OSB
109	Ünsal Damper San. Tic. Ltd. Şti.	1174. Sk. (eski: 6.) Dış Kapı: 16 Ostim OSB
110	Volkan Ekzos	1178. Sk. (eski: 2.) No: 93 Ostim OSB
111	Yılmazlar Şase Makina CNC Torna İşleme Merkezi	1169. Sk. (eski: 1.) No: 62 Ostim OSB
112	Yaşar Man Otom. San. Tic. Ltd. Şti.	1156. Sk. (eski: 216.) No: 4-6 Kuruçayırılı San. Sit.
113	Yüksel Oto Döşeme	100. Yıl Bulvarı Ostim Stataltı İş Merkezi No: 133/H Ostim OSB
114	Yalçın Akü Ltd. Şti.	1234. Cad. (eski: 57.) No: 91 Ostim OSB
115	Yavaş Oto Servis Hizmetleri	1231/1. Sk. (eski: 41/A.) No: 33 Yeni Ostim San. Sit.



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- **Master's Degree :** Aleppo University, Economic Faculty, Business Administration Department (Graduated 2015)
- **Bachelor Degree :** Aleppo University, Economic Faculty, Business Administration Department (Graduated 2013)

Publications :

- Amino, Mahmoud & Ekiyor, Aykut, 2018, Supplier Selection Criteria and Their Influence on Operational Performance: A Field Study in Aleppo City, Proceedings of ISER International Conference, Philadelphia, USA.
- Amino, Mahmoud & Ekiyor, Aykut, 2017, Sağlık İşletmelerinde Tedarik Zinciri Seçim Kriterlerinin Operasyonel Performansa Etkisi Var Mıdır? , 1. Uluslararası Kültür ve Medeniyet Kongresi, Mardin, Türkiye.

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GAZİLİ OLMAK AYRICALIKTIR..

