

A Study on the Impact of Production Efficiency on Customer Satisfaction at VB Dace

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ABSTRACT

Production efficiency plays an important role in maintaining product quality, reducing defects, minimizing wastage and ensuring timely delivery. This study examines the impact of production efficiency on customer satisfaction at VB DACE. The study was carried out during the internship period at LLM Appliances, where different stages of manufacturing such as raw material handling, cutting, pressing, trimming, beading, welding, polishing, quality checking, packing and dispatch were observed. A descriptive research design was adopted. Primary data was collected through a structured questionnaire from 60 respondents using Google Forms and secondary information was collected from company-related information, websites, journals, research articles and previous studies. Percentage analysis, weighted mean analysis, Pearson correlation and Chi-square analysis were used for data analysis. The weighted mean analysis showed a generally positive opinion about product quality, reliability and performance, while delivery within the promised time recorded the lowest mean score of 2.67. Pearson correlation produced a strong positive relationship between production efficiency and customer satisfaction ($r = 0.803$, $p < 0.001$). The Chi-square test showed no significant association between duration of product usage and overall customer satisfaction ($\chi^2 = 4.758$, $df = 6$, $p = 0.575$). The study concludes that maintaining good product quality, improving delivery performance and preventing defects can help VB DACE strengthen customer satisfaction.

Keywords: Production Efficiency, Product Quality, Customer Satisfaction, Delivery Performance, Product Defects, VB DACE

INTRODUCTION

The home appliances and cookware industry has become an important part of the Indian manufacturing sector. Customers today prefer products that are easy to use, durable and capable of making daily cooking activities more convenient. The industry consists of products such as cookware, kitchen storage solutions, pressure cookers, frying pans, kitchen gadgets and other household appliances. Customers are becoming more aware of product quality, safety, durability and design before making a purchase.

Production efficiency plays an important role in this industry. Efficient production helps companies manufacture quality products within the required time while reducing wastage and defects. Better production practices also help companies maintain product consistency and meet customer demand effectively. When products are manufactured efficiently and delivered on time, customer satisfaction tends to increase.

VB DACE is one of the growing cookware and kitchen appliance brands in India. The company mainly focuses on manufacturing and marketing premium quality cookware products for household use. The manufacturing activities for VB DACE products are carried out at LLM Appliances (Lakshmi Lite Metal). The manufacturing unit follows a systematic production process starting from raw material inspection and ending with packing and dispatch. During the internship, the production process and customer-related observations provided the basis for this study.



Statement of the Problem

During the internship with VB DACE, different production activities and manufacturing operations at LLM Appliances were observed. Maintaining product quality and meeting customer expectations are important challenges faced by manufacturing companies. Certain issues such as product defects and customer complaints related to delivery delays were observed. One observation was related to a VB DACE product in which the battery holder was not fixed properly and the battery tended to slip during usage. Another observation was related to product delivery, where a customer expressed dissatisfaction regarding a delay in receiving an ordered product. These issues may affect customer satisfaction and the overall image of the brand. Therefore, there is a need to study how production efficiency affects customer satisfaction in VB DACE products.

Objective

Primary Objective

1. To study the impact of production efficiency on customer satisfaction in VB DACE products.
2. To understand the production process followed in manufacturing VB DACE products.
3. To identify factors affecting production efficiency.
4. To examine the relationship between product quality and customer satisfaction.
5. To study the impact of product defects on customer satisfaction.
6. To analyze the effect of delivery performance on customer satisfaction.
7. To identify customer opinions regarding VB DACE products.

Research Question

1. What are the factors affecting production efficiency?
2. What is the relationship between product quality and customer satisfaction?
3. What is the impact of product defects on customer satisfaction?
4. What is the effect of delivery performance on customer satisfaction?
5. What are the customer opinions regarding VB DACE products?

LITERATURE REVIEW

Terziovski, M. (2006). The study showed that quality management practices have a positive effect on productivity improvement and customer satisfaction. Quality should be maintained throughout the production process rather than depending only on final inspection.

Shah, R. and Ward, P. T. (2007). The study explained that production efficiency cannot be achieved by improving only one activity in a manufacturing unit. Different production activities need to work together smoothly and proper flow of production can help a company use its resources more effectively.

Anil, A. P. and Satish, K. P. (2019). The findings showed that Total Quality Management practices have an important relationship with customer satisfaction. Customer focus, proper management of quality and continuous improvement can help manufacturing organisations improve customer experience.

Peng, D. X. and Lu, G. (2017). The study showed that the ability of a company to complete and deliver orders within the expected period is important for the customer experience. Delays in production or dispatch can affect overall customer experience.

Fullerton, R. R., Kennedy, F. A. and Widener, S. K. (2014). The study showed that lean practices can support better operational outcomes when properly implemented. Reducing unnecessary waiting time, excess inventory, repeated work and inefficient movement can make the production process smoother and more efficient.

Baird, K., Hu, K. J. and Reeve, R. (2011). The study highlighted the importance of quality practices, process management, employee involvement and management support in maintaining quality and improving operational performance.

RESEARCH METHODOLOGY

Research Design

For this study, a descriptive research design was adopted. This design was considered suitable because the main objective of the research is to understand customers' opinions and satisfaction with VB DACE products based on their actual experience. The study does not attempt to influence or change the behaviour of the respondents; instead, it focuses on collecting and analysing their views. A structured questionnaire was used to collect data from 60 respondents. The responses were analysed using percentage analysis, weighted mean analysis, Pearson correlation and Chi-square analysis.

Sampling Method

For the present study, convenience sampling technique was used. Respondents were approached based on their availability and willingness to participate in the survey. The questionnaire was shared with suitable respondents and participation was voluntary. Convenience sampling made it possible to collect responses within the available period of the internship project.

Sampling Size

For the present study, the sample size consists of 60 respondents. The respondents considered for the study are people who have knowledge or experience of using VB DACE products. The decision to use 60 respondents was made considering the nature of the study, availability of suitable respondents and the time available for completing the project.

Data Collection Method

For the present study, information was collected using both primary data and secondary data. Primary data was collected through a structured questionnaire prepared using Google Forms from 60 respondents. The questionnaire contains 25 questions related to production efficiency, product quality, defects, delivery, packaging, value for money and customer satisfaction. Secondary data was collected from company-related information, websites, journals, research articles and previous studies related to production efficiency, product quality and customer satisfaction. Direct observations during the internship at LLM Appliances were also used to understand manufacturing activities.

Data Analysis Tool

The collected responses were analysed using Percentage Analysis, Weighted Mean Analysis, Pearson Correlation and Chi-Square Analysis. The analysis was used to understand customer opinions and identify the relationship between production efficiency and customer satisfaction.

Variable



Independent Variable: Production Efficiency. Production efficiency is studied through product quality, durability, reliability, consistency, defects, finishing and performance.

Moderating Variable: Product Quality and Delivery Performance. Product quality and delivery performance are considered as factors connecting production performance with the final customer experience.

Dependent Variable: Customer Satisfaction. Customer satisfaction is studied through overall satisfaction, value for money, product performance, recommendation and repurchase intention.

Limitation

1. The study is based on 60 respondents and may not represent the views of every VB DACE customer.
2. The time available for collecting information and completing the report was limited.
3. Convenience sampling was used, so every VB DACE customer did not have an equal chance of being selected.
4. The study depends largely on the personal opinions of respondents and customer satisfaction is based on individual experience.
5. Different respondents may have used different VB DACE products and the duration of product usage may also differ.
6. Customers do not directly observe the internal manufacturing process, so production efficiency is mainly understood through the final product they experience.
7. The findings are specific to VB DACE and the selected respondents and should not automatically be applied to all cookware or kitchen appliance companies.
8. There is a possibility of response bias and the structured response options may not fully express all customer opinions.
9. The study focuses mainly on production efficiency, product quality, delivery performance and customer satisfaction; other factors may also influence customer satisfaction.

Weighted Average Table

The weighted mean analysis was carried out to understand the respondents' opinions regarding production efficiency, product performance and customer satisfaction of VB DACE products. The mean score for each statement was calculated to identify the areas where customers were highly satisfied and the areas that require improvement.

Particulars	N	Mean	Std. Deviation	Interpretation
VB DACE products are free from manufacturing defects.	60	4.05	1.048	High
Product quality is consistent across purchases.	60	4.2	0.898	High
Products are delivered within the promised time.	60	2.67	1.13	Moderate
The finishing quality of the product is satisfactory.	60	3.97	0.843	High
The product performs according to my expectations.	60	4.23	0.722	Very High
The product functions properly without operational issues.	59	4.07	0.888	High
The quality of VB DACE products meets my expectations.	60	4.2	0.84	High
Product availability is satisfactory when needed.	60	3.9	1.1	High

VB DACE products are reliable during regular use.	60	4.23	0.831	Very High
The overall manufacturing quality of VB DACE products is good.	60	4.17	0.827	High
The packaging and condition of the product upon delivery is satisfactory.	60	4.03	0.882	High
Product defects negatively affect my satisfaction with the brand.	60	4.25	0.895	Very High
Timely delivery influences my satisfaction with VB DACE products.	58	4.12	1.125	High
Product quality influences my decision to repurchase.	60	4.33	0.968	Very High
Product durability influences my overall satisfaction.	60	4.37	0.802	Very High
I am satisfied with the overall quality of VB DACE products.	60	4.2	0.819	High
VB DACE products provide good value for money.	59	4.15	0.962	High
The product design meets my expectations.	58	4.29	0.817	Very High
The product is easy to use and maintain.	59	4.31	0.815	Very High
I am satisfied with my overall experience with VB DACE products.	59	4.36	0.846	Very High

Mean Score Interpretation: 4.21–5.00 Very High; 3.41–4.20 High; 2.61–3.40 Moderate; 1.81–2.60 Low; 1.00–1.80 Very Low.

The weighted mean analysis indicates that respondents generally have a positive opinion about the production efficiency and product performance of VB DACE products. Product durability influences my overall satisfaction received the highest mean score of 4.37, followed by I am satisfied with my overall experience with VB DACE products with a mean score of 4.36. The lowest mean score was observed for products being delivered within the promised time (2.67), showing that delivery performance is an area where customers are comparatively less satisfied.

Correlation Result

The purpose of this analysis is to examine whether there is a relationship between customers' perception of production efficiency and product performance and their overall satisfaction with VB DACE products.

Variables	Pearson Correlation	Sig. (2-tailed)	N
Production Efficiency and Customer Satisfaction	0.803***	<0.001	60

Source: Primary Data – SPSS Output (2026)

The Pearson correlation analysis produced a correlation coefficient (r) of 0.803 with a significance value (p) of less than 0.001. This indicates a strong positive relationship between production efficiency and customer satisfaction. Since the significance value is much lower than the accepted level of 0.05, the null hypothesis is rejected and the alternative hypothesis is accepted. Customers who gave higher ratings for production efficiency and product performance also tended to report higher levels of satisfaction with VB DACE products.

CHI-Square Result

The Chi-Square test was carried out to examine whether there is an association between the duration of using VB DACE products and overall customer satisfaction.

Test	Value	df	p-value	5% Level	Decision
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Pearson Chi-Square	4.758	6	0.575	0.05	Do not reject H_0
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The Chi-Square test produced a Pearson Chi-Square value of 4.758 with 6 degrees of freedom. The significance value (p-value) was 0.575, which is higher than the commonly accepted significance level of 0.05. Therefore, the null hypothesis is accepted and the alternative hypothesis is rejected. There is no statistically significant association between duration of product usage and overall customer satisfaction in this sample.

DISCUSSION

The study shows that customers generally have a positive opinion about the quality, reliability and performance of VB DACE products. The weighted mean results show high and very high ratings for product quality, product performance, reliability, durability, design and overall experience. Product durability received the highest mean score of 4.37, which shows that customers value durable products.

At the same time, delivery timeliness was identified as the most noticeable area requiring improvement. Products being delivered within the promised time received the lowest mean score of 2.67. Timely delivery also received a high mean score of 4.12 as a factor influencing satisfaction, showing that customers consider delivery performance important. The study also identified that product defects negatively affect satisfaction.

The Pearson correlation result shows a strong positive relationship between production efficiency and customer satisfaction ($r = 0.803$, $p < 0.001$). This supports the view that maintaining good manufacturing quality, product reliability, durability, packaging and overall product performance is important for customer satisfaction. The Chi-Square result, however, shows that duration of product usage is not significantly associated with overall customer satisfaction ($\chi^2 = 4.758$, $p = 0.575$). Therefore, customer satisfaction appears to be influenced by factors other than the duration of product usage.

The internship observations also support the importance of quality checking, production planning, defect prevention and coordination between production and dispatch. The battery fitting issue observed in the Snack Chef provides a practical example of why careful quality checking is necessary, although that specific defect was not directly measured through the questionnaire. Overall, the findings indicate that production efficiency and product performance are strongly linked to customer satisfaction, while delivery performance remains an area for improvement.

CONCLUSION

The present study titled “A Study on the Impact of Production Efficiency on Customer Satisfaction at VB DACE” was carried out to understand how different production-related factors can influence customer satisfaction. During the internship, different stages involved in the manufacturing process such as raw material cutting, pressing, trimming, beading, welding, polishing, quality checking, packing and dispatch were observed.

Primary data was collected from 60 respondents through a structured questionnaire. The responses were analysed to understand customer opinions regarding product quality, reliability, manufacturing defects, product performance, delivery, packaging, value for money and overall satisfaction. Most respondents have a generally positive opinion about VB DACE products, particularly regarding product quality, reliability and performance.

The study identified delivery timeliness and prevention of manufacturing defects as areas requiring attention. The weighted mean analysis showed that products delivered within the promised time recorded the lowest mean score of 2.67. The Pearson correlation analysis showed a strong positive relationship between production efficiency and customer satisfaction. The Chi-Square analysis showed no significant association between duration of product usage and overall customer satisfaction.

Overall, maintaining good product quality while improving delivery performance, preventing defects, improving quality checking and strengthening coordination between production and dispatch can help VB DACE improve customer satisfaction further and maintain customer trust in the long run.



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