

A Study on Implementation of Quality Management System At Universal Implements, Shoranur

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Abstract- *The project focused on assessing the quality management system (QMS) within Universal Implements an agricultural parts manufacturing company, identifying gaps, and proposing recommendations for improvement. A quality management system (QMS) is a structured framework of policies, processes, and procedures aimed at ensuring that an organization's products or services consistently meet customer and regulatory requirements while continuously improving efficiency and effectiveness. Data collection is done through interviews, document analysis, observations and analysed by descriptive statistics, thematic analysis and trend analysis. The project helps in emphasizing the importance of continuous improvement, collaboration and innovation in achieving quality excellence.*

Keywords- QMS, Product standards, Product quality, Quality assessment

I. INTRODUCTION

A quality management system (QMS) is an organized set of policies, processes, and procedures designed to ensure that an organization's products or services consistently meet customer and regulatory requirements. It provides a systematic approach for achieving and maintaining high quality through planning, control, assurance, and improvement practices. By integrating various elements such as document control, process management, and performance evaluation, a QMS fosters a culture of continuous improvement and operational excellence. Implementing a QMS, such as ISO 9001, helps organizations enhance customer satisfaction, reduce errors, and increase efficiency, ultimately driving long-term success and competitiveness in the market.

The agriculture tools manufacturing industry focuses on producing a wide range of equipment and implements essential for farming activities, including plows, harrows, seeders, and harvesters. This industry plays a critical role in enhancing agricultural productivity and efficiency by providing farmers with durable and efficient tools designed to perform various tasks from soil preparation to crop harvesting. The steel industry, on the other hand, is a cornerstone of

industrialization, involving the production of steel from iron ore and its subsequent processing into a variety of products used in construction, automotive, machinery, and infrastructure projects. Steel is a fundamental material due to its strength, durability, and versatility, making it indispensable for building and manufacturing a multitude of goods, including agricultural tools. Both industries are interconnected, as high-quality steel is crucial for manufacturing reliable and long-lasting agricultural equipment, highlighting the importance of robust supply chains and stringent quality control in ensuring the performance and longevity of agricultural tools.

Universal Implements, the runners in the field of agricultural implements, estate tools and cutleries, was established in 1996 as a small scale industry. The founder of the industry Sri. C.P. Jayan, also the chief mentor, has by his labyrinth bloomed up this concern to its respectable position for the benefit of farmers.

The cost efficient approach along with its handcrafted tools has allowed them to thrive and adapt in the industry. The company is located at Shornur in Kerala having land of 60 cents. A committed team of skilled workers is the driving force behind company's continuous success. Special types of alloy steel from used rails is used for manufacturing their implements which make them highly resistant to wear and tear. The company uses mass production techniques to achieve economies of scale, reducing operating expenses and offering competitive prices compared to rivals. Universal implements mainly manufacturing agricultural implements and estate tools, which are mainly used by farmers, construction workers and quarry workers. The products manufactured by the company includes Pickaxe, Chisel, Wedge, Sledge hammer, Allen key, etc.

II. LITERATURE REVIEW

- The effect of quality management practices on operational & financial performances(2023) By Takwa Belwakes & Lassaad Lakhal:-

This empirical study examines the relationship between quality management practices and operational and financial performance in Tunisian-based businesses, particularly those with ISO 9001 certification. Using structural equation modeling, the study highlights the mediating role of operational performance and emphasizes the importance of effectively implementing quality management practices to enhance overall performance. The results indicate that quality management practices significantly influence both operational processes and financial outcomes, with operational performance playing a partial mediating role between research and development activities and financial results.

- Quality Management Practices in Manufacturing Enterprises in the Context of Their Performance-(2022)- Marek Potkany , Jan Zavadsky , Roman Hlawiczka , Pavol Gejdos, Jarmila Schmidtova :-

This research paper investigates the role of Quality Management Practices (QMPs) in enhancing the performance and competitiveness of Slovak manufacturing enterprises, highlighting the influence of capital structure on QMP utilization and performance metrics like Return on Sales. Through surveys and statistical analyses, it identifies significant relationships between capital structure, QMP utilization, and performance, emphasizing the potential for quality management approaches to drive competitiveness, particularly in enterprises with effective management practices.

- Increasing the value of quality management systems Ida Gremyr, Jan Lenning, Mattias Elg and Jason Martin,(2020)

-The paper examines the correlation between different types of Quality Management System (QMS) usage and management perceptions of quality management, emphasizing the strategic relevance and cost implications. It identifies compliance-oriented, business management, and improvement-oriented uses of QMS, highlighting the importance of selecting the appropriate approach to enhance respect, strategic importance, and cost-effectiveness in quality management.

- Influence of quality management system on improving processes in small and medium-sized organizations Article · (2016)-Dominik Zimon

- The publication focuses on assessing how the implementation of ISO 9001 requirements enhances management processes in small and medium-sized organizations, particularly in improving customer

relationships and achieving quality objectives. It also addresses challenges associated with implementing ISO 9001 in this context, suggesting opportunities for refining the quality management system.

III. OBJECTIVES

PRIMARY OBJECTIVES

Implementation of Quality Management System at Univeral Implements, Shoranur

SECONDARY OBJECTIVES

1. To Study the Quality Management System.
2. Identify the Deficiency's in the Quality Management System
3. Suggestion for improvement in Quality Management System

IV. RESEARCH METHODOLOGY

Descriptive research methodology is a systematic approach focused on accurately and methodically describing the characteristics, behaviors, and phenomena of the company’s product standards without manipulating any variables. It aims to provide a detailed and factual representation of the current state or conditions of the quality management system at Universal Implements being studied. This methodology involves collecting data through various means such as observations, case studies, and archival research to identify patterns, trends, and relationships. Descriptive research is valuable for gaining a comprehensive understanding of the subject, forming the basis for further investigative studies, and informing decision-making processes by providing a clear picture of the existing situation.

V. DATA ANALYSIS

SCHEDULE FOR PICKAXE

CURRENT MEASUREMENTS OF PICKAXE

QUALITY METRICS	MEASUREMENTS	DETAILS
Total length	33-36 inches (84-91 cm)	Length from tip of handle to head
Head weight	2-5 Kg	Suitable for various heavy-duty applications

Handle material	Forged steel	Extremely durable and resistant to wear
Handle diameter	1-1.5inches(2.5-3.8cm)	Ensures a comfortable grip for users
Pick length	22-29 cm	Provides better penetration for breaking hard surfaces
Adze Blade width	1-2 inches(2.5-5cm)	Typical width for digging and prying
Shock absorption	low	Limited shock absorption, may transmit more vibration to the user
Durability	High	High-quality materials ensure long-lasting use
Balance	No balance checking done	Balance not specifically measured

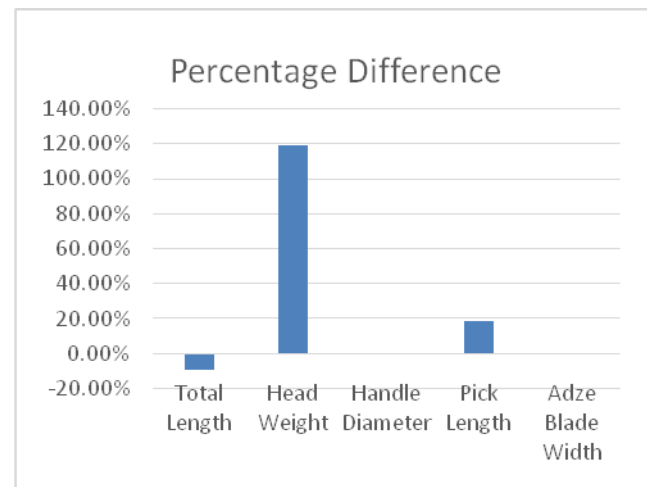
		of the head
Blade width	1-2 inches(2.5-5cm)	Width of the pick blade(varies with type)
Shock absorption	High, medium, low	Depends on handle material and design
Durability	High, medium, low	Determined by material quality and construction.
Balance	Balanced, top heavy	Effects ease of use and fatigue

STANDARD MEASUREMENTS OF PICKAXE

QUALITY METRICS	STANDARD MEASUREMENTS	DETAILS
Total length	36-40inches(91-102cm)	Length from tip of handle to head
Head weight	2-5lbs(0.9-2.3kg)	Varies based on intended use and material
Handle material	Wood, fiber glass, steel	Impacts durability, weight and shock absorption
Handle diameter	1-1.5inches(2.5-3.8cm)	Ensures a comfortable grip for users
Pick length	7-10 inches(18-25cm)	Length of pointed end of head
Adze length	6-9 inches(15-23cm)	Length of the broad, flat end

PERCENTAGE ANALYSIS

Measurement	Standard (Avg.)	Provided (Avg.)	Percentage Difference
Total length	96.5cm	87.5 cm	-9.33%
Head weight	1.6kg	3.5 kg	118.75%
Handle diameter	3.15cm	3.15 cm	0%
Pick length	21.5cm	25.5 cm	18.6%
Adze blade width	3.75cm	3.75 cm	0%



INTERPRETATION

- Total Length shows a negative percentage difference, indicating the provided length is shorter than the standard.
- Head Weight shows a significant positive percentage difference, indicating the provided weight is much higher than the standard.

- Handle Diameter and Adze Blade Width show no difference, indicating they match the standard.
- Pick Length shows a positive percentage difference, indicating the provided length is longer than the standard.

SCHEDULE FOR WEDGE

CURRENT MEASUREMENTS OF WEDGE

Quality Metrics	Measurements	Details
Total Length	30-36 inches (76-91 cm)	Length from the base to the tip of the wedge
Width	1-3 inches (2.5-7.5 cm)	Width at the base of the wedge
Thickness	1-6 cm	Thickness at the base of the wedge
Material	Steel	Ensures durability and effectiveness
Edge Angle	Not measured	Not specified for this wedge
Hardness	Not measured	Not specified for this wedge
Durability	High	Made with high-quality materials for long-lasting use
Edge Retention	High	Maintains a sharp edge over time
Impact Resistance	High	Able to withstand heavy strikes and impacts
Corrosion Resistance	Medium to High	Resistant to rust and corrosion

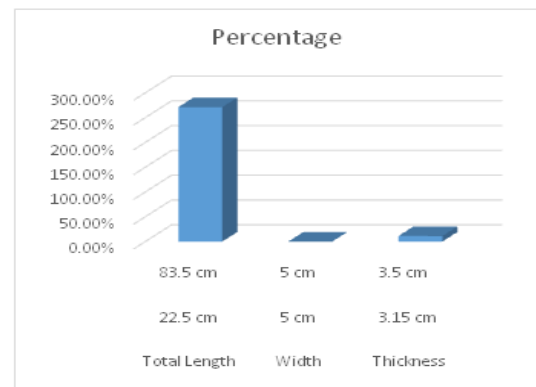
5.3.2 STANDARD MEASUREMENTS OF WEDGE

Quality Metrics	Measurements	Details
Total Length	6-12 inches (15-30 cm)	Length from the base to the tip of the wedge
Width	1-3 inches (2.5-7.5 cm)	Width at the base of the wedge
Thickness	0.5-2 inches (1.3-5 cm)	Thickness at the base of the wedge

Material	Hardened steel, high-carbon steel, or iron	Determines durability and effectiveness
Edge Angle	15-30 degrees	Common angle for the wedge's sharp edge
Hardness	50-60 HRC	Rockwell hardness, indicates durability and wear resistance
Durability	High	Determined by material quality and construction
Edge Retention	High	Ability to maintain a sharp edge over time
Impact Resistance	High	Ability to withstand heavy strikes and impacts
Corrosion Resistance	Medium to High	Resistance to rust and corrosion

5.3.3 PERCENTAGE ANALYSIS

Measurement	Standard (Avg.)	Current(Avg)	Percentage
Total Length	22.5 cm	83.5 cm	271.11%
Width	5 cm	5 cm	0%
Thickness	3.15 cm	3.5 cm	11.11%



INTERPRETATION

The results suggest that while the width of the provided wedge remains consistent with standard measurements, both the total length and thickness are notably

different. The longer length may provide added leverage and force, while the increased thickness may enhance durability. These differences should be considered when selecting the appropriate wedge for specific splitting or prying applications.

Key Observations

To improve the quality of products and process at Universal Implements, addressing errors in quality assessment methods is essential. Some of the methods are:

- Implement Standard Operating Procedures (SOPs)*:
 - Develop and document detailed SOPs for all production processes to ensure consistency and uniformity.
 - Regularly review and update SOPs to incorporate best practices and new technological advancements.
- Enhance Quality Control Measures*:
 - Introduce robust quality control checkpoints at critical stages of the production process.
 - Use statistical process control (SPC) techniques to monitor and control manufacturing processes.
- Adopt Advanced Quality Assessment Tools*:
 - Utilize precision measurement tools and automated inspection systems to detect and correct errors early in the production process.
 - Implement non-destructive testing (NDT) methods to assess the integrity of parts without damaging them.
- Implement Continuous Improvement Programs*:
 - Adopt methodologies such as Six Sigma, Lean Manufacturing, and Total Quality Management (TQM) to identify and eliminate waste, reduce variability, and enhance product quality.
 - Encourage continuous feedback and suggestions from employees and customers to drive ongoing improvements.
- Invest in Technology and Automation*:
 - Integrate advanced manufacturing technologies such as computer-aided design (CAD) and computer-aided manufacturing (CAM) to enhance precision and reduce human error.
 - Automate repetitive and error-prone tasks to improve efficiency and consistency.
- Monitor and Analyze Quality Data*:
 - Establish a comprehensive data collection system to monitor key quality metrics and performance indicators.
 - Use data analytics to identify trends, root causes of defects, and areas for process optimization.

By systematically addressing these areas, Universal Implements can significantly enhance the quality of its products, leading to increased customer satisfaction, reduced

costs due to rework and scrap, and a stronger competitive position in the market.

VI. CONCLUSION

In conclusion, the investigation into the quality management system (QMS) within Universal Implements has revealed significant gaps and opportunities for improvement. The findings highlight issues such as inconsistencies in product weight, the absence of quality checks, and the lack of standardized procedures in the production process. Additionally, concerns regarding supplier quality and customer satisfaction have been identified as areas requiring immediate attention.

Addressing these shortcomings and implementing the suggested recommendations, including the development of standard operating procedures, robust quality control measures, and enhanced supplier quality assurance, can help the company achieve higher levels of product quality, reliability, and customer satisfaction. Furthermore, the adoption of a structured quality management system, such as ISO 9001, can provide a framework for continuous improvement and ensure adherence to international quality standards. It underscores the importance of continuous improvement, collaboration, and innovation in driving excellence in quality management within the manufacturing industry.

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