

Factors Influencing Consumers' Behavior Towards Chinese Products on E-Commerce Platforms in Thailand

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ABSTRACT. The rapid growth of e-commerce in Thailand has reshaped consumer purchasing behavior, particularly concerning Chinese-branded products on leading platforms such as Shopee and Lazada. This study investigates the key factors influencing Thai consumers' purchasing decisions regarding Chinese-branded smartphones. By employing a machine learning model, the research identifies determinants such as product attributes, brand reputation, pricing strategies, and consumer reviews that significantly impact purchasing choices. The study utilizes data collected from 300 students across six regions in Thailand. It applies analytical methods such as Association Rule Mining (ARM), Support Vector Machine (SVM), and Decision Tree (DT) techniques to examine consumer behavior patterns. The findings reveal that detailed product descriptions, competitive pricing, and social influence are crucial in consumer decision-making. Mobile commerce and digital payment methods have also shaped Thailand's e-commerce landscape. The insights derived from this study provide strategic recommendations for businesses aiming to enhance market positioning, improve customer engagement, and develop targeted marketing strategies to boost sales of Chinese-branded smartphones in Thailand.

1. Introduction

1.1 Research Background

In recent years, Thailand has experienced remarkable growth in e-commerce, driven by technological advancements and widespread adoption of digital platforms. Notably, platforms such as Shopee and Lazada have dominated the Thai e-marketplace, collectively accounting for approximately 90% of market searches by 2020 ([14]). These platforms significantly influence Thai

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consumers' daily activities, offering extensive product varieties and unparalleled convenience. This rapid expansion of Thailand's digital commerce sector has significantly reshaped consumer behaviors and market dynamics ([1]). As e-commerce becomes increasingly central, businesses are compelled to adapt strategically, innovating to align with digital transformation ([17],[7]). Understanding the determinants driving consumer preferences and purchasing decisions on these platforms is thus essential. Specifically, this study employs Artificial Neural Network (ANN) models to analyze Thai consumers' behaviors concerning Chinese products on platforms like Shopee and Lazada. The research seeks to generate insights businesses can leverage to enhance strategic positioning and competitive advantage within Thailand's dynamic e-commerce landscape. Thailand's e-commerce growth has been predominantly mobile-driven, reflecting consumer preferences and behaviors. Mobile e-commerce alone accounted for 45% of the market, significantly ahead of retailer websites (11%) and social media channels (10%). Projections indicate continued growth, with the mobile e-commerce sector expected to reach \$15.8 billion by 2023, underscoring the critical role of mobile platforms in Thailand's digital economy ([13]). The fierce competition between Shopee and Lazada further highlights the intensity of the market rivalry in Thailand. Bank of America (2021) emphasized this competitive environment, citing rapid market expansion to approximately 300 billion baht by 2024. Such growth emphasizes Thai consumers' increasing reliance on these platforms, intensifying competition, and reshaping market dynamics ([3]).

Over recent decades, Thailand's broader economic transformations have significantly elevated income levels, urbanization, and access to finance, stimulating robust consumer market growth. Concurrently, Chinese products have significantly influenced Thai retail dynamics, particularly in sectors such as consumer electronics. The growing presence of competitively priced Chinese products has profoundly impacted local industry practices and consumer behaviors, raising strategic concerns regarding market sustainability and competitive resilience.

This study focuses on identifying key factors influencing online consumer behavior in Thailand. Insights derived from advanced ANN analytical models will inform strategic business decisions, enabling companies to optimize their digital strategies and improve consumer experiences on platforms such as Shopee and Lazada.

1.2 Statement of the Problem

The rapid growth of e-commerce in Thailand, notably driven by Chinese-branded smartphones, highlights significant shifts in consumer behavior. Despite their popularity due to competitive pricing and diverse features on platforms like Shopee and Lazada, factors influencing Thai consumer decisions remain underexplored. This study uses ANN models to identify key determinants of consumer preferences and purchasing behaviors. It aims to provide actionable

insights for strategic marketing and enhance understanding of digital consumer behavior in emerging markets.

1.3 Scope of Study

This research explores Thai consumers' purchasing behavior toward Chinese-branded smartphones on Lazada and Shopee. It covers six regions in Thailand, using data collected from 300 students (50 per region). The analysis spans e-commerce data (2018-2022) and interview data (2022-2023), classifying brands into well-known (e.g., Xiaomi, Huawei, OPPO) and lesser-known categories. The study aims to identify key factors influencing consumer decisions to inform marketing and product development strategies.

1.4 Objectives

The objectives of this study are:

- 1) To identify key factors influencing consumer decisions when purchasing Chinese-branded smartphones.
- 2) To analyze consumer purchasing behavior toward Chinese-branded smartphones.
- 3) To measure consumer satisfaction levels and identify areas for product improvement.
- 4) Investigate strategic marketing tools employed by Chinese enterprises and retailers selling smartphones in Thailand.

2. Literature Review

This chapter thoroughly evaluates existing literature on consumer behavior, particularly concerning Chinese-branded smartphones, aiming to identify research gaps and inform future studies. The review synthesizes both Thai and international studies, organized into three key sections: factors influencing consumer purchasing behavior, patterns of consumer behavior, and the economic relationship between Thailand and China.

2.1 Studies Related to Consumer Purchasing Behavior

Technological advancements have significantly reshaped consumer purchasing behaviors, transitioning from traditional physical store visits to convenient online shopping experiences. The growth of e-commerce has intensified competition and transformed consumer interactions by enabling 24/7 access, convenience, and extensive product comparisons across global platforms. Digitalization has affected consumers' preferences and behaviors, enhancing their ability to make informed and discerning purchasing decisions. Consumer behavior encompasses various psychological, sociological, and economic factors influencing purchasing decisions. Kotler and Armstrong (2018) highlight a five-stage model of consumer decision-making online: need recognition, information search, product evaluation, purchase decision, and post-purchase evaluation ([10]). Online product reviews influence consumers at multiple stages, shaping their perceptions and final choices. Research demonstrates psychological dimensions in

online shopping, emphasizing how customers' varying emotional responses, motivations, and attitudes affect their purchasing choices ([8]). Factors such as perceived quality, price sensitivity, country of origin, and brand reputation influence consumers' decisions, particularly concerning Chinese-branded products. Innovation ([19]), e-service quality ([16]), and electronic word-of-mouth (e-WOM) significantly affect consumer buying intentions. Positive online customer reviews (OCR) also enhance consumer trust, shaping perceptions of product reliability and influencing buying decisions. Convenience, security, product quality, and promotional strategies notably drive consumer preferences in online environments. Additionally, consumer knowledge and memorable marketing communications, such as compelling slogans, further influence purchasing behavior. Understanding these multifaceted influences allows businesses to strategically enhance consumer satisfaction, improve customer engagement, and maintain competitive advantages in rapidly evolving digital markets.

2.2 Studies Related to E-commerce Platforms

2.2.1 Global Dimensions of E-commerce

E-commerce, defined as the online buying and selling of goods and services, has significantly reshaped global trade by eliminating geographical barriers and providing consumers with easy access to products worldwide ([18],[2]). Its development traces back to the 1960s when Electronic Data Interchange (EDI) evolved into popular consumer-oriented platforms like Amazon and eBay, substantially transforming retail practices. E-commerce transactions include various models such as business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C), consumer-to-business (C2B), and interactions involving government entities (Jain et al., 2021). Mobile devices have notably driven recent growth, comprising over 63% of global e-commerce transactions in 2022 ([18],[2]).

2.2.2 E-commerce in Thailand

Thailand's e-commerce sector has witnessed rapid growth, positioning the country as a leading digital economy in Southeast Asia, second only to Indonesia. This growth reflects Thailand's high internet penetration rates and changing consumer behavior accelerated by the COVID-19 pandemic. By 2022, Thailand's e-commerce market value will reach approximately 720 billion baht, with projections of continued annual growth ([15]). Fashion products initially dominated Thai e-commerce, but consumer preferences have expanded into household goods, personal care, and food. Digital payment methods, including QR codes and e-wallets, have primarily replaced cash-on-delivery, enhancing transaction convenience and security. Shopee and Lazada have emerged as Thailand's leading e-commerce platforms due to their extensive product ranges, promotions, and efficient services. Shopee introduced Shopee Mall, focusing on verified brands to assure product authenticity and improve consumer trust ([17]). Similarly, Lazada established LazMall, a platform featuring carefully curated international and local brands

across various categories, reinforcing consumer confidence and providing a seamless shopping experience ([6]).

2.3 Key Factors Influencing Consumer Behavior in Online Shopping

2.3.1 Mobile Website Usability

The emergence of mobile-optimized websites has significantly reshaped consumer shopping experiences by enhancing convenience and accessibility. Mobile platforms facilitate easy browsing, product comparisons, and seamless purchasing processes, leading to increased consumer preference for smartphone-based transactions ([11]). High-quality mobile websites featuring intuitive navigation, responsive design, and convenient checkout processes significantly influence consumer satisfaction and purchasing decisions.

2.3.2 Product Images

The key limitation of online shopping—the inability to physically inspect products—places great importance on high-quality product images. Clear, detailed, and multiple-angle images help consumers better visualize product attributes, enhancing their confidence and likelihood of purchase. Features such as zoom functionality and multiple viewing angles substantially enhance the user experience, providing greater assurance in the online shopping environment.

2.3.3 Detailed Product Descriptions

Accurate and comprehensive product descriptions significantly impact online purchasing decisions. Detailed product information, including features, specifications, usage guidelines, and benefits, enables consumers to make informed choices and reduces uncertainty, increasing customer confidence and satisfaction ([11]).

2.3.4 Customer Reviews

Customer reviews critically shape consumer purchasing behavior in the online marketplace. Reviews offer potential buyers valuable product quality, performance, and reliability insights, strongly influencing their final purchasing decisions. Positive reviews can notably enhance product credibility and encourage consumer trust, directly contributing to increased sales ([11]).

2.3.5 Influencer Marketing and Social Media

Influencer marketing, leveraging social media influencers, has become a powerful tool in shaping consumer purchasing behaviors. Influencers effectively promote brands through authentic, relatable content, significantly impacting consumer attitudes and purchase intentions ([4]). Studies indicate that influencer marketing enhances word-of-mouth marketing effectiveness and boosts consumer trust, highlighting its strategic importance for brands competing in dynamic e-commerce environments ([4]).

2.4 Other Related Theories

2.4.1 Types of Customers

Understanding consumer types is critical for businesses aiming to tailor marketing strategies effectively. Corporate Finance Institute. (n.d.) identifies five primary customer types: impulsive, discount-oriented, need-based, loyal, and wandering ([5]). Impulsive customers make spontaneous purchase decisions driven by emotional triggers rather than rational evaluation. Discount-oriented customers primarily seek products that offer financial incentives. Specific requirements drive need-based customers and are less influenced by marketing. Loyal customers repeatedly buy from preferred brands due to established trust and satisfaction. Wandering customers typically browse without defined purchase intentions, generating substantial traffic but limited direct sales.

2.4.2 Factors Influencing Online Consumer Decisions

Several critical factors significantly influence consumer decisions in online shopping. High-quality product imagery is essential since consumers rely on visual representations due to the absence of physical product interaction. Approximately 93% of consumers cite product visuals as crucial in purchasing decisions ([9]). Similarly, comprehensive and accurate product descriptions substantially enhance consumer decision-making by reducing uncertainty. Customer reviews also strongly influence purchasing behaviors, providing insights into product quality and reliability. Effective influencer marketing, leveraging influential social media personalities, significantly shapes consumer attitudes and enhances purchase intentions ([5]).

2.4.3 Product Descriptions and Shipping

Detailed product and shipping descriptions are vital in e-commerce, influencing consumer satisfaction and purchase decisions. Research indicates that unclear or incomplete product descriptions significantly contribute to purchasing failures, underscoring the importance of accuracy and detail. Reliable shipping services similarly impact consumer trust and satisfaction, influencing repeat purchase intentions and brand loyalty.

2.4.4 Product Name

The product name significantly impacts consumer perceptions and purchasing behaviors. Effective branding and naming strategies can substantially influence consumer perceptions, affecting the market success or failure of products. Strategic product naming enhances consumer recall, positively affects brand perception, and increases sales and market presence ([12]).

3. Research Methodology

3.1 Introduction

This chapter outlines the research methodology for investigating consumer behavior towards Chinese-branded smartphones. The methodological framework integrates descriptive

and inferential research approaches to comprehensively address the study's primary research questions. Descriptive research methods are utilized to characterize consumer behavior accurately, detailing specific consumer preferences, attitudes, and purchasing habits related to Chinese-branded smartphones. Complementing the descriptive approach, inferential statistical methods generalize findings from sample data to the broader population. This approach enables the study to draw meaningful conclusions about consumer behavior from selected representative samples. The research aims to identify significant patterns and relationships through inferential statistics, facilitating generalized insights about the broader consumer population. Overall, this combined methodological strategy ensures a robust and thorough analysis, providing actionable insights into consumer behavior in the Thai market for Chinese-branded smartphones.

3.2 Conceptual Framework of Influential Factors

3.2.1 Consumer Decision-Making Model

This study adopts a conceptual framework focusing on key factors influencing consumer behavior toward Chinese-branded smartphones (Fig. 1). The framework includes product attributes, pricing strategies, brand reputation, cultural factors, and marketing influences. Understanding these elements enables businesses to effectively target consumers, create tailored marketing campaigns, and enhance competitive advantage. By systematically addressing these critical dimensions, companies can optimize their marketing efforts, increase consumer engagement, and sustain market success in the dynamic Thai e-commerce landscape.

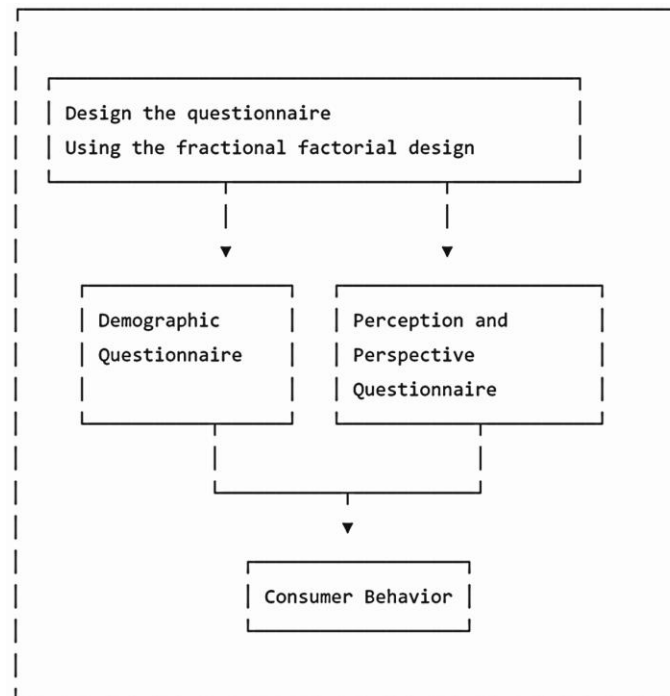


Fig. 1 Conceptual model.

The consumer decision-making process involves multiple stages, including need recognition, information search, evaluation of alternatives, purchase decision, and post-purchase evaluation (Fig. 2). Initially, consumers identify a need or desire, triggering a comprehensive information search through sources such as social media, online reviews, and personal recommendations. During this stage, consumers develop perceptions of brands, which influence their evaluations based on price, quality, durability, and other attributes. Specifically, perceptions of Chinese brands can significantly impact consumer choices, with evaluations comparing these brands against non-Chinese alternatives. Factors influencing brand selection include perceived quality, affordability, and brand reliability. Positive perceptions often result in increased purchasing likelihood, brand loyalty, and positive recommendations, while negative perceptions lead to brand switching and reduced loyalty. Post-purchase behavior further shapes future decisions. Satisfaction encourages repeat purchases and positive recommendations, whereas dissatisfaction may prompt consumers to switch brands or explore alternative options. Understanding these dynamics enables businesses to develop targeted strategies, enhance product quality, and foster consumer loyalty.

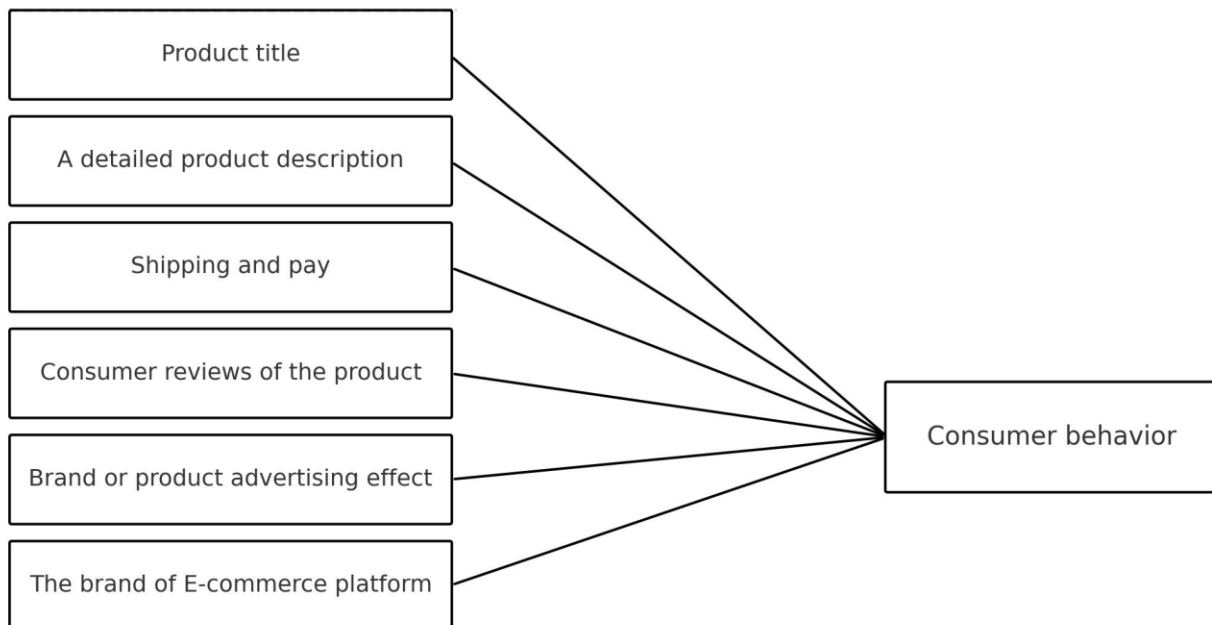


Fig. 2 Framework of Influential factors for consumer behavior.

3.2.2 Description of Influential Factors

The study identifies several critical factors influencing consumer behavior towards Chinese-branded smartphones, particularly within e-commerce platforms. These factors are summarized and discussed in Table 1.

Table 1. The description of influential factors

Influential Factor	Description
Product Title	Clearly labeled product titles influence consumer attention and purchase intentions.
Product Description	Detailed descriptions with comprehensive product information and high-quality images enhance consumer trust.
Shipping and Payment	Rapid shipping and secure payment methods significantly affect customer confidence and purchasing decisions.
Customer Reviews	Reviews from previous customers directly impact potential buyers' perceptions and purchase decisions.
Brand Reputation	A positive brand reputation fosters trust, influencing consumer preference and loyalty.
Shopee Mall Verification	Shopee Mall-certified stores (B2C verified) improve consumer confidence through guaranteed authenticity.

3.3 Data Analysis

Data collected from respondents were analyzed using SPSS software. Descriptive statistics were employed to summarize and identify patterns within the dataset. Statistical techniques were utilized for in-depth analysis, including percentages, Chi-square tests, mean scores, correlation coefficients, one-sample t-tests, independent t-tests, and ANOVA. Factor analysis explored key consumer behavior determinants, revealing significant impacts from social influence, product quality, and price (Table 2). Results were presented through tables and charts to enhance clarity and facilitate interpretation.

Table 2. Influential factors for consumer behavior towards Chinese-branded smartphones

Category	Factors
1. Demographic Factors	Gender, Age, District, Area, Education, Occupation, Monthly income, Marital status
2. Influencers in Buying Decision	Self, Family, Friends, Society
3. Sources of Information	Advertisement, Friends, Family, Society, Dealers
4. Incentives Received by Consumers	Price incentives, gifts, Additional extended guarantee and warranty, Cost reduction for future purchase
5. Influencing Factors	Product type, Quality, Price, Variety, Brand image, Credit facilities, Exchange, Low maintenance cost, Retail schemes, Previous experience, After-sales service, Guarantee and warranty, Advanced features, Durability
6. Buying Behavior	Need recognition, Information search, Evaluation of alternatives, Selection, Repeated purchase, Preference for domestic brands, Rational thinking before purchasing, Time of purchase, Replacement of durables.

7. Perception	Reasonable price, Superior quality, After-sales service, Availability, Variety, Technological upgradation, Durability, Warranty and guarantee, Offers and discounts, Exchange value, Value for money, Low maintenance cost, Advertising, Purchase plan, Prime choice, Recommendation to others, Banning of Chinese-branded smartphones
8. Satisfaction	Price, Quality, After-sales service, Availability, Variety, Durability, Offers and discounts, Country of origin, Adoption of new technology, Brand image, Energy efficiency, Guarantee and warranty, Advertisement, Exchange value, Value addition, Advanced features, Low maintenance cost, Value for money
9. Promotional Tools of Chinese Brands	Advertisement, Direct marketing, Publicity, Personal selling, Sales promotion

3.4 Validity Test

Validity is essential in research to ensure accurate measurement of intended constructs. This study specifically employed content validity, which assesses how comprehensively and accurately a measurement instrument covers the intended domain. To achieve this, a questionnaire was developed and rigorously reviewed by marketing, business, and digital innovation experts. Their feedback was systematically integrated into the questionnaire, enhancing its content accuracy and relevance. Consequently, the final questionnaire was confirmed to possess strong content validity, ensuring the reliability and credibility of the findings.

3.5 Ethical Considerations

Ethical considerations were critical in this study due to the personal nature of the questionnaire responses. Participants provided informed consent after clearly explaining the study's objectives, ensuring confidentiality, and maintaining trust throughout the research process.

4. Research Methodology

This research investigates the factors influencing consumer behavior toward Chinese-branded smartphones on e-commerce platforms in Thailand. Specifically, the study aims to 1) identify key factors impacting consumer decision-making, 2) examine consumer purchasing behavior patterns, 3) assess consumer satisfaction levels to identify product strengths and weaknesses, and 4) explore strategic marketing tools utilized by Chinese brands and retailers.

4.1 Identification of Key Factors Influencing Consumer Choices for Chinese-Branded Smartphones

The sample data analysis comprises two primary sections: 1) demographic profiles of respondents and 2) key factors influencing consumer preferences for Chinese-branded smartphones.

Table 3. Results of the analysis of the questionnaire data.

General information	Meaning of data	Percentage
Gender	Male	55.19
	Female	44.81
Age	19 - 25 years	100.00
Marital Status	Single	100.00
Education	Bachelor's degree or equivalent	100.00
Field of Study	Science and Engineering	36.38
	Humanities and Social Sciences	24.75
	Other	38.87
Monthly Income	Less than 5,000 THB	2.22
	5,001 - 10,000 THB	58.66
	10,001 - 15,000 THB	33.41
	More than 15,001 THB	5.71
Current Residence	Eastern Region	12.12
	Northern Region	25.24
	Central Region	53.21
	Northeastern Region	9.43
Have you ever purchased a mobile phone online	Yes	100.00

The survey respondents predominantly identified as male (55.19%), with females comprising 44.81% (see Table 3). All participants were between 19 and 30 years old, married, and possessed a bachelor's degree or equivalent qualification. Their fields of study varied, with 36.38% from Science and Engineering, 24.75% from Humanities and Social Sciences, and 38.87% from other disciplines. Regarding income distribution, the majority (58.66%) earned between 5,001 and 10,000 baht monthly. Respondents represented diverse geographical areas: Central (58.66%), Northern (25.24%), Eastern (12.12%), and Northeastern regions (9.43%). Significantly, all respondents reported prior experience purchasing mobile phones through online platforms, highlighting their familiarity with digital shopping practices.

4.2 Apply Association Rule Analysis/SVM/Decision Tree for Consumer Behavior

4.2.1 Association Rule Analysis

This study applies Association Rule Mining (ARM) using the Apriori Algorithm to identify key patterns and relationships influencing consumer behavior in online shopping. The analysis aims to uncover factors significantly impacting purchasing decisions, enabling businesses to refine their marketing strategies. The Apriori Algorithm operates in three major phases: 1) Frequent item generation is used to identify item sets that frequently co-occur, 2) Rule Generation is extracts association rules from frequent item sets, and 3) Rule Evaluation is an assesses rules using Support, Confidence, and Lift.

Support (S) measures the frequency of item set occurrence in the dataset, which is defined as Eq. (1).

$$S(X) = \frac{|T(X)|}{N} \quad (1)$$

where $|T(X)|$ is the number of transactions containing item set X and N. Meanwhile, confidence (C) measures the probability of Y occurring given X and is defined as Eq. (2).

$$C(X \Rightarrow Y) = \frac{S(X \cup Y)}{S(X)} \quad (2)$$

where $S(X \cup Y)$ represent the support of itemset (X, Y) and $S(X)$ denoted support of itemset X. Lift (L) represent the evaluate the strength of the association between X and Y, which is defined as Eq. (3).

$$L(X \Rightarrow Y) = \frac{S(X \cup Y)}{S(X) \times S(Y)} \quad (3)$$

where Support of itemset Y, A lift value $L > 1$ indicates a strong positive correlation, $L = 1$ suggests no association and $L < 1$ implies a negative correlation.

Parameter Settings: To ensure a robust analysis, the following thresholds were applied:

- Minimum Support (Smin: 0.05): In this analysis, we set a threshold, capturing only those frequent item sets that make their presence felt in at least 5% of the transactions. This criterion ensures we focus exclusively on the most significant combinations, filtering out the noise and highlighting patterns that reflect consumer behavior.

- Minimum Confidence (Cmin: 0.7): A steadfast guardian of predictive reliability, this threshold ensures that the rules we forge build a solid foundation of certainty, elevating the trustworthiness of our insights and guiding decisions with unwavering accuracy.

• Minimum Lift (Lmin: 1.2) identifies and selects rules that exhibit significant and impactful correlations, ensuring that the relationships drawn are relevant and meaningful in their context.

4.2.2 SVM Analysis

Support Vector Machine (SVM) is a supervised learning algorithm widely used in classification problems, including consumer behavior analysis. It is particularly effective in high-dimensional spaces and when the number of dimensions exceeds the number of samples. SVM aims to find an optimal hyperplane that maximally separates different classes within a dataset.

1) SVM works by finding a hyperplane that best separates data points belonging to different classes. The hyperplane is defined as Eq. (4).

$$f(x) = w^T x + b = 0 \quad (4)$$

where x is the input feature vector (consumer behavior factors), w is the weight vector (defining the orientation of the hyperplane), and b is the bias term (shifting the hyperplane). For a given dataset (x_i, y_i) where $y_i \in \{-1, 1\}$ (i.e., consumer behavior labels), SVM optimizes the hyperplane by maximizing the margin (distance between the hyperplane and the nearest data points, called support vectors) while minimizing classification errors.

The optimization problem for SVM is defined as Eq. (5).

$$\min_{w,b} \frac{1}{2} \|w\|^2 \quad (5)$$

Subject to the constraints is calculated by Eq. (6).

$$y_i(w^T X_i + b) \geq 1, \quad \forall i \quad (6)$$

This ensures that all training samples are correctly classified while maximizing the margin. The RBF kernel is defined as Eq. (7).

$$K(x_i, x_j) = \exp(-\gamma \|x_i - x_j\|^2) \quad (7)$$

where $K(x_i, x_j)$ is a similarity between data points x_i and x_j , $\|x_i - x_j\|^2$ is the Euclidean distance between two feature vectors, γ is a hyperparameter that determines the influence of each training sample. The function exponentially decreases as the distance between points increases, ensuring closer points have a more substantial influence.

2) Updated SVM Model with RBF Kernel

The objective function in SVM remains and is defined as Eq. (8) and (9).

$$\min_{w,b} \frac{1}{2} \|w\|^2 + C \sum_{i=1}^n \xi_i \quad (8)$$

$$y_i(W^T \phi(x_i) + b) \geq 1 - \xi_i, \quad \xi_i \geq 0, \quad \forall i \quad (9)$$

where $\phi(x_i)$ maps the input features into a higher-dimensional space using the RBF kernel, C is a regularization parameter controlling the trade-off between margin maximization and misclassification, ξ_i is a slack variable allowing some misclassifications. Using the RBF kernel, the feature mapping $\phi(x_i)$ is implicit, meaning the SVM algorithm does not compute the transformation explicitly but uses the kernel function directly.

4.2.3 Decision Tree Analysis for Consumer Behavior

Decision Tree (DT) is a robust supervised learning algorithm for classification and regression tasks. In consumer behavior analysis, decision trees help understand how different factors influence purchasing decisions on e-commerce platforms. For this analysis, the Decision Tree model will predict whether a consumer will purchase a product based on key influencing factors, such as price, brand perception, product reviews, advertisements, and payment methods.

1) Entropy and Information Gain (Splitting Criteria)

A decision tree selects the best feature to split the data using Entropy (H) and information Gain (IG). Entropy measures impurity or randomness in the dataset and is defined as Eq. (10).

$$H(S) = -\sum_{i=1}^c p_i \log^2 p_i \quad (10)$$

where S is a set of samples, c is a number of classes, and p_i is a probability of class i . If entropy is 0, the dataset is pure (i.e., all consumers behave the same way). If entropy is 1, the dataset is evenly split across different behaviors.

2) Information Gain Calculation:

Information Gain measures the reduction in entropy after splitting on a feature, and defined as Eq. (11).

$$IG(S, A) = H(S) - \sum_{v \in V} \frac{|S_v|}{|S|} H(S_v) \quad (11)$$

where S is the original dataset, A is an attribute used for splitting, V is a possible value of attribute A , S_v is a subset of S after split. The feature with maximum Information Gain is selected for splitting.

3) Gini Impurity (Alternative Splitting Criteria)

Another approach is Gini Impurity, which measures the likelihood of misclassification is calculated by Eq. (12).

$$Gini(S) = 1 - \sum_{i=1}^c p_i^2 \quad (12)$$

where p_i is a probability of class i . A lower Gini score indicates a better split. The results of our study present a detailed comparison among three distinct methodologies: Association Rule Analysis, Support Vector Machines (SVM), and Decision Trees (DT). This comprehensive comparison is encapsulated in Table 4, where each method is evaluated across several criteria, highlighting its strengths and weaknesses. The analysis delves into each technique's unique characteristics, providing insights into its performance and applicability in various scenarios. Through this comparative framework, we aim to identify the most effective approach for our specific research objectives.

Table 4. Results of the analysis of factors affecting product selection decision.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Buying products online is influenced by the product name, size, color, special features, and attractive or eye-catching appearance.	0.30/0.45/0.38	0.95/0.92/0.89	1.22/1.18/1.15
2) Products with unique features, such as size, color, or special features, that have made a purchase decision based on an interesting or catchy product name influence online shopping decisions.	0.34/0.40/0.33	0.93/0.94/0.90	1.20/1.22/1.17
3) Consider the product name. Have you ever decided to purchase a product based on an interesting or catchy name? This factor influences the decision to buy products online.	0.32/0.35/0.37	0.93/0.91/0.92	1.20/1.19/1.20

The results in Table 4 highlight key factors significantly influencing consumer decisions when purchasing high-value products online. The reputation of the product name, specific product features (such as size, color, and unique attributes), and the visual appeal of product design emerged as critical determinants of consumer choice. These elements collectively enhance trust, usability, and purchase interest. The reliability of the findings is notably high (0.95), indicating robust consistency in the analysis.

Table 5. Results of the analysis of factors affecting purchasing decisions from product details and descriptions.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Product descriptions that include information such as dimensions and weight reduce the risk of purchasing the wrong product and influence online shopping decisions. Detailed product descriptions provide confidence in buying decisions.	0.33/0.35/0.30	0.97/0.91/0.89	1.23/1.24/1.20
2) Product descriptions that include information such as product dimensions and weight, and product descriptions reduce the risk of purchasing the wrong product. Product descriptions with illustrations or videos influence online purchasing decisions, and detailed product descriptions provide confidence in purchasing decisions.	0.32/0.38/0.33	0.96/0.92/0.88	1.22/1.23/1.18
3) Detailed product descriptions with information such as product dimensions and weight, product descriptions with illustrations or videos, and detailed product descriptions to help reduce the risk of purchasing the wrong product are factors influencing online shopping decisions, where detailed product descriptions provide confidence in purchasing decisions.	0.43/0.45/0.42	0.96/0.93/0.90	1.22/1.25/1.22

Table 5 highlights key factors influencing consumers' online shopping decisions, emphasizing comprehensive product descriptions as the most significant determinant. Detailed information on product dimensions, weight, and other critical attributes significantly enhances consumer confidence and reduces concerns about potential purchasing errors. This finding demonstrates a high reliability score (0.97), underlining the strong relationship between detailed product descriptions and consumer trust in online shopping.

Table 6. Results of the analysis of factors affecting purchasing decisions from shipping and payment.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Shipping options from e-commerce platforms and shipping speed are essential for online shopping decisions, and online payment before delivery when shopping online is an influential factor in purchasing decisions, which affects the payment method necessary for buying decisions.	0.55/0.60/0.58	0.97/0.95/0.93	1.20/1.25/1.22
2) Shipping Options from E-commerce Platforms Shipping speed is essential for purchasing decisions, and the Cash on Delivery (COD) payment method is an influential factor in purchasing decisions, which influences the payment method that is important for purchasing decisions.	0.55/0.59/0.57	0.96/0.94/0.92	1.19/1.23/1.21
3) Shipping options from e-commerce platforms and cash on Delivery (COD) payment methods influence the purchasing decision and affect the speed of online shopping delivery.	0.55/0.62/0.61	0.96/0.96/0.61	1.27/1.30/1.27

Table 6 highlights key factors influencing consumer decisions in online shopping, emphasizing timely delivery and secure payment methods. Prompt shipping significantly impacts consumers' purchase intentions, while the availability of online prepayment options further enhances consumer confidence and decision-making. The reliability of these findings is robust, with a reliability coefficient of 0.97, underscoring the strong influence of these factors on online consumer behavior.

Table 7. Results of the analysis of factors affecting purchasing decisions from product reviews.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Reading customer reviews carefully before making a purchase decision, affecting the purchase decision with customer ratings, and writing reviews regularly after shopping influence the purchase decision, which affects the feeling that customer reviews on the shopping website are reliable.	0.50/0.52/0.51	0.96/0.93/0.91	1.31/1.28/1.26

2) Customer ratings influence purchasing decisions. Regular post-purchase reviews and the perception that customer reviews on shopping websites are trustworthy influence purchasing decisions, leading to the recommendation to read customer reviews carefully before making a purchase decision.	0.50/0.53/0.50	0.94/0.94/0.92	1.34/1.30/1.25
3) Reading customer reviews carefully before making a purchase decision and writing reviews regularly after shopping influences the decision to purchase a product, which affects the feeling that customer reviews on the shopping website are reliable.	0.54/0.55/0.54	0.93/0.92/0.90	1.27/1.29/1.27

According to Table 7, customer reviews and ratings significantly influence consumer purchasing decisions in online shopping contexts. Consumers heavily rely on customer reviews and product ratings to inform their purchase choices. Specifically, thoroughly examining reviews and ratings significantly impacts consumers' willingness to buy. The reliability coefficient of 0.96 underscores the strong correlation between consumer feedback and purchasing behavior, highlighting the crucial role of customer evaluations in online shopping decisions.

Table 8. Results of analysis of factors affecting purchasing decisions, from the brand's attractiveness to the effect of product advertising.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Brand or product advertising influences purchase decisions. Irrelevant ads and clicks on brand or product ads seen on social media or websites are factors that influence purchase decisions, which in turn influence interest in brand or product ads (when seen on online platforms such as Facebook, Instagram, and YouTube)	0.50/0.52/0.50	0.96/0.94/0.92	1.31/1.32/1.30
2) Brand or product advertising influences purchasing decisions, and advertising unrelated to purchasing decisions is a factor that influences buying decisions, which in turn influences interest in brand or product advertising (when seen on online platforms such as Facebook, Instagram, and YouTube).	0.56/0.58/0.55	0.94/0.91/0.90	1.29/1.31/1.28

3) Brand or product advertising influences purchasing decisions, and clicking on brand or product ads you see on social media or websites is often an influential factor in these decisions, which in turn influences interest in brand or product ads (when seen on online platforms like Facebook, Instagram, and YouTube).	0.53/0.55/0.53	0.94/0.93/0.91	1.29/1.30/1.29
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Table 8 examines the influence of brand and product advertisements on consumer purchasing decisions. The findings indicate that advertising effectiveness is crucial in shaping consumer choices, with targeted and relevant advertisements generating the highest impact. Inadvertent clicks on ads across social media platforms such as Facebook, Instagram, and YouTube significantly affect engagement and purchase intent. The study reports a strong reliability coefficient of 0.96, underscoring the consistency of these results and emphasizing the importance of strategic advertising in driving consumer behavior.

Table 9. Results of analysis of factors affecting purchasing decisions from consideration of the product e-commerce platform.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Brand and after-sales service influence the choice of an e-commerce platform. These factors influence the purchase decision and affect the website design, essential for choosing an e-commerce platform.	0.58/0.62/0.60	0.97/0.95/0.93	1.30/1.32/1.30
2) Brand influence on e-commerce platform selection, website design, and after-sales influence is essential. These factors influence purchasing decisions, which affect website design, which is important for e-commerce platform selection.	0.53/0.56/0.54	0.96/0.94/0.92	1.29/1.31/1.28
3) Brand influence on e-commerce platform selection is essential, website design influence is significant, and user experience influences e-commerce platform selection. These factors influence purchasing decisions, which affect website design, which is essential for e-commerce platform selection.	0.52/0.55/0.53	0.96/0.93/0.91	1.29/1.30/1.27

Table 9 highlights key factors influencing online shopping decisions, with comprehensive product descriptions emerging as the most significant determinant. Detailed specifications, including dimensions and weight, enhance consumer confidence by reducing uncertainty in purchasing decisions. The high-reliability coefficient of 0.97 underscores the strong correlation between thorough product descriptions and consumer trust in e-commerce.

Table 10. Results of the analysis of factors affecting purchasing decisions from shipping and payment.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Shipping options from e-commerce platforms and shipping speed are essential for online shopping decisions, and online payment before delivery when shopping online is an influential factor in purchasing decisions, which affects the payment method necessary for purchasing decisions.	0.55/0.59/0.56	0.97/0.95/0.93	1.20/1.22/1.20
2) Shipping Options from E-commerce Platforms Shipping speed is essential for purchasing decisions, and the Cash on Delivery (COD) payment method is an influential factor in purchasing decisions, which influences the payment method necessary for purchasing decisions.	0.55/0.57/0.56	0.96/0.94/0.92	1.19/1.21/1.18
3) Shipping options from e-commerce platforms and cash on Delivery (COD) payment methods influence the purchasing decision and affect the speed of online shopping delivery.	0.55/0.58/0.56	0.96/0.95/0.93	1.27/1.30/1.27

Table 10 examines key factors influencing online purchasing decisions, particularly in the Shipping and Payment dimensions. The availability of diverse shipping options and the speed of delivery significantly impact consumer satisfaction and purchase intent. Additionally, the preference for prepayment before delivery plays a crucial role in shaping consumer behavior. The reliability coefficient of 0.97 underscores the strong consistency of these findings, highlighting the critical role of shipping and payment methods in online shopping decisions.

Table 11. Results of the analysis of factors affecting purchasing decisions from product reviews.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Reading customer reviews carefully before making a purchase decision, affecting the purchase decision with customer ratings, and writing reviews regularly after shopping influence the purchase decision, which affects the feeling that customer reviews on the shopping website are reliable.	0.50/0.54/0.52	0.96/0.94/0.92	1.31/1.33/1.30
2) Customer ratings influence purchasing decisions. Regular post-purchase reviews and the perception that customer reviews on shopping websites are trustworthy influence purchasing decisions, leading to the recommendation to read customer reviews carefully before making a purchase decision.	0.50/0.53/0.51	0.94/0.92/0.90	1.34/1.36/1.33

3) Reading customer reviews carefully before making a purchase decision and writing reviews regularly after shopping influences the decision to purchase a product, which affects the feeling that customer reviews on the shopping website are reliable.	0.54/0.57/0.55	0.93/0.91/0.90	1.27/1.29/1.26
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Table 11 highlights key factors influencing consumer purchasing decisions, with product reviews emerging as the most significant determinant. Consumers heavily rely on customer reviews and ratings to guide their purchasing choices, as these assessments shape trust and buying confidence. Additionally, the continuous submission of reviews fosters a sense of credibility within online shopping platforms. The high reliability coefficient 0.96 underscores the strong correlation between product feedback and consumer decision-making.

Table 12. Results of analysis of factors affecting purchasing decisions, from the brand's attractiveness to the effect of product advertising.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Brand or product advertising influences purchase decisions. Irrelevant ads and clicks on brand or product ads seen on social media or websites are factors that influence purchase decisions, which in turn influence interest in brand or product ads (when seen on online platforms such as Facebook, Instagram, and YouTube)	0.50/0.53/0.51	0.96/0.94/0.92	1.31/1.33/1.29
2) Brand or product advertising influences purchasing decisions, and advertising unrelated to purchasing decisions is a factor that influences buying decisions, which in turn influences interest in brand or product advertising (when seen on online platforms such as Facebook, Instagram, and YouTube).	0.56/0.60/0.58	0.94/0.92/0.90	1.29/1.31/1.28
3) Brand or product advertising influences purchasing decisions, and clicking on brand or product ads you see on social media or websites is often an influential factor in these decisions, which in turn influences interest in brand or product ads (when seen on online platforms like Facebook, Instagram, and YouTube).	0.53/0.56/0.54	0.94/0.92/0.91	1.29/1.30/1.27

Table 12 examines the influence of brand and product advertisements on consumer purchasing decisions. The findings indicate that advertising effectiveness is crucial in shaping consumer choices, with targeted and relevant advertisements generating the highest impact. Inadvertent clicks on ads across social media platforms such as Facebook, Instagram, and YouTube significantly affect engagement and purchase intent. The study reports a strong reliability coefficient of 0.96, underscoring the consistency of these results and emphasizing the importance of strategic advertising in driving consumer behavior.

Table 13. Results of analysis of factors affecting purchasing decisions from consideration of the product e-commerce platform.

Data List	Association rule analysis/SVM/DT		
	Support	Confidence	Lift
1) Brand and after-sales service influence the choice of an e-commerce platform. These factors influence the purchase decision and affect the website design, essential for choosing an e-commerce platform.	0.58/0.62/0.60	0.98/0.95/0.93	1.30/1.32/1.29
2) Brand influence on e-commerce platform selection, website design, and after-sales influence is essential. These factors influence purchasing decisions, which affect website design, which is important for e-commerce platform selection.	0.53/0.57/0.55	0.96/0.94/0.92	1.29/1.31/1.28
3) Brand influence on e-commerce platform selection is essential, website design influence is significant, and user experience influences e-commerce platform selection. These factors influence purchasing decisions, which affect website design, which is necessary for e-commerce platform selection.	0.52/0.56/54	0.96/0.94/0.92	1.29/1.32/1.29

Table 13 analyzes key factors influencing consumers' choice of e-commerce platforms, with brand recognition emerging as a primary determinant of purchase decisions. Consumers favor platforms associated with reputable brands, reinforcing brand credibility's role in driving traffic and sales. Additionally, after-sales service significantly impacts platform preference, as strong post-purchase support enhances customer trust and satisfaction. These factors also shape website design, emphasizing brand alignment and service efficiency. The high-reliability coefficient of 0.97 underscores the consistency of these findings, highlighting their strategic relevance in e-commerce development. Fig. 3 shows the visualizations, including bar charts and pie charts, representing the analysis of factors affecting product selection decisions.

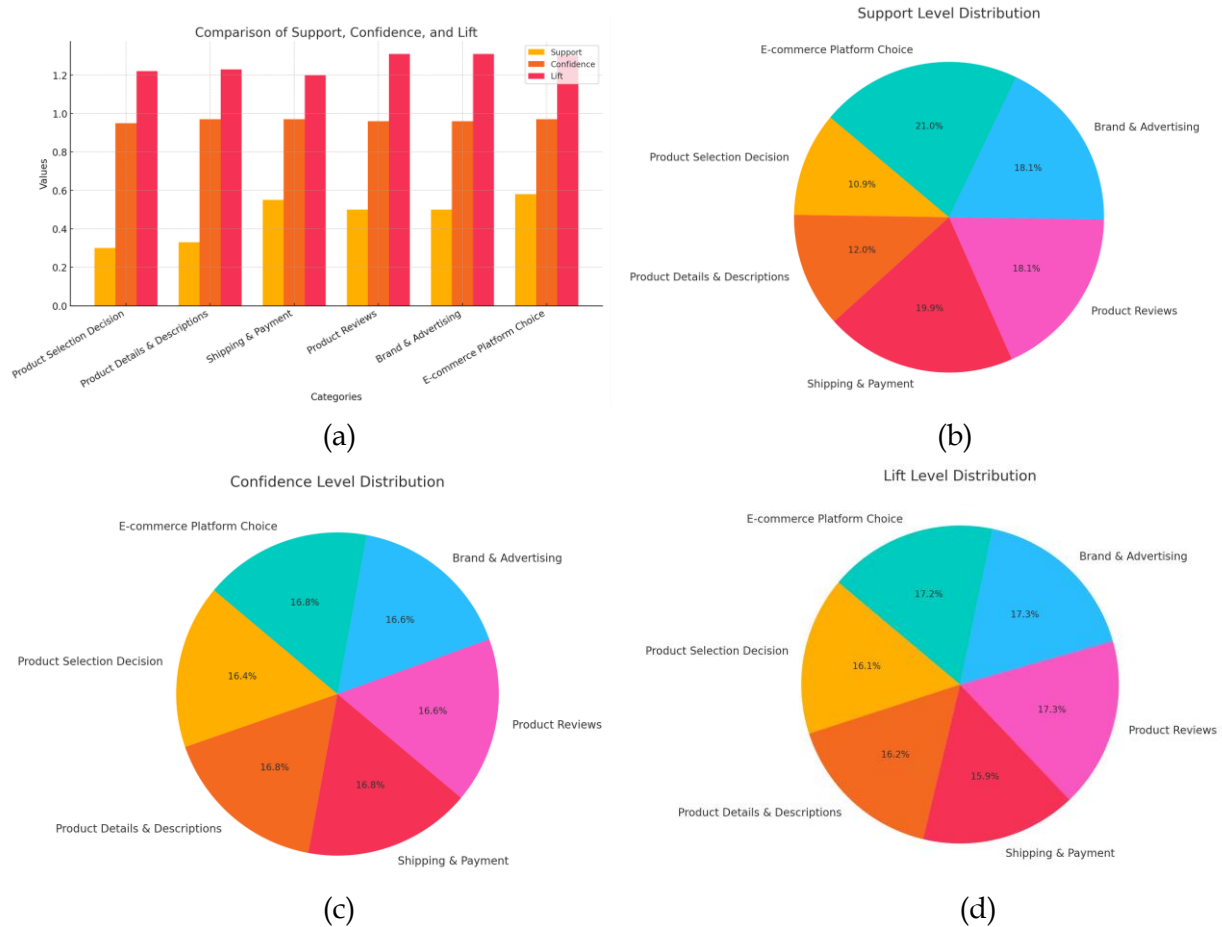


Fig. 3 The visualizations represent the analysis of factors affecting product selection decisions: (a) comparison of support, confidence, and lift, (b) support level distribution, (c) confidence level distribution, and (d) lift level distribution.

4.3 Evaluation of Consumer Satisfaction with Chinese-Branded Smartphones

This section examines consumer satisfaction with Chinese-branded smartphones, analyzing key factors such as performance, design, pricing, and customer service. Table 14 summarizes consumer sentiments, highlighting areas of strength and opportunities for improvement. Understanding these dimensions enables the identification of strategies to enhance user experience and foster greater brand loyalty.

Table 14. Results of the analysis of consumer satisfaction towards Chinese brand smartphones and product purchasing decisions.

No.	Statement	Import		
		\bar{x}	S.D.	Level
1	How important is the product title when you select a product online?	3.90	0.96	Much
2	Do you consider product titles when choosing a merchant?	3.60	0.89	Much

3	Do you prefer product names that include product characteristics such as size, color, or special features?	3.54	0.92	Much
4	Have you ever decided to buy a product based on an interesting or catchy product name?	3.64	0.98	Much
Total		3.67	0.94	Much

The analysis of consumer satisfaction with Chinese-branded smartphones, as presented in Table 14, indicates high satisfaction and strong purchasing intent. The mean satisfaction score of 3.67 (SD = 0.94) underscores positive consumer perceptions. Individual satisfaction criteria were ranked in descending order, highlighting key factors influencing purchasing behavior and areas for potential enhancement.

Table 15. Results of analysis of consumer satisfaction towards Chinese brand smartphones, based on product details and descriptions.

No.	Statement	Import		
		\bar{x}	S.D.	Level
1	How important are detailed product descriptions when you shop online?	3.24	0.96	Moderate
2.	A detailed product description should include information such as product size and weight.	3.04	0.94	Moderate
3.	Detailed product descriptions help you feel confident in your purchasing decision.	3.58	0.83	Much
4.	Do you like product descriptions that include illustrations or videos?	3.69	0.88	Much
5.	Detailed product descriptions reduce the risk of purchasing products that do not meet your needs.	3.60	0.91	Much
Total		3.43	0.90	Moderate

Table 15 analyzes consumer satisfaction with Chinese-branded smartphones, particularly regarding product details and descriptions. The overall satisfaction level was moderate, with a mean score of 3.43 (SD = 0.90). The highest-rated factor included visual elements such as illustrations and videos (M = 3.69, SD = 0.88), indicating their importance in enhancing product comprehension. Additionally, detailed descriptions were valued for reducing purchasing risks (M = 3.60, SD = 0.91) and fostering consumer confidence (M = 3.58, SD = 0.88). These findings highlight the critical role of comprehensive product descriptions in shaping consumer satisfaction and purchase decisions.

Table 16. Results of the analysis of consumer satisfaction towards Chinese brand smartphones regarding delivery and payment.

No.	Statement	Import		
		\bar{x}	S.D.	Level
1.	How important are the shipping options provided by the e-commerce platforms you use?	3.60	0.94	Much
2.	How important is the speed of delivery in your decision to purchase products online?	3.74	0.90	Much
3.	Do you prefer the cash-on-delivery (COD) payment method when purchasing products online?	3.46	0.85	Moderate
4.	Do you like to pay online before shipping when purchasing products online?	3.72	0.85	Much
5.	How important is the payment method in the purchasing decision?	3.90	0.96	Much
Total		3.68	0.90	Much

Table 16 analyzes consumer satisfaction with Chinese-branded smartphones, specifically regarding delivery and payment. Overall satisfaction was rated highly, with a mean score of 3.68 (SD = 0.90), reflecting consistently positive feedback. Individual satisfaction components were uniformly rated at high levels, underscoring the importance of efficient delivery and secure payment processes in shaping consumer experiences.

Table 17. Results of the analysis of consumer satisfaction towards Chinese brand smartphones regarding Product reviews.

No.	Statement	Import		
		\bar{x}	S.D.	Level
1	Do you read customer reviews carefully before making a purchase decision?	3.60	0.91	Much
2.	How important do customer ratings influence purchasing decisions?	3.63	0.92	Much
3.	Do you regularly leave reviews after shopping?	3.66	0.90	Much
4.	Do you feel that customer reviews on sales websites are trustworthy?	3.63	0.92	Much
Total		3.63	0.92	Much

Table 17 analyzes consumer satisfaction with Chinese-branded smartphones, focusing on product reviews. Overall satisfaction was high (M = 3.63, SD = 0.92). Shoppers frequently left reviews post-purchase (M = 3.66, SD = 0.90), trusted customer reviews (M = 3.63, SD = 0.92), and

valued reading reviews before purchasing ($M = 3.60$, $SD = 0.91$). These findings highlight the significance of product reviews in shaping consumer confidence and decisions.

Table 18. Results of the analysis of consumer satisfaction towards Chinese brand smartphones in terms of the attractiveness of the brand or product advertising effect.

No.	Statement	Import		
		\bar{x}	S.D.	Level
1.	You are interested in brand or product advertising. When seen on online platforms such as Facebook, Instagram, and YouTube.	3.69	0.88	Much
2.	To what extent do brand or product advertisements affect your purchasing decisions?	3.60	0.89	Much
3.	Have you ever felt distracted by advertisements irrelevant to your interests? Your purchasing decision.	3.68	0.92	Much
4.	You often click on brand or product advertisements on social media or websites.	3.54	0.92	Much
Total		3.63	0.90	Much

Table 18 examines consumer satisfaction with Chinese-branded smartphones, highlighting brand attractiveness and advertising effectiveness. Overall satisfaction was high ($M = 3.63$, $SD = 0.90$). Consumers engaged most with ads on social media ($M = 3.69$, $SD = 0.88$), while irrelevant ads were seen as distractions ($M = 3.68$, $SD = 0.92$). Advertising significantly influenced purchasing decisions ($M = 3.60$, $SD = 0.89$), emphasizing the impact of strategic marketing.

Table 19. Results of the analysis of consumer satisfaction towards Chinese brand smartphones in terms of consideration from the product e-commerce platform.

No.	Statement	Import		
		\bar{x}	S.D.	Level
1.	How important does the brand influence in choosing an e-commerce platform?	3.60	0.94	Much
2.	How important is website design in influencing the choice of an e-commerce platform?	3.66	0.88	Much
3.	How significant is the after-sale influence on choosing an e-commerce platform?	3.52	0.92	Much
4.	How important does word of mouth influence choosing an e-commerce platform?	3.43	0.91	Moderate
5.	How important is the user experience when choosing an e-commerce platform?	3.61	0.93	Much
Total		3.56	0.92	Much

Table 19 presents consumer satisfaction with Chinese-branded smartphones concerning product selection on e-commerce platforms. Overall satisfaction was high ($M = 3.56$, $SD = 0.92$), reflecting strong agreement among respondents. Individual factors contributing to satisfaction were also rated highly, emphasizing the significance of product selection in shaping consumer experiences.

5. Conclusion

This study comprehensively analyzes consumer behavior toward Chinese-branded smartphones on e-commerce platforms in Thailand. The research successfully identifies critical factors that drive consumer purchasing decisions by leveraging machine learning models alongside ARM, SVM, and DT techniques. The findings indicate that product attributes, pricing strategies, brand reputation, and customer reviews significantly influence consumer choices. Additionally, mobile commerce has emerged as a dominant force, with an increasing preference for digital payment methods and seamless shopping experiences. The study highlights the importance of strategic marketing, such as influencer-driven promotions and targeted advertising, in shaping consumer perceptions and boosting sales. Detailed product descriptions, high-quality images, and verified customer reviews enhance trust and engagement. Furthermore, shipping efficiency and secure payment options have been identified as vital determinants of consumer satisfaction. For businesses and marketers, these insights emphasize the need to refine digital strategies, optimize product listings, and engage with consumers through personalized marketing campaigns. Future research should explore the long-term impacts of evolving e-commerce trends and consumer preferences, particularly in light of emerging technologies and digital innovations. By addressing these factors, businesses can enhance their competitive advantage and cater effectively to the growing demand for Chinese-branded smartphones in Thailand's dynamic online marketplace. Moreover, the findings suggest that companies should incorporate artificial intelligence and machine learning models into their decision-making processes to refine customer engagement strategies. The role of big data analytics in consumer behavior analysis will be crucial in forecasting market trends and personalizing user experiences. Additionally, policy implications highlight the necessity for regulatory frameworks to ensure fair competition and consumer protection in the e-commerce ecosystem. Lastly, given the rapid digital transformation, further studies should investigate how technological advancements such as blockchain, augmented reality, and virtual assistants impact consumer trust and purchasing behavior. These insights will benefit marketers and e-commerce firms and contribute to the broader academic discourse on digital consumer behavior in Southeast Asia.

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