

Research on the operation mode and strategy of mobile e-commerce under the background of new information technology

Bo Xiao, Xueying Wang, Yizhao Jia, Wenxi Zuo

Xinjiang University of Science and Technology, Korla, 841000, China

Keywords: New-generation information technology; Mobile e-commerce; Operational model; Optimization strategies

Abstract: In recent years, China's mobile e-commerce market has grown rapidly. Despite having a vast customer base, mobile e-commerce platforms still face significant challenges in areas such as pricing strategy, traffic acquisition and conversion efficiency, and the security of mobile payments. To address these challenges, this paper analyzes the impact of new-generation information technology on the e-commerce industry and proposes corresponding solutions. These include using machine learning models to predict market trends and user behavior, real-time data tracking to capture immediate buying intent, considering user privacy protection at every stage of product and service development, and implementing multi-layer security keys to reduce payment risks. The implementation of these strategies aims to enhance the operational efficiency of mobile e-commerce, improve user experience, and promote sustainable and healthy industry development.

With the widespread application of new-generation information technology, many Chinese enterprises have adopted a mobile e-commerce model to enter the market. This model utilizes mobile devices to enable shopping anytime and anywhere, online payments, and a variety of business, financial, and integrated services, effectively boosting user growth and driving consumption upgrades.

1. The Significant Advantages of Mobile E-commerce

Mobile e-commerce is distinct from traditional e-commerce in that it expands and enhances channels, users, traffic, and marketing effectiveness. It allows anyone to access mobile information and services through mobile terminals without being constrained by time or location. Mobile devices facilitate a richer online experience, including leisure shopping, personal business transactions, remote information services, and more. Mobile e-commerce can reach a broader consumer base, significantly increasing its user group compared to traditional e-commerce. Its notable advantages include:

Instantaneity: Mobile e-commerce is no longer bound by time and space, offering a significant advantage over traditional e-commerce. Mobile devices such as smartphones and tablets are smaller and more portable, freeing users from the geographical restrictions of traditional desktop computers. People can enjoy e-commerce services anytime, allowing them to search for and purchase products,

receive information, and access entertainment services.

Tracking, Location, and Algorithmic Recommendations: Tracking and algorithmic recommendations highlight the precision of mobile e-commerce operations. Mobile e-commerce platforms can provide information related to the user's geographical location and recommend personalized products or services based on their preferences, which traditional e-commerce struggled to achieve effectively.

Convenient and Flexible Payment Methods: Mobile e-commerce's development is closely tied to the widespread adoption of mobile payments. Technologies such as mobile banking, e-wallets, WeChat Pay, and Alipay make online shopping simpler and easier. The habitual use of mobile devices for shopping significantly increases the likelihood of users making purchases during fragmented time periods, including impulsive buying behaviors.

Intensive and Virtualized Interaction: Leveraging new-generation information technology, mobile e-commerce enterprises can achieve denser interactions with users. Business discussions, ordering, contracting, and payment processes can be fully digitalized and virtualized, significantly enhancing the sense of privacy for users utilizing mobile e-commerce services [1].

2. Current State and Issues in Mobile E-commerce Operations

According to the latest report from the China Internet Network Information Center, "The 53rd China Internet Development Statistics Report," by the end of 2023, China's mobile internet users reached 1.091 billion, an increase of 25.62 million users throughout the year, marking the sustained high growth of mobile internet. Data usage has also risen significantly, reaching 301.5 billion GB, a year-on-year increase of 15.2%. China continues to lead globally in 5G network deployment, with 805 million 5G users, accounting for 46.6% of total mobile phone users, demonstrating the rapid adoption and widespread application of 5G technology. The online retail market has also maintained steady growth, with online retail sales reaching 15.42 trillion RMB, a growth rate of 11%. The number of online shoppers grew to 915 million, an increase of 69.67 million. Notably, with the participation of different age groups, including Gen Z and older users, online shopping is exhibiting new trends and patterns. Consumers are showing preferences for domestic, eco-friendly, and smart products, which account for 58.3%, 29.7%, and 21.8% of user preferences, respectively, reflecting rapid changes in consumer upgrades. Meanwhile, online retail companies are expanding into fourth- and fifth-tier cities and rural areas, such as community e-commerce company Meituan Select, which covered 2,000 cities and counties nationwide in 2023, and Alibaba's rural market e-commerce platform Taote, which had over 300 million active consumers annually.

Considering these data, China's mobile e-commerce platforms have a vast user base. How to ensure that e-commerce products and services are quickly and frequently accessible to consumers, achieve cost control, improve production supply efficiency, ensure safe and timely logistics distribution, and provide accurate and prompt after-sales responses are key focuses for e-commerce companies in mobile e-commerce operations. Consumers, on the other hand, face challenges in dealing with numerous mobile e-commerce shopping channels, varying product quality, choosing the best value-for-money products, payment security, and after-sales service considerations. Precise scenario-based marketing, by aligning closely with consumers' personalized needs and quick response, can not only enhance trust and willingness to purchase but also address these core concerns [2].

2.1. Issues of Product Pricing, Traffic, and Conversion Rates

When operating a mobile e-commerce business, the pricing of new store products directly affects sales volume. How to price products and reduce channel pricing differences are essential concerns for e-commerce operations. Some mobile e-commerce vendors have failed to accurately gauge

changes in external environments such as economic, social, technological, and cultural factors, as well as shifts in mobile shopping demands and consumer psychology, resulting in difficulties in ensuring the effective operation of mobile e-commerce. The ranking of stores and the proportion of new and old customers are particularly significant for conversion rates, and a company's service awareness also directly affects conversion rates and customer reviews. Mishandling after-sales can exacerbate conflicts, greatly impacting the reputation and credibility of the vendor [3].

2.2. Security Issues in Mobile Payments

According to the "2023 Global Payments Report" published by Worldpay, digital wallets have become the dominant method for e-commerce and point-of-sale payments worldwide, particularly in the Asia-Pacific region. Experts predict that digital wallets' share of e-commerce transaction volume will rise from 69% in 2022 to 73% in 2026. China leads globally in real-time payments and digital wallet usage, striving to promote the digital yuan to strengthen its leadership in global e-commerce and mobile payments. Data from the People's Bank of China shows that prior to 2018, China's online payment transactions far exceeded mobile payment transactions, but in 2018, mobile payments overtook online payment transactions. In 2023, the volume of mobile payment transactions in China reached 296.163 billion, with a value of 339.527 trillion RMB, representing a year-on-year increase of 6.17% and 9.17% respectively, making it the most popular payment method among Chinese consumers.

The "2023 Mobile Payment Security Survey Report" published by China UnionPay shows that payment security has become a primary concern for users, with over 70% of Chinese users adopting various verification measures. Nearly half of users have accepted the option of contactless payments for amounts under 100 RMB. Online consumption is becoming increasingly frequent and diverse, with users' awareness of payment security improving, resulting in a general decline in losses from online fraud. However, specific groups such as "the elderly and the young" require special attention. The report also emphasizes the importance of anti-fraud tools and education, offering specific preventive measures to protect consumers' assets [5]. Risk assessment for transactions on mobile e-commerce platforms must include preemptive prediction, in-process control, and post-loss mitigation, ensuring users can shop with peace of mind.

As the number of users opting for mobile payments surges, issues concerning user privacy breaches and payment security have become more prominent. Despite China's third-party payment backend platforms being generally secure and cybersecurity technology continually advancing, potential risks cannot be ignored. Mobile payments rely on apps and mobile devices, which cannot always guarantee payment by the actual user, making it difficult for payment platforms to distinguish between authorized, unauthorized, and normal use. Threats to mobile payment security include phishing websites, scam messages, and malware.

2.3. Issues with Logistics Efficiency, Cost, and Safety Stock

According to China's corporate database, there are over 25,000 registered enterprises in the logistics industry. In 2023, the demand for logistics reached new heights, with the total social logistics amounting to an astounding 352.4 trillion RMB, a 7% increase year-on-year. An Accenture survey of online consumption shows that consumers are primarily under 45 years old, particularly those born in the 1980s and 1990s. This demographic has high demands for logistics speed and is willing to pay extra for faster services. Data from the "2023 China Instant Delivery Industry Trend White Paper" shows that the order volume of China's instant delivery industry reached 40.88 billion orders, a 22.8% increase year-on-year, with the instant logistics industry's orders accounting for 30.9% of the entire courier market, indicating a consensus in the logistics industry towards improving delivery speed.

Mobile e-commerce companies mainly adopt two logistics models: one involves building their own logistics system, characterized by high processing efficiency, quick response, and timely feedback, but with a concentrated customer base and limited delivery range. The other model involves third-party logistics services, characterized by broad markets and dispersed regions, but with several limitations in improving service quality due to reliance on third-party logistics. While shopping on mobile e-commerce platforms, consumers need to check logistics details at any time, with occasional changes to delivery information. Most users prefer free shipping, making shipping efficiency, delivery speed, logistics costs, and support for a seven-day unconditional return policy crucial to a merchant's competitiveness.

3. Optimization Strategies for Mobile E-commerce Operations

3.1. Market Prediction and Marketing Optimization with Machine Learning Models

Formulating a sales strategy for mobile e-commerce requires careful consideration of consumer needs. Mobile e-commerce platforms and businesses can leverage machine learning models for big data analysis, offering targeted marketing based on users' consumption habits and preferences. This enhances the efficiency of sales activities and significantly optimizes marketing outcomes, yielding greater profits. By utilizing big data analysis, businesses can meticulously collect and process user behavior data and transaction records, gaining deep insights into consumer behavior and predicting market trends to optimize their operations [4].

Businesses should focus on the search engine mechanisms on mobile platforms. By tracking real-time data on user behavior across various products or services and their search rankings, companies can capture consumers' immediate purchase intentions. Through real-time promotions and personalized ads, they can attract potential buyers. Furthermore, employing frequent, high-quality video and poster content, optimizing mobile page load speed, implementing local SEO strategies, and encouraging influencer endorsements can attract more users to search and order products. A/B testing and other methods should be periodically used to test and optimize marketing campaigns, identifying the most effective strategies to improve conversion rates. Mobile e-commerce businesses can also establish mobile-friendly links, increasing traffic and fan engagement, thereby enhancing overall benefits.

3.2. Multi-Level Security Keys to Combat Mobile Payment Risks and Protect User Privacy

While offering convenient payment services, mobile e-commerce platforms must incorporate encryption measures to ensure transaction security. The "2023 Mobile Payment Security Survey Report" by China UnionPay indicates that payment security is a top priority for users. Over 70% of Chinese users employ various verification measures, and nearly half have accepted small payments under 100 RMB without authentication. Despite the increase in online consumption scenarios and the improved awareness of payment security, certain groups such as the elderly and the young require special attention. The report also emphasizes the importance of anti-fraud tools and education, offering specific preventive measures to further safeguard consumers' assets [5]. Consequently, upon detecting abnormal transactions, immediate control measures should be taken to help users recover losses promptly. Mobile e-commerce platforms must carry out risk assessments, including preemptive prediction, control during transactions, and post-transaction loss mitigation, to ensure secure usage.

A crucial strategy to reduce payment risks involves implementing multi-level security keys. This entails multiple layers of encryption during the payment process, ensuring transaction security. Measures include multiple verification methods, such as passwords, fingerprints, or facial recognition, advanced encryption standards (e.g., SSL/TLS) for encrypting transaction data, generating one-time

dynamic security tokens, monitoring transactions in real time to identify and prevent suspicious activities, and adhering to the Payment Card Industry Data Security Standard (PCI DSS) to ensure data processing security. These multi-level security measures reduce mobile payment risks, enhancing user trust in e-commerce platforms and businesses.

To personally mitigate mobile payment risks, users should install and update antivirus software on their mobile devices, protect their mobile payment passwords by setting complex ones, and avoid insecure network links or unsafe websites. When downloading software and applications, users should ensure they do so from official platforms, avoiding bundled malicious plugins or viruses.

3.3. Enhancing Logistics Efficiency and Optimizing Inventory Management

Logistics strategies for mobile e-commerce should be tailored to operational needs, selecting efficient and cost-effective options to manage logistics costs effectively. Companies can utilize their own logistics systems to serve key high-priority clients, ensuring high-quality and stable delivery, while leveraging third-party logistics for broader coverage of dispersed customers. Artificial intelligence can optimize delivery routes, improving logistics efficiency and reducing the cost burden on enterprises. Cost reduction should also be balanced with maintaining service levels to increase customer satisfaction and loyalty.

For inventory management, small and medium-sized enterprises can employ IoT technologies to enable real-time inventory monitoring, automatic counting, and intelligent forecasting, thus improving efficiency and accuracy. This includes using RFID tags and sensors for real-time tracking of inventory items; sensors to monitor the temperature, humidity, and location of inventory; automatic counting and recording of inventory quantities and locations, reducing manual errors and time costs [6]; setting inventory warning thresholds and adjusting inventory levels based on historical sales data and predictive models, avoiding overstock or understock; and collecting and analyzing IoT-generated data to optimize inventory structure, increase turnover rates, and reduce capital occupation.

3.4. Strengthening Legal Frameworks and Industry Oversight

Mobile e-commerce has permeated many aspects of the economy and society, and corresponding legal frameworks are essential for sustained, orderly development. These frameworks cover areas such as consumer rights protection, the rights of e-commerce platforms and enterprises, data security and privacy, intellectual property protection, and preventing monopolistic and unfair competition [7]. To ensure compliance with unified standards, relevant laws and industry regulations need further revision, with an emphasis on day-to-day supervision and enforcement to protect consumer rights. Mobile e-commerce platforms and merchants can collaborate with users, review agencies, and others to form an effective oversight mechanism, and establish cooperative relationships with government departments and industry associations worldwide to combat illegal activities in the cross-border mobile e-commerce sector. Platforms and merchants should also strive to establish reputable business brands and service awareness, fostering good communication with users through sincere service, thereby boosting credibility and promoting a harmonious, positive, and progressive direction for mobile e-commerce.

4. Conclusion

China's mobile e-commerce industry is experiencing new development opportunities, profoundly altering consumption habits. However, alongside rapid growth, mobile e-commerce has exposed certain issues and deficiencies. The current operational models for mobile e-commerce are being explored and refined, but developing a mature, stable business model requires continuous

optimization and innovation. This paper has discussed operational models and strategies for mobile e-commerce under the new generation of information technology, concluding that precise marketing, logistics cost control, and mobile payment security are key issues to address. Mobile e-commerce has immense potential for growth and a broad market space, which will provide sustained impetus for the healthy development of the national e-commerce industry. As technology advances and markets are further explored, mobile e-commerce is poised to become a significant force driving the transformation and upgrading of China's market consumption.

Acknowledgement

General Project for Undergraduate Education Teaching Research and Reform of Xinjiang Uygur Autonomous Region Higher Education Institutions in 2022 "Exploration of First-Class Undergraduate Course Construction on Entrepreneurship Project Incubation Oriented E-commerce Operation Practice" (Project Number: XJGXPTJG-202289).

References

- [1] Ruiyu Huang & Zhenbin Yang. "Reflections on Cost Management of E-commerce Enterprises in the Internet Era." *Cooperative Economy and Science & Technology*, 2022(28).
- [2] Chenming Song. "Research on the Impact of Mobile E-commerce Scenario Marketing on Consumer Behavioral Intentions." *Chang'an University*, 2023(4).
- [3] Zhiqiong Bu. "Research on Chinese Consumer Purchasing Behavior under the Background of Mobile E-commerce." *Commercial Economic Research*, 2020(11).
- [4] Jing Liu. "Analysis of E-commerce Enterprise Management Models in the Era of Big Data." *Commercial Economic Research*, 2017(05).
- [5] China UnionPay. "2023 Mobile Payment Security Survey Report" [EB/OL]. (2024-02-05) [2024-03-31]. <https://www.unionpay.com/upowhtml/cn/templates/newInfo-nosub/7885004da382485e8bde5a0ba000fdd3/20240205152732.html>.
- [6] Rui You. "Multi-site Selection Method for Cross-border E-commerce Logistics Networks Considering Uncertain Returns." *Journal of Chongqing University of Science and Technology (Natural Science Edition)*, 2023(06).
- [7] Minghuan Yao. "Research on the Government Regulation of E-commerce Live Streaming." *Jilin Provincial Party School (Jilin Provincial Academy of Administration)*, 2024(06).
- [8] Juan Du. "Research on the Influencing Factors of Third-party Mobile Payment User Brand Loyalty." *Hebei University of Economics and Business*, 2020(05).