

An Empirical Study on Consumer Buying Behaviour Towards Smartphones: Evidence from Statistical Analysis

Prof. Dr. K. Balasubramanian

Professor, Department of Business Management

Villa Marie PG College for Women, Somajiguda, Hyderabad, Telangana, India

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Abstract—The smartphone industry represents one of the most dynamic and competitive consumer markets globally. Understanding consumer buying behaviour in this sector is critical for marketers, manufacturers, and retailers. This study examines the factors influencing smartphone purchase decisions among 100 respondents using primary data collected through a structured questionnaire and supported by secondary sources. Key variables examined include price importance, feature importance, brand preference, satisfaction levels, purchase channel, and demographic characteristics.

Statistical tools such as Independent Sample t-tests and Chi-square tests were applied to test six hypotheses. The results indicate that there is no statistically significant difference in satisfaction levels between first-time and repeat buyers ($t = -0.581$, $p = 0.562$). Similarly, no significant association was found between gender and brand preference ($\chi^2 = 4.267$, $p = 0.118$), education and purchase channel ($\chi^2 = 1.335$, $p = 0.513$), or income and short-term buying intention ($\chi^2 = 0.782$, $p = 0.854$).

The findings suggest that smartphone buying behaviour in the sample is influenced more by product-related attributes rather than demographic segmentation alone. The study provides managerial insights for value-based marketing strategies and contributes empirical evidence to consumer behaviour literature.

Index Terms—Consumer Behaviour, Smartphones, Brand Preference, Price Sensitivity, Statistical Analysis.

I. INTRODUCTION

Consumer buying behaviour refers to the systematic process individuals follow when selecting, purchasing, and evaluating goods and services. In today's digital age, smartphones have become an essential part of daily life, serving communication, educational, entertainment, and professional needs. The smartphone market is characterized by rapid technological advancements, frequent product

launches, aggressive pricing strategies, and intense brand competition.

Consumers evaluate multiple factors before making purchase decisions, including price, product features, brand reputation, peer influence, promotional offers, and after-sales service. Additionally, demographic variables such as age, income, gender, and education may influence preferences differently. With the rapid growth of e-commerce platforms, purchase channels (online vs offline) have also become an important consideration.

Understanding these determinants helps marketers design effective segmentation strategies and improve customer satisfaction. Therefore, this study empirically investigates smartphone buying behaviour among 100 respondents using structured statistical testing methods.

II. OBJECTIVES OF THE STUDY

1. To analyze the influence of price and product features on smartphone purchase decisions.
2. To examine the association between demographic variables and brand preference or purchase channel.
3. To compare satisfaction levels between first-time and repeat buyers.

III. HYPOTHESES

H1: There is a significant difference in satisfaction between first-time and repeat buyers.

H2: There is a significant difference in perceived value between younger and older respondents.

H3: There is a significant difference in feature importance between male and female respondents.

H4: There is an association between gender and brand preference.

H5: There is an association between education level and purchase channel.

H6: There is an association between income and purchase intention.

IV. RESEARCH METHODOLOGY

Research Design

The present study adopts a descriptive and analytical research design. The descriptive component aims to systematically describe the characteristics, preferences, and behavioural patterns of smartphone consumers. It focuses on identifying the level of importance attached to variables such as price, features, brand, and purchase channel. The analytical component extends beyond description by applying statistical techniques to test formulated hypotheses and examine relationships between variables.

A cross-sectional design was followed, wherein data were collected at a single point in time from respondents. This approach is appropriate for consumer behaviour studies where the objective is to capture prevailing attitudes and decision-making patterns. The design enables both comparison (through t-tests) and association analysis (through chi-square tests), ensuring methodological rigor.

V. DATA COLLECTION

The study is based on both primary and secondary data sources to ensure comprehensive analysis.

Primary Data

Primary data were collected through a structured questionnaire administered to 100 respondents.

The questionnaire was designed to ensure clarity, simplicity, and ease of response. Closed-ended questions were used to facilitate statistical analysis. Data collection was conducted through direct interaction and online distribution methods.

Secondary Data

Secondary information was obtained from academic textbooks, peer-reviewed journal articles, and published research papers related to consumer behaviour and technology adoption. These sources helped in developing theoretical foundations, framing hypotheses, and supporting the interpretation of findings.

Sample Size

The total sample size for the study was 100 respondents. This size was considered appropriate for conducting basic inferential statistical analysis such as independent sample t-tests and chi-square tests. A sample of 100 provides sufficient variability to examine differences and associations while remaining manageable for structured analysis.

Sampling Method

The study employed a non-probability convenience sampling technique. Respondents were selected based on accessibility and willingness to participate. This method was chosen due to time constraints and ease of data collection.

Statistical Tools Used

To analyze the collected data and test the hypotheses, the following statistical tools were applied:

1. Independent Sample t-test (Three Tests)

The independent sample t-test was used to compare the mean scores of two independent groups.

The t-test helps determine whether observed mean differences are statistically significant or due to random variation. A 5% significance level ($\alpha = 0.05$) was used as the decision criterion.

2. Chi-Square Test of Independence (Three Tests)

The Chi-square test was employed to examine associations between categorical variables. The Chi-square statistic evaluates whether there is a statistically significant relationship between two categorical variables. If the p-value is less than 0.05, the null hypothesis of independence is rejected.

Level of Significance

All hypotheses were tested at a 5% level of significance ($\alpha = 0.05$). This means that results were considered statistically significant only if the probability value (p-value) was less than 0.05. The 5% level is commonly accepted in social science research as it balances the risk of Type I error while maintaining reasonable sensitivity to detect real effects.

Data Analysis and Interpretation

t-test 1 Satisfaction by Buyer Type

Buyer Type	N	Mean	Std. Deviation	Std. Error Mean
First-time	51	3.59	0.92	0.129
Repeat	49	3.69	0.88	0.126

Levene's Test for Equality of Variances

F	Sig.
0.214	0.645

t-test for Equality of Means

t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
-0.581	98	0.562	-0.10	0.173

Interpretation

Levene's Test shows $p = 0.645 (> 0.05)$, indicating equal variances can be assumed. The independent sample t-test reveals that the difference in satisfaction between first-time ($M = 3.59$) and repeat buyers ($M = 3.69$) is not statistically significant ($t = -0.581, p = 0.562$). Since $p > 0.05$, the null hypothesis is accepted and H_1 is rejected. This indicates that buyer type does not significantly influence satisfaction levels in the sample. The small mean difference (-0.10) suggests practical similarity between the two groups.

t-test 2 Perceived Value by Age Group

Age Group	N	Mean	Std. Deviation	Std. Error Mean
≤35 Years	73	2.79	0.87	0.102
>35 Years	27	2.76	0.91	0.175

Levene's Test

F	Sig.
0.118	0.732

t-test for Equality of Means

t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
0.171	98	0.865	0.03	0.175

Interpretation

Levene's Test ($p = 0.732$) confirms homogeneity of variances. The t-test result ($t = 0.171, p = 0.865$) indicates no statistically significant difference in perceived value between younger and older respondents. Since $p > 0.05$, H_2 is rejected. Although younger consumers show a marginally higher mean score, the difference is negligible and statistically insignificant. Age does not appear to be a determining factor in perceived smartphone value.

t-test 3 Feature Importance by Gender

Gender	N	Mean	Std. Deviation	Std. Error Mean
Male	54	2.91	1.34	0.182
Female	46	2.76	1.29	0.190

Levene's Test

F	Sig.
0.367	0.546

t-test for Equality of Means

t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
0.535	98	0.594	0.15	0.280

Interpretation

Levene's Test indicates equal variances ($p = 0.546$). The t-test result ($t = 0.535, p = 0.594$) shows no significant difference between male and female respondents regarding feature importance. As $p > 0.05$, H_3 is rejected. The mean difference of 0.15 is minimal and statistically insignificant. Therefore, feature preference appears consistent across genders in this study.

CHI-SQUARE TESTS

χ^2 Test 1 Gender \times Brand Preference Cross tabulation

Gender	Brand A	Brand B	Brand C	Total
Male	27	14	13	54
Female	14	19	13	46
Total	41	33	26	100

Chi-Square Tests

Test	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.267	2	0.118
Likelihood Ratio	4.312	2	0.115

Interpretation

The Pearson Chi-Square value is 4.267 with $p = 0.118$. Since $p > 0.05$, there is no statistically significant association between gender and brand preference. Therefore, H4 is rejected. Brand choice appears independent of gender in this sample. This suggests marketers should not rely solely on gender-based segmentation for brand positioning strategies.

χ^2 Test 2 Education \times Purchase Channel Cross tabulation

Education	Online	Offline	Total
Graduate	37	22	59
High School	10	10	20
Postgraduate	11	10	21
Total	58	42	100

Chi-Square Tests

Test	Value	df	Sig.
Pearson Chi-Square	1.335	2	0.513

Interpretation

The chi-square result ($\chi^2 = 1.335$, $p = 0.513$) indicates no significant relationship between education level and purchase channel. H5 is rejected. Consumers across educational categories use both online and offline channels similarly. This reflects widespread adoption of digital purchasing platforms irrespective of educational background.

χ^2 Test 3 Income \times Purchase Intention Cross tabulation

Income	Yes	No	Total
<25k	5	20	25
25k-50k	12	29	41
50k-1L	6	19	25
>1L	2	7	9
Total	25	75	100

Chi-Square Tests

Test	Value	df	Sig.
Pearson Chi-Square	0.782	3	0.854

Interpretation

The chi-square value ($\chi^2 = 0.782$, $p = 0.854$) indicates no significant association between income level and short-term purchase intention. Since $p > 0.05$, H6 is rejected. Purchase planning appears evenly distributed across income groups. This suggests that smartphone demand is not restricted to a particular income segment within the sample.

Hypothesis Testing Summary Table

Hypothesis	Test Used	Test Statistic	p-value	Decision at 5%
H1	t-test	-0.581	0.562	Rejected
H2	t-test	0.171	0.865	Rejected
H3	t-test	0.535	0.594	Rejected
H4	Chi-square	4.267	0.118	Rejected
H5	Chi-square	1.335	0.513	Rejected
H6	Chi-square	0.782	0.854	Rejected

VI. FINDINGS

1. The comparison between first-time and repeat buyers showed no statistically significant difference in satisfaction levels. Although repeat buyers reported a slightly higher mean satisfaction score, the difference was not meaningful at the 5% significance level. This indicates that satisfaction is relatively consistent regardless of purchase experience.
2. The analysis revealed no significant difference in perceived value between younger (≤ 35 years) and older (> 35 years) respondents. While younger consumers demonstrated marginally higher perceived value scores, the difference was statistically insignificant. This suggests that value perception towards smartphones is broadly similar across age groups.
3. The results indicated that male and female respondents attach comparable importance to smartphone features. The absence of significant gender-based differences suggests that technical

attributes and functionality are universally valued among consumers.

4. The chi-square test demonstrated that brand preference is independent of gender in this sample. Both male and female respondents showed similar distribution across brands, indicating that brand positioning may not require gender-specific targeting.
5. The relationship between educational qualification and choice of purchase channel (online or offline) was found to be statistically insignificant. This implies that digital purchasing behaviour has become widespread and is not limited to a specific educational segment.
6. The study found no significant association between income category and intention to purchase a smartphone in the near future. Purchase planning appears evenly distributed across income groups, indicating that smartphones are considered essential products rather than luxury goods.

VII. SUGGESTIONS

1. Since demographic variables did not show significant influence, companies should emphasize value-based positioning, highlighting performance, durability, battery life, and technological innovation rather than relying solely on demographic targeting.
2. As feature importance was consistently valued across respondents, marketers should promote key specifications such as camera quality, processor speed, storage capacity, and software updates in advertising campaigns.
3. With a considerable proportion of respondents purchasing online, companies should invest in improving digital platforms, ensuring easy navigation, secure payment systems, and transparent return policies.
4. Since income did not significantly affect purchase intention, pricing strategies should remain competitive and flexible. Offering installment payment options and exchange programs can further encourage purchase decisions.
5. Although satisfaction levels were similar across buyer types, companies should strengthen after-sales service and customer support to maintain loyalty and encourage repeat purchases.
6. Future strategies should incorporate psychographic and behavioural segmentation variables such as

lifestyle, technology usage patterns, and brand loyalty levels for deeper market insights.

VIII. CONCLUSION

This study examined consumer buying behaviour towards smartphones using empirical data from 100 respondents and applied statistical tools to test formulated hypotheses. The findings reveal that demographic variables such as age, gender, education, and income do not significantly influence purchase decisions within the sample. Instead, product-related factors such as perceived value and feature evaluation appear to play a more central role. The absence of significant demographic differences suggests that smartphones have become universally accepted consumer products across segments. The study highlights the importance of value-driven marketing strategies over demographic-based segmentation. Although limited in scope, the research provides a structured analytical framework for understanding consumer decision-making in technology markets.

IX. FUTURE RESEARCH DIRECTIONS

Future studies should include a larger sample size across multiple regions to enhance external validity. Stratified or probability sampling techniques may improve representativeness. Further research can incorporate variables such as lifestyle, personality traits, technology adoption readiness, brand loyalty, and consumer innovativeness to gain deeper behavioural insights. A focused comparative analysis between specific smartphone brands could provide more detailed understanding of brand positioning and competitive advantages. Future studies may apply regression analysis, factor analysis, structural equation modeling (SEM), or machine learning approaches to develop predictive models of consumer behaviour.

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