

**BINDURA UNIVERSITY OF SCIENCE EDUCATION FACULTY OF
COMMERCE DEPARTMENT OF ECONOMICS**



**ANALYSE THE IMPACT OF SUPPLIER SELECTION IN IMPROVING THE
QUALITY OF MATERIALS IN AN ORGANISATION. A CASE STUDY OF
BINDURA UNIVERSITY OF SCIENCE EDUCATION.**

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DEDICATION

To the Lord Jesus Christ who was with me through thick and thin throughout the research work. For all the effort that they put in ensuring that I continued with my studies, I also

dedicate this work to my parents; the late father Tinarwo Chikobvu and late mother Pauline Chikobvu. You made me who I am and I love you so much.

ABSTRACT

This study focused on the investigation of the impact of supplier selection in improving the quality of materials using a case of B,U.S.E. For an institution to cope with the dynamic quality era and to change in view of the cut throat disgruntlements currently

existing, the researcher found it relevant to investigate whether supplier selection has an impact on the delivery of good quality. Descriptive research design was used and 85 respondents were selected using stratified random sampling. Data was collected by the use of questionnaires, interviews and observations. With the use of tables and graphs the collected data was presented for analysis. Findings showed that supplier selection is of prime importance in the improvement of quality of materials in academic institutions. A positive impact between supplier selection and quality of materials was discovered. The better the supplier selection process and criteria, the finer the quality of materials. The institution should continually review their selection criteria, specifications and processes in the light of the nature of the products so as to improve the quality thus making use of the value for money. In supplier selection process, payment system of the institution should also be reviewed to avoid delivery of poor quality products. The researcher also recommends that since the research was mainly centering on quality, further research should be done on the impact of supplier selection on reducing the costs of an institution. Since B.U.S.E is an academic institution, a further study is recommended to be conducted on the impact of supplier selection on improving the quality of materials, mainly focusing on academic institutions .

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CHAPTER I

INTRODUCTION

1.0 Introduction

During the last quarter of the 20th century, there has been a rapid increasing awareness of the vital role played by supply chain management, to enable the competitiveness of an organization. One of the most important aspects of supply chain management is supplier selection. The main challenge of supplier selection is that of qualifying innovative suppliers that can deliver products of right quality, at the right cost and time as suggested by Ramadan and Schmits, (2006). Hence, supplier selection is one of the most important decision making problems, since selecting right suppliers significantly reduces the purchasing costs and improves corporate competitiveness (Ghodsypour and O'Brien, 2001).

Suppliers are very critical on organizations' performance, so in this case supplier selection decisions require the assessment of multiple criteria covering strategic and operational factors as well as tangible and intangible factors. The studies show that today's organizations have considered other factors besides price when making supplier selection decision.

This chapter mainly focuses on introducing the research project to the reader and will highlight the following key features; background of the study, statement of the problem, objectives of the study, research questions, literature review (definition of terms), significance of the study, limitations of study and summary of the study.

1.1 Background of the study

Purchasing is the function responsible for acquiring all the materials needed by an organisation. Many of these transactions are not standard purchases, but include rental, leasing, contracting, exchange, gifts, borrowing, and so on. This is why some people

prefer to talk about the „acquisition of materials“ or the more common term of procurement. „Procurement“ and „purchasing“ are often taken to mean the same thing.

Usually, though purchasing refers to the actual buying, while procurement has a broader meaning. It can include different types of acquisition (purchasing, rental, contracting, and so on) as well as the associated work of selecting suppliers, negotiating, agreeing terms, expediting, monitoring supplier performance, materials handling, transport, warehousing and receiving goods from suppliers (Waters, 2002)

The selection of suppliers locally, regionally or internationally is not a process to be taken lightly owing to its significance and long lasting impact on sourcing (Hokey, 1994). Wrong supplier selection may result in mounting material costs, litigation, shoddy product quality, transport delay, production bottlenecks and can also create interdepartmental conflicts.

Bindura University of Science Education introduced centralized purchasing function in 2005. The Buying Department is responsible for procuring goods and services for all departments namely; Registry, Works and Estates, Information, Communication Technology, Marketing, Bursary, Library, Students Affairs, Research and Postgraduates, Virtual Open Distance Learning (VODL), Faculties of Science, Science Education, Agriculture and Environmental Science and Commerce.

The buying section considers main attributes of supplier selection like financial terms, service performance and supplier relationships. They compile and approve a list of suppliers to deliver goods as per requisitions raised. The reason behind an approved supplier list is simple enough; the list comprises the suppliers that are approved through some form of assessment, basing on the main attributes above. The approved suppliers“ list acts as a control for the buying section to ensure that only suitable suppliers are contacted (Tidwell and Sutterfield 2012)

In the past, buyers achieved saving in a variety of ways, which is include negotiations, change in suppliers and by streamlining specification since some of these goods and services are technical and needed technical expertise. However, the issue of the quality remained a problem. It is against this background that the researcher chose to look on the impact of supplier selection on improving quality of materials.

1.2 Statement of the problem

There is dissatisfaction from the user departments regarding the quality of goods being procured by the buying department. The complaints against the quality of goods have influenced a change in attitude towards the Buying section. This study will be aiming to investigate the impact of supplier selection in improving the quality of materials coming into an organization. The challenge of supplier selection is that of qualifying innovative suppliers that can deliver products of quality, cost and on time.

1.3 Research objectives

1. To identify the supplier selection processes used by the buying section at Bindura University.
2. To investigate if clear specifications are being established to the buying personnel when requesting products or materials.
3. To explore the quality systems used by the suppliers to ensure that there is improvement in their products.
4. To recognize the supplier selection criteria in which the institution focuses.

1.4 Research questions

1. What is the supplier selection process in place at Bindura University?
2. Do the user departments give clear specifications (of goods) to the buying section when requesting?
3. What are the quality systems used by the suppliers to make sure that there is delivery of better quality products.
4. What are the supplier selection criteria used by the buying personnel at Bindura University?

1.5 Assumptions

The researcher assumes that;

- Proper selection of suppliers can improve the quality of goods to be procured.
- The respondents to the research will be co-operative and hence give a true and factual response.
- Data obtained by the researcher is accurate and hence can be relied upon.

- Quality management systems used by the suppliers can affect the quality of the products they supply.

1.6 Significance of study

1. This study will be useful to the Buying Department at Bindura University. It will enable them to get deliveries from the most competitive suppliers to meet the required quality. The researcher will also develop knowledge and expertise in the field of procurement and supplier selection in particular.
2. The study will help scholars and other researchers to have a better understanding of the importance of supplier selection in improving the quality of the materials.
3. This will help buyers or procurement officers to learn from past mistakes in order to proactively plan for the future.
4. This study can be used by institutions of higher learning for literature review.
5. The researcher is going to benefit as well, this project is going to improve his data mining, problem identification, problem solving and analysis skills and help him to be one of the best procurement officers and advisors as well as one of the best providers of procurement/ purchasing services.

1.7 Delimitation of the study

1. The research will focus on the process of selecting suppliers of goods only and not services.
2. The research will focus on the period between 2020 and 2021.
3. The researcher will get information mainly from the other suppliers, buying staff, head of departments or sections, stores men clerks and secretaries.
4. This research will be confined to domestic supplier selection problems only and a host of factors are not relevant to international supplier selection.

1.8 Limitations

- a. Problems in accessing information from stakeholders because of its sensitivity and confidentiality. To overcome this problem, the writer will

ask for a supporting letter from the university that seeks to introduce him to relevant stakeholders as a student carrying out an academic research.

- b. Financial constraints may limit the design of the research as the researcher may need to employ economical and affordable designs.
- c. The researcher is going to rely mainly on the desk research data which is not verifiable from its source. To overcome this, a selective questionnaire survey will be conducted on a carefully chosen panel of respondents so that quality of possible outcomes will be enhanced.
- d. Some respondents may fail to submit the questionnaires within stipulated time. The researcher will make a follow up, to remind the respondents to bring back the questionnaires.

1.9 Definition of Terms

Specification refers to an explicit set of requirements to be satisfied by a material, product, or service. Should a material, product or service fail to meet one or more of the applicable specifications, it may be referred to as being out of specification. In casual usage, under-specification or over-specification are used when something is worse or better than specified, though in general (such as for sizes) there is only a notion of "in specification" or "out of specification", not "better" or "worse". Specifications are a type of technical standard (Lysons, 1993).

Quality Assurance refers to the systematic activities implemented in a quality management system so that quality requirements for a product or service will be fulfilled. It is the systematic measurement, comparison with a standard, monitoring of processes and an associated feedback loop that confers error prevention. This can be contrasted with quality control, which is focused on process outputs (Benton 2010)

Supplier selection is the process by which firms identify, evaluate, and contract with suppliers. The supplier selection process deploys a tremendous amount of institution's financial resources and in return the institution expects significant benefits from contracting suppliers who offer high value products and services (Lyson and Farrington, 2006)

Quality; Jewel, (2000) defines quality as "the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs."

Purchasing is that function responsible for obtaining by purchase, lease or other legal means equipment, materials, supplies and service required by an undertaking for use to satisfy wants (Lysons, 1993).

Supply chain management is the real world system that transforms raw materials and resources into end products that will be distributed to the final consumer. It encompasses series of steps that add value through time, place and material transformation. Each supplier has some subset of supply chain that it must manage and run profitably and efficiently to survive and to grow (Pinto, 1990)

1.10 Summary

The chapter began with the general introduction of the company as well as the description of the research problem. It also laid out the objectives of the study and the research hypothesis thus laying foundation for the entire study. Limitations, delimitations and general assumptions of the study were also laid out. The chapter also paved way for Chapter 2 which is on literature review.

CHAPTER II

LITERATURE REVIEW

2.0 Introduction

The researcher in this chapter will look at the available information or literature of other authorities relevant to the study. The researcher will focus on what other scholars and researchers did in relation to the same research problem by looking at existing literature which includes summaries of thesis and dissertations, journals, books, primary documents like circulars and reports, electronic sources like online journals and articles, encyclopedia and dictionaries. The chapter will explore and cite the theoretical framework and empirical literature review in order to ascertain what other authorities have contributed in an attempt to analyze the impact of supplier selection in improving the quality of materials flowing into an organization. In trying to review relevant literature, this chapter has been divided into two segments; theoretical and empirical literature.

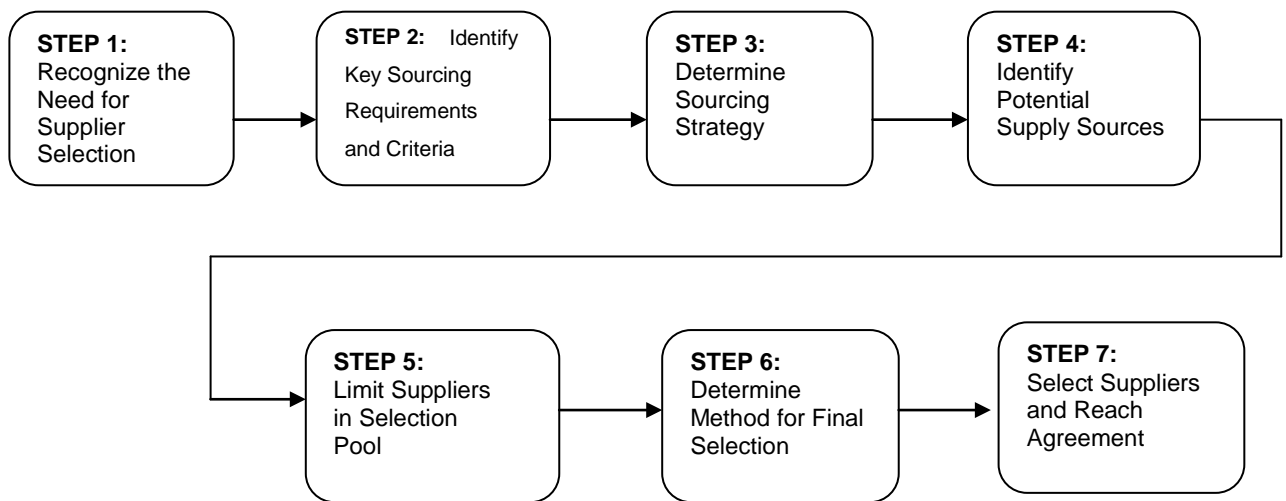
2.1 Theoretical framework

2.1.0 Supplier Selection Process

Experts agree that no best way exists to evaluate and select suppliers and thus organizations use a variety of approaches. The overall objective of the supplier selection

process is to reduce risk and maximize overall value to the purchaser. An organization must select suppliers it can do business with over an extended period of time.

This section presents the steps involved in the supplier selection process, as addressed by Monczka et al (2009). The quality of the final set of suppliers largely depends on the quality of all the steps involved in the selection process. The first part of this research proposes an analysis for supplier selection that integrates the various steps of the selection process. Figure 1.5 depicts the supplier selection and evaluation process.



Source: Monczka (2009) pp237

Figure 2.1 Supplier Evaluation and Selection Process

Step 1: Recognize the Need for Supplier Selection

The first step in supplier selection usually implies the identification of the need for a specific product or service. Different situations may trigger the need for supplier selection. For example, new product development, modifications to a set of existing suppliers due to a bad performance, the end of a contract, expansion to different markets, current suppliers' capacity is not sufficient to satisfy increases in demand. These situations are particular to every company.

Step 2: Identify Key Sourcing Requirements and Criteria

Supplier selection is complicated because of the multiple criteria involved in the decision process. Additionally, many times these criteria may contradict each other. Therefore, defining the proper criteria becomes critical. Some of the most widely used criteria in supplier selection are supplier's capacity, quality, and purchasing price. However, the set of criteria (e.g., Stamm and Golhar (1993), Ellram (1990), Weber et al. (1991), Kingsman et al. (1999), Easton and Moodie (1999), and Mummalaneni et al. (1996) to be chosen largely depends on the company's objectives and the type of industry in which the company competes.

Step 3: Determine Sourcing Strategy

In sourcing there is need for organisations for clearly define the strategic approach to be taken during the supplier selection process. Some of the examples of sourcing strategies are: single versus multiple suppliers, domestic versus international and short term versus long term supplier contracts. Rasheed (2012) articulated that single sourcing may not be an appropriate strategy in most purchasing situations. Single sourcing tends to minimize total costs by determining the best supplier for each purchased part or product. However, dependency on a single supplier exposes the buying company to a greater risk of supply interruption. Multiple sourcing strategies provide a greater flexibility due to the diversification of the firm's total requirements. In addition to ensuring product availability, working with multiple suppliers is important because suppliers are motivated to be competitive in factors such as price and quality (Jayaraman, 1999).

Step 4: Identify Potential Supply Sources

The importance of the item under consideration influences the resources spent on identifying potential suppliers. For example, major resources are spent when potential suppliers are needed for an item of high strategic importance like construction or machinery and on the other hand fewer resources on low value items like stationery.

Monczka et al (2006) gives a simple guideline in identifying potential suppliers.

Step 5: Limit Suppliers in Selection Pool

Given the limited resources of a company, a purchaser needs to pre-screen the potential suppliers to reduce their number before proceeding with a more detailed analysis and evaluation. The supplier selection criteria determined in Step 2 plays a key role in this reduction process. Howard (2008) defined this reduction process as the process by which suppliers satisfy certain 'entry qualifiers' before further analysis.

Step 6: Determine Method for Final Selection

There exists many different ways to evaluate and select suppliers and each organisation has its own methods of selecting shortlisted suppliers. Weber et al, (1991) articulated that the buyer should look for the following factors before making final selection; quality, price, delivery, performance history, financial position, technical capability and bidding procedural compliance. These will guide the buyers in making final decisions.

A pioneering work in supplier selection criteria was that of Dickson (1966). He identified and ranked 23 criteria collected from responses to a questionnaire completed by purchasing agents. In 1991, he reprioritized the 23 criteria identified by Dickson based on 74 articles that appeared in the literature since 1966 (see Table 1).

Table 2.1: Supplier Selection Criteria

Rank		
Dickson 1966	Weber et al.1991	Criteria
1	3	Quality
2	2	Delivery
3	10	Performance History
4	23	Warranties and Claim Policies
5	4	Production Facilities and Capabilities
6	1	Net Price
7	6	Technical Capability
8	9	Financial Position
9	16	Bidding Procedural Compliance
10	18	Communication System
11	8	Reputation and Position in Industry

12	21	Desire for Business
13	7	Management and Organization
14	14	Operational Controls
15	11	Repair Service
16	12	Attitude
17	20	Impression
18	13	Packaging Ability
19	17	Labour Relations Records
20	5	Geographical Location
21	22	Amount of Past Business
22	15	Training Aids
23	19	Reciprocal Arrangements

Source : Monczka et al (2006)

Notice that in both rankings price, delivery, and quality continued to be considered important criteria. The most significant difference in the rankings is geographical location. With economic globalization, companies can choose suppliers from anywhere in the world. For instance, developing countries are becoming more competitive given their low labour and operating costs. Not only have criteria changed over time in terms of importance, but in definition and meaning. Net price was once considered the price offered by each vendor including discounts and freight charges (Dickson, 1966). Today, net price per se is not longer sufficient and total cost has become a more accurate term. The total cost may include the fixed cost (Current and Weber 1999), the inventory holding cost (Tempelmeier, 2002), and the technology cost (Bhutta and Huq, 2002).

Step 7: Select Suppliers and Reach Agreement

The final step of the supplier evaluation and selection process is to clearly select those suppliers that best meet the company's sourcing strategy. This decision is often accompanied with determining the highest degree of quality to selected suppliers (Lysons and Farrington , 2006).

2.1.1 Supplier Selection Models

Bello, (2003) articulated that there are several supplier selection methods/models available in the literature. Some authors propose linear weighting models in which suppliers are rated on several criteria and in which these ratings are combined into a single score. These models include the categorical, the weighted point (Timmerman, 1986) and the analytical hierarchical process (Nydick and Hill, 1992). Total cost approaches attempt to quantify all costs related to the selection of a vendor in monetary units, this approach includes cost ratio (Timmerman, 1986) and total cost of ownership (Ellram, 1995). Mathematical/arithmetical programming models and methods often consider only the more quantitative criteria; this approach includes the principal component analysis (Petroni and Braglia, 2000) and neural network (Wei, 1997).

2.1.2 Categorical Model

The categorical method relies heavily on the experience and ability of the individual buyer (Timmerman, 1986). People in charge of purchasing, production and sales express their opinions about the supplier's performance on the basis criteria which are important to them. These departments assign either a preferred, unsatisfactory, or neutral rating for each of the selected attributes for every contending supplier. At periodic evaluation meetings, the buyer discusses the rating with department members. The buyer then determines the supplier's overall scores. The primary advantage of the categorical approach is that it helps structure the evaluation process in a clear and systematic way. This method is quite simple; it is not supported by objective criteria, and rarely leads to performance improvements. The main drawback of this method is that the identified attributes are weighted equally and the decisions made using this system tend to be fairly subjective.

2.1.3 Weighted Point Model

Another method used in supplier selection is the weighted point model which considers attributes that are weighted by the procurement officer. The weight for each attribute is

then multiplied by the performance score that is assigned. Finally, these products are totalled to determine a final rating for each supplier (Timmerman, 1986).

All measurement factors are weighted for importance in each purchasing situation. Typically this system is designed to use numerical measurements. The advantages of the weighted point method include the ability for the organization to include numerous evaluation factors and assign them weights according to the organization's needs. The subjective factors on the evaluation are minimized.

2.1.4 Cost-ratio model

Cost-ratio model is also another method that relates all distinguishable supply chain costs to the monetary value of the products received from suppliers (Timmerman, 1986). The higher the ratio of costs to value, the lower the rating applied to the supplier. The choices of costs to be incorporated in the evaluation depend on the products involved. The costs associated with quality include the costs of visits to a vendor's plants and sample approval, inspection costs of incoming shipments, and the costs associated with defective products such as unusual inspection procedures, rejected parts and manufacturing losses due to defective goods. Quality costs can be determined and documented by the quality control department, with the help of other departments such as production and receiving. The usual costs associated with delivery include communications, settlements and emergency transport costs (for example air shipments). The same tabulation procedure is followed as for the quality costs. The cost-ratio method establishes a "norm" of supplier services and evaluates vendors above and below the norm in relation to price. The subjective elements common to other methods are thus reduced.

The cost ratio method is based on cost analysis that considers cost ratios for product quality, delivery, customer service and price. The cost ratio measures the cost of each factor as a percentage of total purchase for the supplier. Due the flexibility of this method, any company in any market can adopt it. The drawback of the method is its complexity and requirement for a developed cost accounting system.

2.1.5 Total cost of ownership model

Similarly the total cost of ownership method attempts to quantify all of the costs related to the purchase of a given quantity of products or services from a given supplier (Degraeve and Roodhooft, 1999). Optimum use of all discounts available can lead to substantial savings. In addition to the price component, other cost factors also play an important role, including the costs associated with quality shortcomings, a supplier's unreliable delivery service, transport costs, ordering costs, reception costs, and inspection costs. This method uses activity-based costing which is a management accounting technique that attempts to assign costs to cost generating activities within a business. This technique uses activity analysis, which defines the various activities performed by an organization. The first step of the total cost of ownership method is to define all the activities related to external purchasing. These are specific to every enterprise and should be expressed through the activity analysis. Subsequently, costs must be assigned to the different activities. The next step is to define factors which raise the cost of a given activity (cost drivers). Finally, one must identify which activities are generated in the purchasing organization by each individual supplier. This approach enables substantial cost savings to be achieved and, at the same time, allows various purchasing policies to be compared with one another.

2.1.6 Principal component analysis model

In addition, the principal component analysis (PCA) method is a multi-objective approach to supplier selection that attempts to provide a useful decision support system for a purchasing manager faced with multiple suppliers and trade-offs such as price, delivery, reliability, and product quality (Petroni and Braglia, 2000). This multivariate statistical method is a data reduction technique used to identify a small set of variable that account for a large portion of the total variance in the original variance. This technique is also used to identify "latent" dimensions in the data. In fact, the principal component analysis computes linear combinations of variables. This method is also a popular ranking method in multidimensional analysis. The principal component analysis methodology has the

advantage to be fairly simple to exploit, since it has been accessible for decades. This method has proved to be capable of handling multiple conflicting attributes inherent in supplier selection while simultaneously trading-off key supplier selection criteria.

2.1.7 Analytical Hierarchical Process (AHP)

Another useful method is the Analytical Hierarchical Process (AHP), a decision-making method developed by Saaty (1980) for prioritizing alternatives when multiple criteria must be considered and allows the decision maker to structure complex problems in the form of a hierarchy, or a set of integrated levels. Generally, the hierarchy has at least three levels: the goal, the criteria, and the alternatives. For the supplier selection problem, the goal is to select the best overall supplier (Nydick and Hill, 1992). The criteria can be quality, price, service, delivery, etc. The alternatives are the different proposals supplied by the suppliers.

The AHP offers a methodology to rank alternative courses of action based on the decision maker's judgments concerning the importance of the criteria and the extent to which they are met by each alternative. For this reason, AHP is ideally suited for the supplier selection problem.

The problem hierarchy lends itself to an analysis based on the impact of a given level on the next higher level. The process begins by determining the relative importance of the criteria in meeting the goals. Next, the focus shifts to measuring the extent to which the alternatives achieve each of the criteria. Finally, the results of the two analyses are synthesized to compute the relative importance of the alternative in meeting the goal.

Managerial judgments are used to drive the AHP approach. These judgments are expressed in terms of pair wise comparisons of items on a given level of the hierarchy with respect to their impact on the next higher level. Pair wise comparisons express the relative importance of one item versus another in meeting a goal or a criterion. Each of the pair wise comparisons represents an estimate of the ratio of the weights of the two

criteria being compared. Because AHP utilizes a ratio scale for human judgments, the alternatives weights reflect the relative importance of the criteria in achieving the goal of the hierarchy.

The use of the AHP approach offers a number of benefits. One important advantage is its simplicity. The AHP can also accommodate uncertain and subjective information, and allows the application of experience, insight, and intuition in a logical manner. The AHP approach, as applied to the supplier selection problem, consists of the following five steps (Nydick and Hill, 1992):

1. Specify the set of criteria for evaluating the supplier's proposals.
2. Obtain the pair wise comparisons of the relative importance of the criteria in achieving the goal, and compute the priorities or weights of the criteria based on this information.
3. Obtain measures that describe the extent to which each supplier achieves the criteria.
4. Using the information in step 3, obtain the pair wise comparisons of the relative importance of the suppliers with respect to the criteria, and compute the corresponding priorities.
5. Using the results of steps 2 and 4, compute the priorities of each supplier in achieving the goal of the hierarchy.

2.2 Types of Suppliers

Suppliers are essential to any business, and the process of identifying and selecting suppliers is both relevant and important. Sometimes suppliers will contact the purchasing organization through their sales representatives, but more often, the buyer will need to locate them themselves either at trade shows, wholesale showrooms and conventions, or through buyers' directories, industry contacts, the Business-to-Business Yellow Pages and trade journals.

To understand better this approach, it is significant to present that suppliers can be divided into four general categories: manufacturers, distributors, independent craftspeople and importation sources (Lesonsky, 2001). The first category is the manufacturers in which

most retailers buy through company salespeople or independent representatives who handle the wares of several different companies. Prices from these sources are usually lowest, unless the retailer's location makes shipping freight costly.

The second type of suppliers are the distributors who also are known as wholesalers, brokers or jobbers, distributors buy in quantity from several manufacturers and warehouse the goods for sale to retailers. Although their prices are higher than a manufacturer's, they can supply retailers with small orders from a variety of manufacturers. A lower freight bill and quick delivery time from a nearby distributor often compensates for the higher per-item cost.

Another kind is the independent craftspeople that are exclusive distributors of unique creations frequently offered by these independent craftspeople, who sell through representatives or at trade shows.

The last category of suppliers is the importation sources in which many retailers buy foreign goods from a domestic importer, who operates much like a domestic wholesaler. Or, depending on the company's familiarity with overseas sources, it may want to travel abroad to buy goods.

2.3 Quality

2.3.1 What is quality?

Cavinato and Kauffman (2000) defines quality in various ways, they defined it as the totality of features and characteristics of a product or service that bear on its ability to satisfy given needs. They goes on to say it is fitness for use, conformance to requirements, the degree to which product characteristics conform to the requirements placed upon that product, including reliability, maintainability, and safety. The meaning of quality differs from person to person, depending on their position in the supply chain. For example, for the customer, a good quality product is one that meets his or her needs in terms of performance, appearance, and price. For the product designer, quality is related to a

product satisfying functional requirements. For the manufacturer, the definition of quality is based on conformance to specifications at a minimum cost.

Monczka et al (2009), once quoted a renowned quality expert, Feigenbaum, defining quality as the total composite of product and service characteristics of marketing, engineering, manufacturing, and maintenance through which the product or service in use will meet or exceed the expectations of the customer. They said definition differs from other popular definitions that typically view quality as primarily conforming to customer requirements. Joseph Juran, perhaps the foremost expert on quality, defined quality simply as fitness for use. Philip Crosby, another well-known total quality expert, defined quality as conformance to requirements. In recent years, the concept of quality has changed radically from meeting customer requirements or expectations to exceeding them.

They argued that, customer expectations are dynamic and constantly shifting. Not surprisingly, many actions taken by a firm's competitors can change the user's quality expectations. For example, a customer may be satisfied with three-day package delivery service until another company offers two-day service with guaranteed delivery at a competitive cost. Changes due to competition can quickly and dramatically redefine the requirements that customers accept as their standard of performance. This scenario actually occurred as UPS (United Parcel Services) announced it was reducing by one day the time it takes to deliver a package to certain parts of the United States. Its competitors had to adapt their delivery systems and processes to offer comparable services. The challenge with customer expectations is the company's ability to specifically define them and then translate those expectations upstream throughout its supply chain.

In business philosophy, Baily et al (2010) asserted that quality is a vocabulary that can be noted with several meanings. It may mean the excellence of a product or an extent to which a product achieves customer satisfaction. They went on to say that quality is what customers say it is and quality gurus (Deming and Juran) have extremely influenced and taught them that quality is an issue related to strategic advantage. However they gave a

detailed definition of quality as the whole set of features and characteristics of a product or service that are relevant to meeting the specified requirements.

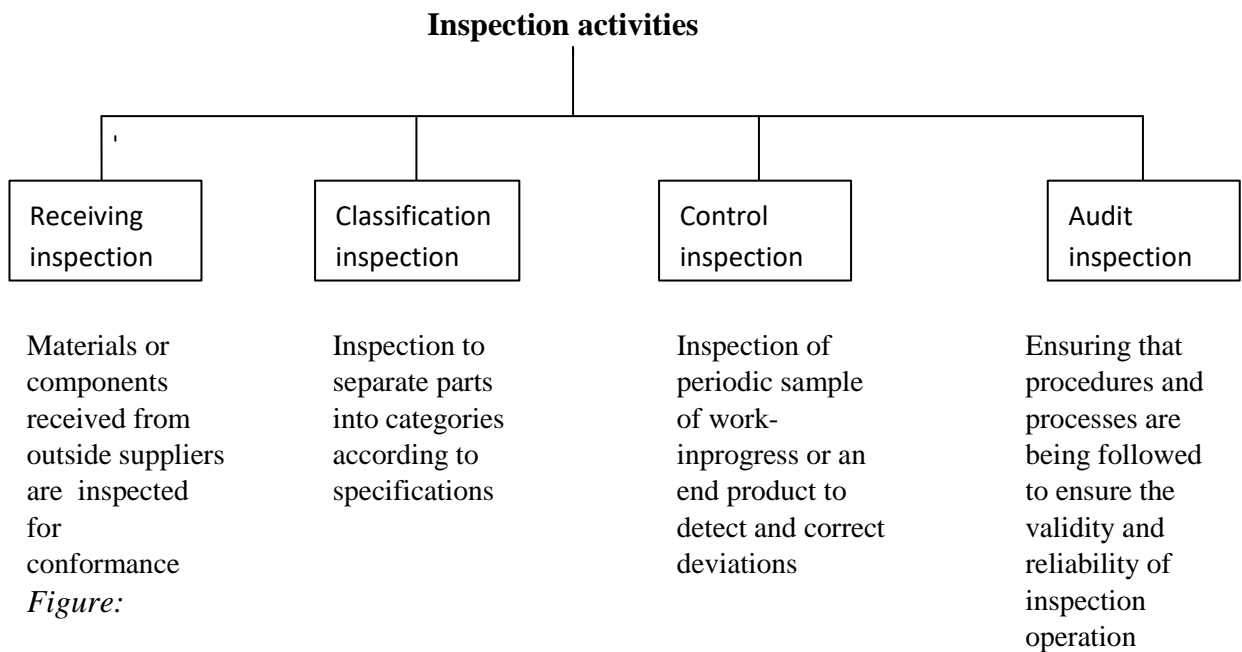
The quality of products and services is important not only for users but also for suppliers. For manufacturers, quality deficiencies result in additional costs for inspection, testing, scrap, re-work, and the handling of complaints and warranty claims. In the service industries, errors, checking, enquiries, and complaints account for losses in efficiency and productivity. Repeat sales and future market share will also be affected, with significant effects on profitability and survival. Quality must therefore be taken into account throughout all the areas of marketing, design, purchasing, production or operations, and logistics. It must be controlled in all these functions, and their activities coordinated to achieve a balanced corporate quality performance. Quality performance will not just happen; effective leadership and teamwork is the only sure recipe for success. Real understanding and commitment by senior management, together with explicit quality policies, lead to an improvement throughout the entire organisation, which in turn generates a momentum for the improvement of products, services, and performance. Achieving quality relies upon consideration of both the external environment and the internal resources: The identification of the customer's requirements must be matched by the ability to produce a product or generate a service which will be recognised as satisfying the needs (Quayle, 2006).

2.4 A Four-level Model

In their paper "The process of total quality management", Dales et al, (1990) proposed a four-level model of the evolution of quality management. They outlined that, for one to understand the issue of quality, there is need to look into a four level model of quality. This can be explained with the help of a summary of evolution of stages of quality management namely; Quality Inspection, Quality Control, Quality Assurance and Total Quality Management (Dahlggaard 1998).

2.4.1 Quality Inspection

This is by far the most important activity in supply chain to ensure that goods or services meet the required quality standards. Although inspection is a non-value adding activity, some form of inspection required either at source or on delivery is often unavoidable (Lysons, 2006). The four main inspection activities are shown in figure 2.2 below;



Source: Lysons (2006)

Figure 2.2 Inspection activities

Two important aspects of inspection are how much and how often to inspect and where to inspect. Rasheed (2012) stated that only rarely is the 100% inspection required. This is because frequent inspection also increases the cost in general. He went on to say that

operations with high human input necessitate more inspection than mechanical operations which tend to be more reliable. He said generally, inspection should take place when materials are received from supplier, before dispatch, before costly operation and before a covering process like painting or plating which can often mask defects.

2.4.2 Quality Control System

Quality control is defined as the operational techniques and activities that are used to fulfil requirements for quality. It is concerned with defects detection and correction and relates to such activities as determining where, how and at what intervals inspection should take place. There is also collection and analysis of data relating to defects determining what corrective action should be taken, (Juran, 1951). As defects are detected after they have been made, Schonberger (1992) has referred to quality control as the “death certificate” approach.

2.4.3 Quality Assurance System

By definition, quality assurance is the system that involves all those planned and systematic activities implemented within the quality systems and demonstrated as needed to provide adequate confidence that an entity will fulfil requirements for quality (Lysons and Farrington, 2006). It is concerned with defect prevention. It can involve number of approaches including quality requirement (ISO 9000), new design control, supplier appraisal, to ensure that only suppliers able to meet supplier requirements are approved.

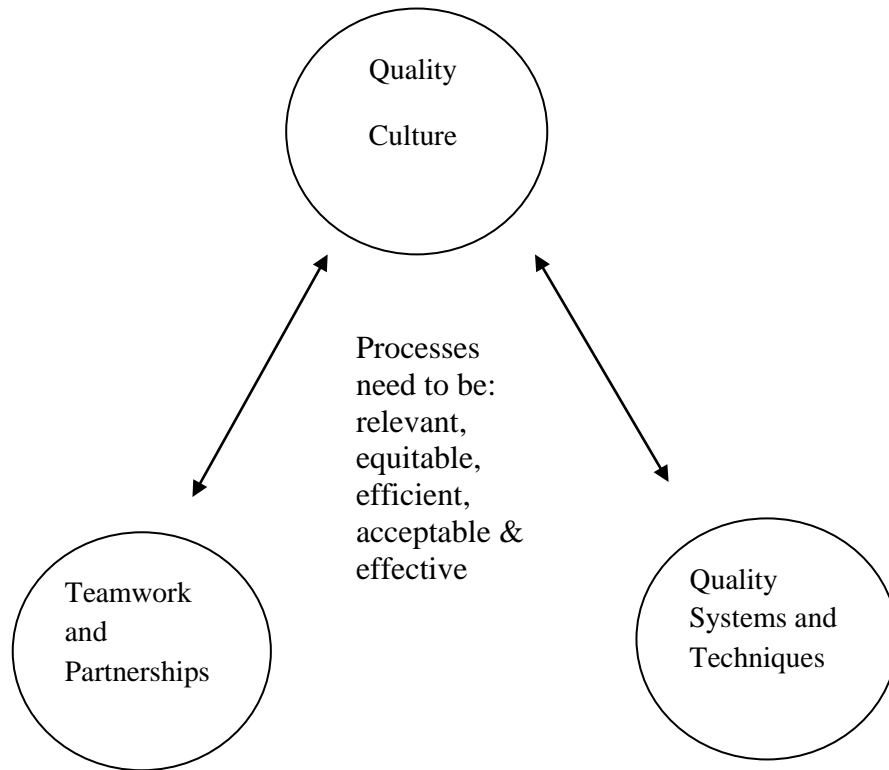
On this system, Benton (2010) articulated that the quality assurance system must be consistent with the in house quality requirements of the customer. Thus the stated targets and expectations of the customer must meet the minimum level of performance. In cases where the quality targets expectations are not achieved, the system must be programmed to respond rapidly in order to return to the agreed quality targets.

Pham and Oztemel (1996) noted that the purpose of a quality assurance system is to provide a measure of how a product, process, or machine meets customer needs. The concept of quality relates to the functioning of an industrial organization where all departments are required to work closely together to achieve and maintain the desired standards of quality.

2.4.4 Total Quality Management System

Since the early 1980s, TQM has proved the most persisting management theory in industries and businesses. The total quality concept and the term “total quality management” was first introduced to the western business world by Feigenbaum (1957), in the first edition of his book “Total Quality Control”. A number of widely recognised approaches to quality management followed. Some of the most famous “quality gurus” are Phillip Crosby, Joseph Juran and W. Edwards Deming. Crosby is known for his work on the cost implication of poor quality and his book “Quality is Free”. Juran emphasised that quality is a continuous process and introduced the “pareto principle” or “80/20 rule”*. Deming is often referred to as the father of quality control in Japan, he is known for his “14 points for quality improvement” (Slack, et al., 1995 and Varnadoe, 1996).

Competitiveness of a supplier is often measured by quality, price, and delivery (Quayle, 2006). He went on to say that it is often a misconception that quality costs extra money in terms of inputs. The theory behind a total quality management (TQM) system is that, as quality improves, costs actually fall because of lower failure and appraisal costs and less waste. TQM involves much more than assuring product or service quality; it is a system of dealing with quality at every stage of the production process, both internally and externally.



Source: Lysons (2006)

Figure 2.3 Total Quality Management

TQM is truly a system requiring the commitment of senior managers, effective leadership, and teamwork. He argued that TQM system on the suppliers' side requires that every part of the organisation is integrated and must be able to work together. The main elements of the system are teamwork, commitment, communication, organisation, planning, control and monitoring as shown by figure 2.1 above.

He concluded that a breakdown in any part of the TQM system can lead to organisational gaps where wastage may occur or quality be overlooked. Errors have a habit of becoming multiplied, and failure to meet the requirements of one part of the organisation creates problems elsewhere. The correction of errors is time consuming and costly. TQM can provide a company with a competitive edge. This means that managers must plan strategically both externally and internally, and that internal strategic planning has to involve everyone in the workplace.

2.5 ISO 9000 Standards

Another important aspect concerning this study is comparing the supplier selection issues in each organization with a supplier evaluation system as the ISO 9000 standards. This quality system was chosen as a structure for comparison because it is recognized as a required quality standard in many parts of the global marketplace. Besides, the three companies under study are either ISO 9000 certified or structured therefore comparison can be established by the procedures actually used by these organizations in the vendor selection process and the key metrics used in this process, with these quality standards, Bello (2003)

The International Organization for Standardization (ISO) is a worldwide federation of national standards bodies, which prepares international standards to facilitate trade. The ISO 9000 standards provide a tool that can be used in supplier customer contracts since many of the clauses focus on this relationship. ISO registration helps suppliers demonstrate their capabilities to meet quality requirements. In addition to specifying product and service requirements, a customer (e.g. buyer) can also require that a supplier has a quality management system that meets the requirements of one of the ISO 9001 standards.

It is in the best interest of the suppliers to pursue ISO 9000 certification, particularly if buyers value the certification. Buying firms can also benefit from ISO 9000 registration since few buying firms have the size or resources to develop and conduct comprehensive supplier certification audits. ISO 9000 provides insight into a supplier's quality system conformance that a buyer may otherwise lack.

2.6 Empirical framework

A research was conducted by Ferhan and Demet (2011) on the usage of an integrated approach for supplier selection for a Turkish food manufacturing company. They sought to analyze the conflicting multiple criteria on supplier selection that are tangible and

intangible. They found out that, Supplier management is one of the most important parts in supply chain management, hence; supplier selection should be performed by a systematic and scientific approach. They proposed an integrated lexicographic goal programming (LGP) and analytic hierarchy process (AHP) model for decision-making problem. Ferhan and Demet (2001), in their study, differ with the present study in that they were mainly concerned in designing an intergrated approach for supplier selection. This study goes on further to investigate on how proper supplier selection can improve the quality of materials into an organisation.

Dogan and Sahin (2003) carried out a research on supplier selection using activity-based costing and fuzzy present-worth techniques and discovered that supplier selection process is performed by choosing the supplier who minimizes the present total additional costs associated with the purchase decision. These include price differentials and supplementary estimated internal production costs caused by the supplier in each period. After selecting the supplier, evaluation process could be done according to the supplier performance at the end of each period. The present study goes beyond the research by Dogan and Sahin, (2003) because it encompasses the issue of supplier selection within the research and goes beyond the issue of price as indicated above to dig further on the issue of improving quality.

In a research conducted by Davidrajuh, (2003) on modelling and implementation of supplier selection procedures for e-commerce initiatives, he looked at methodology, tools and implementation techniques for automation of supplier selection procedures as an ecommerce application. He found out that automating supplier selection is not done elsewhere and this idea is new in the industry. Davidrajuh, (2003) concentrated on the automated procedures of supplier selection whereas this study is mainly concerned with how these procedures can be used to improve the quality of goods.

Kannan and Tan (2002) conducted a study on a supplier selection and assessment: their impact on business performance. Their study demonstrated the importance of supplier selection and assessment on a buying firm's business performance and found out that a

strategic commitment from suppliers is clearly a vital determinant of business success. In their research, they propounded that, for supplier selection to be effective, firms should develop relationships with suppliers that are willing to engage in closer ties, have order entry systems that support the relationship, are willing to share confidential information, and are otherwise committed to serving the buyer's long-term needs. Their study also reinforces the need to view suppliers as extensions of the buying firm itself and not as independent entities to be dealt with at arm's length. The present study similarly studies the same aspect and what differs is that this study aims at improving the quality of materials whereas Kannan and Tan (2002) dug deeper on the impact on business performance.

Richard et al (2006) conducted a research in United States of America (USA) on Supplier selection based on process capability and price analysis. In their study, they presented a new approach to supplier selection using capability index and price comparison (CPC) chart. Cost was seen as the major important factor they considered in supplier selection. They found out that the CPC charting method to integrate both process capability and cost performance of multiple suppliers into a simple chart, allowing a clear view of quality–cost performance all suppliers. They concluded that, CPC chart is an efficient but easy to use method to consider process capability and cost together in supplier selection process. Their research was similar to the current study on process capability which is the impact of supplier selection. However it differs with the current one in that Richard et al (2006) concentrated more on cost whereas the researcher's main focus is on improving the quality of materials flowing into an organisation.

CHAPTER III

RESEARCH METHODOLOGY

3.0 Introduction

This chapter intends to give an outline of the methodological approaches used, the specific data gathering techniques employed in this research. Furthermore, it discusses the target population, for the research, the sampling procedures, the research instruments and the quality standards incorporated in this study. In this chapter the researcher discussed several research methods and techniques which were used in the data collection analysis and presentation process.

3.1 Research design

Samathi and Saravanavel (2003) defined research design as the plan, structure and strategy of investigation conceived so as to obtain answers to a research question and to control variance. It is a master plan that specifies the methods and procedures for collecting and analyzing the needed information (Zikmund, 2003). The plan is an outline of the research scheme on which the researcher used. Research design specifies the methods and procedures for acquiring the information needed. It is the overall operational pattern or framework of the project that stipulates what information is to be collected from which sources and by what procedures. Case study approach has been selected for this particular study.

3.1.1 Case study approach

Saunders et al (2005) describes a case study as a development of detailed intensive knowledge about a single or small number of related cases. It is appropriate when one needs to collect a great deal of information on one individual, institution or organization over a period of time. Morris and Wood (1991) explain that it has a considerable ability to answer the questions like “What?“, “How?“, and “Why?“, in a bid to understand the context of the research and the process being enacted.

In this study, the case study approach was applied. The researcher discovered comprehensiveness and ability to describe and analyze the full richness and variety of events and issues involved as the main advantage of using a case study approach

In a move to minimize the effects of weaknesses on the findings and to ensure validity of the findings, the researcher used this research design together with the questionnaires, interviews and observations so as to limit the information to what the researcher is interested in collecting.

3.2 Subjects

3.2.1 Population

According to Lancaster (2005) research population is a full set of cases from which a sample is taken. Population is any one group of aggregate of individuals, groups, organizations, social groups for social interaction and events. The research encompasses only sampling units with features that is relevant to the problem. The population for this study is confined mainly to the end users of most of the products. The population in this study was drawn from staff members of the academic departments, academic support departments and the suppliers.

3.2.2 Sampling

By definition, a sample is a small group of elements selected from the population whose responses represent the pattern of the whole population (Leedy, 1993). In this research, stratified random sampling technique was used.

3.2.3 Sampling techniques

Stratified random sampling is the division of a population into smaller groups known as strata. In stratified random sampling, the strata are formed based on members' shared attributes or characteristics. A random sample from each stratum is taken in a number proportional to the stratum's size when compared to the population. These subsets of the strata are then pooled to form a random sample. In this research, four strata namely academic, non-academic employees, students and suppliers were selected because they are the ones who are affected by the issue of material quality. Dividing the population into a series of relevant strata meant that the sample was more likely to be representative. Its main advantage was simplicity (Lancaster, 2005). It allowed the researcher to add a degree of system or process into the random selection of subjects. Shortcomings faced were that its theoretical properties made it difficult to quantify that accuracy.

3.2.4 Sample Size

For the purposes of this study, the researcher chose to work with the staff from academic faculties and academic support departments. The researcher also chose those suppliers who make regular transactions with the institutions. A sample can be used to make inferences. The sample was composed of 65 staff members and 20 suppliers. The sample frame was taken from the Bindura University population of 715 staff members and 200 suppliers.

To calculate the sample size, the researcher used the following formula that was set forward by Saunders (2005);

$$n^a = \frac{n \times 100}{re\%}$$

Where n^a is the actual sample size, n is the estimated minimum sample size and $re\%$ is the estimated response rate expressed as a percentage. So $n = 65$, $re\% = 100\%$ because Saunders (2005) asserted that, when one is collecting data from a primary source within an organization that had clearly granted him access, his/her response rate should be 100%.

$$\frac{n^a = 65 \times 100}{100} \longrightarrow \frac{n^a = 6500}{100}$$

Therefore, the actual sample size for the B.U.S.E. staff (n^a) = 65 members.

These were administrators from academic support departments of which 20 were selected out of 40 and technicians, 15 of which were chosen from a group of 36. For the academic staff, 30 were chosen from a group of 60 secretaries and head of departments and 20 (10%) regular suppliers were chosen from a group of 200 on the approved suppliers“ list. This information is shown in table below.

Table 3.1 Sample size

Personalities	Sample
Academic staff	30
Academic support staff -Administration	20
-Technicians	15
Suppliers	20
Total	85

Source: Raw data

3.3 Research Instruments

Research instruments were used as a way of obtaining standardized information from all subjects in the sample. These are instruments which are used to collect data for the research to achieve the objective of the study through assisting in data presentation and

analysis. The researcher used questionnaires, interviews and observations. Questionnaires were distributed to Bindura University's employees.

3.3.1 In depth Interviews

The researcher also used interviews as a way of obtaining information from the sample under study. According to Barbour (2008), an interview is a direct face to face attempt to obtain reliable and valid measures in the form of verbal responses from one or more respondents. It is conversation in which the roles of the interviewer and the respondent change continually. The advantages are that the researcher will be able to clarify questions, and can be used with lower and senior level workers. Berker (1996) highlights that interviews facilitate coercion thus making the respondent more frank than originally intended. Since the study focused on quality, an interview was used since some of the respondents were willing to see the quality of products improving. Verbal expressions and non verbal expressions will help the researcher see the general emotion of the respondent.

3.3.2. Observations

According to Walliman (2006), observation is a method of recording conditions, events, and activities through the non inquisitorial involvement of the researcher. The non participant research takes a detached stance to the phenomena and aims to be invisible, either in fact or in effect being ignored. Observation can record whether people act differently to what they say. In essence observation is a quick and efficient method of making preliminary assessment of a state or condition. In this study the researcher used the observation method to assess the materials delivered by different suppliers of Bindura University mainly focusing on the quality.

3.3.3 Questionnaire

It is used as a general term to include all techniques of data collection in which each person is asked to respond to the same set of questions in a predetermined order. This instrument has been used as a guide for the collection of data from respondents for

surveys and interviews. The questionnaire used in this research was a structured one with closed ended questions.

Merits of the questionnaire

- The questionnaires were kept precise in order to avoid autonomy in answering the questions. This is because people tend to be bored by long questions thus feeling reluctant to finish the questionnaire.
- The responses are gathered in a standardized manner to keep the respondents minds focused on the issue in question.
- The researcher bias caused by the presence of the researcher at question answering spot was greatly reduced by allowing respondents to fill the questionnaire at their home in their spare time. Thus respondents could freely enroll out their views without any influence of the researchers' presence. By so doing, the researcher facilitated more thoughtful responses to be gathered from respondents.
- The questionnaire was designed in a special way so as to enforce respondents to be specific and precise in answering questions by limiting the space available for answers on closed ended questions.

Demerits of the questionnaire

- Few questionnaires were returned incomplete and others were not returned at all.
- The researcher had no control over who filled the questionnaire and the time of returning the questionnaire there were delays on the returning of a number of a questionnaires.

3.4 Data collection procedures

The data was collected using questionnaires and interview guide. Questionnaires were distributed to the respondents by hand by the researcher and collected them. The researcher kept on reminding the respondents to answer the questionnaires. Appointments

were made and the researcher was managed to meet them. Interviews were carried on readily available respondents. This was because some respondents tend to be busy with their work since being interviewed was not part of their job description. A pilot study was carried to see if the questionnaire and interview guide capture the research objectives.

3.5 Data Presentation and Analysis

The researcher dealt with nominal data that is data at the lowest level of data measurement. Numbers or other symbols were used to classify and organize objects into a number of groups and categories which were exhaustive and mutually exclusive, at this level. Due to the nature of the information the researcher organized the information using graphs, tables and charts. Much of description of the data was done using non-numeric description procedures. The data obtained was analyzed by human judgment considering the categories the data were placed depending on the levels of impact of supplier selection on improving quality they were attached to.

3.6 Summary

This chapter described and outlined how the data was collected. Issues included were the study area description, sampling process that suits the research being undertaken, research design, describing the justification for the research design chosen and research instruments to be used. It also outlined how the data collected was to be presented and analyzed.

In the next chapter, were the research findings and data presentation. Data were be presented, analyzed and interpreted. To help interpret the data obtained, graphs, tables and charts were drawn. For the analysis of quantitative data human judgments and content analysis were be used.

CHAPTER IV

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.0 Introduction

This chapter focused on the analysis and presentation of data gathered from the field research. The researcher used the circulated questionnaires and interview results as the source of data referred to in this analysis, together with secondary data. Data was analyzed using descriptive statistics and raw data was presented by means of pie charts, graphs and tables. In this report, the researcher gathered information relating to the impact of supplier selection on improving the quality of materials, mainly centering on Bindura University.

4.1 Response Rate

Table 4.1 Questionnaire response rate

Questionnaires were issued to the respondents and the response rate from them is represented below.

Sample	Questionnaires Distributed	Number of Responses	Response Rate (%)
Academic staff	30	30	100%
Academic support - Administrators	20	19	95%
Technicians	15	14	93%
Suppliers	20	20	100%
Total	85	83	97%

Source: Primary Data

Table 4.1 above presents the questionnaire response rate. The response rate for the suppliers was excellent at 100%. This was a result of follow ups on respondents to ensure that they responded and also the ease with which questionnaires were structured. Staff questionnaire response rate was high that is at 96% for the academic staff (lecturers, chairpersons and secretaries) and academic support staff (administrators and technicians). This was mainly due to the fact that the researcher worked with the staff and had established a good relationship with the contacts. The overall response rate was at 97%, which was a usable return used in the data presentation, interpretation and analysis. A high response rate means that the data to be presented will be more accurate and reliable. This is supported by Barclay (2001) who pointed out that when a sample response rate is higher than 50%, its findings can be generalized on the whole population and he used a population of 50

Table 4.2 Interview response rate

Interviewee	No. of Interviews Scheduled	No. of Interviews Conducted	Percentage Response

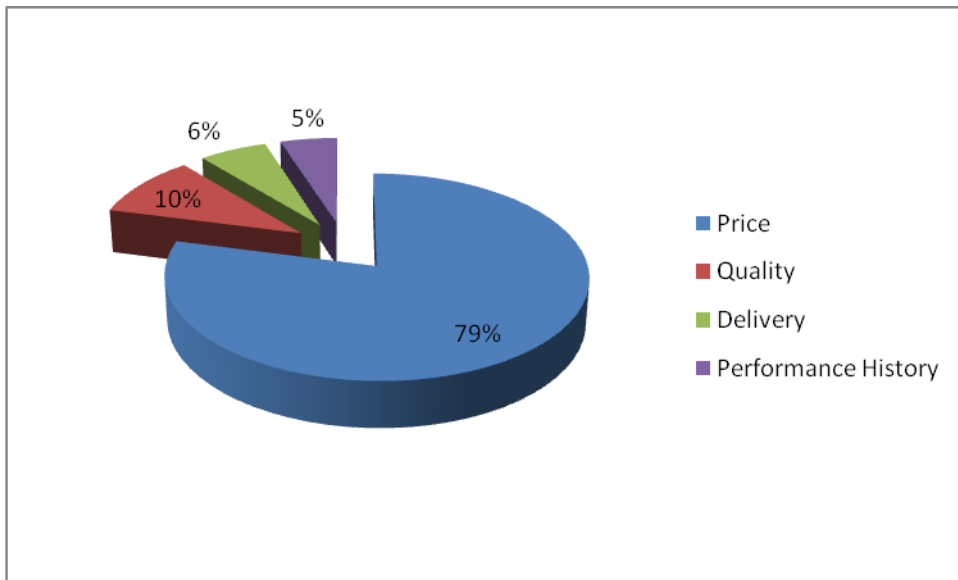
Buying and stores staff	5	5	100%
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Source: Primary Data

In terms of interviews, the researcher made appointments with 5 buying and stores representatives managed to carry out all the interviews as scheduled, giving a 100% response rate in that category. 100% for interviews was high enough and allowed an objective investigation on the impact of supplier selection in improving the quality of materials at Bindura University.

4.2 Supplier selection criteria at Bindura University

One of the objectives is to recognize the supplier selection criteria used in the buying office and the results are shown in the figure 4.3 below;



Source : Raw data

Figure 4.1 Supplier selection criteria

Figure 4.1 above shows that 79% of the respondents believe that price is the main attribute considered when selecting suppliers. This is followed by 10% which considers

quality most, 6% believe its delivery period that is considered most and 5% said its the performance history. This pattern follows the criteria reprioritized by Weber et al (1991) where price is ranked first followed by delivery time (lead time), quality and performance history was ranked at number 10.

The research by Dickson (1966) on the supplier selection criteria is different from this research in that, he highlighted that quality is ranked first, followed by performance history, delivery time and warranties and claim policies. So the results clearly follow the ranks by Weber et al meaning to say that at Bindura University, they consider net price of materials first before anything else.

4.3 Employees' views on supplier appraisal and quality assurance

Table 4.3 Employees' views on quality and supplier appraisal

	Always		Sometimes		Not at all	
	N	%	N	%	N	%
Are you satisfied with the quality of materials purchased?	43	68%	17	27%	3	5%
Do you receive the exact products as per your request?	27	43%	31	49%	5	8%
Do you have any contribution in selecting suppliers of technical products?	33	52%	20	32%	10	16%
Would you say that departments are specifying goods and products clearly when requesting?	50	79%	13	21%	0	0%

Source: Raw data

From the table 4.3 above, 68% of the respondents are always satisfied by the quality of materials from various suppliers. This shows that the majority of the staff members including the technicians are not facing any difficulties in finding more defects.

Sometimes, 27% of the respondents are satisfied with the quality of materials and only 5% of the respondents are not satisfied by the quality of materials at all. The importance of user satisfaction is because the main judge of the quality of work is the customer, thus if the customer is not satisfied, the work does not have quality. By this it is easy to conclude that the majority of the staff members have no problems with the quality of materials purchased by the buying personnel.

In terms of receiving the exact products or material requested, 43% said they receiving exactly as per their requests. 49% were saying sometimes they are receiving what they have requested leaving room for certain probability of dissatisfaction. This group constitute the majority of the respondents. 8% were saying that they are receiving totally different products from the ones they requested. In general there is a certain degree of dissatisfaction in terms of the right materials.

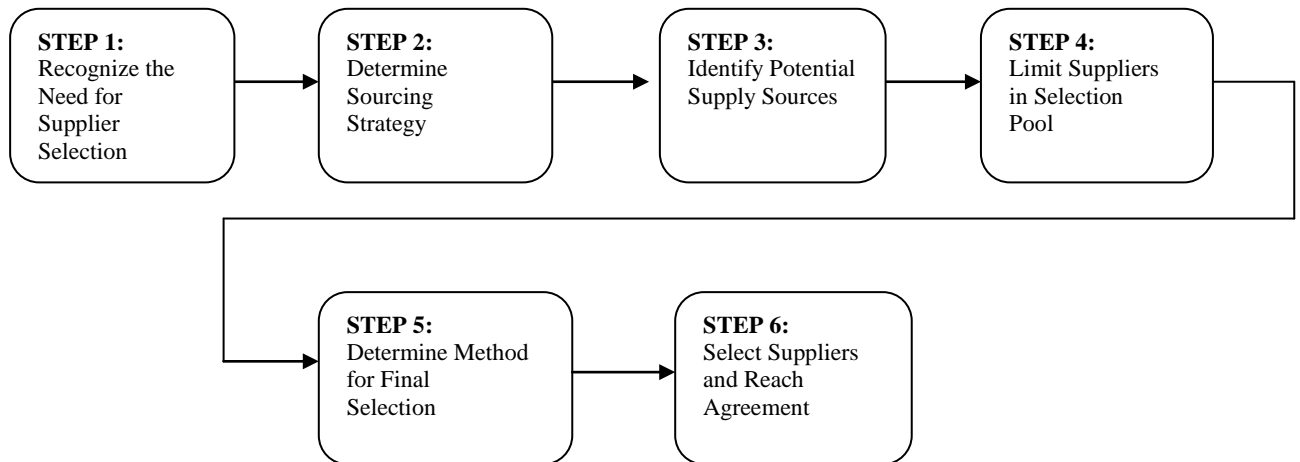
The information from the above table also shows that the majority of respondents were being consulted when making supplier selection decisions as represented by 52% who said were always consulted. 32% were sometimes consulted and 16% were not considered anymore. The respondents also pointed out that it is very important to consult technical personnel when selecting the suppliers of technical products especially from overseas because it can take much more time to return the same product and get it back when it is wrong.

More so, 79% were saying that they specify clearly when raising requests. This shows that user departments are aware of the exact products they want but 21% sometimes specify clearly. This may be because they lack technical expertise and knowledge of what the product is but only aware of the use or name of that product. This can be another reason for not specifying clearly.

4.4 Supplier selection process

From the interviews conducted and general observation undertaken in the Buying section, the researcher found out the supplier selection process as represented below. This is a simplified version of what Monczka et al (2009) addressed. It shows some of the stages in

Monczka's model of supplier selection process and only few stages are not in use at Bindura University. Below is the diagram that shows the supplier selection process at Bindura University. It is also important to note that the university owns a printing press where some of the materials are acquired. Since this is operated by the institution, supplier selection process is not the same as the external suppliers.



Source: Raw data

Figure 4.2: Supplier selection process at Bindura University

Figure 4.2 above shows the supplier selection process at Bindura University. Prior to the reception of a request from the user departments, the need for supplier selection will be recognized. This looks deeper into the capabilities of the current suppliers in line with the requested product. Different situations may trigger the need for supplier selection.

When a need has been recognized, stage 2 is where the sourcing strategies are laid down. Sourcing requires that companies clearly define the strategy approach to be taken during the supplier selection process. Examples of sourcing strategies are: single versus multiple suppliers, domestic versus international and short term versus long term supplier contracts. There are some products which are supplied by Bindura University printing press, an institution owned printing facility and do not follow the supplier selection procedure. For example counter books, letterheads and banners need a single quotation justification for a single supplier. However for some other materials like furniture, machines or computer consumables there is clear supplier selection process from multiple sources.

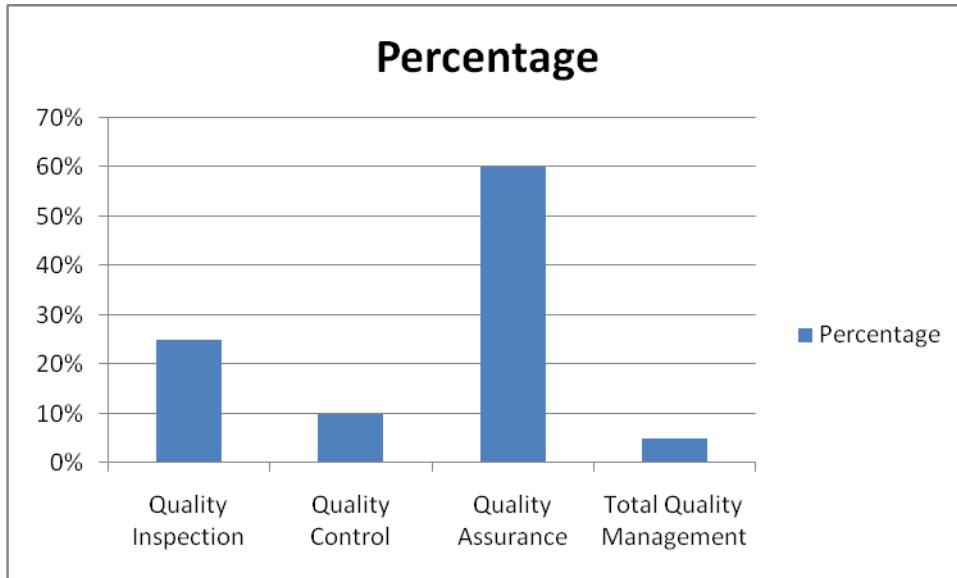
At Bindura University there is a list of approved suppliers" list which makes it easier to identify potential supply sources. For every request, there is an appropriate category of suppliers and these are the one that will be identified and requests for quotations will be sent. Request for quotations can be raised via e-mails, telephone or direct visit to the supplier"s site depending on the distance or the value of the requested product.

There are actually some quotations that do not meet the exact specifications of the user; this is a stage of limiting suppliers in a selection pool. Those that quote wrong product will be eliminated first. Then after this, the buying staff in consultation with the technicians (on technical products only) or user department (if necessary) will determine the criteria of supplier selection. Therefore, defining the proper criteria becomes critical. In this case, the researcher found out that the most widely used criteria in supplier selection are net price, delivery time, performance history and quality. This is supported by the research conducted by Weber et al (1991).

Finally the supplier that meets all the requirements will be selected and a purchase order will then be forwarded to that supplier to deliver the goods. That is where a contract is made and marks an end of the supplier selection process. The process will be the same where there are multiple sources. The final step of the supplier selection process is to clearly select those suppliers that best meet the company's sourcing strategy. This

decision is often accompanied with determining the highest degree of quality to selected suppliers (Lysons and Farrington, 2006).

4.5 Supplier quality management system



Source: Raw data

Figure 4.3 Quality management systems of the suppliers

From the above diagram it can be easily noted that the majority of respondents are using quality assurance system with 60%, the second most common system is the quality inspection with 25%. Quality control is the third most common system in the supply market with 25% and the least common is total quality management. Total quality management is more common in more economically developed countries where they intensified the issue of quality. This may be because the system is strenuous to implement because of its complexity and also it requires the whole organisation to focus on the same objective which cannot be profitable.

4.6 Supplier's views on the payment system

Table 4.4 Suppliers' evaluation of BUSE's payment system

	Excellent		Good		Fair		Poor		Very poor	
	N	%	N	%	N	%	N	%	N	%
How would you rate BUSE's payment system?	0	0%	17	85%	3	15%	0	0%	0	0%

Source: Primary data

As shown in table 4.7 above, it is clear that the majority (85%) of the suppliers have no problems with the payment system of Bindura University. Even though it is neither excellent nor poor it clearly shows a better relationship position between the suppliers and the institution.

4.6.1 Quality performance

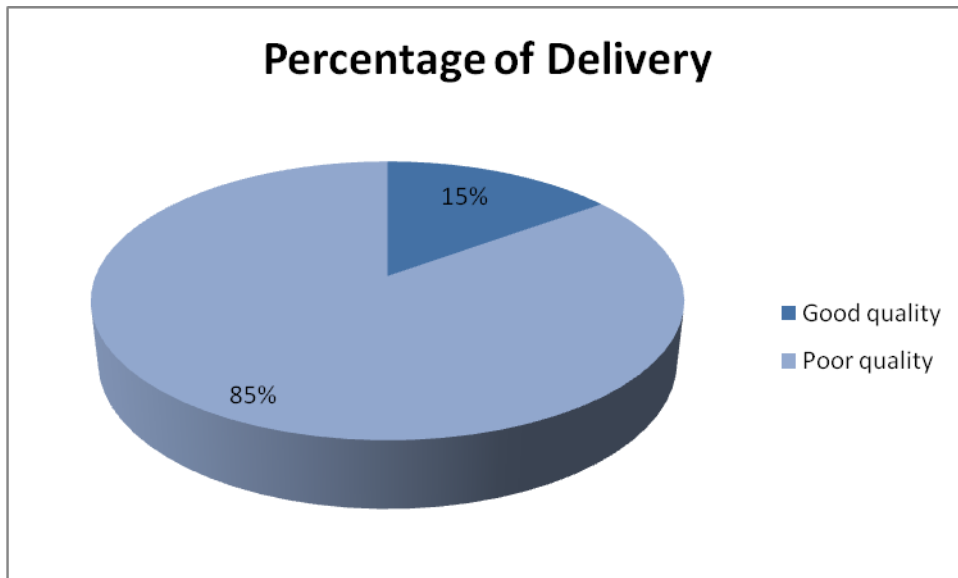
After analyzing the documents in the buying section, the researcher managed to calculate performance quality. The performance of quality at Bindura University was calculated using Percentage of delivery Lysons, (2003). This is the proportion of deliveries of the right quality and is calculated as follows;

$$\text{Percentage of delivery} = \frac{\text{Number of good quality deliveries}}{\text{Total number of deliveries}} \times 100$$

The researcher managed to extract data from the purchasing documents of the last quarter of 2012. The total number of deliveries was 222. There were 33 of the deliveries which were of poor quality and did not meet the specifications leaving difference of 189 being made to specifications.

$$\text{Percentage of delivery} = \frac{189}{222} \times 100$$

= 85%

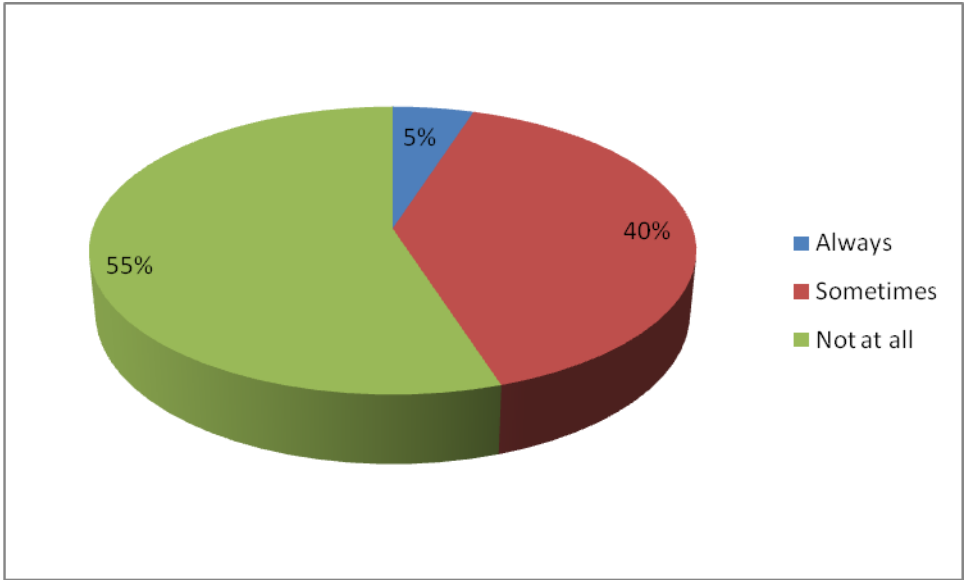


Source: Raw data

Figure 4.4 Percentage of delivery

There is a positive relationship between the percentage delivery of good quality goods and payment system at B.U.S.E. It can be noted that the percentage of respondents who are satisfied with the payment system is equally the same percentage of the of good quality products received during the last quarter of 2012. On other 15% rated this payment system as fair and it is corresponding with the percentage of poor quality products delivered during the same period.

4.6.2 Suppliers' views on whether B.U.S.E. payment system affects quality



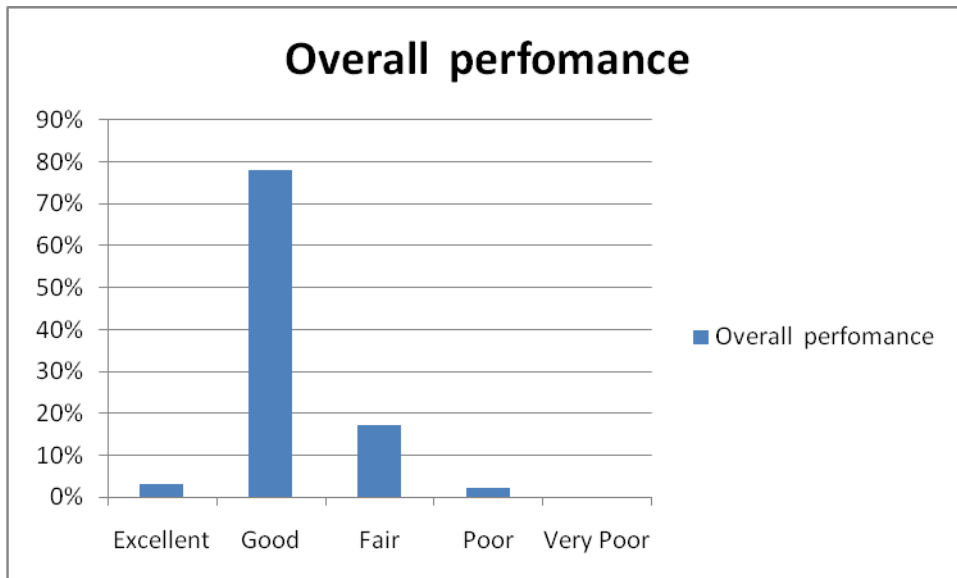
Source: Raw data

Figure 4.5: Effect of BUSE’s payment system on the supplier quality

From fig 4.7 above, 5% of the suppliers are affected by the payment system of Bindura University to the extent of comprising their quality. Only 40% are sometimes affected by this system and sometimes this have an impact on the quality of materials. However, the majority represented by 55% is not affected by the payment system and they deliver required materials in required qualities without compromise. Generally it has been noted that payment system has an effect on the quality of some of the materials.

4.7 Rating for the institution’s overall performance of the purchasing function in relation to quality

Represented in the figure below are the perceived employees’ ratings for the institution’s overall performance of the purchasing function in relation to quality



Source: Primary data

Figure 4.6 Overall performance of the purchasing function

Overallly from the figure above, 79% of the respondents rated the performance purchasing function in the relation to quality as as good. 17% rated it as fair, followed by 3% which said it is excellent, 2% are in contrast with others and rated the function’s performance as poor whilst no one thought of it as very poor. This means that a lot has to be done ignored for the buying function to improve on its approach to quality ignored to perform excellently.

4.8 Discussion

In this research, it has been noted that price is the main criterion used at Bindura University. This contradicts with the findings presented in a study made by Aberdeen Group, a leading provider of technology market consulting and research and iSource Business, a leading supply and demand chain multi-tiered media company. In their report, “The Supplier Performance Measurement Benchmarking Report” completed on December 2002, they highlight that the main supplier performance measurement criteria are quality, on-time delivery, service, price, and quality being the most important one overall. It also contradicts with Dickson (1966) who found out and ranked quality as the first criterion, followed by performance history and delivery time. However, this research

is consistent with the research of Weber (1991) where the conclusion was that net price is the main criterion considered when selecting suppliers.

The supplier selection process in place plays a pivotal role in ensuring that best suppliers are selected. This process is similar to the one set forward by Monczka (2006). It involves all stages as stated in his research thus making it a proper selection tool.

The findings in this research are that most of the suppliers use the quality assurance system. This result is supported by Benton (2010), he asserted that the quality assurance system must be consistent with the in house quality requirements of the customer. Thus the stated targets and expectations of the customer must meet the minimum level of performance. In cases where the quality targets expectations are not achieved, the system must be programmed to respond rapidly in order to return to the agreed quality targets.

On the same note, Pham and Oztemel, (1996) noted that the purpose of a quality assurance system is to provide a measure of how a product, process, or machine meets customer needs. The concept of quality relates to the functioning of an industrial organization where all departments are required to work closely together to achieve and maintain the desired standards of quality. This approach is a more customer oriented than the other three.

4.9 Chapter summary

This chapter presented and analyzed the data collected from the field through mainly questionnaires, interviews and observations. From the above findings, it could be said that the primary data collected was a success especially given an overwhelming overall response rate of ninety eight percent (97%). The next chapter focused on the summary of this research and making recommendations as well as conclusions to this research based on the above findings.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of major findings of the research. It makes conclusions and also gives recommendations for future research. This study aimed at investigating the impact of supplier selection on improving the quality of materials. The study was carried out at Bindura University, a tertiary education institution in Bindura. In-depth interviews, questionnaires and observations were used to collect data. The results were generalised to the entire population of Bindura University.

5.1 Summary of the findings

The research was carried out to investigate the impact of supplier selection on improving quality. The research findings show that price is the main criterion that is considered first when selecting suppliers. The study reveals that, other traditional attributes like quality, delivery and historical performance were not being considered in the process of selecting suppliers. Price sensitivity is very high at B.U.S.E. because most of the suppliers are qualified on this basis as articulated by Weber et al, (1991).

The researcher also found out from the suppliers that the most common quality management system is quality assurance. This is because most of the suppliers import their merchandise, and they have no direct control over the quality of material but can reduce abnormalities. It is clear that quality assurance is better than other systems in that it is concerned with defect prevention. It can involve number of approaches including quality requirement, new design control, supplier appraisal, to ensure that only suppliers able to meet supplier requirements are approved.

Dissatisfaction from user departments has prompted the researcher to carry out a research at this institution thus digging deeper to identify the selection process. Observation and interviews were employed to identify the supplier selection process. The researcher also found out that the supplier selection process is similar to the previous work of Monczka (2009) and it is effective if adhered to.

From the research findings, there is a positive relationship between payment system and the quality of delivered materials. The researcher found out that those who are satisfied by the payment system are the ones who supplied good quality materials and vice versa. Users also pointed that products are clearly specified when requesting for quotation.

5.2 Conclusion

The methodology selected for this study (exploratory case study approach) was appropriate to address the research questions initially proposed. The study found out that although the selection criterion (price) mainly used is effective, there is need to involve other attributes like quality and delivery. The quality criterion is important because of the market requirements of some products (like pharmaceutical products) while delivery is a key criterion to ensure short lead times. At Bindura University, the selection of suppliers should be based on various attributes other than price alone depending on the nature of product. Generally the price of a product determines its quality, so low priced products need careful inspection before accepting them.

A close association between the issue of quality performance and payment system was also established. The issue of poor quality materials could be attributed to the delay in paying the suppliers. Generally it has been observed that payments take two weeks after delivery to be effected. Suppliers will be frustrated to supply other material before previous payment. So to improve quality, suppliers should be paid within the agreed time frame.

While problem of specifications was quite prevalent, it was observed that some users of technical products were not involved in the selection of the suppliers who meet their requirements. Disgruntlements from other sections show that they are keen to contribute to the improvement in the quality of materials.

Quality management system used by the majority of suppliers is quite commendable. Out of the rest of the systems, quality assurance has proven to be the best especially in Zimbabwe since most suppliers are importing their merchandise. This has greatly contributed to the delivery of quality products as shown by the few rejects.

To improve the quality of materials, the selection process in place at B.U.S.E. should be adhered to and activities which are not procedural (shortcuts) should be avoided. The process combines all criteria and systems above, so it is a vital tool towards improving the quality of materials.

5.3 Recommendations

5.3.1 To the company

In the light of the above conclusions, it is recommended that the buying and accounting sections should agree on the supplier selection criterion. Accountants should not expect Buyers to select suppliers based on net price only but also look for other attributes that reduce dissatisfaction within an organization by improving quality. Other criteria like quality, delivery and performance history are equally important and this can be achieved through effective communication between departments.

After clear specifications have been established, users of technical products should play an important role in selecting suppliers of the actual product in need. Stakeholder involvement is important because it integrates the buyer and the users' expertise to achieve a common goal. The buying staff should also be increased to enable them to cope up with the demands of the users and smoothening information flow.

Effectiveness of supplier selection process can be improved by computerizing the purchasing system with the help of the IT department. There are software packages (SAP) that can integrate Buying section with all departments, this can reduce movement of staff from one department to another and reduce loss of documents. Bindura University should also invest in supplier assessment software like Achieving Excellence (AE). The achieving excellence web site is a tool used by suppliers and the buying organization's employees to aid in the communication process and keeping records on the performance of suppliers.

ISO (International Standards Organization) certification or SAZ (Standard Association of Zimbabwe) certification are also a powerful supplier selection tools that cannot be ignored. It should be noted that nowadays with the introduction of sustainable purchasing,

certification is very important factor to improve quality without compromising future requirements.

5.3.2 Recommendations for further study

This study recommends that further research be conducted on impact of supplier selection on improving the quality of materials and services of various corporate organizations. Using this information comparison of the different supplier selection and evaluation processes across industries can be established and key supplier's performance metrics identified. Also, other institutions of the same industry (other universities) could be studied, in order to explore whether they are consistent with the results of this project.

The researcher also recommends that since the research was mainly centering on improving the quality of materials, further research be done on the impact of supplier selection on the profitability or cost reduction of an institution.

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APPENDIX 1

STAFF QUESTIONNAIRE

I am a Purchasing and Supply student at Bindura University of Science Education (BUSE) Registration Number B1026423 conducting research on the impact of supplier selection on improving the quality of materials/ products at Bindura University. In an attempt to conduct the research, I kindly request for permission and access of information that helps in my research study. All your company information will be treated as confidential and the results of my research will be available on request.

1. Department Academic

Academic support – Administration

Technical

2. a) Are you satisfied with the quality of material from buying section so far?

Always

Sometimes

Not at all

b) If not, explain the possible reason for that;

.....
.....
.....
.....

....

3. Do you always receive the exact products you have requested or specified?

Always Sometimes Not at all

4. What aspect do you consider first when selecting a supplier of any product?

Price Quality Delivery Performance history

5. a) Do you have any contribution in selecting some of suppliers of technical products which are critical in your department?

Always Sometimes Not at all

b) If not, explain the possible reason for this;

.....
.....
.....
.....

.....

6. Would you say that user departments are specifying goods and products clearly when raising requests?

Always Sometimes Not at all

7. What is the overall performance of buying section in relation to the quality of materials?

Excellent Good Fair Poor Very Poor

APPENDIX 2

SUPPLIER QUESTIONNAIRE

I am chikobvu Farai a part time employee and a third year student at Bindura University of Science Education doing Bachelor of Commerce studies (Honours) degree in Purchasing and Supply. The aim of the dissertation is to investigate the impact of supplier selection on improving the quality of materials as per the requirement of the University.

Kindly assist by completing the attached questionnaire. The information you provide will be kept strictly confidential and only for the purpose of the research project. I would be very much appreciative if the questionnaire could be returned at your earliest suitable time.

1. Which quality management method/system is **mainly** used in your organization?

Quality Inspection []

Quality Control []

Quality Assurance []

Total Quality Management []

2. How long have you been supplying goods to B.U.S.E.?

1-5 years []

6-10years []

11-15years []

16years and above []

3. How would you rate BUSE's payment system?

Excellent []

Good []

Fair []

Poor []

Very poor []

4. Does this payment system affect the quality of materials you deliver?

Always [] Sometimes [] Not at all []

5. What have been the biggest operational challenges that you have faced recently in connection with the quality of your products?

.....
.....
.....
.....

6. How will doing business with your company instead of your competitor(s) make our organization more profitable?

.....
.....
.....
.....

APPENDIX 3

INTERVIEW GUIDE FOR THE EMPLOYEES IN THE BUYING SECTION AND STORES

- a) Which supplier selection process is currently operational at B.U.S.E.?
- b) Have you ever made supplier visit before evaluating your suppliers?
- c) Are the user departments specifying clearly when requesting?
- d) What can be done to improve the quality of materials at B.U.S.E.?
- e) What inadequacies do you see on the supplier selection criteria used at B.U.S.E.?
- f) How can you rate the overall performance of B.U.S.E.'s purchasing function in relation to the quality of materials coming into the institution?

Thank you for taking your time to respond to the questions.

