Research on Marketing Transformation Driven by Big Data and Fintech: Case Analysis and Risk

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Abstract: This paper focuses on the transformation of marketing by big data and fintech. Through typical cases of beauty, sports brands and financial services, it dissects the practical paths of data-driven marketing, including user profiling construction, predictive marketing implementation and omni-channel integration strategies. At the same time, in combination with typical case events, reveal the information security risks, technical loopholes and third-party compliance risks in digital marketing, and construct a three-dimensional risk governance framework of "technology - system - compliance". The study found that enterprises need to strike a balance between precision marketing and risk control, and achieve sustainable development through technology reinforcement, compliance management and government-enterprise collaboration.

Keywords: Big data, Fintech, Marketing transformation, Risk governance.

1. Introduction

As humanity enters the digital age, big data and fintech are developing rapidly, profoundly changing the landscape of the financial industry. Big data provides massive, multi-source data, laying the foundation for precise insight into customer needs; Fintech, which combines emerging technologies with financial services, drives financial innovation [1]. The combination of the two has driven financial marketing to shift from traditional models to digital and intelligent ones, with precision marketing and personalized services becoming trends. Ant Financial, for example, uses big data to analyze users' consumption and financial management habits and launches personalized financial products such as Yu 'E Bao, changing users' financial management methods and market competition patterns. In this context, studying marketing changes driven by big data and fintech is of great significance for financial institutions to seize opportunities and meet challenges [2]. Based on the profound transformation background of the financial industry under the digital wave mentioned above, this paper aims to achieve the following research goals: Analyze the reconstruction mechanism of the underlying logic of marketing by big data and fintech; Summarize the practical methods of user profiling and market trend prediction through typical cases; Analyze the causes of information security risks and propose preventive strategies at the technical and compliance levels; Build a risk governance framework for digital marketing to provide reference for enterprise practice. The research focuses on the core question: How do companies balance precision demands and risk control in the data-driven marketing transformation? What is the transmission mechanism of three-dimensional risks (technical loopholes, institutional flaws, compliance risks)? By studying the integration of big data marketing and risk governance theories, supplementing the academic research of industry-differentiated practices, and providing enterprises with actionable user profiling methods and risk response strategies at the practical level to facilitate decision-making optimization in digital transformation.

2. Theoretical Basis and Literature Review

2.1. Theoretical Evolution of Big Data Marketing

At the theoretical construction level of big data marketing, scholars have clarified the role of big data in reconstructing marketing paradigms. The "Intelligent Recommendation - Precise prediction" model proposed by Li et al. quantifies for the first time the positive correlation between data dimensions and marketing effects, providing a theoretical basis for the application of technology; The three-stage marketing framework divided by Wang Kaiqin clearly reveals the transformation logic of data from collection to application and becomes a classic tool for interpreting the operation mechanism of e-commerce platforms [3]. These studies together established the core proposition of "data-driven decision-making", laying the methodological foundation for subsequent exploration. The analysis reveals that the current marketing theory has shifted from the AIDA model to data-driven decision-making. The core of traditional marketing theory is the AIDA model, which emphasizes the linear nature of the communication path, but it is difficult to adapt to the dynamic changing trends of user behavior in the digital age. With the advancement of data technology, theoretical research is gradually transitioning to the "data-driven" paradigm, but existing research has obvious limitations: One is overemphasizing the general nature of the technology while ignoring the differences between industries, such as beauty users have a need for "emotional resonance" and sports users have a need for "functional verification", requiring differentiated setting of model parameters; The second is an incomplete analysis of the "data-decision-making" part (such as the effect of algorithmic bias), resulting in a disconnection between theory and practice.

In addition, there is a blind spot in the theory of industry differentiation in marketing models. Some scholars have taken into account the impact of industry characteristics on marketing models. Zhang Min conducted an empirical study using the beauty user tag library and found that the "emotional

response threshold" of female users aged 18-23 was significantly lower than that of other groups; Smith , based on the Nike collaboration case, found that users in the sports industry are 2.3 times more sensitive to "scarcity signals" (such as limite releases) than the general population [4, 5]. The research shows that industry differences actually exist, but it fails to form a systematic theoretical framework. In Wang Kaiqin's three-stage model, the strategy design of the "application layer" does not distinguish the different logics of "emotional communication" and "functional communication", the former relies on the dynamic update of user interest tags, and the latter depends on the accuracy of hot event predictions [6]. Therefore, this differentiation theory model needs to be adjusted by embedding "industry characteristic coefficients".

2.2. Risk Studies of Digital Marketing

Existing research categorizes risks into three types: technical risk refers to leaks caused by vulnerabilities in data storage and transmission; Institutional risks are reflected in regulatory gaps in corporate partnerships with third parties; Compliance risks stem from conflicts between cross-border data flows and privacy regulations (such as the differences between the EU GDPR and China's Data Security Law). Technical risks stem from vulnerabilities in "data lifecycle" protection, Liu Chang said, "excessive access" during data collection, "insufficient encryption strength" during storage, and "interfaces with vulnerabilities" during transmission probably form a chain of risk transmission [7]. Institutional risks are mainly reflected in the gap between "compliance requirements and enterprise practices", and Wang Lei 's related permission control model shows that "third-party cooperation" is involved in 63% of data security incidents: In the third-party data breach that Nissan encountered in 2025, the service provider failed to comply with the requirements related to "data desensitization", resulting in the leakage of information of 18,000 customers, reflecting the regulatory gap of the enterprise over its partners [8]. The differences in global regulatory rules (such as the EU GDPR and China's Data Securit Law's requirements for cross-border data flows) have given companies room for regulatory arbitrage, further magnifying compliance risks - a multinational brand faced a € 12 million fine in 2025 due to its failure to comply with GDPR requirements.

To sum up: First, the existing theoretical framework for big data marketing is fragmented and ill-suited to the industry. Second, the lag in case selection is disconnected from practice [9]. Third, the passivity of risk research and the lack of forward-looking prevention and control. Fourth, the superficial integration of technologies. In response to the above limitations, this study will achieve innovation in three aspects: First, construct a three-dimensional integrated framework of "technology- scenario - governance", incorporate variables of government-enterprise relationship, and enhance the adaptability of theory to vertical industries; Second, Focus on typical cases from 2024 to 2025 to capture the dynamic characteristics of marketing innovation; Third, propose a "risk prediction - graded prevention and control" mechanism, combining the technical characteristics of generative AI to explore forward-looking compliance paths. Through these breakthroughs, the aim is to bridge the gap between existing research and practical needs and provide more valuable theoretical support for the sustainable development of big data marketing.

3. Research Methods and Data Sources

This study uses the literature review method to sort through 214 core papers from 2018 to 2025 (source: CNKI, Web of Science), and uses the CiteSpace tool for cluster analysis to extract the three hotspots of "user profiling", "risk governance", and "predictive marketing" to support the theoretical framework.

From 2024-2025, including Judo, Nike, Dior, etc. The criteria for the selection included: innovation, the use of big data or fintech models with industry breakthroughs; Typicality, risk events should reflect common problems in the industry; Data accessibility: The company's publicly released reports, user complaint data, regulatory notifications and the like are complete. To ensure the objectivity and impartiality of the case analysis, the study adopted a triangulation method consisting of "enterprise data + user feedback + regulatory reports": the enterprise data included the Judo user profile report, the Nike collaboration sales data, and the Dior incident investigation report; User feedback covered 59,000 password-free payment complaint texts and sentiment analysis of social media comments; Regulatory data included MIIT security incident notifications and GDPR compliance audit reports.

4. Big Data and Fintech-Driven Marketing Practice Cases

4.1. Beauty Industry: Jinduo's Precise Profiling and Emotional Marketing

Judo builds multi-dimensional user profiles by integrating data from platforms such as Bilibili, Xiaohongshu, and Tmall: in terms of demographic attributes, 82% are women aged 18-23, with a TGI index of 167 (significantly above average); In terms of interests, the TGI index in the fields of food, culture and education, and lifestyle is over 110, with a preference for "best friend sharing" content; The behavioral trajectory shows that 80% of users first encountered the brand through "little blogger seeding", and the interaction peak was concentrated between 8 and 10 p.m. Through TGI index (Target Group Index) analysis, Judo targeted the core users of the "student group" and increased the tag update frequency from the traditional "weekly level" to the "hourly level" to ensure the timeliness of the profile.

Based on the user profile, Judo adopts "decentralized" marketing: In terms of content strategy, it collaborates with lifestyle ups with less than 100,000 followers, with themes such as "stockpiling tutorials" and "everyday makeup" to enhance the "sense of friendship"; In terms of channel allocation, 80% of the resources are directed to small bloggers, whose fan interaction rate (7.3%) is 3.5 times that of top bloggers; In terms of conversion paths, the "grass-planting + lottery" model reduced the rejection rate of hard advertisements by 37%, and the proportion of users' spontaneous dissemination reached 18%. The July 2024 data shows that Judo has achieved a 42% increase in user interaction rate and a 29% repurchase rate of new products through this strategy, verifying the effectiveness of emotional communication.

4.2. Sports Industry: Nike's Predictive Marketing Tied to Hotspots

Nike builds predictive models based on "hot event - user behavior" correlation analysis: input variables include social

media popularity (1.1 billion views on G-Dragon's discharge from the military), fan profile (62% of men aged 25-30), and repurchase rate of historical collaborations (38%); Algorithmic logic predicts peak demand through the LSTM time series model and combines the Apriori algorithm to mine association rules for "browsing celebrity dynamics - buying sneakers" (support 0.73, confidence 0.81); The prediction shows that the demand for the G-Dragon collaboration is 5.7 times that of the regular model, and the price premium space is more than 10 times.

Based on the forecast, Nike implemented precise marketing: the pre-sale was launched within one hour after G-Dragon's discharge news was released to seize the heat window period; In terms of channel strategy, Tmall limited 1,000 pairs, offline stores set up "experience zones" to collect try-on data, and optimized online detail pages; The results showed that the goods sold out in 0.06 seconds, the price of the red checkmark limited edition was pushed up to 20,000 yuan, and the price of the double white checkmark rose from $200 to $2,999, with sales exceeding expectations by 300%. This case confirms the value of predictive marketing in the delivery of "scarcity signals" and provides a practical paradigm of "hot spot binding + data validation" for sports brands [10].

4.3. Fintech-Enabled Payment Scenario Innovation

Cases such as Alipay and Apple Pay show that fintech is turning payment tools into marketing entry points: data such as payment frequency, amount and time period can extract 27 consumption characteristics, contributing 39% to demand forecasting; The combination of password-free payment and real-time alerts has increased conversion rates by 35 percent in the short-video shopping scenario; Alipay's "delayed arrival" feature identified the risk of "nighttime large transactions" by analyzing data from 120 million users, reducing the rate of fraud complaints by 52 percent. The deep application of payment data has achieved a triple synergy of "security - convenience - marketing", providing a differentiated competitive path for the financial industry.

5. Three-dimensional Risk Mechanism Analysis of Digital Marketing

5.1. Information Collection and Privacy Leakage Risk: A Case Study of Dior

Unauthorized access to Dior's database in 2025 led to the leakage of information (names, phone numbers, consumption preferences, etc.) of 120,000 Chinese users. Technical traceability reveals flaws in protection with "weak password + single firewall", 73% of employees have "read-only access", and there is a lack of operation log auditing; Hackers broke through the protection through SQL injection and exploited redundant permissions to download data; With a 72-hour interval from discovery to fix, brand reputation index drops.

The incident exposed a protection vulnerability throughout the data lifecycle: excessive acquisition of user privileges in the collection process beyond what is necessary for marketing [11]. The storage section is underencrypted and core data is not graded for protection; The lack of real-time monitoring mechanisms in emergency response has led to increased losses. According to industry statistics, the average global loss due to data breaches is $4.45 million in 2025. The luxury goods industry, due to sensitive user data, has a loss multiple of 2.3 times that of the general industry.

5.2. Security Vulnerabilities in Password-Free Payments: An Example of Apple Account fraud

In April 2025, Apple users suffered 162 consecutive transactions in the early hours of the morning, losing more than 80,000 yuan. The root causes include: At the enterprise level, to boost conversion rates, the password-free payment limit was raised from 500 yuan to 2,000 yuan without setting a "nighttime transaction limit"; At the user level, 83% did not activate the "device lock", and 67% used the payment function in a public Wi-Fi environment; Technically, the early morning defense system response was delayed, and small transactions did not trigger secondary verification. Industry data shows 59,000 complaints related to password-free payments, with the "convenience - security" imbalance being the main contradiction.

The risk amplification factor is reflected in the fact that hackers take advantage of the weak defense period from 2 to 6 a.m. to bypass the limit through multiple small transactions; It is difficult to trace fraudulent transactions in scenarios such as game recharges and App subscriptions; Users are not vigilant about the opening of password-free permissions, and 62% of users have not read the relevant agreements.

5.3. Compliance Risks in Third-Party Data Cooperation

In 2025, Nissan Motor experienced the leakage of 17,998 customer information due to violations by a third-party service provider. Such incidents accounted for 63% of the total data security incidents throughout the year. Compliance risks stem from: uncontrolled data flow, third-party use of data beyond authorized scope, such as using consumer information for precise marketing; In terms of cross-border differences, the EU GDPR requires "data localization", but some companies have not established regionalized compliance systems; Regulatory arbitrage takes advantage of regional regulatory differences to lower data protection standards in order to cut costs.

Cost and loss estimates show that multinational companies' compliance costs have risen by 30% year-on-year to fit GDPR and China's Data Security Law, with a single data center costing more than $5 million; Global average fines for data compliance will be 12 million euros in 2025, 76% of which are related to third-party abuse; Third-party breaches have led to a 15-20 percent drop in user retention and an average 18-month brand repair cycle.

6. Building a Marketing Closed-Loop Mechanism Driven by Big Data and Fintech

6.1. Data collection Layer: Convergence of All-Channel Touchpoints

Data collection is the beginning of the marketing loop, with a focus on achieving "multi-touchpoint - all-scenario" user behavior collection, and the technical paths adopted include:

First, online channels: Integrate real-time data from social platforms (such as the browsing duration and interactive content Bilibili and Douyin), e-commerce platforms (such as the consumption records of Tmall and specific behaviors of additional purchases), and self-owned apps (related situations of member logins and points redemption). Second. Offline

scenarios: Fill in the "missing scenarios" of online data through in-store Wi-Fi probes, POS consumption records, shopping guide service feedback, etc. Third, cross-domain integration: using federated learning technology to break the data shackles between brands and third-party platforms (such as Judo and Bilibili) while the data is available but not visible.

Scale validation notes show that as of July 2024, the five major content platforms - Bilibili, Douyin, Tmall, JD.com, and Xiaohongshu - have a user base of 1.049 billion and generate more than 800TB of behavioral data daily, laying the data foundation for precision marketing. Financial payment data has the highest value density - the payment trajectory (time period, amount, frequency) of a single user can extract 27 consumption characteristics, contributing 39% to demand forecasting.

6.2. Algorithm Analysis Layer: Real-Time Dynamic Tagging System

The core of algorithmic analysis is to transform raw data into "decision-making" user insights, and the algorithmic technical logic includes:

First, tag generation: Build a multi-dimensional tag system based on machine learning models like Random Forest, including demographic attributes. Take Judo as an example, the brand uses TGI index to identify the core interest categories of female users aged 18-23, and the frequency of tag updates increases from the traditional "weekly" level to the "hourly" level; 2. Association rule mining: Relying on the Apriori algorithm to identify hidden associations of "behavior-demand", in the case of Nike, the algorithm knew that the support for "browsing G-Dragon related content" and "buying sneakers" was 0.73, presenting a confidence level of 0.81, providing a basis for related decisions in the marketing of co-branded items; Third, dynamic optimization: By using reinforcement learning mechanisms, the model parameters are adjusted with real-time feedback (such as click-through rates of push notifications), achieving a 28% improvement in tag accuracy.

6.3. Application Output Layer: A Closed Loop of Decision and Action

Application output is the key node for converting insights into specific strategies, and it operates in a closed loop of "data → insight → action → feedback":

First, achieve precise push. During its marketing campaign on Bilibili, Judo matched lifestyle ups based on user interest tags and adopted the content format of "seeding plus raffle", which led to a 37 percentage point drop in the rejection rate of hard advertising. The strategy of "80% of resources invested in small bloggers with less than 100,000 followers" relied on "friendship" to enhance emotional resonance, and the user interaction rate increased by 42%. Secondly, complete the demand forecast. Combining time series models (like LSTM) to predict market trends, Nike analyzed 1.1 billion views on G-Dragon's discharge topic and historical sales data of the collaboration items to determine the peak level of demand for the collaboration items, and adopted the strategy of "1,000 pairs on Tmall and precise distribution", ultimately achieving sales within 0.06 seconds and a price increase of more than 10 times. In addition, risk alerts: Financial applications place more emphasis on the synergy of security and marketing. Alipay, by analyzing user payment data, provides real-time alerts for risky behaviors such as "out-of-place logins + large transactions", pushing marketing content while triggering "secondary verification", resulting in a 61% reduction in the rate of fraud.

7. Risk Governance Framework and Practice Recommendations

7.1. Enterprises Build a Three-In-One Protection System

In terms of technical reinforcement, blockchain evidence storage is used to achieve full lifecycle on-chain user data, and tampering is traceable (Ant Group's practice shows that data security is enhanced 10^6 times); Train models through federated learning on the premise that data is "usable but not visible" to reduce the risk of leaks; Implement permission grading, make core data accessible only to up to 3% of employees, and audit operation logs in real time.

At the compliance management level, establish a third-party whitelist system, set data access permissions for partners, and cut off the interface for violations; Create a compliance calendar that automatically prompts nodes such as "data retention period" and "cross-border declaration" to avoid omissions; Conduct data breach simulation emergency drills every quarter and compress the response time to within 2 hours.

In terms of ethical review, push for algorithmic transparency and explain the recommendation logic to users, such as Judo's public "Little Blogger selection criteria"; Use "differential privacy" technology to hide individual information in data analysis.

7.2. The Government Implements Flexible Regulation and Collaborative Governance

The government needs to strike a balance between "encouraging innovation and controlling risks", implement sandbox regulation, allow enterprises to test cross-border data flow models in pilot areas such as Qianhai in Shenzhen, and promote them after meeting the standards; Introduce review metrics for generative AI content and implement a "filing system" for high-risk areas; Establish a special support fund for fintech marketing, provide certain cost subsidies to small and medium-sized enterprises that adopt compliant technologies, and build an "industry common technology platform" to lower the threshold for technology application.

7.3. Special Risk Governance Framework for Financial Institutions

In response to the above-mentioned risks and challenges, financial institutions need to establish a complete digital marketing risk governance framework and comprehensively enhance their risk prevention and control capabilities from the three dimensions of technology, system and compliance.

Technical dimension: Strengthening data security and technical protection. Technically, financial institutions should establish a multi-level data security protection system. First, strengthen data encryption and access control, encrypt the storage and transmission of sensitive customer information, and strictly limit data access rights to prevent unauthorized access and leakage. Secondly, deploy advanced cyber security technologies such as intrusion detection and prevention systems, firewalls, security authentication, etc. to monitor and defend against cyber attacks in real time. For intelligent marketing systems, ensure the security and reliability of algorithms and models to prevent them from being

maliciously attacked or manipulated. In addition, conduct regular security assessments and penetration tests to identify and patch system vulnerabilities in a timely manner. Minimize the risk of data breaches and system failures through the continuous upgrading of technical means.

Institutional dimension: Improve internal management and process control. Institutionally, financial institutions should establish strict internal management systems and operational procedures to regulate behaviors in all aspects of big data marketing. First, establish a data governance system that clarifies the processes and responsibilities for data collection, storage, use, and sharing to ensure that data processing activities are regulated. For example, stipulate that marketing departments must obtain customer data through approval, limit the scope of data use, and avoid excessive collection and abuse. Secondly, strengthen safety awareness training and ethics education for employees, increase their awareness of data security and compliance, and prevent risks caused by negligence or misconduct of internal personnel. Again, introduce an independent audit and oversight mechanism to regularly inspect data usage and compliance in marketing campaigns, and promptly correct and hold accountable any violations. Through the establishment of a sound internal system, a risk management system that combines human defense and technological defense is formed.

Compliance dimension: Ensure legal and compliant operation. In terms of compliance, financial institutions should incorporate regulatory requirements into their marketing strategies and operations to achieve "compliance first". First, establish a compliance review mechanism to conduct compliance assessments before launching new marketing campaigns or using new data technologies to ensure compliance with the Personal Information Protection Law, the Data Security Law, and relevant regulations of financial regulatory authorities. For example, explicit authorization is required for obtaining customers' personal information, marketing text messages and phone calls follow the "double opt-in" principle (customers subscribe voluntarily), and convenient unsubscribe methods are provided. Secondly, enhance communication with regulatory authorities, keep abreast of regulatory dynamics and policy directions in a timely manner, actively participate in industry self-discipline, and continuously improve one's compliance management level. Again, in terms of marketing content, strictly abide by the Advertising Law and financial marketing and publicity norms, eliminate exaggerated and false publicity and misleading information, and protect consumers' right to know and right to choose. By operating in compliance, financial institutions can not only avoid legal sanctions and fines, but also win the trust of customers and maintain a good industry image.

Implementation of the risk governance framework: The three dimensions of technology, system, and compliance mentioned above are not isolated but need to cooperate with each other and be implemented in a coordinated manner to form a systematic risk governance framework. For example, technical measures require systems to ensure their implementation, and compliance requirements require technical means to monitor their execution. Financial institutions can establish a dedicated digital marketing risk governance committee, involving departments such as information technology, risk management, compliance and law, to regularly assess the risk profile in marketing activities and formulate improvement measures. At the same time,

introduce a customer feedback mechanism to listen to customers' opinions on marketing activities, identify potential risks and problems in a timely manner and make improvements. Through continuous risk monitoring and governance optimization, financial institutions can pursue marketing innovation while keeping risks within an acceptable range and achieving stable development.

8. Conclusions

The convergence of big data and fintech is reshaping the future landscape of financial marketing. Through theoretical analysis and case studies, this study systematically presents the mechanisms, methods, and challenges of the transformation of financial marketing driven by big data and fintech. Main conclusions are as follows:

First, big data and fintech have restructured the underlying logic of financial marketing, driving marketing models from traditional to digital intelligence. Data-driven decision-making, customer-centricity, digital channels, real-time interaction, and intelligent services have become notable features of financial marketing in the new era. These changes have enhanced the precision and efficiency of marketing and created new value growth points for financial institutions.

Secondly, user profiling and market trend forecasting are two core applications of big data in financial marketing. Typical cases show that by scientifically building user profiles, financial institutions can gain in-depth insights into customer needs and achieve personalized customization of products and services; With big data analysis and predictive models, financial institutions can proactively grasp market trends and changes in customer behavior, and adjust marketing strategies in advance. The effective use of these methods helps financial institutions gain the upper hand in the fierce market competition.

Again, the digital transformation of financial marketing comes with new information security risks, including data breaches, technical vulnerabilities, compliance risks, etc. These risks, if not handled properly, can cause serious losses for both clients and institutions. As a result, financial institutions must attach great importance to risk control and build a safety line while enjoying the technological dividend.

Finally, building a risk governance framework for digital marketing is key to ensuring the success of the transformation. This study proposes to establish a comprehensive risk governance system from the three dimensions of technology, system, and compliance, and to incorporate risk control throughout marketing activities by strengthening data security, improving internal management, and strictly operating in compliance. Only in this way can financial institutions seize opportunities to enhance marketing competitiveness in the digital wave and effectively prevent risks to achieve sustainable and healthy development.

Overall, big data and fintech have brought unprecedented transformative momentum to financial marketing. Looking ahead, with the further development of technologies such as artificial intelligence and blockchain, financial marketing will become more intelligent and ecological. Financial institutions need to keep learning and innovating, constantly improving data-driven marketing models and risk governance mechanisms in practice. The findings and recommendations of this study are expected to provide a reference for the academic community to further explore digital marketing theories and offer useful guidance for digital marketing practices in the financial industry. In the digital age where

opportunities and challenges coexist, only by actively embracing change and prudently managing risks can financial marketing achieve a qualitative leap, create greater value for customers and inject new vitality into the development of the industry.

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