



**Shikshan Prasarak Santha's
Padmabhushan Vasantraodada Patil Mahavidyalaya
Kavathe Mahankal
DEPARTMENT OF STATISTICS**



**Case Study Report on
“Analysis of Customer Ratings for Online Products”**

**Submitted to
Department of Statistics,
P. V. P. Mahavidyalaya,
Kavathe Mahankal**

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**As a partial fulfillment of the SEC-I (P): Practical on Data Analysis
Using MS-Excel – I for B.Sc. II (Semester III)**

***Under the guidance of*
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2025-2026

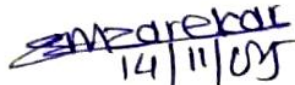
CERTIFICATE

This is to certify that *Miss. Shinde Swapnali Ramdas, Miss. Vankhede Gayatri Dhamesh and Miss. Tone Arti Anil* of B.Sc. II (Semester III), P. V. P. Mahavidyalaya, Kavathe Mahankal have successfully completed the case study report entitled “*Analysis of Customer Ratings for Online Products*” based on SEC-I (P): Practical on Data Analysis Using MS-Excel – I, as prescribed by the curriculum of Shivaji University, Kolhapur, under my supervision and guidance during the academic year 2025 – 2026.



Guide

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Place: Kavathe Mahankal

Date: 10/11/2025

DECLARATION

We hereby declare that the Case Study Report entitled “*Analysis of Customer Ratings for Online Products*” submitted in partial fulfillment of the requirements of SEC-I (P): Practical on Data Analysis Using MS-Excel – I for B.Sc. II (Semester III) is our original work carried out under the guidance of Dr. A. M. Suryawanshi, Assistant Professor, Department of Statistics, P. V. P. Mahavidyalaya, Kavathe Mahankal.

We further declare that this report has not been previously submitted to any other university or institution for any other degree.

Place: Kavathe Mahankal

Date: 10/11/2025

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Abstract:

This study analyzes customer ratings and satisfaction levels for various online product categories, including Electronics, Clothing, Beauty, Grocery, and Home Décor. The data collected from 50 respondents explores relationships between product quality, value for money, delivery time, overall rating, and recommendation behavior. Results indicate that higher product quality and perceived value for money strongly correlate with customer satisfaction and recommendation intention. Females tend to provide higher satisfaction scores compared to males. The study highlights the importance of maintaining product quality, timely delivery, and value-driven pricing to enhance customer loyalty in the online marketplace.

Introduction:

Online shopping has revolutionized the way consumers purchase goods and services, becoming an integral component of modern retail systems. With advancements in digital technology, secure payment systems, and widespread internet accessibility, consumers now enjoy the ability to browse, compare, and purchase products from anywhere at any time. The growing reliance on e-commerce platforms such as Amazon, Flipkart, and Myntra reflects the increasing consumer preference for convenience, variety, and personalized shopping experiences.

Despite these advantages, customer satisfaction remains a critical determinant of online business success. Factors such as product quality, delivery time, packaging, website usability, and value for money significantly influence customer perceptions and loyalty. A positive online shopping experience not only enhances satisfaction but also increases the likelihood of repeat purchases and positive word-of-mouth recommendations, which are essential for sustaining brand reputation in a competitive marketplace.

However, online shopping also poses certain challenges, including delayed deliveries, product mismatches, payment issues, and concerns about return policies. These factors can lead to customer dissatisfaction and reduced trust in e-commerce platforms. Therefore, understanding the relationship between delivery time, product quality, and value for money with overall customer satisfaction and recommendation likelihood becomes essential.

This study aims to analyze these interrelationships using real customer data across various product categories. By examining customer feedback, ratings, and satisfaction levels, the research seeks to identify key drivers of customer satisfaction and provide actionable insights for businesses to enhance service quality, improve customer retention, and foster long-term brand loyalty in the digital marketplace.

Objectives:

- ❖ To analyze the relationship between product quality, value for money, and overall customer satisfaction.
- ❖ To compare satisfaction levels and recommendations across genders and product categories.
- ❖ To examine how delivery time influences overall ratings and satisfaction.
- ❖ To identify key factors affecting customer recommendations for online products.

Hypotheses:

The null and alternative Hypotheses are:

1)

H₀: There is no significant relationship between Delivery time and Overall rating.

H₁: There is a significant relationship between Delivery time and Overall rating.

2)

H₀: There is no significant relationship between product quality and Overall rating.

H₁: There is a significant relationship between product quality and Overall rating.

3)

H₀: There is no significant relationship between value for money and Overall rating.

H₁: There is a significant relationship between value for money and Overall rating.

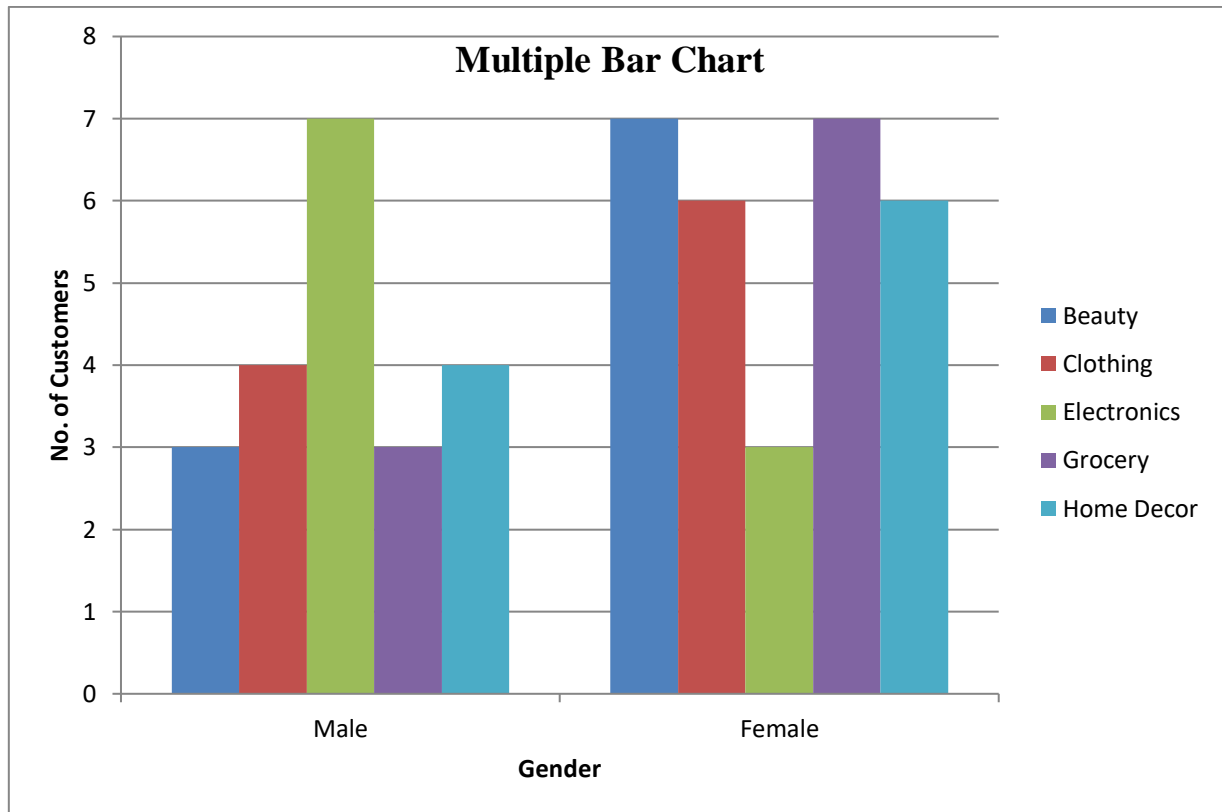
Methodology:

Data was collected from 50 online customers equally divided between males and females. The study includes variables such as product category, delivery time, product quality, value for money, satisfaction level, and recommendation. Microsoft Excel was used for data entry and analysis using descriptive statistics, correlation, and graphical representation.

Statistical Analysis:

1) Graphical representation:

A. Multiple Bar charts

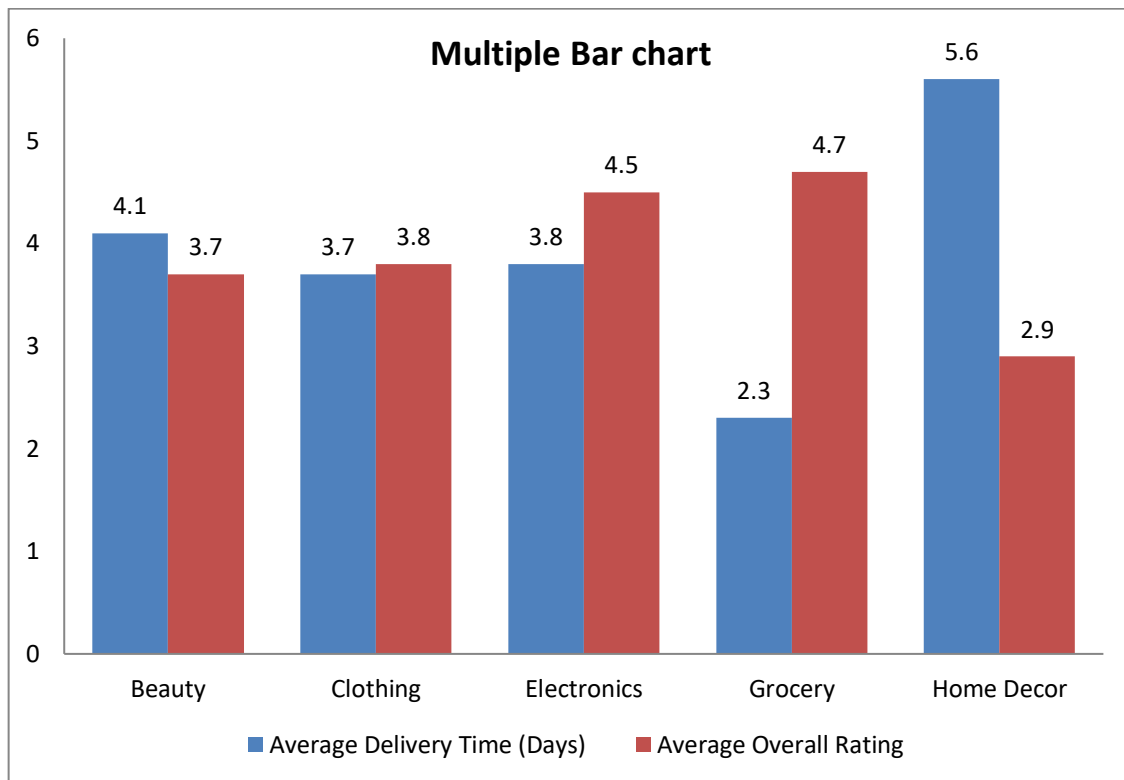


Interpretation:

The multiple bar chart displays the number of male (21) and female (29) customers across five product categories — Beauty, Clothing, Electronics, Grocery, and Home Décor. From the chart, it can be interpreted that: Among male customers, the Electronics category has the highest number (7 customers), followed by Clothing (4) and Home Décor (4). The least preferred categories are Beauty (3) and Grocery (3).

Among female customers, the highest number of customers is seen in Beauty (7) and Grocery (7) categories, followed by Clothing (6) and Home Décor (6), while Electronics (3) records the lowest count.

There is a clear difference in product preferences between genders. Male customers are more inclined toward electronics-related purchases, while female customers are more attracted to beauty and grocery products. This insight highlights the importance of gender-based marketing strategies to better target customer preferences in online shopping.



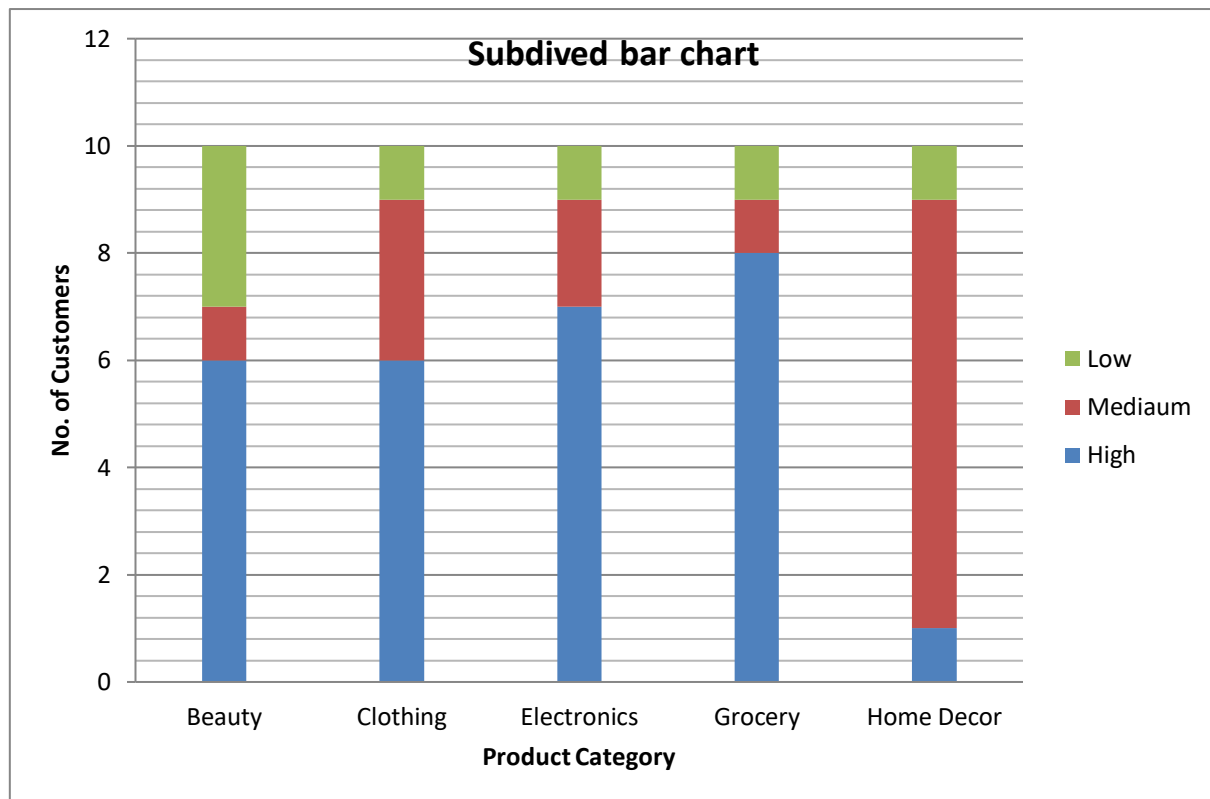
Interpretation:

The multiple bar chart represents the comparison between Average Delivery Time (in Days) and Average Overall Rating across five product categories — Beauty, Clothing, Electronics, Grocery, and Home Décor.

From the chart, the following observations can be made:

- ✚ Beauty products show a moderate delivery time of 4.1 days and an overall rating of 3.7, indicating fairly good customer satisfaction.
- ✚ Clothing has nearly similar values, with a delivery time of 3.7 days and a rating of 3.8, suggesting balanced performance between service speed and customer satisfaction.
- ✚ Electronics products have a delivery time of 3.8 days but a slightly higher overall rating of 4.5, showing that customers value product quality despite moderate delivery duration.
- ✚ Grocery items record the shortest delivery time (2.3 days) and a high overall rating (4.7), indicating strong customer satisfaction and efficient service.
- ✚ Home Décor products show the longest delivery time (5.6 days) and the lowest rating (2.9), reflecting delays and lower customer satisfaction in this category.
- ✚ The analysis reveals that shorter delivery times generally correspond to higher customer ratings. Categories like Grocery and Electronics perform well due to quick delivery and product satisfaction, while Home Décor lags behind, indicating a need for improvement in delivery efficiency and service quality to enhance customer satisfaction.

B. Subdivided Bar charts



Interpretation:

The subdivided bar chart illustrates the relationship between product categories (Beauty, Clothing, Electronics, Grocery, and Home Decor) and customer satisfaction levels (High, Medium, and Low).

From the chart, the following observations can be made:

- ❖ In the Beauty category, the majority of customers show a high satisfaction level, with a smaller portion reporting medium and low satisfaction.
- ❖ For Clothing, the satisfaction distribution is slightly lower, with most customers indicating high satisfaction, followed by medium, and a few with low satisfaction.
- ❖ In the Electronics category, the pattern is similar — most customers exhibit high satisfaction, while a smaller number fall into the medium and low groups.
- ❖ The Grocery category records the highest proportion of highly satisfied customers, with minimal medium and low satisfaction levels, indicating consistent customer approval.
- ❖ Conversely, in the Home Décor category, the medium satisfaction level dominates, while high satisfaction is the lowest among all categories, suggesting room for improvement in this product segment.
- ❖ Overall, most customers report high satisfaction across most product categories, especially in Grocery and Electronics, indicating positive

experiences with these products. However, Home Décor shows comparatively lower satisfaction, suggesting that businesses in this segment should focus on enhancing product quality and customer experience to increase satisfaction levels.

2) Descriptive Statistics: Mean, Median, Standard deviation

variables	Mean	Median	S.D
Delivery Time	3.9	4	1.501699717
Product Quality	3.94	4	0.956396297
Value for Money	4	4	0.782460796
Overall Rating	3.92	4	0.9655283

Interpretation:

The descriptive statistical analysis summarizes the central tendency and variability of the key variables — Delivery Time, Product Quality, Value for Money, and Overall Rating.

- ❖ The mean delivery time is 3.9 days, with a median of 4 days, indicating that most products are delivered within 4 days. However, the standard deviation (1.50) suggests moderate variation in delivery durations among different categories.
- ❖ The mean product quality rating is 3.94, close to the median of 4, showing that customers generally perceive product quality as good, with low variability (SD = 0.96) in their opinions.
- ❖ The value for money has a mean and median of 4, and the lowest standard deviation (0.78), indicating that customers consistently find the products reasonably priced for their quality.
- ❖ The overall rating has a mean of 3.92 and a median of 4, with a standard deviation of 0.97, showing that most customers rated their shopping experience positively with minimal variation.
- ❖ Overall, the descriptive analysis indicates that customer satisfaction levels are generally high and consistent across variables, with product quality and value for money being the most stable factors influencing positive ratings.

3) Correlation analysis:

i. Correlation between Delivery Time (Days) and Overall Rating:

The Excel function = CORREL(Delivery Time, Overall Rating) calculate correlation between Delivery Time (Days) and Overall Rating.

The value of correlation coefficient is: $r = -0.8361$

Degrees of freedom for correlation = $n-2 = 50- 2 = 48$

Significance level (α) = 0.05

Critical value of r at 48 degrees of freedom with 5% significance level = 0.279

Interpretation:

The absolute value of r (0.8361) is greater than critical value of r (0.279). Hence we reject null hypothesis at 5% level of significance and conclude that there is a significant negative relationship between Delivery Time in Days and Overall rating.

ii. Correlation between Product Quality and Overall Rating:

The Excel function = CORREL(Product Quality, Overall Rating) calculate correlation between Product Quality and Overall Rating.

The value of correlation coefficient is: $r = 0.9229$

Degrees of freedom for correlation = $n-2 = 50- 2 = 48$

Significance level (α) = 0.05

Critical value of r at 48 degrees of freedom with 5% significance level = 0.279

Interpretation:

The absolute value of r (0.9229) is greater than critical value of r (0.279). Hence we reject null hypothesis at 5% level of significance and conclude that there is a significant positive relationship between Product Quality and Overall rating.

iii. Correlation between Value for Money and Overall Rating:

The Excel function = CORREL(Value for Money, Overall Rating) calculate correlation between Value for Money and Overall Rating.

The value of correlation coefficient is: $r = 0.8644$

Degrees of freedom for correlation = $n-2 = 50- 2 = 48$

Significance level (α) = 0.05

Critical value of r at 48 degrees of freedom with 5% significance level = 0.279

Interpretation:

The absolute value of r (0.8644) is greater than critical value of r (0.279). Hence we reject null hypothesis at 5% level of significance and conclude that there is a significant positive relationship between Value for Money and Overall rating.

Conclusions:

This study on customer satisfaction in online shopping reveals that product quality, value for money, and delivery time are the key factors influencing overall customer ratings and recommendations. Statistical results show a strong positive correlation between product quality and overall rating, and between value for money and overall rating, indicating that better product standards and fair pricing directly enhance customer satisfaction. Conversely, a significant negative correlation between delivery time and overall rating highlights that delays adversely affect customer perceptions.

Gender-based analysis further indicates that female customers generally report higher satisfaction levels, particularly in the Beauty and Grocery categories, while male customers show greater preference for Electronics. Categories such as Grocery and Electronics demonstrate strong satisfaction and recommendation levels, whereas Home Décor requires improvement due to lower ratings and longer delivery times.

Overall, the findings emphasize that online retailers should focus on ensuring high product quality, maintaining reasonable pricing, and reducing delivery delays to strengthen customer trust, satisfaction, and loyalty. These strategies are essential for long-term success and competitiveness in the growing digital marketplace.

References:

1. Kotler, P. & Keller, K. L. (2016). *Marketing Management*, Pearson Education.
2. Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality, *Journal of Retailing*.
3. Online Consumer Review Studies – *Journal of Electronic Commerce Research* (2022).
4. Data collected through a structured questionnaire and analyzed using Microsoft Excel (2025).

Questionnaire:

1. Name of customer: _____
2. Gender: Male Female
2. Product Category: Electronics Clothing Beauty Grocery Home Décor
3. Delivery Time (in days): _____
4. Rate Product Quality (1–5): _____
5. Rate Value for Money (1–5): _____
6. Rate Overall Experience (1–5): _____
7. Satisfaction Level: High Medium Low
8. Would you recommend this product? Yes No