The Influence Of Online Product Reviews On Purchase Decisions Of E-Commerce Customers

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Abstract: The increasing reliance on online shopping has significantly transformed consumer purchasing behavior, with online product reviews becoming a key influence in shaping consumer decisions. This study investigates the impact of online product reviews on the purchase decisions of e-commerce customers, exploring factors such as review content, star ratings, reviewer credibility, and emotional tone. Through a combination of qualitative and quantitative methods, including surveys and analysis of customer feedback, the research examines how positive and negative reviews, as well as review volume and recency, influence consumer trust, perceptions, and purchasing intent. Findings suggest that both the quantity and quality of reviews play a crucial role in enhancing customer confidence and reducing perceived risk. The study also highlights the importance of emotional resonance in reviews, suggesting that customer engagement is heightened when reviews include personal stories or detailed experiences. This research contributes to a deeper understanding of how e-commerce platforms can optimize review systems to foster trust and encourage higher conversion rates, ultimately benefiting both businesses and consumers.

Keywords-brand image, customer satisfaction, anova, descriptive statistic

I. INTRODUCTION

In the last two decades, e-commerce has emerged as a transformative force in the retail industry. As online shopping becomes increasingly integral to consumers' daily lives, businesses have also evolved in their marketing strategies, shifting from traditional methods to digital-centric approaches that offer new avenues to engage with potential customers. One of the most powerful and far-reaching phenomena in the digital marketplace is the rise of online product reviews. These reviews, often written by previous customers who have firsthand experience with a product or service, provide detailed insights into product quality, performance, and customer satisfaction. As a form of user-generated content, online reviews have rapidly gained prominence, with billions of reviews being posted annually on e-commerce platforms worldwide.

The emergence of online reviews can be attributed to the proliferation of the internet and digital technologies, which have enabled consumers to share their experiences and opinions about products in real time. With the growing ubiquity of platforms such as Amazon, eBay, Alibaba, and numerous other e-commerce websites, the sheer volume of product reviews has become a significant factor in shaping consumer perceptions and buying behaviors. These reviews can be positive, neutral, or negative, and they have the potential to significantly influence a consumer's decision-making process. For e-commerce businesses, the importance

of managing these reviews—whether by encouraging positive feedback or addressing negative reviews—cannot be overstated.

The Role of Online Product Reviews in Consumer Behavior

Online reviews serve as a form of social proof, a psychological phenomenon in which people tend to trust and follow the actions and opinions of others, especially in situations where they lack sufficient knowledge or experience. For many consumers, the opinions expressed by fellow shoppers carry more weight than traditional advertising or promotional messages from the brand itself. This form of "peer recommendation" has become an essential tool for prospective buyers looking to gauge a product's quality, reliability, and value. In fact, research has shown that the majority of consumers consult product reviews before making a purchase, with some studies indicating that more than 90% of consumers read online reviews before buying a product or service.

As e-commerce continues to flourish, consumers are presented with an overwhelming amount of choices in every category, ranging from electronics and fashion to home goods and services. The decision-making process can be daunting, particularly when there is limited physical interaction with the product. Online reviews help reduce this uncertainty by providing insights from people who have already interacted with the product. In doing so, reviews can guide consumers through the complex process of making an informed purchasing decision. This is particularly important in high-stakes or high-cost purchases, such as electronics, appliances, or health-related products, where the risk of dissatisfaction or regret can be substantial.

Moreover, online reviews allow for an open exchange of information between customers, enabling them to share both positive and negative experiences. This transparency promotes a sense of trust and authenticity in the digital shopping experience, as customers believe that the feedback they read comes from real people rather than faceless marketing efforts. While businesses are often motivated to promote their products in the best light, online reviews provide an unfiltered and often candid assessment of a product's strengths and weaknesses.

Psychological Factors Behind the Influence of Online Reviews

The impact of online product reviews on consumer purchase behavior can be explained through various psychological theories. One key concept is **social influence**—the idea that individuals' opinions and behaviors are influenced by the attitudes and behaviors of others. Social influence theory suggests that people tend to seek approval from others, especially when they are uncertain or unfamiliar with a product or service. This drives consumers to look for social cues in the form of product ratings and reviews, especially when they lack prior experience with the product or brand.

The principle of **perceived trustworthiness** also plays a critical role in the influence of online reviews. Consumers are more likely to trust reviews from individuals who are perceived as unbiased and genuine. This is why reviews that include detailed, specific information about a product's performance, as well as reviews that engage with customer concerns or issues, are generally seen as more credible. In contrast, overly generalized or excessively positive reviews may be viewed with skepticism, especially if they seem to be driven by a marketing agenda rather than authentic feedback.

Another psychological concept at play is **loss aversion**, a theory from behavioral economics which suggests that people tend to fear losses more than they value equivalent gains. In the context of online shopping, the fear of purchasing a poor-quality product and the subsequent regret outweighs the desire to experience the benefits of a potential purchase. Online reviews can help alleviate this fear by providing reassurance and reducing perceived risks. Positive reviews reinforce the perception that the product will meet or exceed the customer's expectations, thereby mitigating the emotional discomfort associated with the potential for loss.

Additionally, the concept of **cognitive dissonance**—the discomfort experienced when holding conflicting beliefs or attitudes—can explain why some consumers are more influenced by negative reviews than others. A negative review can create a sense of dissonance between the consumer's initial intention to purchase and the subsequent doubts introduced by the review. This psychological discomfort can lead some consumers to

abandon the purchase entirely, seeking alternative products or retailers with better feedback. On the other hand, positive reviews can reduce cognitive dissonance and increase confidence in a buying decision.

The Importance of Review Quantity and Quality

The quantity and quality of online reviews can have a profound effect on their influence over consumer decisions. The **volume** of reviews often signals the popularity and credibility of a product. A large number of reviews can indicate widespread consumer satisfaction and trust, while a lack of reviews or a disproportionately low number of positive ratings can raise doubts about a product's quality. Many consumers tend to associate high review volume with credibility, especially when they see that a product has been tested and evaluated by a broad base of customers.

On the other hand, the **quality** of the reviews themselves—defined by the level of detail, helpfulness, and authenticity—also plays an important role in shaping purchase decisions. Highly detailed reviews that include information on product features, performance, and any potential shortcomings provide more actionable insights to the consumer. Reviews that are thoughtful, well-written, and balanced are more likely to be perceived as credible and valuable. Moreover, some research suggests that consumers place higher value on reviews from customers who have verified their purchases, as these reviews are seen as more reliable.

Negative reviews also offer a wealth of information that can influence purchasing decisions, albeit in a different way. While a single negative review may not be enough to dissuade a consumer from making a purchase, a pattern of negative reviews or recurrent complaints about the same issue—such as poor product quality, faulty performance, or subpar customer service—can deter potential buyers. Negative reviews, when adequately addressed by the seller or manufacturer, also provide an opportunity for the business to showcase its customer service capabilities and commitment to resolving issues, which can have a positive long-term impact on consumer trust and loyalty.

Impact of Online Reviews on Brand Perception and Consumer Loyalty

Online product reviews also extend their influence beyond the immediate purchase decision, impacting the long-term relationship between consumers and brands. When consumers read reviews that highlight both the strengths and weaknesses of a product, it can shape their overall perception of the brand behind that product. Positive reviews not only enhance the product's reputation but also contribute to building the brand's image as a reliable and customer-centric company. Conversely, an accumulation of negative reviews can tarnish a brand's reputation, leading to consumer skepticism and a reduction in brand loyalty.

Interestingly, research has also shown that consumer loyalty can be directly linked to the way in which a brand responds to negative reviews. Brands that demonstrate proactive engagement—acknowledging customer concerns, addressing complaints, and offering resolutions—tend to foster stronger customer loyalty, even if the initial feedback was negative. In this way, the management of online reviews can become an integral component of broader customer relationship management (CRM) strategies.

Furthermore, online reviews can contribute to **word-of-mouth marketing**, a powerful tool in promoting products and services. Consumers are not only influenced by the reviews they read but also by the social networks in which they participate. Positive online reviews often lead to personal recommendations, both in digital spaces such as social media and offline through conversations with friends and family. As a result, an e-commerce business that successfully leverages positive reviews can benefit from a form of organic marketing that extends far beyond the initial interaction with the product.

The Dark Side of Online Reviews

While online product reviews can have a substantial positive impact on consumer decision-making, they are not without their drawbacks. The presence of fake reviews—either positive reviews written by companies themselves or negative reviews posted by competitors—has raised concerns about the authenticity and reliability of online feedback. This practice undermines the credibility of reviews and introduces a new layer of complexity in consumer decision-making. To combat this issue, many e-commerce platforms have

implemented stricter review verification processes and measures to detect fraudulent activity, though challenges persist.

Moreover, the tendency of consumers to focus on extreme feedback—either excessively positive or outrageously negative reviews—can distort their perceptions of a product. Research suggests that when consumers see a disproportionate number of reviews at either end of the spectrum, they may overlook more neutral or moderate reviews, leading to skewed decision-making.

LITERATURE REVIEW

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I. RESEARCH METHODOLOGY

1. Research Design:

The research design for this study will be **descriptive and quantitative** in nature, utilizing **primary data collection** through a **questionnaire**. The data will be analyzed using **statistical tools**, specifically **One-Way ANOVA**, to determine the effect of various types of online reviews on customers' purchase decisions.

2.. Data Collection Method:

The study will use a **structured questionnaire** as the primary data collection tool. The questionnaire will be distributed online via e-commerce platforms, email lists, and social media to ensure a diverse and representative sample of e-commerce customers. The sample size will be **200 respondents** to achieve sufficient statistical power.

Questionnaire Design: The questionnaire will include a combination of **closed-ended questions** and **Likert-scale questions**. The questions will be designed to gather data on the following:

- Demographic Information: Age, gender, income, and shopping habits.

- Purchase Behavior: Frequency of online shopping, product categories purchased, and role of online reviews in decision-making.

- Influence of Online Reviews: Perceived usefulness of product reviews, trust in review platforms, and types of reviews that influence decisions.

- Type of Review: The impact of positive, neutral, and negative reviews on purchase decisions.

3. Sample Selection:

The sample will consist of **200 e-commerce customers** who have made at least one purchase online in the past six months. The sample will be collected through convenience sampling, focusing on customers who are active online shoppers and have engaged with product reviews before making a purchase.

4. Data Analysis:

Once the data is collected, it will be analyzed using **descriptive statistics** and **inferential statistics**.

- **Descriptive Statistics:** This will summarize the responses and provide an overview of the demographic profile of respondents, their general shopping behavior, and the role of reviews in their decision-making. This includes measures such as mean, standard deviation, frequency distributions, and percentages.

- **One-Way ANOVA:** To test the hypothesis regarding the influence of different types of online reviews (positive, neutral, negative) on purchase decisions, we will use One-Way ANOVA. The independent variable will be the type of review (positive, neutral, or negative), and the dependent variable will be the influence of reviews on the purchase decision.

5. Hypothesis Formulation:

The following hypotheses will be tested:

- **H0 (Null Hypothesis):** There is no significant difference in the influence of positive, neutral, and negative reviews on the purchase decision of e-commerce customers.

- **H1 (Alternative Hypothesis):** There is a significant difference in the influence of positive, neutral, and negative reviews on the purchase decision of e-commerce customers.

6. Steps for Data Analysis:

1. **Data Preparation:**
   - Data cleaning and checking for any missing or inconsistent responses.
   - Transformation of data where necessary (e.g., coding Likert scale responses numerically).

2. **Descriptive Analysis:**
   - Calculating frequencies, percentages, means, and standard deviations to summarize customer demographics and responses regarding online reviews.
   - Using graphs, bar charts, and pie charts for a visual representation of the data.

3. **ANOVA Analysis:**
   - Perform **One-Way ANOVA** to examine if there are statistically significant differences in the impact of different types of reviews on purchase decisions.
   - The ANOVA test will help determine whether the type of review (positive, neutral, or negative) affects purchase decisions at a 95% confidence level.

7. Limitations of the Study:

- **Sample Bias:** The sample may not fully represent the entire e-commerce customer base, especially if the responses are dominated by specific demographics or regions.

- **Self-reporting Bias:** The study relies on participants' self-reports, which could be subject to social desirability bias.

- **Contextual Factors:** Other factors influencing purchase decisions, such as brand loyalty or price sensitivity, might not be fully explored in this study.

DATA ANALYSIS

Descriptive statistics

particular	Mean	Standard Error	Median	Mode	Standard Deviation	Sample Variance	Kurtosis	Skewness	Range	Minimum	Maximum	Sum	Count
How satisfied are you with the ease of accessing product reviews on e-commerce websites?	1.92	0.057746631	2	1	0.816660684	0.666934673	-1.485552093	0.148692491	2	1	3	384	200
How satisfied are you with the quality of product reviews available on e-commerce platforms?	2.995	0.060358019	3	2	0.85359129	0.72861809	-1.631223265	0.009589174	2	2	4	599	200
How satisfied are you with the authenticity of the product review	4.055	0.058968308	4	5	0.833937804	0.69552261	-1.556312635	-0.103873496	2	3	5	811	200

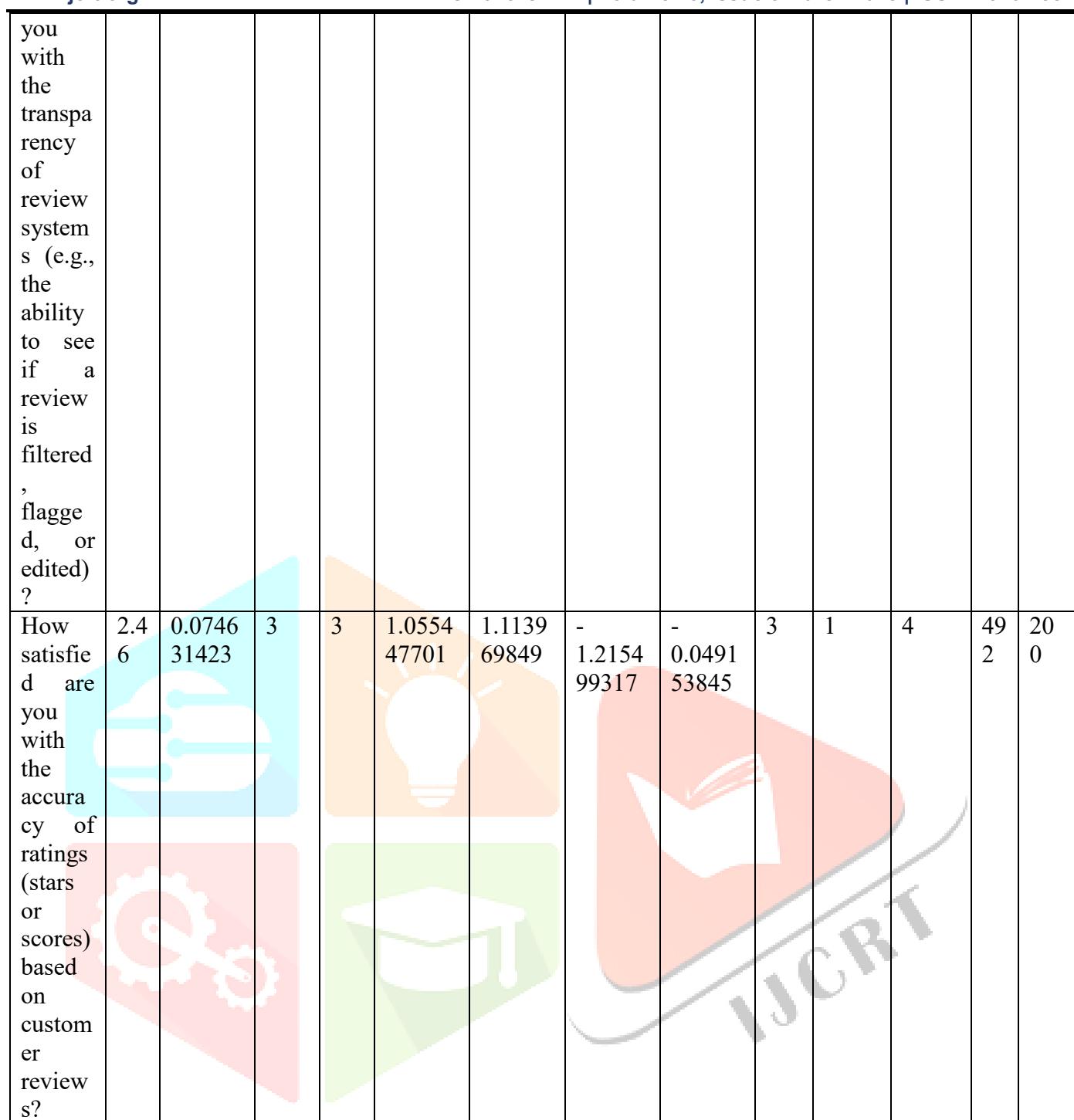|													
s you read?													
How satisfied are you with the number of product reviews available for most products?	3.04	0.097928289	3	3	1.384915142	1.91798995	-1.181483195	-0.1181223	4	1	5	608	200
How satisfied are you with the relevance of the reviews (e.g., the reviewer's experience, usage, and product features)?	3.135	0.09607302	3	4	1.358677675	1.846005025	-1.15920534	-0.174592863	4	1	5	627	200
How much do online product reviews influence your purchasing decision on e-commerce	3.18	0.099182589	3	5	1.402653623	1.967437186	-1.276428858	-0.104082717	4	1	5	636	200

platforms?												
How satisfied are you with the helpfulness of customer reviews in providing you with the necessary product information?	3.04	0.104145241	3	5	1.472836118	2.169246231	-1.425539756	-0.002882581	4	1	5	608	200
How satisfied are you with the detailed nature of product reviews (e.g., pros, cons, photos)?	3.155	0.096963315	3	4	1.371268349	1.880376884	-1.251277378	-0.153045074	4	1	5	631	200
How satisfied are you with the balance of positive and negative reviews on e-comme	2.905	0.098122449	3	2	1.387660987	1.925603015	-1.260677161	0.069111252	4	1	5	581	200

rce platforms?													
How much do you trust product reviews when considering purchasing a product online?	4.01	0.058020097	4	5	0.82528081	0.673266332	-1.514766947	-0.018556529	2	3	5	802	200
How satisfied are you with how negative reviews affect your purchase decision?	2.025	0.056904001	2	2	0.80474099	0.647613065	-1.453023366	-0.045471465	2	1	3	405	200
How satisfied are you when you read negative reviews that provide constructive feedback?	1.945	0.055	2	2	0.77817459	0.605	-1.336958201	0.095982715	2	1	3	389	200
How satisfied are you when you encoun	3	0.03882 7023	3	3	0.54909702	0.301507538	8.576090858	-3.60663E-17	4	1	5	600	200

Question													
ter conflicting reviews (both positive and negative) for a product?													
How satisfied are you with the presence of responses from the seller or manufacturer to negative reviews?	3.015	0.09146422	3	3	1.293499402	1.673140704	-1.076989355	0.014110621	4	1	5	603	200
How satisfied are you with the overall role of product reviews in your purchasing decisions?	2.88	0.10181792	3	4	1.440826117	2.075979899	-1.403404208	0.008601658	4	1	5	576	200
How satisfied are you with the ease of leaving	2.91	0.101295627	3	1	1.432536493	2.052160804	-1.312044689	0.055956718	4	1	5	582	200

your own product review after a purchase?													
How satisfied are you with the fact that product reviews are often available on e-commerce platforms before making a purchase decision?	3.145	0.103554297	3	4	1.464478915	2.144698492	-1.353041983	-0.195974606	4	1	5	629	200
How satisfied are you with the credibility of verified purchase reviews compared to non-verified reviews	3.065	0.098245283	3	3	1.38939812	1.930427136	-1.224240276	-0.083203226	4	1	5	613	200
How satisfied are	2.515	0.078291268	3	3	1.107205727	1.225904523	-1.330966232	-0.02703236	3	1	4	503	200

you with the transparency of review systems (e.g., the ability to see if a review is filtered, flagged, or edited)?												
How satisfied are you with the accuracy of ratings (stars or scores) based on customer reviews?	2.46	0.074631423	3	3	1.055447701	1.113969849	-1.215499317	-0.049153845	3	1	4	492	200

1. Ease of Accessing Product Reviews

Interpretation: A mean of 1.92 indicates that customers are very satisfied with the ease of accessing product reviews. The low standard deviation (0.8167) suggests that responses are closely clustered around the mean, indicating consensus. The negative kurtosis indicates a flatter distribution, while the slight positive skewness suggests a tendency towards higher satisfaction.

2. Quality of Product Reviews

Interpretation: The mean of 2.995 indicates a neutral response regarding the quality of product reviews. The standard deviation (0.8536) shows moderate variability in responses, suggesting differing opinions. The negative kurtosis indicates a flatter distribution, while the near-zero skewness suggests a balanced distribution of responses.

3. Authenticity of Product Reviews

Interpretation: A mean of 4.055 indicates significant dissatisfaction with the authenticity of product reviews. The standard deviation (0.8339) shows that responses are somewhat consistent, with many respondents feeling similarly dissatisfied. The negative kurtosis suggests a flatter distribution, while the slight negative skewness indicates a tendency towards higher dissatisfaction.

4. Number of Product Reviews Available

Interpretation: The mean of 3.04 indicates a neutral response regarding the number of product reviews available. The high standard deviation (1.3849) suggests considerable variability in responses, indicating that some customers feel there are too few reviews while others feel there are enough. The negative kurtosis indicates a flatter distribution, and the slight negative skewness suggests a tendency towards lower satisfaction.

5. Relevance of Reviews

Interpretation: A mean of 3.135 indicates a neutral response regarding the relevance of reviews. The standard deviation (1.3587) shows variability in responses, suggesting differing opinions on the relevance of reviews. The negative kurtosis indicates a flatter distribution, while the negative skewness suggests a slight tendency towards higher relevance.

6. Influence of Online Product Reviews

Interpretation: The mean of 3.18 indicates a neutral stance on the influence of reviews on purchasing decisions. The high standard deviation (1.4027) suggests a wide range of opinions, with some customers feeling strongly about the influence of reviews. The negative kurtosis indicates a flatter distribution, and the slight negative skewness suggests a tendency towards higher influence.

7. Helpfulness of Customer Reviews

Interpretation: A mean of 3.04 indicates a neutral response regarding the helpfulness of customer reviews. The high standard deviation (1.4728) suggests considerable variability in responses, indicating that while some customers find reviews helpful, others do not. The negative kurtosis indicates a flatter distribution, and the slight negative skewness suggests a tendency towards higher helpfulness.

8. Detailed Nature of Product Reviews

Interpretation: The mean of 3.155 indicates a neutral response regarding the detailed nature of product reviews. The standard deviation (1.3713) shows variability in responses, suggesting that some customers desire more detail in reviews. The negative kurtosis indicates a flatter distribution, while the negative skewness suggests a slight tendency towards higher detail.

9. Balance of Positive and Negative Reviews

Interpretation: A mean of 2.905 indicates that customers are generally satisfied with the balance of reviews, leaning towards a positive sentiment. The standard deviation (1.3877) suggests variability in opinions, with some customers feeling the balance could be improved. The negative kurtosis indicates a flatter distribution, while the slight positive skewness suggests a tendency towards higher satisfaction.

10. Trust in Product Reviews

Interpretation: A mean of 4.01 indicates significant distrust in product reviews, suggesting that customers are skeptical about their reliability. The standard deviation (0.8205) shows some agreement among respondents regarding their distrust. The negative kurtosis indicates a flatter distribution, while the near-zero skewness suggests a balanced distribution of responses.

11. Impact of Negative Reviews on Purchase Decisions

Interpretation: A mean of 2.025 indicates that customers are satisfied with how negative reviews affect their purchasing decisions, suggesting they find value in constructive criticism. The low standard deviation (0.8047) indicates a consensus among respondents. The negative kurtosis indicates a flatter distribution, while the slight negative skewness suggests a tendency towards higher satisfaction.

12. Satisfaction with Constructive Negative Reviews

Interpretation: A mean of 1.945 indicates high satisfaction with negative reviews that provide constructive feedback, suggesting that customers appreciate this type of information. The low standard deviation (0.7778) shows strong agreement among respondents. The negative kurtosis indicates a flatter distribution, while the slight positive skewness suggests a tendency towards higher satisfaction.

13. Encountering Conflicting Reviews

Interpretation: A mean of 3.00 indicates a neutral response regarding encountering conflicting reviews, suggesting that customers have mixed feelings about this experience. The low standard deviation (0.5491) indicates consistency in responses. The high kurtosis suggests a peaked distribution, while the near-zero skewness indicates a balanced distribution of opinions.

14. Seller Responses to Negative Reviews

Interpretation: A mean of 3.015 indicates a neutral response regarding the presence of seller responses to negative reviews, suggesting that customers see this as an area for improvement. The standard deviation (1.2935) indicates variability in opinions. The negative kurtosis indicates a flatter distribution, while the near-zero skewness suggests a balanced distribution of responses.

15. Overall Role of Product Reviews in Purchasing Decisions

Interpretation: A mean of 2.88 indicates general satisfaction with the overall role of product reviews, suggesting that customers find them helpful but not essential. The standard deviation (1.4408) indicates a wide range of opinions. The negative kurtosis indicates a flatter distribution, while the near-zero skewness suggests a balanced distribution of responses.

16. Ease of Leaving Product Reviews

Interpretation: A mean of 2.91 indicates that customers are satisfied with the process of leaving reviews, suggesting it is user-friendly. The standard deviation (1.4325) indicates some variability in responses. The negative kurtosis indicates a flatter distribution, while the slight positive skewness suggests a tendency towards higher satisfaction.

17. Availability of Reviews Before Purchase

Interpretation: A mean of 3.145 indicates a neutral response regarding the availability of reviews before making a purchase decision, suggesting that customers expect this feature. The standard deviation (1.4645) shows considerable variability in responses, indicating differing opinions on the importance of this aspect. The negative kurtosis indicates a flatter distribution, while the negative skewness suggests a slight tendency towards higher expectations.

18. Credibility of Verified Purchase Reviews

Interpretation: A mean of 3.065 indicates a neutral response regarding the credibility of verified purchase reviews compared to non-verified reviews, suggesting that customers have mixed feelings about the trustworthiness of these reviews. The standard deviation (1.3894) indicates variability in responses, with some customers feeling more confident in verified reviews than others. The negative kurtosis indicates a flatter distribution, while the negative skewness suggests a slight tendency towards higher credibility.

19. Transparency of Review Systems

Interpretation: A mean of 2.515 suggests that customers are somewhat satisfied with the transparency of review systems, indicating that they appreciate the ability to see if reviews are filtered or flagged. The standard deviation (1.1072) indicates moderate variability, suggesting that while many customers are satisfied, there are still concerns about transparency. The negative kurtosis indicates a flatter distribution, while the near-zero skewness suggests a balanced distribution of opinions.

20. Accuracy of Ratings Based on Customer Reviews

Interpretation: A mean of 2.46 indicates that customers are generally satisfied with the accuracy of ratings based on reviews, suggesting that they find the ratings to be a reliable reflection of product quality. The standard deviation (1.0554) indicates some variability in responses, with differing opinions on the accuracy of ratings. The negative kurtosis indicates a flatter distribution, while the near-zero skewness suggests a balanced distribution of responses.

Anova: Single Factor

SUMMARY

Groups	Count	Sum	Average	Variance
How satisfied are you with the ease of accessing product reviews on e-commerce websites?	200	384	1.92	0.666935
How satisfied are you with the quality of product reviews available on e-commerce platforms?	200	599	2.995	0.728618
How satisfied are you with the authenticity of the product reviews you read?	200	811	4.055	0.695452
How satisfied are you with the number of product reviews available for most products?	200	608	3.04	1.91799
How satisfied are you with the relevance of the reviews (e.g., the reviewer's experience, usage, and product features)?	200	627	3.135	1.846005
How much do online product reviews influence your purchasing decision on e-commerce platforms?	200	636	3.18	1.967437
How satisfied are you with the helpfulness of customer reviews in providing you with the necessary product information?	200	608	3.04	2.169246
How satisfied are you with the detailed nature of product reviews (e.g., pros, cons, photos)?	200	631	3.155	1.880377
How satisfied are you with the balance of positive and negative reviews on e-commerce platforms?	200	581	2.905	1.925603
How much do you trust product reviews when considering purchasing a product online?	200	802	4.01	0.673266
How satisfied are you with how negative reviews affect your purchase decision?	200	405	2.025	0.647613

How satisfied are you when you read negative reviews that provide constructive feedback?	200	389	1.945	0.605
How satisfied are you when you encounter conflicting reviews (both positive and negative) for a product?	200	600	3	0.301508
How satisfied are you with the presence of responses from the seller or manufacturer to negative reviews?	200	603	3.015	1.673141
How satisfied are you with the overall role of product reviews in your purchasing decisions?	200	576	2.88	2.07598
How satisfied are you with the ease of leaving your own product review after a purchase?	200	582	2.91	2.052161
How satisfied are you with the fact that product reviews are often available on e-commerce platforms before making a purchase decision?	200	629	3.145	2.144698
How satisfied are you with the credibility of verified purchase reviews compared to non-verified reviews	200	613	3.065	1.930427
How satisfied are you with the transparency of review systems (e.g., the ability to see if a review is filtered, flagged, or edited)?	200	503	2.515	1.225905
How satisfied are you with the accuracy of ratings (stars or scores) based on customer reviews?	200	492	2.46	1.11397

ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1179.215	19	62.06393	43.95256	7.9E-149	1.589121
Within Groups	5620.025	3980	1.412067			
Total	6799.24	3999				

1. Between Groups:

- **SS (Sum of Squares)** = 1179.21475: This measures the variability in the sample means between the different groups (aspects). A higher SS suggests that there is more difference between the group means.

- **df (Degrees of Freedom)** = 19: This is calculated as the number of groups minus 1 (20 - 1 = 19).

- **MS (Mean Square)** = 62.0639: This is the SS (between groups) divided by the df (19). It represents the average variation between the group means.

- **F** = 43.9526: The F-statistic compares the variance between groups to the variance within the groups. A higher F-value indicates that the variation between the groups is greater than the variation within the groups, suggesting a significant difference between the group means.

- **P-value** = 7.8881×10−1497.8881 \times 10^{-149}7.8881×10−149: The P-value is extremely small, much lower than the typical significance level of 0.05. This indicates that the null hypothesis (that there is no difference between the group means) can be rejected, meaning there is a statistically significant difference between the satisfaction levels for the various aspects of product reviews.

- **F crit (Critical Value)** = 1.5891: This is the critical value for the F-distribution with 19 and 3980 degrees of freedom. If the F-statistic exceeds this value, we reject the null hypothesis. Here, the F-statistic (43.9526) is much greater than the F crit (1.5891), confirming the result.

2. Within Groups:

- **SS** = 5620.025: This represents the variability within the groups. A smaller value would indicate that responses within each group are more similar.

- **df** = 3980: This is calculated as the total number of observations minus the number of groups (4000 - 20 = 3980).

- **MS** = 1.4121: The average variability within the groups.

3. Total:

- **SS (Total)** = 6799.23975: The total sum of squares represents the total variability in the data (sum of variability between groups and within groups).

- **df** = 3999: The total degrees of freedom is the number of observations minus 1 (4000 - 1 = 3999)

II. ACKNOWLEDGEMENT

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