**APPRAISAL OF QUALITY CONTROL PROCEDURES IN A MANUFACTURING ORGANIZATION (A CASE STUDY OF JUHEL PHARMACEUTICAL COMPANY, EMENE, ENUGU)**

**BY**

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**U14/MSS/MAN/033**

**DEPARTMENT OF BUSINESS MANAGEMENT**

**FACULTY OF MANAGEMENT AND SOCIAL SCIENCES**

**GODFREY OKOYE UNIVERSITY, UGWUOMU-NIKE**

**ENUGU STATE.**

**JULY, 2018.**

**TITLE PAGE**

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**U14/MSS/MAN/033**

**A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF BUSINESS MANAGEMENT, FACULTY OF MANAGEMENT AND SOCIAL SCIENCES, GODFREY OKOYE UNIVERSITY, UGWUOMU-NIKE, ENUGU STATE.**

**IN PARTIAL FUFILMENT FOR THE AWARD OF BACHELOR OF SCIENCE (B.sc.) DEGREE IN BUSINESS MANAGEMENT**

**SUPERVISOR: ASSOC.PROF. NICK NGOZICHUKWU IGWE**

**JULY, 2018.**

**APPROVAL PAGE**

The project has been approved for the Department of Business Management Godfrey Okoye University Ugwuomu-Nike Enugu.

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**Assoc. Prof. Nick Ngozi Igwe Date**

**(Project Supervisor)**

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**Asso. Prof. Dr. Nick N. Igwe Date**

**(Head of Department)**

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**Prof A. Oyema Ocheoha Date**

**(Dean Faculty of Management and Social Science)**

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**External Examiner Date**

**CERTIFICATION**

I, Nnamani Chukwuemeka Chimdindu an undergraduate of the Department of Business Management, Godfrey Okoye University with Registration number u14/mss/man/033 do hereby affirm that the work embodied in this research/thesis (appraisal of quality control procedures in a manufacturing organization in Juhel pharmaceutical company, Emene, Enugu state) is original and has not been submitted in part or full in any other diploma or degree of this or any other university.

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**NNAMANI, CHUKWUEMEKA CHIMDINDU DATE**

**DEDICATION**

I humbly dedicate this study to the Almighty God for His infinite mercy and grace that aided my stay in school, as well as the successful completion of this project.

**ACKNOWLEDGEMENTS**

First and foremost, my appreciation goes to the Almighty God, who in His infinite mercies, love, protection, and grace sustained me through the duration of this study.

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**ABSTRACT**

*The study “an Appraisal of quality control procedures in a manufacturing organization” a study of Juhel Pharmaceutical Company Enugu, sees quality as the totality of features of a product or service that bear on its ability to satisfy the customers perceived or stated needs* *(Khanna, 2012). This study made use of the following objectives; to identify the possible poor quality of the organizational products, to examine the processes of quality control in the manufacturing organization, to determine the various ways of mitigating quality defects in the manufacturing organizations. The study tries to find out the procedures through the following research question; what are the causes of poor quality products in the organization? What are the processes of quality control in the manufacturing organization? What are the various ways of mitigating quality defects in the manufacturing organizations? The study also test it’s significant through the help of some hypotheses. The researcher adopted some theories that helped in elaborating more on the topic. A question was use as a form of collecting the data used for the study. Frequency table were used to analyze the bio-data of the respondent, a descriptive table were used to check the importance of the adopted research question and a Z-Test were used to test the significant of the study. The study found out that there are some possible causes of poor quality product, some processes used for quality control were identified and there are effective ways of mitigating quality defect of some product in Juhel Pharmaceutical Company Enugu. The researcher then recommend that the organization should continually investigate its manufacturing procedures so as to identify possible causes of poor quality, the organization should also regularly check to ensure that the processes of quality control used by them is up to standard and they should have safer and better ways of mitigating quality defects in its products. Finally, the study suggest that further research should be done on the influence of quality on the buying behavior of consumers, the effect of quality on organizational profitability and the relationship between quality control and organizational productivity.*

**CHAPTER ONE**

**INTRODUCTION**

**1.1 Background of the Study**

Quality is one of the competing priorities that many organizations adopt. Khanna (2012) defines quality as the totality of features of a product or service that bear on its ability to satisfy the customers perceived or stated needs. Quality of a product or service satisfy both actual and perceived needs of the people for which the products are designed and produced for. Banjoko (2009) defines quality as a measure of the degree to which a particular product satisfies the expectations of customers with respect to certain tangible and intangible attributes inherent in the design of the product or service and its performance under normal use.

High levels of quality are essential to achieve Company business objectives. Quality, a source of competitive advantage, should remain a hallmark of Company products and services. High quality is not an added value; it is an essential basic requirement. Quality does not only relate solely to the end products and services a Company provides but also relates to the way the Company employees do their job and the work processes they follow to produce quality products or services. The work processes should be as efficient as possible and continually improving. Company employees constitute the most important resource for improving quality. Each employee in all organizational units is responsible for ensuring that his/her work processes are efficient and continually improving.

Top management should provide the training and an appropriate motivating environment to foster teamwork both within and across organizational units for employees to improve processes. Ultimately, everyone in a Company is responsible for the quality of an organization’s products and services. (Manghani 2011).

In business, engineering, and manufacturing, quality has a pragmatic interpretation as the non-inferiority or superiority of something; it's also defined as being suitable for its intended purpose (fitness for purpose) while satisfying customer expectations. Quality is a perceptual, conditional, and somewhat subjective attribute and may be understood differently by different people. (Nanda, 2016).

The quality of product or service ensures that proper designing process is followed. This designing process needs to be backed by appropriate process design supported by a suitable technology which confirms to requirements of customers. Quality control ensures that defects and errors are prevented and finally removed from the process or product. Therefore, quality control should include:

* Planning
* Designing
* Implementation
* Gaps identification
* Improvisation

Quality control (QC) is a procedure or set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of quality criteria or meets the requirements of the client or customer. (Rouse,2015).

Sometimes the problem with a product is not that it fails to perform to specification but rather that it does not meet the requirements of the customers. A manager in any organization must therefore have technical knowledge and competence about their products, best control procedures to be adopted and the best way of implementing them effectively.

**1.2 Statement of the Problem**

The Nigerian market is constantly being flooded with sub-standard products and this can be traced to the lack of and/or minimum use of proper quality control procedures by manufacturing organizations. The negative effects of substandard products can be:

* Loss in potential revenue due to counterfeits
* Increase in costs and loss in productivity of organizations.
* Substandard goods such as drugs, skincare products etc can be hazardous to the health of consumers.

Quality control cannot be disregarded if quality goods and products are to be manufactured and made available to consumers. Quality must therefore be controlled as well as other resources used in ensuring quality products. The success of our present day and future manufacturing organizations hinges on our ability to properly understand and utilize the best quality control procedures in each stage of the production process. To this end, this research is preoccupied with Juhel Pharmaceuticals (Nig.) Enugu.

**1.3 Objectives of Study**

1. To identify the possible poor quality of the organizational products
2. To examine the processes of quality control in the manufacturing organization.
3. To determine the various ways of mitigating quality defects in the manufacturing organizations.

**1.4 Research Questions**

1. What are the causes of poor quality products in the organization?
2. What are the processes of quality control in the manufacturing organization?
3. What are the various ways of mitigating quality defects in the manufacturing organizations?

**1.5 Research Hypothesis**

1. H0: There are causes of poor quality products in an organization.
2. H1: There are no causes of poor quality products in an organization.
3. H0: There are processes to quality control in a manufacturing organization.
4. H1: There are no processes to quality control in a manufacturing organization.
5. H0: There are ways of mitigating quality defects in manufacturing organizations.
6. H1: There are no ways of mitigating quality defects in manufacturing organizations.

**1.6 Significance of Study**

The significance of quality control in the manufacturing sector cannot be over emphasized. The beneficiaries of the study include:

1. Manufacturing companies especially pharmaceutical companies.
2. Business management students.
3. Other researchers.
4. Government agencies concerned with the enforcement and administration of quality standards such as NAFDAC, SON, and CPC council.

**1.7 Scope of the Study**

Quality control management is chosen as a topic of relevance to the manufacturing industry in Nigeria. Although quality control management is an activity relevant to all business organizations and employees of the manufacturing sectors. This research is restricted to the study of quality control procedures in pharmaceutical manufacturing organizations and its relationship with the quality of products produced.

**1.8 Limitations to the study**

The limitations faced by this researcher include the delay experienced in collecting current information about my research work. Furthermore, the delay in my research at the beginning due to the lack of a laptop for my research. Also, there was the constraint of data collection for the research.

**1.9 The Profile of the Organization used as Operational Place of Study**

In October 1989, Juhel Nigeria Limited was commissioned as the first Pharmaceutical Manufacturing Company in old Anambra state, Nigeria by the then ruling Governor Col. Robert Akonobi. Beginning with a small range of products, it started continually expanding its operations, reaching a peak employment capacity of over 500 staff members at the time.

In 1995, the company forayed into its first non-pharmaceutical operation by building its first Petroleum Filling Station in Port-Hacourt. This small inititive spurred the creation of an entire subdivision, leading the way for an array of Filling Stations throughout South-Eastern Nigeria and creating Juhel Petroleum along the way.

In the year 2001, facing rapid expansion, the company then moved to its current Headquarters, a much larger location Emene, Enugu State. With this expansion also came the possibility of additional growth. The product range expanded quickly, adding antibiotic capsules and syrups to our growing product cache. The staff count consequentially expanded to 1,800 in order to keep up with the growing product range and increased operational requirements. The company’s water and beverage manufacturing plant was also built on further expansion of the site.

Commissioned by then President of the Federal Republic of Nigeria Goodluck Ebele Jonathan on the 15th of October 2010, its Parenteral Drug Manufacturing Plant was established as the largest Parenteral Drug Manufacturing plant in West Africa. It was built as a required response to the unnecessary importation of parenteral drugs in Nigeria, creating a local source of highest quality intravenous medicines, ear and eye drops.

**1.10 Definition of Terms**

The following terms are defined according to their definitions at www.businessdictionary.com.

**Quality:** In manufacturing, a measure of excellence or a state of being free from defects, deficiencies and significant variations.

**Control:** Device or mechanism installed or instituted to guide or regulate the activities or operation of an apparatus, machine, person, or system.

**Quality control:** An aspect of the quality assurance process that consists of activities employed in detection and measurement of the variability in the characteristics of output attributable to the production system, and includes corrective responses

**Manufacturing:** The process of converting raw materials, components, or parts into finished goods that meet a customer's expectations or specifications. Manufacturing commonly employs a man-machine setup with division of labor in a large-scale production.

**CHAPTER TWO**

**LITERATURE REVIEW**

**2.1 Introduction**

In this chapter, the review of some authors on the subject of quality in general, quality assurance and quality control in particular will be discussed. Special attention will be given to quality control.

**2.2 Conceptual Framework**

**2.2.1 Quality**

In business, engineering, and manufacturing, quality has a pragmatic interpretation as the non-inferiority or superiority of something; it's also defined as being suitable for its intended purpose (fitness for purpose) while satisfying custoribute and may be understood differently by different people. (Nanda, 2016).

Gitlow (2000) states that, Consumers may focus on the specification quality of a product/service, or how it compares to competitors in the marketplace. Producers might measure the conformance quality, or degree to which the product/service was produced correctly. Support personnel may measure quality in the degree that a product is reliable, maintainable, or sustainable.

There are many aspects of quality in a business context, though primary is the idea the business produces something, whether it be a physical good or a particular service. These goods and/or services and how they are produced involve many types of processes, procedures, equipment, personnel, and investments, which all fall under the quality umbrella. Key aspects of quality and how it's diffused throughout the business are rooted in the concept of quality management:

Quality planning - Quality planning is implemented as a means of "developing the products, systems, and processes needed to meet or exceed customer expectations.” This includes defining who the customers are, determining their needs, and developing the tools (systems, processes, etc.) needed to meet those needs.

Quality assurance – Quality assurance is implemented as a means of providing enough confidence that business requirements and goals (as outlined in quality planning) for a product and/or service will be fulfilled. This error prevention is done through systematic measurement, comparison with a standard, and monitoring of processes.

Quality control – Quality control (QC) is implemented as a means of fulfilling quality requirements, reviewing all factors involved in production. The business confirms that the good or service produced meets organizational goals, often using tools such as operational auditing and inspection. QC is focused on process output.

Quality improvement - Quality improvement is implemented as a means of providing mechanisms for the evaluation and improvement of processes, etc. in the light of their efficiency, effectiveness, and flexibility. This may be done with noticeably significant changes or incrementally via continual improvement. (Nanda, 2016).

The definition of "quality" has changed over time, and even today some variance is found in how it is described. However, some commonality can still be found. The common element of the business definitions is that the quality of a product or service refers to the perception of the degree to which the product or service meets the customer's expectations. Quality has no specific meaning unless related to a specific function and/or object.

The business meanings of quality have developed over time. Various interpretations are given below:

The American Society for Quality (2008) states that: "A combination of quantitative and qualitative perspectives for which each person has his or her own definition; examples of which include, "Meeting the requirements and expectations in service or product that were committed to" and "Pursuit of optimal solutions contributing to confirmed successes, fulfilling accountabilities". In technical usage, quality can have two meanings:

a. The characteristics of a product or service that bear on its ability to satisfy stated or implied needs;

b. A product or service free of deficiencies."

According to Subir Chowdhury (2005): "Quality combines people power and process power."

Philip B. Crosby (1979) sees quality as "Conformance to requirements." The requirements may not fully represent customer expectations; Crosby treats this as a separate problem.

Edwards Deming (1986) says that: concentrating on "the efficient production of the quality that the market expects," and he linked quality and management: "Costs go down and productivity goes up as improvement of quality is accomplished by better management of design, engineering, testing and by improvement of processes."

According to Peter Drucker (1985): "Quality in a product or service is not what the supplier puts in. It is what the customer gets out and is willing to pay for."

ISO 9000 (2005) defines quality as the: "Degree to which a set of inherent characteristics fulfills requirements." The standard defines requirement as need or expectation.

Joseph M. Juran was quoted by the American society for quality (2008): "Fitness for use." Fitness is defined by the customer.

Noriaki Kano (1984) and others, present a two-dimensional model of quality: "must-be quality" and "attractive quality." The former is near to "fitness for use" and the latter is what the customer would love, but has not yet thought about. Supporters characterize this model more succinctly as: "Products and services that meet or exceed customers' expectations."

According to Hagerty and Shirouzu, (2018), Customers recognize that quality is an important attribute in products and services, and suppliers recognize that quality can be an important differentiator between their own offerings and those of competitors (the quality gap). In the past two decades this quality gap has been gradually decreasing between competitive products and services. This is partly due to the contracting (also called outsourcing) of manufacturing to countries like China and India, as well internationalization of trade and competition. These countries, among many others, have raised their own standards of quality in order to meet international standards and customer demands.

**2.2.2. Quality Assurance**

Quality assurance (QA) is a way of preventing mistakes or defects in manufactured products and avoiding problems when delivering solutions or services to customers; which ISO 9000 (2005) defines as "part of quality management focused on providing confidence that quality requirements will be fulfilled". This defect prevention in quality assurance differs subtly from defect detection and rejection in quality control and has been referred to as a shift left as it focuses on quality earlier in the process i.e. to the left of a linear process diagram reading left to right. (Larry Smith 2001).

The terms "quality assurance" and "quality control" are often used interchangeably to refer to ways of ensuring the quality of a service or product. (Asq.org, 2018). For instance, the term "assurance" is often used as follows: Implementation of inspection and structured testing as a measure of quality assurance in a television set software project at Philips Semiconductors is described. The term "control", however, is used to describe the fifth phase of the Define, Measure, Analyze, Improve, Control (DMAIC) model. DMAIC is a data-driven quality strategy used to improve processes. (Asq.org, 2018)

Quality assurance comprises administrative and procedural activities implemented in a quality system so that requirements and goals for a product, service or activity will be fulfilled. (Asq.org, 2018). According to the Marketing Accountability Standards Board (MASB), 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 output.

Quality assurance includes two principles: "Fit for purpose" (the product should be suitable for the intended purpose); and "right first time" (mistakes should be eliminated). QA includes management of the quality of raw materials, assemblies, products and components, services related to production, and management, production and inspection processes. (Stebbing, 1993). The two principles also manifest before the background of developing (engineering) a novel technical product: The task of engineering is to make it work once, while the task of quality assurance is to make it work all the time. (Prause, 2016).

Historically, defining what suitable product or service quality means has been a more difficult process, determined in many ways, from the subjective user-based approach that contains "the different weights that individuals normally attach to quality characteristics," to the value-based approach which finds consumers linking quality to price and making overall conclusions of quality based on such a relationship.

James Bucki talking about quality assurance says, Quality assurance is a methodology used in the development of products or services that ensure a level of quality in production. Also referred to as quality control (and QA or QC for short), it encompasses the processes and procedures that systematically monitor different aspects of a service, process or facility to detect and correct problems or variances that fall outside of established standards or requirements.

Most businesses utilize some form of quality assurance in production, from manufacturers of consumer-packaged goods to software development companies and may even be represented by distinct departments or divisions that focus solely on quality assurance issues.

**Purposes of Quality Assurance**

By ensuring a level of quality in its products or services, the business is able to build a positive reputation for reliability and consistency. This bolsters consumer trust and confidence in the business and helps it compete with other businesses in the same market.

**History of Quality Assurance**

Early concepts of quality control can be traced back to the middle Ages and the rise of guilds. By joining a guild organization, a craftsman could access a network of connections with other craftsmen and suppliers, and benefit from the reputation of the guild based on standards of quality in the products produced by its members.

The Industrial Revolution brought about more specialization in labor, as well as mechanization, and quality assurance evolved and quality assurance practices began to be established around specialized tasks performed by workers. With the introduction of mass production, the need to monitor the quality of components being produced by large numbers of workers required inspectors.

Statistical quality control (or statistical process control) was developed during this period, utilizing statistical methods to help ensure quality. The modern concept of quality assurance was introduced during World War II when the inspection and testing of munitions became vital to war efforts. (The balance, 2018).

**2.2.3 Quality Control**

Techopedia defining quality control says, Quality control is the set of measures and procedures to follow in order to ensure that the quality of a product is maintained and improved against a set of benchmarks and that any errors encountered are either eliminated or reduced. The focus of quality control is to ensure that the product and product manufacturing are not only consistent but also in line with customer requirements.

Quality control is similar to quality assurance. One of the features of quality control is the use of well-defined controls. It brings standardization into the process. Most organizations have a quality control/assurance department that provides the set of standards to be followed for each product. Either an internal team or a third-party team is hired to determine whether the products that are delivered meet these standards. Quality control relies on testing of products, as product inspection gives a clearer picture of the quality of the end product. There are different standards available for quality control.

The quality of a product is often impacted by deviations from target standards and by the high variability around target specifications. Effective quality control should be able to address both these issues. Quality control can help businesses in improving their products in the market along with brand recognition. It also helps in addressing liability concerns, planning and decision making, and meeting customer needs. The effort and finance involved in product delivery can be much improved with the help of quality control. Techopedia, (2018).

According to Helm (2004), Techniques and methods for checking the quality of materials and the building of houses, temples, monuments and roads have been used over the centuries. For example, the ancient Egyptians had to make and use precise measurements and adopt very high standards of work in order to build the Pyramids. In the middle Ages, the Guilds were established in Europe to ensure that new entrants to the craft/trade-maintained standards. The newcomer was required to serve a long period of apprenticeship under the supervision of a master craftsman and had to demonstrate his ability to produce work of the appropriate quality and standard before becoming a recognized tradesman.

According to cleverism (2018), Quality control is defined as that facet of logistics management which pertains to sets of activities and techniques that are intended to assess the quality of products at various stages of the production process, all the way to the point right before distribution.

The quality assessment will be based on predetermined requirements or standards previously set by the company. In the context of performing quality control before shipping, any product or unit of product that does not meet the minimum standards will have to be reworked, disposed, or dealt with accordingly by the company, instead of being shipped to the end user. Cleverism, (2018)

**2.3 Causes of Poor Quality Products**

The market is customer-centric. Competition is very high. Still, most of the companies face the problem of poor quality. In spite of various quality models, quality improvement processes and methodologies the issue of poor quality is there. Why is it so?

According to quality gurus (2018), Causes of poor quality may be grouped into six main categories:

**Man**

* Lack of motivation/interest, fear, stress
* Shortage of people
* Lack of training/skills
* Unqualified personnel
* People taking shortcuts

**Machine**

* Lack of capability
* Lack of maintenance
* Non-availability of spares
* Wear and tear
* Improper setup/calibration
* Outdated technology

**Material**

* Low-grade material
* Unspecified material
* Variation

**Management**

* Lack of vision, mission, value system
* Failing to identify/understand customer needs/requirements
* Short term planning
* Inadequate/poor planning
* Flawed incentives and indicators
* Favoritism
* Lack of supervision/monitoring
* Attitude towards change
* Lack of decision making and communication skills
* Lack of process understanding
* Lack of fact-based decision making

**Method**

* Lack of procedures
* Procedures not followed
* Conflicting requirements
* Procedures not communicated
* Too rigid or too relaxed requirements

**Environment**

* Humidity
* Temperature
* Lighting

**2.1.5 Processes of Quality Control**

Cleverism (2018) points out that, Unfortunately, for many businesses, quality control is often overlooked, resulting to returns, damaged products, losses, and customer dissatisfaction. In the long run, all these bode ill for the business as a whole. Another sad reality is that businesses intentionally omit performing quality control or, even when they do, they do it haphazardly, in favor of speedy shipment.

Quality control is performed at various stages. The more commonly performed checks include the following:

* Inspection upon receipt of raw materials and parts that will be placed into production, or of finished goods that will be for resale.
* Inspection prior to production. Normally, one unit or piece will be produced and, if it passes inspection, production run will proceed.
* Inspection in-process. The inspections will be made at intervals during the production process.
* Inspection after production. For many, this is considered as the final inspection and testing stage. A sample or 100% of the finished products will be inspected and tested.
* Inspection prior to shipping. The orders placed by a customer will be inspected and will not be shipped until the final inspector has cleared them.

Companies should have their own manual of quality control procedures to guide the inspectors. This is true even if the company hires the services of an external inspector. Sure, the external inspector is likely to have his own inspection or quality control system in place, and quality assurance agencies and inspectors use industry standard processes in their inspection. However, having a manual will still be helpful in order for him to know the points to watch out for during the inspection. The manual will contain the quality policy of the company and an overview of the processes and the quality system in place. (Anastasia, 2015).

Anastasia (2015) states that, the procedures could vary depending on the volume of the products.

* 100% vs. a sample. The inspector checks ALL the items to be shipped, or only a certain percentage of the whole. Large volumes would normally entail only having a certain sample size inspected.
* Piece by piece or random selection. All the items are inspected one by one, or the inspector picks several items at random for checking. Random selection is often used for large volumes of products up for pre-shipment inspection.

The quality control procedures will vary depending on the nature or type of product. There are certain products that require testing while others only require ocular inspection.

Of course, the basic procedures include some, or all, of the following:

* Manual counting of quantity;
* Reconciling product quantity and other quantitative details to files on record (actual vs. what is written on documents such as purchase orders and invoices);
* Product testing, if required;
* Ocular inspection of the packaging and the labeling;
* Checking to ensure that the weight of the product coincides with the weight indicated on the label where applicable. (Anastasia, 2015).

**2.4 Ways of Mitigating Quality Defects in the Manufacturing Organization**

According to Estrada and Maungwa (2018), whether you’re sourcing abroad, or from a manufacturer down the street, similar issues with product quality, shipment delays, cost and safety concerns, etc. still apply. To mitigate the quality risks and cost involved in sourcing, we recommend five actions that have been proven successful throughout the three decades of experience we have working with clients and suppliers around the world.

**1 – Audit Potential & Existing Suppliers**

To help ensure that potential or existing suppliers deliver high-quality products, operate efficiently, and support continuous improvement, process surveys and factory audits are performed.

From supplier capability and qualification to process control and quality system audits, there are a wide range of options. More specific audits incorporate standards such as the ISO series, TS 16949 specifications for the automotive industry, social accountability, sustainability, C-TPAT for security, AS 9100 for aerospace and many others. Requirements for audits do vary based on a number of factors. Two commonly performed general system audits include:

Supplier Capability & Qualification – Auditors survey potential suppliers and provide feedback regarding general operations, quality systems, qualifications and capabilities. This critical information aids in determining if the supplier is a viable source and potential partner.

Supplier Process Control & Quality System – Auditors evaluate all manufacturing process control systems for existing or new suppliers. Audits cover several areas, including evaluations of management, quality control methods, non-conforming materials, production, corrective action and inspection and test equipment.

In general, there are four questions considered to be critical to the audit process:

1) Are controls defined?

2) Are controls applied?

3) Do controls really work?

4) Will controls last?

Many organizations incorporate a supplier rating system to monitor performance. Examples include no rating, quality rating only, quality & delivery rating (graphic method), quality & delivery method (cost index method) and a comprehensive method.

Being mindful of communication with suppliers is impactful as well and should not be discounted.

**2 – Develop Product Criteria/Specifications – Know Your Product**

A good plan is only as good as its foundation, so comprehensive and detailed product specifications are critical to success. An important component of product quality is knowing your product. And, that requires detailed product specifications that identify exactly how the item(s) should turn out. What characteristics of the product are required for it to “meet or exceed expectations?”

Product specifications should include defect details with classifications that later link to accept/reject determinations during QC checks. They also clarify the acceptable quality levels and expectations for the supplier. Each defect noted is generally classified as major, minor or critical.

**3 – Test Products**

Product testing has multiple applications, from determining if the specifications are being met to troubleshooting various issues. Using applicable regional and/or industry related standards to measure the product’s properties and evaluate performance provides assurance of quality throughout the production process. Used as a proactive strategy, applicable product testing can avoid costly delays and rework down the line.

**4 – Inspect Throughout Production**

Controlling quality by utilizing product inspections throughout the production cycle reduces sourcing risks and cost. Inspections can be conducted at any point throughout the production process, with the maximum benefit observed when strategically employed at the beginning (first-article), in-process (30% -50% complete) and pre-shipment (100% produced and at least 80% packaged). The idea is to identify, contain and resolve issues as quickly as possible. Inspections generally include:

**Quantity verification** – This may include raw materials, in-process components, inputs (components) from other sources and/or completed and packaged product. Sample sizes are selected for each component identified in the criteria for inspection. Acceptable quality levels, AQLs, are identified for determining accept or reject result.

**Packaging –**Drop-testing is often conducted to check the integrity of the unit and/or master carton packaging integrity. In addition, the condition of the cartons and labeling accuracy is evaluated.

**Appearance & Workmanship** -Examples of appearance and workmanship usually include making sure samples are free of cosmetic defects such as scratches or dents and that all components and accessories are included.

**Function & Performance** – Examples of function and performance might include assembly or electrical testing, as applicable.

**5 – Focus On & Support Continuous Improvement (Kaizen)**

Define, evaluate, and implement, document and review results. Strategically planned continuous improvement initiatives result in the following:

* A decrease in costs due to less reworking, consequently producing less scrap.
* An improvement in cycle time due to less time being spent on correcting mistakes, and more time being spent on value added activities.
* An improvement in productivity due to less time being spent on reworking nonconformities.
* Improved relationships with suppliers (partners).
* An overall improvement in service.
* An overall improvement in cost.

**2.5 Theoretical Frameworks**

**2.5.1 Denim’s Theory**

Deming's theory of Total Quality Management rests upon fourteen points of management he identified, the system of profound knowledge, and the Shewart Cycle (Plan-Do-Check-Act). He is known for his ratio - Quality is equal to the result of work efforts over the total costs. If a company is to focus on costs, the problem is that costs rise while quality deteriorates. Deming's system of profound knowledge consists of the following four points:

* System Appreciation - an understanding of the way that the company's processes and systems work
* Variation Knowledge - an understanding of the variation occurring and the causes of the variation
* Knowledge Theory - the understanding of what can be known
* Psychology Knowledge - the understanding of human nature

By being aware of the different types of knowledge associated with an organization, then quality can be broached as a topic. Quality involves tweaking processes using knowledge. The fourteen points of Deming's theory of total quality management are as follows:

1. Create constancy of purpose
2. Adopt the new philosophy
3. Stop dependencies on mass inspections
4. Don't award business based upon the price
5. Aim for continuous production and service improvement
6. Bring in cutting-edge on the job training
7. Implement cutting-edge methods for leadership
8. Abolish fear from the company
9. Deconstruct departmental barriers
10. Get rid of quantity-based work goals
11. Get rid of quotas and standards
12. Support pride of craftsmanship
13. Ensure everyone is trained and educated
14. Make sure the top management structure supports the previous thirteen points.

**2.5.2 Crosby’s Theory**

Philip Crosby is another person credited with starting the TQM movement. He made the point, much like Deming, that if you spend money on quality, it is money that is well spent. Crosby based on four absolutes of quality management and his own list of fourteen steps to quality improvement.

Crosby's four absolutes are:

* We define quality as adherence to requirements
* Prevention is the best way to ensure quality
* Zero Defects (mistakes) is the performance standard for quality
* Quality is measured by the price of nonconformity

The fourteen steps to continuous quality improvement, for Crosby, are:

1. Attain total commitment from management
2. Form a quality improvement team
3. Create metrics for each quality improvement activity
4. Determine cost of quality and show how improvement will contribute to gains
5. Train supervisors appropriately
6. Encourage employees to fix defects and keep issues logs
7. Create a zero-defects committee
8. Ensure that employees and supervisors understand the steps to quality
9. Demonstrate your company's commitment by holding a zero defects day
10. Goals are set on 30, 60, or 90-day schedule
11. Determine root causes of errors, remove them from processes
12. Create incentives programs for employees
13. Create a quality council and hold regular meetings
14. Repeat from step one

**2.5.3 Joseph Juran’s Theory**

Joseph Juran is responsible for what has become known as the "Quality Trilogy." The quality trilogy is made up of quality planning, quality improvement, and quality control. If a quality improvement project is to be successful, then all quality improvement actions must be carefully planned out and controlled. Juran believed there were ten steps to quality improvement. These steps are:

1. An awareness of the opportunities and needs for improvement must be created
2. Improvement goals must be determined
3. Organization is required for reaching the goals
4. Training needs to be provided
5. Initialize projects
6. Monitor progress
7. Recognize performance
8. Report on results
9. Track achievement of improvements
10. Repeat

**2.5.4 Ishikawa’s Theory**

Creator of the last theory, Dr. Kaoru Isikawa is often known for his namesake diagram, but he also developed a theory of how companies should handle their quality improvement projects. Ishikawa takes a look at quality from a human standpoint. He points out that there are seven basic tools for quality improvement. These tools are:

* Pareto Analysis - Pareto analysis helps to identify the big problems in a process.
* Cause and Effect Diagrams - Cause and effect diagrams help to get to the root cause of problems.
* Stratification - Stratification analyzes how the information that has been collected fits together.
* Check Sheets - Check sheets look at how often a problem occurs.
* Histograms - Histograms monitor variation.
* Scatter Charts - Scatter charts demonstrate relationships between a variety of factors.
* Process Control Charts - A control chart helps to determine what variations to focus upon.

**2.6 Empirical Review**

An empirical study carried out by Arumugam, Chang, Ooi, & Teh, (2009) on the relationship of total quality management practices and quality performance on manufacturing companies in Malaysia through multiple regression and correlation analyses showed that there was partial correlation of the quality practices with quality performance.

Talib, Rahman, & Quresha, (2010)developedand proposedthe conceptual framework and research modelof total quality management implementation in relation to company performance particularly incontext with the Indian service companies. It examined the relationships between total quality management and a company’s performance by measuring the quality performance as a performance indicator. The theoretical model was proposed to help companies to gain a better understandingtotal quality management practices by focusing onidentified practiceswhile implementing total quality management in their companies.

Altiok (2012) argues that one cannot inspect quality into a product. A product will remain in the same quality it was produced during inspection no matter how many inspections are done, it will remain unchanged. The delivering of quality for optimal performance in an organization is integral and involves also practices that prevent failure from occurring and hazardous that would jeopardize performance.

Kim-Soon (2015) observed that quality is a perceptual, conditional and somewhat subjective attribute of a product or service, its meaning in business has developed over time and it has been understood differently and interpreted differently by different people.

**2.7 Summary of related literature**

In the preceding chapter the presentation and discussion of quality as well as quality assurance and quality control where made. The chapter identifies some of the causes of poor quality, some of the processes of quality control and some ways of mitigating quality defects in manufacturing organizations of which the company should undertake as the way for effective implementation of quality control as an instrument for organizational growth.

When there is effective quality control it will be of immense use to the success of the organization.

**CHAPTER THREE**

**RESEARCH METHODOLOGY**

**3.1 Introduction**

This chapter describes the methods and procedures that were followed in conducting the research. It describes the research design, area of study, population for the study, sample technique, sources of data, and validation of instrument, reliability of instrument, method of data collection and methods of data. The method adapted by this study was specifically a survey research using questionnaire. This study adopted the mixed method approach utilizing both qualitative and quantitative methods. Qualitative approach was used to supplement and strengthen the quantitative aspects and provide an opportunity for the researcher to conduct an appraisal of quality control procedures on manufacturing organizations.

**3.2 `Research Design**

A research design is the conceptual structure within which the research is conducted. It is the blueprint and a detailed plan of how a research study is to be conducted. The researcher chose a survey research design. In this case the researcher should use a questionnaire.

**3.3 Area of Study**

The targeted area of study is an appraisal of quality control procedures on Juhel Pharmaceutical Company which is in Emene located in Enugu North local government Area of Enugu state Nigeria.

**3.4 Sources of Data Collection**

The study is based on both primary and secondary data. Both primary and secondary data was collected for the present study.

**3.4.1 Primary Data:** The primary data for the study was collected through the following methods and techniques. It is often undertaken after the researcher has gained some insight into the issue by reviewing secondary research or by analyzing previously collected primary data like data collected for pilot study.

**3.4.2 Secondary Data:** Secondary data is information that has already been collected and analyzed by other researchers for academic and other purposes. Secondary data was gathered from various sources namely, textbooks, journal articles and conference papers.

**3.5 Research Population**

Population means the whole body of items, objects, materials or people that fall within the geographical location in which a researcher intends to investigate for his study. That is the whole participants of a study. The constituents of population have certain attributes in common; the number may be large or small. In the context of this research, the population included every individual or element within the research environment that was likely to be affected in one way or another by the findings of the research. Therefore, the target population for this research consisted of the entire employee in the targeted community which is Juhel Pharmaceutical Company, Emene in Enugu North Local Government Area, Enugu state, Nigeria.

**Table 3.1 Population of the Study (Statistics) Juhel Pharmaceutical Company Emene.**

|  |  |
| --- | --- |
| **Staff Category** | **Staff Strength** |
| Admin Block | 30 |
| Production Department | 150 |
| Packaging Department | 100 |
| Sales/Marketing Department | 30 |
| **TOTAL** | **310** |

**Source: *Field Survey May, 2018.***

**3.6 Determination of Sample Size**

Sample is a fraction or segment of the total population whose characteristics is used to represent the entire population. The formula adopted in determining the sample size is given by Taro Yamane (1964).

*n=*

where:

n= sample size

N= Population

1= Fixed Numerical Factor

e= margin of error usually 5%

n=

n=

n=

n=

n= n= 175

Therefore, this research will be using a population sample size of 175 which has been tested using the Taro Yamane formula.

**3.7 Description of the Research Instrument**

The research instrument used for this study are questionnaires. Questionnaire is designed to have two sections. All the questions section A contains the biographic data while the questions section B are aimed at obtaining data and information that addressed the research objectives, questions and hypothesis. The questionnaire was designed using the 5-Likert scale format of Strongly Agree, Agree, Disagree, Strongly Disagree, and Undecided.

**3.8 Validity of Instrument**

Validity is the ability of the research instrument to measure what it is supposed to measure. In order to ensure the validity of the research instrument, proper structuring of the questionnaire and a conduct of a pretest of all questions contained in the questionnaire were carried out. Also the design of the questionnaire was made easy for respondents to tick their preferred choice from the options provided.

**3.8 Reliability of Test**

Reliability refers to the stability of the measurement used to study the relationships between variables. The questions in the questionnaire were designed taking into consideration the research questions on the subject. To ascertain the reliability of the research instrument, the Cronbach alpha reliability test/method will be used. This method is based on a scale of 0.60 and above Any coefficient below this scale will be rejected as having the characteristics of inter inconsistency.

**3.9 Method of Data Analysis**

This research will make use of frequency table percentages to analyze the descriptive characteristics of the respondents. The researcher will also make use of Z-Test in testing the hypotheses.

To test the hypotheses, the Z-Test formula is stated as follows:

*X – N*

*Ƶ =*

*S*

X = the sample Mean

N = the population mean

S = the standard deviation

**Decision Rule**

If the Z-test value is below the critical value of 0.05 we accept the null hypotheses and reject the alternative hypotheses. If the Z-test value is greater than the critical value we accept the alternative hypotheses and reject the null hypotheses.

**CHAPTER FOUR**

**PRESENTATION AND ANALYSIS OF DATA**

**4.1 Introduction**

This chapter is devoted to the presentation, analysis and interpretation of the data gathered in the course of this study. The data are based on the number of copies of the questionnaire completed and returned by the respondents. The data are presented in tables. The chi-square test was used in the validation of hypothesis.

**4.2 Data Presentation and Analysis**

The data presented below were gathered during field work:

**Bio Data of Respondents**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table 4.2.1 SEX** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | MALE | 93 | 58.1 | 58.1 | 58.1 |
| FEMALE | 67 | 41.9 | 41.9 | 100.0 |
| Total | 160 | 100.0 | 100.0 |  |

***Source: Field work, May 2018.***

Table 1 above shows the gender distribution of the respondents used for this study. Out of the total number of 160 respondents, 93 respondents which represent 58.1percent of the population are male. 67 which represent 41.9 percent of the population are female.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table 4.3.2 MARITAL STATUS** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | MARRIED | 99 | 61.9 | 61.9 | 61.9 |
| SINGLE | 38 | 23.8 | 23.8 | 85.6 |
| WIDOW | 3 | 1.9 | 1.9 | 87.5 |
| WIDOWER | 10 | 6.3 | 6.3 | 93.8 |
| SEPERATED | 10 | 6.3 | 6.3 | 100.0 |
| Total | 160 | 100.0 | 100.0 |  |

***Source: Field work, May 2018.***

Table 2 above shows the marital status of the respondents used for this study. 99 respondents which represent 61.9 percent of the population are married. 38 which represent 23.8 percent of the population are single. 3 which represent 1.9 percent of the population are widows. 10 which represent 6.3 percent of the population are widowers. 10 which represent 6.3 percent of the population are separated.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table 4.2.3 AGE** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 21-30YEARS | 10 | 6.3 | 6.3 | 6.3 |
| 31-40YEARS | 60 | 37.5 | 37.5 | 43.8 |
| 41-50YEARS | 58 | 36.3 | 36.3 | 80.0 |
| 51-60YEARS | 22 | 13.8 | 13.8 | 93.8 |
| 61YEARS AND ABOVE | 10 | 6.3 | 6.3 | 100.0 |
| Total | 160 | 100.0 | 100.0 |  |

***Source: Field work, May 2018.***

Table 3 above shows the age grade of the respondents used for this study. Out of the total number of 160 respondents, 10 respondents which represent 6.3 percent of the population are between 21-30yrs. 60 respondents which represent 37.5 percent of the population are between 31-40yrs. 58 respondents which represent 36.3 percent of the population are between 41-50yrs. 22 respondents which represent 13.8 percent of the population are between 51-60yrs. 10 respondents which represent 6.3 percent of the population are 61yrs and above.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table 4.2.4 ACADEMIC QUALIFICATION** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | WAEC | 10 | 6.3 | 6.3 | 6.3 |
| ND/NCE | 13 | 8.1 | 8.1 | 14.4 |
| B.Sc/HND/BA | 124 | 77.5 | 77.5 | 91.9 |
| M.Sc/MA/MBA/M.Ed | 10 | 6.3 | 6.3 | 98.1 |
| Ph.D | 3 | 1.9 | 1.9 | 100.0 |
| Total | 160 | 100.0 | 100.0 |  |

***Source: Field work, May 2018.***

Table 4 above shows the academic qualification of the respondents used for this study. 10 which represent 6.3 percent of the population are WASSCE holders. 13 which represent 8.1 percent of the population are ND/NCE holders. 124 which represent 77.5 percent of the population are B.Sc./HND/BA holders. 10 which represent 6.3 percent of the population are M.Sc./MA/MBA/M.Ed. holders. 3 respondents which represent 1.9 of the population are Ph.D holders.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table 4.2.5 YEARS WORKED** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | LESS THAN 10YEARS | 38 | 23.8 | 23.8 | 23.8 |
| 11-20YEARS | 42 | 26.3 | 26.3 | 50.0 |
| 21-30YEARS | 19 | 11.9 | 11.9 | 61.9 |
| 31-40YEARS | 13 | 8.1 | 8.1 | 70.0 |
| 41YEARS AND ABOVE | 48 | 30.0 | 30.0 | 100.0 |
| Total | 160 | 100.0 | 100.0 |  |

***Source: Field work, May 2018.***

Table 5 above shows the number of years spent by respondents in Juhel Pharmaceutical Company. 38 respondents which represent 23.8 percent of the population have spent less than 10years in Juhel Pharmaceutical Company. 42 respondents which represent 26.3 percent of the population have spent between 11-20 years in Juhel Pharmaceutical Company. 19 respondents which represent 11.9 percent of the population have spent between 21-30 years in Juhel pharmaceutical company. 13 respondents which represent 8.1 percent of the population have spent between 31-40 years in Juhel Pharmaceutical Company. 48 respondents which represent 30.0 percent of the population have spent 41 years and above in Juhel Pharmaceutical company.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Table 4.2.6 STAFF CATEGORY** | | | | | |
|  | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | JUNIOR STAFF | 3 | 1.9 | 1.9 | 1.9 |
| SUPERVISOR | 48 | 30.0 | 30.0 | 31.9 |
| SENIOR STAFF | 42 | 26.3 | 26.3 | 58.1 |
| MANAGER | 58 | 36.3 | 36.3 | 94.4 |
| SENIOR MANAGER | 9 | 5.6 | 5.6 | 100.0 |
| Total | 160 | 100.0 | 100.0 |  |

Source: Field Work, May 2018.

Table 6 above shows the various staff category of respondents in Juhel Pharmaceutical Company. 3 respondents which represent 1.9 percent of the population are junior staff in Juhel Pharmaceutical Company. 48 respondents which represents 30.0 percent of the population are supervisor in Juhel Pharmaceutical Company. 42 respondents which represent 26.3 percent of the population are senior staff in Juhel Pharmaceutical Company. 58 respondents which represent 36.3 percent of the population are managers in Juhel Pharmaceutical Company. 9 respondents which represent 5.6 percent of the population are senior managers in Juhel Pharmaceutical Company.

**4.3 Analysis of Research Questions**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table 4.3.1 Possible Causes of Poor Quality** | | | | |
| **Description** | **N** | **Mean** | **Std. Deviation** | **Variance** |
| The organization has a quality control unit. | 160 | 4.6 | 0.49 | 0.24 |
| The organization has quality control procedures. | 160 | 4.5 | 0.50 | 0.25 |
| The organization uses substandard materials in production. | 160 | 1.2 | 0.70 | 0.50 |
| The organization performs quality checks at every stage of production. | 160 | 4.3 | 0.53 | 0.29 |
| The organization follows set quality standards. | 160 | 4.3 | 0.65 | 0.42 |
| Valid N (listwise) | 160 |  |  |  |

***Source: field survey, May 2018.***

Table 4.3.1 shows the descriptive statistics on the possible causes of poor quality. Therefore, the researcher figure out that a 4.6 mean with its standard deviation of 0.48 and its variance of 0.24 shows that the organization has a quality control unit which tends to be the highest. A mean of 4.5 with a standard deviation of 0.49 and a variance of 0.25 indicates that the organization has quality control procedures in place to ensure quality products. A mean of 1.2 with its standard deviation of 0.70 and a variance of 0.50 shows that the organization does not use substandard materials in production as it is the lowest. A mean of 4.3 with a standard deviation of 0.53 and a variance of 0.29 shows that the organization performs quality checks at every stage of production. A mean of 4.3 with a standard deviation of 0.65 and a variance of 0.42 shows that the organization follows set quality standards. Hence, the research found out the possible causes of poor quality in the organization.

**Research Question Two: What are the processes of quality control?**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table 4.3.2 Processes of Quality Control** | | | | |
| **Decription** | **N** | **Mean** | **Std. Deviation** | **Variance** |
| The organization carries out inspection at every stage. | 160 | 4.4 | 0.60 | 0.36 |
| The organization uses a zero-defect procedure. | 160 | 4.3 | 0.69 | 0.49 |
| The organization carries out product testing. | 160 | 4.4 | 0.61 | 0.37 |
| All items are checked before shipping. | 160 | 4.2 | 0.71 | 0.51 |
| The organization does manual counting to ensure accuracy of quantity. | 160 | 4.2 | 0.70 | 0.50 |
| Valid n (listwise) | 160 |  |  |  |

Source: field survey, May 2018.

Table 4.3.2 intends to identify the processes of quality control used by the organization through the following observation: a mean of 4.4 with a standard deviation of 0.60 and a variance of 0.36 shows that the organization carries out inspection at every stage to check for defects, a mean of 4.3 with a standard deviation of 0.69 and a variance of 0.49 shows that the organization uses a zero-defect procedure in manufacturing, a mean of 4.4 with a standard deviation of 0.61 and a variance of 0.37 shows that the organization carries out product testing as one of its procedures, a mean of 4.2 with a standard deviation of 0.71 and a variance of 0.51 shows that the organization checks all items before shipping them out, a mean of 4.2 with a standard deviation of 0.70 and a variance of 0.50 shows that the organization does manual counting to ensure accuracy of quantity. Hence, the researcher figured out that the quality control process the organization gives more attention to is using a zero-defect procedure in manufacturing which helps to minimize defects in the products being produced. This is chosen as the best quality control process because it has the highest response.

**Research Question Three: Ways of mitigating quality defects**

**Table 4.3.3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Description** | **N** | **Mean** | **Std. Deviation** | **Variance** |
| Suppliers are audited to ensure the delivery of high quality materials.  The organization has a comprehensive and detailed specifications for its products.  Inspection is done throughout the production process.  The quality of each product is verified before shipping.  All products are tested for high quality performance.  There are after sales complaints from the customers.  Valid n (listwise) | 160  160  160  160  160  160  160 | 4.2  4.5  4.2  4.3  4.4  4.3 | 0.59  0.54  0.67  0.72  0.69  0.89 | 0.35  0.29  0.45  0.59  0.37  0.79 |

***Source: field study, May 2018.***

Table 4.3.3 intends to show the ways the organization mitigates quality defects in its products. A mean of 4.2 and a standard deviation of 0.58 with a variance of 0.34 shows that the organization audits its suppliers to ensure that they only supply high quality materials, a mean of 4.4 and a standard deviation of 0.53 with a variance of 0.28 shows that the organization has a comprehensive and detailed specifications for its product, a mean of 4.2 and a standard deviation of 0.67 and a variation of 0.45 shows that the organization carries out inspection throughout the production cycle, a mean of 4.2 and a standard deviation of 0.72 with a variance of 0.51 shows that the organization verifies the quality of each product before shipping them, a mean of 4.4 and a standard deviation of 0.67 with a deviation of 0.37 shows that all products are tested for high quality performance, a mean of 4.2 and standard deviation of 0.88 with a variance of 0.78 shows that the organization listens to after sales complaints from its customers to better help them in quality production. Hence, this researcher concludes that the best ways of mitigating quality control defects are having comprehensive and detailed specifications for products and testing each product for high quality in performance. By so doing it will ensure that products produced are of set standards and are of high quality in their performance. This researcher decided to choose this strategy because it has the highest response.

**4.4 Test of Hypotheses**

This section is concerned with the testing of hypotheses earlier stated. In doing this, Z-Test was used. A test of hypotheses help to decide which of the contradictory claims is correct. It acts as guide through the research work in order to draw a logical or empirical conclusion.

**Decision Rule**

If the calculated Z-Test value is greater than the critical value (0.05), we accept the null hypothesis and if the calculated Z-Test value is less than the critical value (0.05) accept the alternative hypothesis.

**H0: There are causes of poor quality products in an organization.**

**H1: There are no causes of poor quality products in an organization.**

**Table 4.4.1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **N** | **Mean** | **Z-Test** |
| Zscore | 160 | 18.9 | 6.03 |

***Source:*** *Field Survey, 2018*

The result in table 4.4.1 tested the positive effect of employee relations strategies on organizational performance. From the Z-Test above, a 6.03 Z-score was found positively significant due to the Z-Test value is greater than the critical value of 0.05. Thus, the researcher is advised to accept the alternative hypotheses and rejects the null hypotheses. In this cases, there are no causes of poor quality products in Juhel Pharmaceutical Company.

**H0: There are processes to quality control in a manufacturing organization.**

**H1: There are no processes to quality control in a manufacturing organization.**

**Table 4.4.2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **N** | **Mean** | **Z-Test** |
| Zscore | 160 | 21.5 | 6.01 |

***Source:*** *Field Survey, 2018*

The result in table 4.4.2 tested the positive effect of employee relations strategies on organizational performance. From the Z-Test above, a 6.01 Z-score was found positively significant due to the Z-Test value is greater than the critical value of 0.05. Thus, the researcher is advised to accept the alternative hypotheses and rejects the null hypotheses. In this cases, there are no processes to quality control in a manufacturing organization in Juhel Pharmaceutical Company.

**H0: There are ways of mitigating quality defects in manufacturing organizations.**

**H1: There are no ways of mitigating quality defects in manufacturing organizations.**

**Table 4.4.3**

|  |  |  |  |
| --- | --- | --- | --- |
| **Description** | **N** | **Mean** | **Z-Test** |
| Zscore | 160 | 25.9 | 5.93 |

***Source:*** *Field Survey, 2018*

The result in table 4.4.3 tested the positive effect of employee relations strategies on organizational performance. From the Z-Test above, a 5.93 Z-score was found positively significant due to the Z-Test value is greater than the critical value of 0.05. Thus, the researcher is advised to accept the alternative hypotheses and rejects the null hypotheses. In this cases, there are no ways of mitigating quality defects in manufacturing organizations in Juhel Pharmaceutical Company.

**4.5 Reliability Test**

|  |  |
| --- | --- |
| **Table 4.5.1 Reliability Statistics** | |
| Cronbach's Alpha | N of Items |
| .951 | 16 |

***Source: field study, May 2018. Via SPSS***

Table 4.4.4 is a statement of the reliability of the study. The adopted reliability of this study is a Cronbach’s alpha of 0.6. The study shows a reliability of 0.951 which indicates that all the data presented and analyzed are reliable. Therefore, this study passed the test of reliability.

**4.6 Discussion of the findings**

Table 4.3.1 to 4.3.6 was meant to find out the bio data of the respondents. The result shows that the majority of the respondents are male, majority are married, majority of the respondents are 41-50 years old, majority of the respondents are BA/Bsc/HND while majority have worked with the organization for 41 years and above, majority of the respondents are managers.

Table 4.4.1 was used to answer the question what the possible causes of poor quality are. From the result of the findings it showed that to a small extent there is still the use of substandard materials in the production of goods by the organization. This is where one of Philip Crosby’s fourteen steps to continuous quality improvement should be applied. It states that an organization should determine root causes of errors and remove them from the processes. Thus, in this case the use of substandard materials should be removed from the processes.

Table 4.4.2 was used to identify the processes of quality control used by the organization. Based on the result of the findings it showed that to a great extent the organization’s most used quality control method is the zero-defect procedure. This ensures that there is a production of goods with little or no defects. This agrees with one of Phillip Crosby’s four absolutes in quality improvement which states that zero defects(mistakes) is the performance standard for quality.

Table 4.4.3 intends to identify the ways the organization mitigates quality defects in its products. Based on the result of the findings it revealed that to a great extent the most used method for mitigating quality defects in their products is having comprehensive and detailed specifications for products and testing each product for high quality in performance. This agrees with Denim’s Shewart cycle (plan-do-check-act). By so doing it will ensure that products produced are of set standards and are of high quality in their performance.

**CHAPTER FIVE**

**SUMMARY OF FINDINGS, CONCLUSIONS AND RECCOMENDATIONS**

**5.1 Introduction**

This chapter is aimed at summing up the findings of this study as well as to draw the conclusion from the research work. Secondly the researcher gives recommendations based on the findings of the study.

**5.2 Summary of findings**

From the analysis of data presented, a number of findings were made from the study which investigated an appraisal of quality control procedures in a manufacturing organization are as follows:

1. A possible cause of poor quality in Juhel pharmaceutical company was identified.
2. Some processes used in quality control by manufacturing organizations were identified.
3. Effective ways of mitigating quality defects in products were discovered.

**5.3 Conclusion**

This study was carried out to appraise the quality control procedures used in a manufacturing organization. The findings of the study indicated that a possible cause of poor quality in Juhel Pharmaceutical company was identified. This study reveals some of the processes used in quality control by manufacturing organizations. Finally, the researcher found out effective ways of mitigating quality defects in products. The availability and implementation of quality control procedures in a manufacturing organization go a long way in curbing the production of poor quality goods. Identifying the possible causes of poor quality helps a manufacturing organization in taking steps towards eliminating them and also informs them of ways in which they can mitigate quality defects in products which will give them a good advantage over their competitors.

**5.4 Recommendations**

Based on the findings, this researcher recommends as follows:

1. The organization should continually investigate its manufacturing procedures so as to identify possible causes of poor quality.
2. The organization should also regularly check to ensure that the processes of quality control used by them is up to standard.
3. safer and better ways of mitigating quality defects in its products.

It is hoped that if these recommendations are strictly adhered to by all concerned, it will increase the quality of the products produced by the organization.

**5.5 Suggestions for Further Studies**

A further research could be carried out on the following:

1. The influence of quality on the buying behavior of consumers.
2. The effect of quality on organizational profitability.
3. The relationship between quality control and organizational productivity.

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