

A Study on Production Process and Customer Satisfaction Towards Corrugated Boxes at Delta Packaging Solutions

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Abstract—The packaging industry is important in protecting products during storage, handling and transportation. The corrugated boxes are widely used in various industries due to its durability, light weight, cost-effectiveness and eco-friendly nature. The study aims to analyse the production process of corrugated boxes and the level of customer satisfaction towards company products at Delta Packaging Solutions, Kadalakere. The study analyses the corrugated box making process stages such as raw material procurement, corrugation, cutting, printing, quality control and sustainability practices adopted by the company. The study also discusses customer satisfaction on product quality, packaging strength, delivery performance and service quality. Both primary and secondary data were used in the study. Primary data was collected from 52 respondents using a structured questionnaire while secondary data was collected from company records, journals, books and websites. The data were analysed by percentage analysis and correlative analysis. Results show that systematic production processes, effective quality control measures, and sustainable practices have positive effects on customer satisfaction. The analysis concludes that the maintenance of the product quality and customer-oriented services is the cause of the improvement in the customer loyalty and the business performance.

Index Terms—Corrugated Boxes, Packaging Industry, Production Process, Customer Satisfaction, Quality Control, Sustainability

I. INTRODUCTION

Manufacturing industries are vital to economic growth as they process raw materials into finished goods. Packaging industry has become very important among different manufacturing sectors as packaging helps to protect products during storage, handling and transportation. Packaging also enables efficient logistics, better product handling and greater customer convenience.

Corrugated boxes are one of the most common packaging materials in modern industries. These containers are made of corrugated paperboard, which is composed of fluted sheets glued between liner boards. Corrugated boxes are lightweight, durable, inexpensive and environmentally friendly. They are widely used in industries such as food processing, pharmaceuticals, agriculture, electronics, textiles and consumer products.

The explosion of e-commerce and industrial activity has created a great demand for corrugated packaging products. Organisations need to use quality and reliable packaging materials to ensure safety of products during transportation and storage. Corrugated boxes also help with branding and presentation of the product in addition to protection.

The production process of corrugated boxes involves raw material procurement, corrugation, cutting, slotting, printing, folding, glueing and quality control. A good control of those processes should preserve the quality and the strength of the boxes. Efficient production processes enable organisations to minimise waste, enhance operational efficiency, and satisfy customer requirements.

Customer satisfaction has been one of the major factors that determine the success of the business in the packaging industry. Customer satisfaction depends on factors such as product quality, durability, pricing, delivery performance, customisation and service quality. Repeat business and long-term relationships are more probable when customers are satisfied.

Delta Packaging Solutions, Kadalakere, manufactures corrugated boxes and packaging products. The company emphasises product quality, production efficiency and customer satisfaction. This paper studies the production process of the company and the customer satisfaction towards the products.

A. OBJECTIVES OF THE STUDY

- To study the production process of corrugated boxes and the measures taken to maintain quality, strength, and sustainability.
- To measure customer satisfaction to company products at Delta Packaging Solutions.

B. NEED FOR THE STUDY

The packaging industry plays an important role in protecting products during transportation and storage. Corrugated boxes are widely used because they provide safety, durability, and cost-effective packaging solutions. Maintaining product quality and customer satisfaction is essential for organizational growth and competitiveness.

This study helps in understanding the production process followed by Delta Packaging Solutions and identifies factors influencing customer satisfaction. The study also analyses how quality management and production efficiency affect customer loyalty and organizational performance.

II. REVIEW OF LITERATURE

Pereira et al. (2020) used the PDCA methodology to analyse the improvement of the production process in the corrugated cardboard industry. The study pointed out that optimizing processes helps to reduce waste, increase efficiency and improve product quality.

Marinova (2022) reviewed sustainability of cardboard packaging. The research found that cardboard packaging supports environmental sustainability due to its recyclable and biodegradable nature.

III. RESEARCH METHODOLOGY

The study is descriptive research to know the production process and customer satisfaction at Delta Packaging Solutions.

a) Sources of Data

Primary Data

Primary data was collected through a structured questionnaire from the customers. Information was collected from 52 respondents on customer satisfaction product quality and service performance.

Secondary Data

Secondary data were collected from company records, journals, books, websites, and previous studies related to the packaging industry.

b) Sampling Method

Convenience sampling technique was used to select the respondents.

c) Statistical Tools Used

Correlation Analysis

IV. PRODUCTION PROCESS OF CORRUGATED BOXES

The production of corrugated boxes is a systematic process, which has different stages to ensure the quality of the product, its durability and customer satisfaction.

A. Raw Material Sourcing

Kraft paper is the primary raw material for the production of corrugated boxes. The company uses superior quality kraft paper sourced from trusted vendors. Manufacturing process is made of virgin and recycled paper materials.

B. Corrugation Process

The paper passes through heated rollers where the fluted shape is created. The linerboards and the fluting medium are bonded together with adhesive. The bonded sheets are then dried and pressed properly to ensure strength and durability.

C. Cutting and Slotting

Corrugated boards are cut into required sizes according to customer specifications. Creasing and slotting operations are employed to form fold lines and flaps for the assembly of boxes.

D. Printing and Customization

Printing is done to provide logos, product information, handling instructions, and branding details. Flexographic and digital printing are available as per customer requirements.

E. Folding and Gluing

The corrugated sheets are folded along pre-made creases. Box flaps are joined by way of adhesives and stapling methods to maintain the structural stability.

F. Quality Control and Inspection

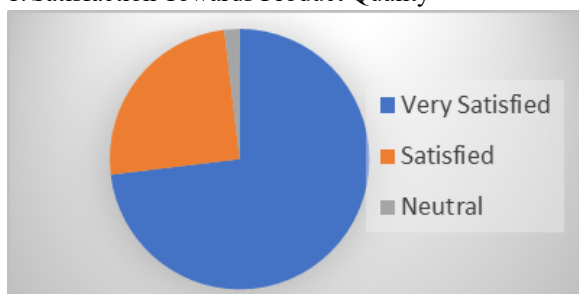
Strength tests, edge crush tests, dimension inspections, and printing quality inspections to guarantee the quality and reliability of the products.

G. Sustainability Practices

The company promotes environmental sustainability through the use of recycled materials, eco-friendly inks, waste reduction methods and energy-efficient production practices.

V. CUSTOMER SATISFACTION ANALYSIS

1. Satisfaction Towards Product Quality



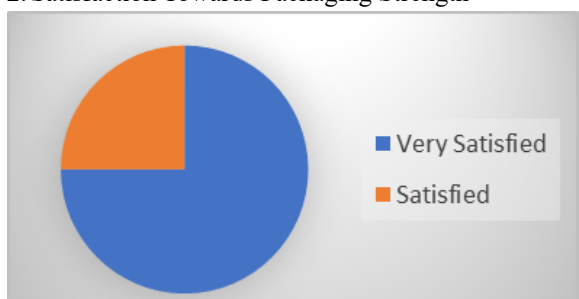
Analysis

Majority of respondents (73.1%) were satisfied with the quality of corrugated boxes manufactured by Delta Packaging Solutions.

Interpretation

This indicates that the company maintains good quality standards and can satisfy the customer's expectations.

2. Satisfaction Towards Packaging Strength



Analysis

Most respondents (75%) are satisfied with the strength and durability of corrugated boxes.

Interpretation

This indicates effective production processes and proper quality maintenance practices.

3. Satisfaction Towards Delivery Performance



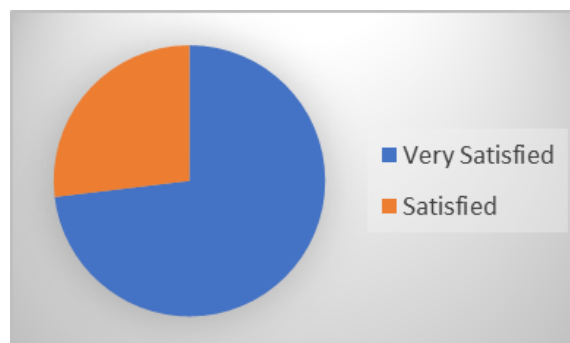
Analysis

Majority of respondents (73.1%) are satisfied with delivery performance and timely supply of products.

Interpretation

This indicates efficient operational management and customer-oriented service practices.

4. Overall Customer Satisfaction



Analysis

Most respondents (73.1%) expressed overall satisfaction with company products and services.

Interpretation

This shows that the company successfully maintains customer trust and loyalty.

5. Correlation Analysis

Correlation analysis used to identify the relationship between product quality and customer satisfaction. This analysis identified a positive relationship between each of the quality characteristics (i.e., Product Quality, Packaging Strength and Delivery Performance) and customer satisfaction.

In addition, customers who experienced an adequate level of satisfaction regarding packaging quality and durability reported a greater overall level of customer satisfaction regarding the company's products and

services. These data suggest that effective quality assurance practices and well defined, organized production processes enhance customers' confidence in their purchases, generate loyalty to the company and result in improved performance for the company.

VI. DISCUSSION

The results from the study indicate that good production management and effective quality control methods help improve Delta Packaging Solutions' customer satisfaction from both a raw material selection, and through corrugation; as well as through quality inspections; and sustainability efforts. The corrugation processes, and all other aspects (as listed above) used for producing boxes, enable Delta Packaging Solutions to maintain box strength and product longevity.

According to the analysis performed regarding customer satisfaction, there was a very high percentage of respondents that rated the quality, longevity or durability of the product and/or services as satisfactory. In addition, the majority of customers rated the strength, timeliness of delivery, and respectability of products as above average.

Also shown through using correlation calculations, there is a positive correlation between product integrity and customer satisfaction. Higher quality packaging and manufacturing processes improve customer satisfaction and will yield higher customer loyalty.

Lastly, the analysis showed that through recycling, using green/eco-friendly packaging, as well as reducing wastes while operating businesses; by providing these types of sustainable efforts, organizations are viewed as good/caring corporate citizens; thereby providing to their positive public image and environmentally-responsible organizations. Thus, maintaining production and production systems that help organizations provide satisfactory service creates competitiveness and leads to ongoing growth of that organization.

VII. FINDINGS OF THE STUDY

- Company follows systematic production process for manufacturing of corrugated boxes.
- Quality inspection practices help to preserve packaging durability and strength.

- Most customers are satisfied with product quality and delivery performance.
- Sustainable production practices protect the environment and minimize waste.
- Product quality and packaging strength has positive impact on customer satisfaction.
- Correlation analysis shows there is a positive relationship between the quality of products and customer satisfaction.

VIII. SUGGESTIONS

- The company can introduce advanced automated machines to improve production efficiency.
- Additional eco-friendly packaging solutions can be implemented to improve sustainability practices.
- Customer feedback systems can be improved to enable continuous service improvement.
- Employee training programs can be improved to better operational efficiency and quality management.

IX. CONCLUSION

The conclusion of this analysis is that Delta Packaging Solutions has a consistent production process and an effective method for managing quality in manufacturing corrugated boxes. By consistently sourcing raw materials, producing through the corrugation process correctly and consistently, printing correctly and consistently, cutting properly and consistently, and inspecting their products for quality consistently, they will produce durable corrugated box products which also possess a high level of packaging strength.

The analysis of the customer satisfaction survey results indicates that Delta Packaging Solutions' customers have a high level of satisfaction with Delta's product and service offerings. There are four main variables that contribute to customer satisfaction: product quality, packaging strength, on-time delivery performance, and service quality.

The correlation analysis indicates a positive correlation exists between product quality and customer satisfaction. Quality control processes and practices related to sustainability add to the level of trust customers have in the company, their likelihood of purchasing additional products (i.e., customer

loyalty), and the company's overall performance (i.e., business success).

Finally, the study suggests that continued improvements in production technology along with improvements in customer service and sustainability initiatives will benefit Delta Packaging Solutions' ability to achieve further growth and build upon its competitive advantage within the packaging market.

REFERENCES

- [1] Pereira, T., A. S. L. Neves, F. J. G. Silvia, R. Godina, L. Morgado, and G. F. L. Pinto, "Production process analysis and improvement of corrugated cardboard industry," 2020.
- [2] Marinova, V., "Sustainability of cardboard packages," *Izvestiya na Sayuza na Uchenite-Varna, Series Economic Sciences*, vol. 11, no. 3, pp. 53–63, 2022.
- [3] Ken Research, *India Corrugated Boxes Market*. Ken Research, 2024. [Online]. Available: Ken Research India Corrugated Boxes Market
- [4] IMARC Group, *India Corrugated Boxes Market*. IMARC Group, 2025. [Online]. Available: IMARC Group India Corrugated Boxes Market
- [5] Mordor Intelligence, *Packaging Industry in India*. Mordor Intelligence, 2025. [Online]. Available: Mordor Intelligence Packaging Industry in India