

A Study on the Application of Text Mining Techniques in the Marketing Strategy of DJI Action Cameras

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Abstract: This paper aims to conduct an in-depth study on the marketing strategies of the action camera industry, employing text mining techniques with DJI action cameras as a case study. The study collects customer reviews of the product from the JD platform using the Octoparse web scraper. It then performs word frequency list analysis, co-occurrence network analysis, and cluster analysis using KH Coder, along with sentiment analysis through ROST CM6. The results reveal that consumers' focus on DJI action cameras primarily revolves around three key aspects: product performance (such as image quality, anti-shake functionality, portability), cost-effectiveness, and vendor services (such as logistics speed and customer service attitude). Sentiment analysis indicates that 95.66% of the reviews are positive, with consumers highly appreciating the product's performance and user experience. Based on these findings, the paper suggests three marketing strategies: optimizing product performance, enhancing cost-effectiveness, and improving service systems. These strategies offer theoretical support and data references for the market practices within the action camera industry.

Keywords: Text Mining; Sentiment Analysis; Action Cameras; Marketing Strategies.

1. Introduction

In an era characterized by advanced digitalization and the pervasive influence of social media, the action camera market is experiencing unprecedented growth opportunities. The increasing demand among consumers for capturing athletic moments and sharing exciting life experiences has significantly driven the expansion of the

action camera industry. According to the *China Action Camera Industry Development Research and Prospective Trends Analysis Report (2024-2030)*, compiled by authoritative sources such as the National Bureau of Statistics, the General Administration of Customs, the National Development and Reform Commission, the State Administration for Industry and Commerce, and various industry associations, the future trajectory of the action camera market will emphasize technological innovation and user experience. With the development of 5G networks and cloud storage technology, action cameras are expected to support real-time uploading and live streaming, enabling seamless integration with social media platforms. Furthermore, the integration of augmented reality (AR) and virtual reality (VR) functionalities will provide users with an immersive filming and viewing experience. In addition, action cameras will increasingly embrace smarter and more personalized features, such as AI algorithms for automatic editing and intelligent tracking, as well as real-time first-person perspective recording through wearable devices. This quantitative study aims to assess the popularity of the product and examine consumer satisfaction concerning aspects such as performance, design, and pricing. A deeper investigation into the marketing strategies of action cameras is crucial for understanding industry dynamics, gaining insights into consumer psychology, and promoting sustainable business growth. Additionally, this research will offer valuable references for the broader marketing practices within the action camera industry.

2. Marketing Research Based on User Reviews

Text mining, a subfield of data mining, focuses on extracting valuable information and knowledge from text data. This text data can

take various forms, including books, articles, emails, social media posts, user reviews, and more. The primary objective of text mining is to convert unstructured text data into structured data, facilitating further analysis and understanding.

Currently, this method is employed across various domains. For instance, Luo Xiangdong et al. (2024) conducted text mining on 100,000 online reviews of running shoes from JD.com. They performed word frequency co-occurrence analysis using KH Coder 3.Beta.07e, topic clustering through the LDA model, and sentiment analysis with Python [1]. Liu Jiakai and Li Min (2023) analyzed the sentiment and co-occurrence clustering of product information and reviews related to silk quilts on JD.com, offering relevant recommendations from both industry and enterprise perspectives [2]. Sun Tianxiao et al. (2024) first collected large-scale Weibo review data through web scraping methods for text data preprocessing. They then performed basic statistics, including word frequency analysis and word cloud generation, to identify the core concerns of travelers. Finally, they analyzed sentiment by assessing sentiment polarity scores and employed the LDA model to conduct topic analysis on negative reviews, revealing various dimensions of demand for airline services [3]. Wang Lei et al. (2025) utilized the TF-IDF algorithm and the LDA model to extract themes and keywords from the corpus, referring to airline flight quality monitoring standards, summarizing three core risk evaluation indicators, and constructing a civil aviation flight risk evaluation index system to quantitatively assess aviation flight risks [4]. Ye Gui et al. (2024) analyzed residents' behavior intentions and concerns about low-carbon travel using the BERT-BiLSTM model and LDA topic modeling based on Sina Weibo posts related to low-carbon travel [5]. Zheng Fu et al. (2025) researched consumers' attitudes toward Kuding tea, combining Python data mining techniques with ROST CM6 software. They analyzed JD.com reviews on Kuding tea from three perspectives: high-frequency words, semantic networks, and emotional features, identifying factors affecting consumer satisfaction and proposing strategies for improving satisfaction [6]. Ding Yuchen and Li Hao (2023) conducted text mining on 11,513

reviews of four medical protective suit brands, performing word frequency analysis, co-occurrence network analysis, sentiment analysis, and network analysis to reveal consumers' perceptions of shopping experiences and needs [7]. Li Yong et al. (2019) based their study on three major e-commerce platforms—JD, Tmall, and Taobao—using Python to collect review data for Anhua black tea. They conducted word segmentation and frequency analysis, providing a complete characterization of user traits for Anhua black tea consumers [8]. Song Hongjuan et al. (2016) used Octoparse Collector to gather effective review data from Silk Road network videos and analyzed the tourism marketing value of these videos from the perspective of tourists [9]. Zhan Chuan (2017) constructed an analysis system for e-commerce positions, skills, and skill dictionaries. Using this system, they analyzed 66,925 job postings in the e-commerce industry, examining the overall demand for skills and specific skill requirements for various positions [10]. Wang Chuhan (2025) et utilized large language models and text sentiment analysis to measure the pace of tourism and tourists' emotions, exploring the emotional differences among different tourists regarding the pace of tourism [11]. From 2014 to 2024, the number of related research papers in domestic fields has shown a consistent upward trend. In 2024, there were 641 papers published in Chinese, and 846 in foreign languages, indicating the considerable research value of this field.

3. Current Development of the Action Camera Industry

According to the 2024 Global and China Action Camera Industry Development Status and Competitive Landscape Analysis published by China Economic Intelligence Network at <https://www.huaon.com/>, an action camera is defined as a device designed to record sporting activities. Its convenient features, such as the ability to be mounted on a selfie stick, body, helmet, skateboard, or bicycle handlebar, make it ideal for capturing first-person perspective action scenes. The primary target audience includes extreme sports enthusiasts, travel selfie takers, reality TV shows, drone aerial photography, and virtual reality (VR) applications. Compared to traditional cameras, action cameras offer a

wider field of view and place higher demands on performance aspects such as shock resistance, waterproofing, dustproofing, heat resistance, and drop resistance.

3.1 Industry Overview and Market Size

In recent years, various favorable conditions have propelled the rapid development of the action camera industry. Firstly, the increase in per capita disposable income and per capita consumption expenditure among residents has provided a solid economic foundation for the consumption of action cameras. Secondly, the rise of short video platforms and social media has enriched the usage scenarios for action cameras. And thirdly, continuous technological advancements have driven action cameras towards higher resolutions, stronger stabilization capabilities, and increased portability. As a multitude of outdoor activities and competitions flourish worldwide, the global population of outdoor sports enthusiasts has been steadily expanding. The number of enthusiasts has grown from 420 million in 2017 to 1.22 billion in 2023, with a compound annual growth rate of 19.45%. It is projected that by 2027, the number of enthusiasts will reach 1.77 billion. Geographically, the majority of action cameras are concentrated in North America and Europe, with the Chinese action camera market accounting for approximately 7% in 2023, indicating significant growth potential. Forecasts suggest that by 2027, the market size is expected to surpass the 50-billion-yuan mark, reaching 51.35 billion yuan, with a compound annual growth rate of 13.05% from 2023 to 2027. The shipment volume is projected to reach 69.073 million units, with a compound annual growth rate of 11.55% from 2023 to 2027 (according to analysis from China Economic Intelligence Network). The expansion of the global outdoor sports enthusiast population has provided a vast market space for the development of the action camera industry, fueling its growth significantly. Furthermore, as the internet and social media continue to proliferate globally, the scale of global short video users is also expanding. This trend has made people more eager to record and share their sporting moments or travel experiences, further propelling the development of the global action camera industry.

3.2 Competitive Landscape Analysis

Currently, there is a wide variety of action camera brands, with both Chinese and international manufacturers participating, resulting in intense competition. There is a gradual trend in high-end markets where Chinese brands are emerging as substitutes, while entry-level Chinese products continue to maintain their advantage. The global action camera market is developing steadily. In the high-end market, Chinese brands such as Insta360, DJI, and AKASO (Sena) are gradually replacing Western products like GoPro, thanks to their technological advantages. Since 2022, GoPro has seen a steady decline in revenue, which dropped to 1 billion USD in 2023, marking an 8.26% year-on-year decrease. In 2024, the decline continued, reaching 341 million USD, a 65.9% decrease compared to the same period in 2023. Meanwhile, in the entry-level product category, Chinese action camera brands have consistently dominated the market, largely owing to their strong cost-performance ratio.

4. Research Design

4.1 Research Method

KH Coder is a computer software package used for quantitative content analysis or text mining. It offers various text analysis functionalities such as keyword extraction, co-occurrence analysis, multidimensional scaling analysis, and more, catering to a wide range of applications in text mining and content analysis. It is known for its simple usage and reliable results, widely utilized in academic research. ROST CM6, developed by Professor Shen Yang from Wuhan University, is a social computing platform designed to assist research in humanities and social sciences. In the realm of sentiment analysis, ROST CM6 automatically categorizes collected reader review data into emotional attributes—positive sentiment, neutral sentiment, and negative sentiment. Through this method, it becomes possible to analyze the emotional tendencies and satisfaction levels of specific audiences towards particular events or products. By importing review texts, one can obtain analysis results within minutes. Its high efficiency and reliable outcomes make it widely applicable in sentiment analysis

research.

4.2 Technological Roadmap

In this research endeavor, the initial step involves the utilization of the Octoparse Collector to gather textual reviews on DJI action cameras from the JD platform. Subsequently, the collected text information underwent preprocessing to eliminate irrelevant content. Following this, the text was subjected to word frequency analysis, co-occurrence network analysis, and clustering analysis using KH Coder software. Finally, sentiment analysis was performed using ROST CM6. The technological roadmap is illustrated in Figure 1.

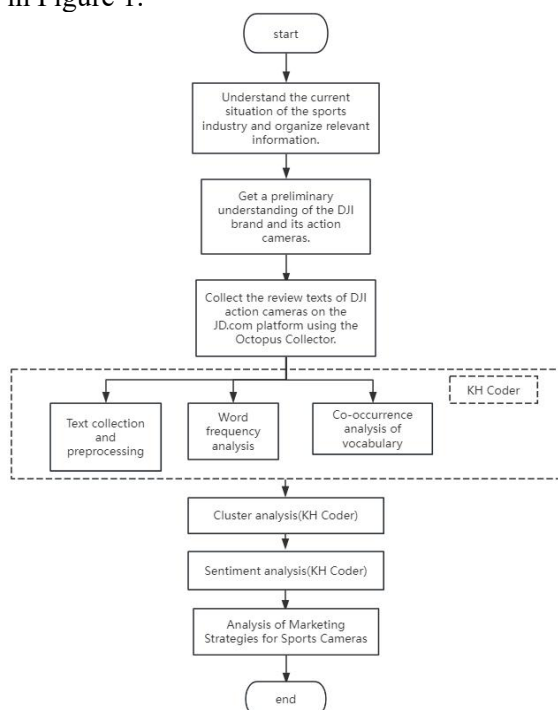


Figure 1. Technological Roadmap

5. Product Overview and Implementation Process

5.1 Product Features and Advantages

On October 25, 2023, DJI launched its latest product, the Osmo Pocket 3. This device is equipped with a 1-inch image sensor, delivering rich color depth and intricate details. It boasts a specially optimized night mode, ensuring that even in low-light environments, the image remains clear and the colors pure. The powerful three-axis gimbal stabilization technology guarantees smooth footage across various dynamic scenes. Additionally, it features a newly upgraded 2-inch OLED

touchscreen, offering more vibrant colors and sharper image quality. The camera supports seamless switching between horizontal and vertical shooting, making it more convenient to operate. With multiple follow modes built in, it can securely lock onto the subject, ensuring precise tracking. The body design incorporates a triple-array microphone system, effectively suppressing wind noise and enabling omnidirectional stereo sound recording, making it ideal for outdoor and noisy environments. The standard version is priced at 3,499 yuan, while the all-inclusive package is available for 4,499 yuan.

5.2 Implementation Process

1.Text Collection

Prior to gathering textual reviews, thorough research was conducted across various platforms to explore works related to DJI Pocket 3 and their associated feedback. It was observed that on most social media platforms, there was a scarcity of content related to DJI Pocket 3, and the existing reviews were largely deemed irrelevant. Additionally, strong anti-scraping mechanisms posed challenges, resulting in limited text retrieval that did not meet the necessary sample size for research. Given that JD.com, as one of China's largest comprehensive e-commerce platforms, possesses vast user, sales, and logistics data while maintaining strict measures for data privacy and security, it was ultimately selected as the primary data source for this study. The Octoparse, known for its robust internet data collection capabilities, simulates human browsing behavior. With its user-friendly interface allowing for simple page selections, the tool automates the collection process, transforming web data into structured formats stored in Excel or databases. Due to its robust functionality and user-friendliness, the Octoparse is widely utilized in areas such as data mining, competitive intelligence, market research, and data analysis. Therefore, data collection for this study was successfully executed using the Octoparse.

2.Textual Review Preprocessing

The data collected for this study consisted entirely of unstructured data, which included a significant amount of irrelevant reviews, emojis, and other distractions that could interfere with the research process. As a result, preprocessing was performed as the first step.

A total of 1,561 reviews were initially gathered, and after eliminating duplicates and removing other irrelevant content, 1,001 valid entries were retained for further analysis.

3. Word Frequency Analysis

KH Coder was employed to conduct an initial word frequency analysis on the processed text. The software performed the analysis based on conventional interpretations of the data. Afterward, the context of the words within their respective sentences was examined. For terms that did not align with the intended meaning of consumer expressions, manual adjustments were made to the word database.

For example, words such as “very”, “also”, “people”, “will”, and “can”, which held no significance for text analysis, were configured to be ignored automatically during analysis. Additionally, terms like “no problem”, “difficult”, “will not”, “not hard”, “DJI”, and “gimbal” were set to be treated as strings so that they would be extracted as vocabulary during the statistical process. Once these settings were configured, a second round of statistics was performed, followed by further adjustments to the word database. After several iterations of refinement, the final results, as presented in Table 1, were obtained.

Table 1. Partial Keyword Frequency

| Keyword | Frequency | Keyword | Frequency | Keyword | Frequency |
|------------|-----------|-------------|-----------|--------------------|-----------|
| Quality | 463 | Shooting | 223 | Portability | 156 |
| Effect | 422 | Imaging | 212 | Packaging | 155 |
| Excellent | 410 | Performance | 204 | Cost-effectiveness | 152 |
| Fast | 403 | Response | 199 | Image quality | 149 |
| Speed | 389 | Service | 182 | Clarity | 148 |
| Convenient | 249 | Appearance | 163 | Function | 135 |

From the keyword frequency table, it is evident that the most frequently mentioned word is “quality”. When purchasing electronic products, most consumers are particularly concerned about the durability and longevity of the product. Furthermore, the characteristics of the product itself are key points of interest for consumers. Terms such as “imaging”, “performance”, “response”, “appearance”, “portability”, and “image quality” reflect the focal concerns of DJI Pocket 3 customers. A significant portion of these users rely on the device to capture life moments at any given time, using it frequently in daily life. Thus, consumers are likely to focus on the quality of the imaging, the clarity of night-time shots, the speed of the device’s response, its portability, and the overall image quality, among other factors.

4. Lexical Co-occurrence Analysis

The co-occurrence network diagram is a visualization tool that illustrates the associative relationships between words. It treats keywords as nodes and represents the connections between them as edges. The size of the nodes and the thickness of the edges convey the frequency and importance of these words. Based on the TF-IDF algorithm, the Jaccard similarity coefficient was employed to determine the similarity between pairs of samples within the dataset, enabling the

construction of a co-occurrence network or correlation map for the keywords. In the co-occurrence network diagram, the correlation coefficients between “response”, “speed”, and “fast” exceed 0.4, with relatively larger bubbles, especially for the term “fast”, indicating that these three words frequently co-occur. The coefficient between “imaging” and “effect” is 0.51, signifying a higher correlation, with larger bubbles and greater frequency, reflecting a higher level of consumer attention. Furthermore, terms like “merchant”, “service”, and “attitude” also emerge as factors influencing consumer decisions. On the outer edges of the co-occurrence diagram, several smaller clusters of words form branching relationships, such as “daily”, “record”, “life”, “cost-effectiveness”, “high”, “price”, “affordable”, “function”, “powerful”, “strongly”, “recommend”, “use”, “operation”, and “simple”. These words often appear together, and to some extent, reflect consumer attitudes toward the product, forming part of the thematic structure within the text. As shown in Figure 2, the co-occurrence network diagram provides a clear representation of these associations.

5.3 Clustering Analysis

Utilizing KH Coder for text clustering analysis,

Products with high cost-effectiveness meet consumers' dual requirements for quality and price, allowing them to enjoy a more affordable shopping experience without sacrificing performance.

Theme 3: Merchant Service

Before making any purchase, consumers often seek detailed product information to make informed decisions. Interactions with customer service representatives play a crucial role, affecting consumer choices directly. Quality customer service enhances brand image, showcasing a company's professionalism and care for its customers, while poor service experiences may damage a brand's reputation.

Theme 4: Express Logistics

Upon purchasing a desired product, consumers expect swift delivery, intact packages, error-free logistics, as a smooth delivery process enhances the brand's image significantly.

Theme 5: Performance Features

After acquiring a product, initial considerations include ease of operation, the ability to effortlessly capture important moments in life, convenience in portability, readiness for immediate use, outstanding stabilization features for clear images even during movement, and ensuring powerful and diverse functionality.

Overall, from the initial selection and research to inquiries, ordering, delivery, and receipt, every step of the consumer journey impacts their perception of the product brand. Each stage is equally crucial.

5.4 Sentiment Analysis

Conducting sentiment analysis using ROST CM6 on the text revealed that positive emotions accounted for 95.66% (957 entries), neutral emotions for 0.18% (2 entries), and negative emotions for 4.16% (42 entries). Detailed segmentation within the positive emotions category found that generally positive emotions stood at 5.49% (53 entries), moderately positive emotions at 8.58% (82 entries), and highly positive emotions at 81.59% (781 entries). Within the negative emotions category, generally negative emotions accounted for 0.62%, moderately negative emotions for 0.27%, and highly negative emotions for 0.09%.

After clustering analysis of the positively emotional texts, the results closely aligned

with the thematic categories in Table 2. Consumers perceive DJI Pocket 3 to have excellent imaging quality, simple operation requiring just a light touch to start recording, fast shooting speed, outstanding stabilization features, clear image quality, stable functionality, compact and convenient design for portability. Additionally, the merchants exhibited exceptional service attitude, offering them a delightful shopping experience. The express delivery was efficient, and the product quality is reassuringly reliable. Many reviews contained phrases like "snagged" and "finally", with some consumers mentioning that each person is only allowed to purchase one unit. Considering the overall situation, DJI Pocket 3 has garnered wide acclaim in the market.

Analysis of the negative sentiment texts revealed that a considerable number of consumers cited issues such as difficulty in acquiring the product and it being out of stock, resulting in a poor shopping experience. While these terms were categorized as negative sentiment texts, further scrutiny indicates that the difficulties in acquisition and stock shortages were a result of the product's high demand, rather than directly impacting consumers' shopping experiences.

6. Marketing Strategy Analysis for Action Cameras

Taking DJI's action camera as an example, this study explores its marketing strategy, drawing from specific cases to offer valuable insights for the broader action camera industry. Based on the research, three key factors for marketing action cameras are summarized:

6.1 Optimizing Product Performance

An analysis of consumer reviews reveals that product performance is a major concern for consumers. Extreme sports enthusiasts, water sports participants, outdoor adventurers, cyclists, travelers, and Vlog creators are all key demographics who are likely to consider using an action camera to capture exciting moments, share adventure experiences, preserve travel memories, or create video content. These groups tend to demand high standards for shock resistance, drop resistance, and waterproof capabilities. Optimizing parameters such as aperture size and shutter speed ensures high-quality images under varying lighting conditions. During

action-packed activities, image stability is paramount. Companies should focus on developing advanced anti-shake technologies, such as optical image stabilization, to ensure stable footage even during fast movements. Furthermore, ease of use directly influences the quality of video capture. As action cameras are often used in harsh environments, waterproof capabilities should be enhanced to meet underwater filming demands. A robust, waterproof body design can expand shooting possibilities, increasing the product's reliability and practicality. To ensure smooth operation in winter conditions, companies must also enhance the camera's low-temperature resistance. Although the issue of charging was not raised in the reviews for this study, businesses should anticipate challenges related to charging in outdoor settings. Increasing battery capacity and optimizing power management to extend shooting time are vital. Additionally, supporting fast-charging functionality would allow users to quickly recharge and continue using the camera without significant downtime.

6.2 Enhancing Product Cost-Effectiveness

In a fiercely competitive consumer market, whether a product provides good value for money is undoubtedly a key factor in its success. For most consumers, the desire to acquire high-quality products that enhance their lifestyle must be balanced with the need for affordability. When a product offers excellent performance, reliable quality, and comprehensive functionality at a reasonably priced (or even discounted) rate, it stands out in the market and attracts attention. High cost-effectiveness allows consumers to get more value within their budget, fulfilling their pursuit of a quality life without burdening their finances.

6.3 Providing Excellent Customer Service

For businesses, offering exceptional customer service is essential. The product serves as a bridge between the company and the consumer, while customer service is the vital link that strengthens this bridge. After purchasing a product, consumers often face various challenges and needs during usage. If a company can promptly and efficiently address queries, provide usage guidance, and resolve

after-sales issues, it will significantly enhance the consumer's experience. This not only boosts customer satisfaction but also fosters trust and loyalty to the brand. High-quality service makes consumers feel valued and cared for, motivating them to become long-term supporters of the brand and encouraging word-of-mouth marketing to attract new customers. On the contrary, if a company neglects customer service and fails to resolve problems adequately, it can tarnish the brand's image and negatively impact sales performance. Therefore, businesses must prioritize customer service throughout the entire product lifecycle—from pre-purchase consultations and product setup to after-sales maintenance. By placing the consumer at the center of every interaction and committing to thoughtful service, businesses can stand out in a competitive market and achieve sustainable growth.

7. Conclusion and Future Prospects

The limitation of this study lies in the small dataset size, as various factors have constrained the amount of collected data, resulting in a limited sample size. Moving forward, there will be a continued effort to extensively collect data on promotional methods for action cameras and consumer review texts using Python. This will bolster the persuasiveness of research conclusions by gathering a larger sample size. Through comprehensive analysis of the collected texts from multiple perspectives, more specific marketing strategies can be derived, enhancing the depth of insights for the future.

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