

A Study on User Segmentation and Differentiated Operational Strategies for Paid Micro-Short Drama Users Based on K-Means Clustering

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Abstract

With the rapid growth of the paid micro-short drama market, understanding user characteristics and implementing refined operations have become critical for the industry's sustainable development. This study uses a sample of 1,224 micro-short drama users in Tianjin and employs the K-means clustering algorithm for user segmentation. Three distinct user groups were identified: Socially Driven Youth (under 18, with high impulsive payment tendency, and preference for light-hearted themes), Price-Sensitive Seniors (over 56, value cost-effectiveness, prefer simple plots), and Quality-Discerning Professionals (26-35, highly educated and high-income, demand stringent content quality). Based on these user profiles, this paper designs differentiated operational strategies encompassing content, distribution channels, pricing, and promotion for each group. These strategies aim to provide empirical evidence for precision marketing and product development within the micro-short drama market.

Keywords

Paid Micro-short Dramas; Consumer Behavior; K-Means Clustering; User Profiling; Differentiated Operations.

1. Introduction

Micro-short dramas (hereinafter referred to as “micro-shorts”) represent a new form of online audiovisual content that has evolved in the mobile internet era. They are defined as “online audiovisual programs with individual episodes ranging from several dozen seconds to approximately 15 minutes in length, featuring relatively clear themes and main storylines, as well as relatively continuous and complete plotlines” [1]. Since the National Radio and Television Administration formally incorporated the “micro-short drama” category into its key online film and television information filing system in August 2020, micro-short dramas have rapidly emerged as a new force within the film and television industry. They continue to captivate audiences with their unique artistic appeal while demonstrating robust developmental momentum [2]. With their concise length, convenient viewing, and dramatic twists, micro-short dramas have become a vital medium for fulfilling modern audiences' fragmented entertainment needs. According to the Statistical Report on China's Internet Development, by June 2024, China's micro-short drama user base had reached 576 million people, accounting for 52.4% of the total internet population.

In recent years, micro-short dramas have experienced explosive growth. This surge has been accompanied by intense competition, where user attention has become a scarce resource. Against this backdrop, broad-brush market strategies have proven ineffective. Gaining deep insights into user characteristics and implementing precision operations have become critical to success.

This study focuses on Tianjin Municipality as its research scope. Data was collected through scientific sampling surveys, and the K-means clustering algorithm was applied to segment users across multiple dimensions, constructing clear user profiles. The aim is to propose reasonable policy recommendations and insights to support the thriving development of the paid micro-short drama industry.

2. Literature Review

As an emerging cultural product, micro-short dramas have garnered significant attention in both academic and industrial circles in recent years. Scholars have conducted in-depth explorations of micro-short dramas from diverse perspectives. Shi Xiaoxi et al. [5] provided a panoramic depiction of China's online micro-short drama development in 2023, categorizing them into two major types: “story-driven short videos” and “micro-shortened web series.” This macro-level analysis revealed the typological characteristics of the rapidly evolving micro-short drama industry. Through field research, Tian Yuan [6] revealed the emergence of a gig-based professional content creation model (Gig-PGC) within the micro-short drama industry. This study highlights the specific position of micro-short drama producers within the occupational hierarchy of the digital content market, demonstrating how their working methods reflect the process of endogenous integration within the industry. This provides crucial insights for research into the practical production models of micro-short dramas. Chen Haiyan et al. [7] examined profit models, revealing the mutual empowerment between micro-short dramas and online literature IPs. They identified commercial monetization through platform revenue sharing, advertising, e-commerce livestreaming, and user payments, while addressing challenges in monetization and cultivating user payment habits. Hu Zheng [8] examined the deep developmental logic of micro-short dramas from the perspective of user emotional experiences, tracing their evolution from “emotional massage” to “emotional consumption.”

Beyond this, the genre's characteristics—popular themes, bizarre content, and frequent climaxes—render it a unique cultural phenomenon with profound impacts on audience values and aesthetic perceptions. Gu Miaomiao [9] notes that the fragmented aesthetic consumption patterns of the mobile internet era drive micro-short dramas to capture audience attention through eye-catching elements and optimized visual language. This fast-food format has led to a trend of low-quality homogenization in content. Su Lin [10] and others propose strategies for elevating micro-short dramas to premium quality, including integrating China's outstanding traditional culture and combining with cultural tourism, offering pathways for content refinement.

Existing research predominantly examines macro perspectives such as definitions, classifications, production models, profit models, and cultural impacts. However, user research, particularly granular segmentation studies of paying users, remains insufficient. Therefore, this paper applies the K-means clustering algorithm to analyze paying micro-short drama users. By examining multiple dimensions—including demographic characteristics, consumption behaviors, and attitudinal tendencies—it conducts user segmentation and constructs user profiles. This approach advances micro-short drama user research from descriptive statistics toward deeper group insights.

3. Questionnaire Data Collection and Validation

3.1. Survey Participants and Methods

The survey targets permanent residents of Tianjin Municipality. Tianjin, which is divided into 16 districts, adopted a sampling method combining stratified sampling with simple random

sampling. The number of questionnaires distributed in each district was determined based on its total permanent population. Subsequently, questionnaires were distributed through random street interviews conducted in each district.

Table 1. Survey Respondents

Region	Permanent resident population (in 10,000)	Sampling ratio	Number of people selected (persons)
Binhai New Area	202.22	0.15	200
Xiqing District	119.47	0.09	118
Wqing District	113.82	0.08	113
Beichen District	93.95	0.07	93
Jinnan District	93.68	0.07	93
Nankai District	86.61	0.06	86
Hedong District	83.89	0.06	83
Dongli District	83.58	0.06	83
Hexi District	80.67	0.06	80
Jizhou District	79.21	0.06	78
Jinghai District	77.64	0.06	77
Baodi District	71.01	0.05	70
Hebei District	62.55	0.05	62
Hongqiao District	42.84	0.03	42
Ninghe District	38.52	0.03	38
Heping District	34.34	0.03	34
Total	1364	1.00	1350

3.2. Questionnaire Reliability and Validity Testing

Using SPSS, reliability and validity analyses were conducted on the questionnaire data. The Cronbach's Alpha coefficient for the scale data was 0.870, with KMO=0.891 > 0.6 and a significance level of 0.000. This indicates that the questionnaire design possesses a certain degree of scientific rigor and rationality, and the survey results are valid.

Table 2. Reliability Analysis of the Scale

Kronbach Alpha	Item count
0.870	14

Table 3. KMO and Bartlett's Tests for the Scale

KMO sampling test cutability index		0.891
Bartlett's Sphericity Test	approximate chi-square	6450.963
	degrees of freedom	91
	significance	0.000

3.3. Valid Questionnaires and Valid Response Rate

This survey targeted permanent residents of Tianjin Municipality as the sampling population. A total of 1,370 questionnaires were distributed, with 1,305 actually returned. Among these, 1,224 were deemed valid, resulting in a questionnaire return rate of 95.26% and a valid response rate of 89.34%.

Table 4. Basic Information of Questionnaire Data

Questionnaires distributed (copies)	Questionnaires returned (copies)	Response rate (%)	Valid questionnaires (copies)	Valid response rate (%)
1370	1305	95.26	1224	89.34

4. User Persona Development

4.1. Selection of Clustering Metrics

This study employs K-means clustering to segment users based on seven indicators—age, monthly income, occupation, education level, payment status, monthly viewing time, and willingness to pay—by synthesizing three core dimensions: demographics, consumption behavior, and attitudinal tendencies.

4.2. User Segmentation Results and Category Feature Analysis

As shown in the elbow plot, the total sum of squared errors (SSE) decreases significantly as the K value increases from 1 to 3. Subsequently, the rate of decrease in SSE gradually slows as K increases, exhibiting the characteristic elbow pattern. Therefore, the elbow rule indicates that the optimal number of clusters is 3.

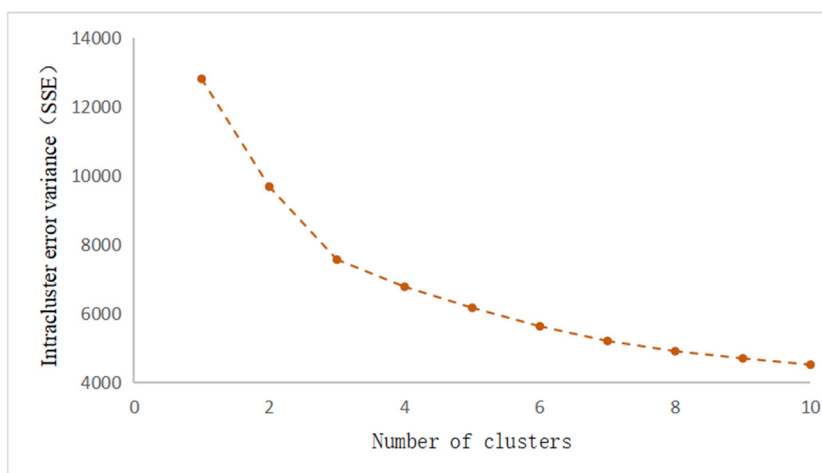


Figure 1. User Profile Analysis Elbow Diagram

The final user feature cluster centers computed after iteration are shown in the table below.

Table 5. Cluster Centers

Category	Age	Occupation	Education Level	Monthly Income	Parent Status	Viewing Duration	Willingness to Pay
I	1	1	2	1	1	2	4
II	6	6	2	2	1	4	3
III	3	2	5	4	1	2	1

User Profile Type I: This category comprises students under 18 with limited spending power, who rely on pocket money or family support. They have ample free time and are highly susceptible to social media and peer influence. They have occasionally paid for micro-short dramas, driven by social recommendations or limited-time promotions. Average monthly viewing time is 1-5 hours. They exhibit high willingness to pay. This group displays strong impulsive spending tendencies and pronounced social attributes, preferring concise, engaging entertainment content (e.g., campus life, comedy genres). Their payment decisions are easily influenced by short-term incentives, leading to their classification as “socially driven youth.”

User Type II Characteristics: This group consists of individuals aged 56 and above, primarily retirees. They maintain a slower pace of life with ample leisure time, primarily seeking entertainment for relaxation. Educational attainment is typically high school/vocational school level, with lower demands for content depth and a preference for straightforward, easy-to-understand plots. Monthly disposable income ranges from 2001-4000 RMB, indicating stable

income but cautious spending habits with a strong focus on value for money. They watch 11-20 hours monthly, using platforms frequently but primarily consuming free or low-cost content, with generally low payment willingness. Price-sensitive seniors are characterized by strong price sensitivity, long viewing durations, but weak payment motivation.

User Type III Characteristics: This group is aged 26-35, employed as corporate workers in career growth phases, facing high work pressure and fragmented time. Hold master's degrees or higher, demanding high content logic and production quality; Monthly income ranges from ¥7,001 to ¥10,000, indicating strong purchasing power; However, viewing duration is short, time investment is low, and willingness to pay is limited. These highly educated users possess significant spending capacity but are extremely demanding about content quality. This group is termed “Quality-Discerning Professionals.”

4.3. Building User Profiles For Paid Micro-Short Drama Subscribers

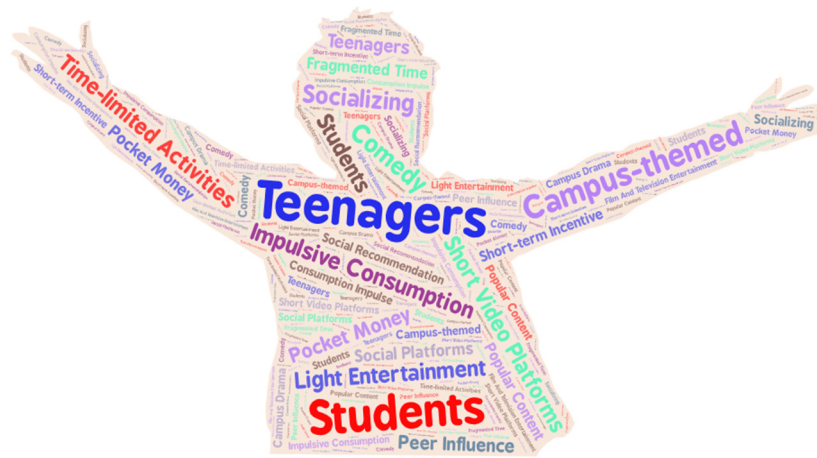


Figure 2. “Socio-Driven Youth” User Profile

Socially driven teens, primarily students under 18, exhibit pronounced social tendencies. Their spending power relies on pocket money or family support, yet they demonstrate high willingness to pay. Their purchasing behavior is impulsive, easily influenced by real-time recommendations from popular short-video platforms (like Douyin and Kuaishou) or peer-shared content. They favor concise, lighthearted entertainment that relieves stress, such as campus-themed content and comedy shorts.



Figure 3. Price-Sensitive Silver-Haired Consumers User Profile

Price-sensitive seniors primarily encompass retirees aged 56 and above. They maintain a relatively slower pace of life with ample leisure time, while exhibiting lower demands for content depth. They prefer straightforward, easy-to-understand plots that allow them to effortlessly grasp and enjoy viewing experiences. Though they possess stable incomes, their consumption attitudes remain cautious, leading them to favor free or low-cost content options. Typically, they are highly price-sensitive.



Figure 4. Profile of Quality-Conscious Professionals

Discerning professionals primarily consist of corporate employees facing significant work pressure and fragmented schedules. Typically holding master's degrees or higher, they demand high logical coherence and production quality in content. With monthly incomes ranging from 7,001 to 10,000 yuan, they possess strong purchasing power yet prioritize efficient and immersive viewing experiences. Consequently, they are exceptionally selective in entertainment choices, favoring works that deliver value and inspiration. Overall, these users represent highly educated, high-quality consumers seeking intellectual and emotional fulfillment amidst busy lives.

5. Conclusion and Policy Recommendations

This study employs K-means clustering analysis to clearly segment paying micro-short drama users into three distinct groups. This not only confirms the structural differences within the market but also transforms abstract user data into three vivid, tangible user personas, providing clear targets for the industry's refined operations.

Based on these personas, the following differentiated operational strategies are proposed:

5.1. Socially Driven Youth

Content Strategy: Focus on “short, flat, and fast” genres like campus underdog stories and light comedies to deliver instant emotional gratification;

Channel and Promotion: Deepen partnerships with platforms like Douyin and Kuaishou, launch topic challenges, encourage UGC creation and sharing, and leverage student KOLs for content seeding;

Pricing Strategy: It is recommended to design low-cost, high-frequency payment options such as single-episode unlocks and limited-time special packages to lower decision-making barriers.

5.2. Price-sensitive Seniors

Content Strategy: Develop short dramas with low comprehension barriers, such as family ethics, health preservation, and traditional performing arts, featuring a relaxed pace and clear narrative.

Channel and Experience: Optimize age-friendly design with large fonts, voice narration, and one-click episode tracking. Partner with community centers and senior universities for promotion.

Revenue Model: Explore a “free preview + ad revenue sharing” model or launch an extremely low-cost “Silver Membership Package”.

5.3. The Quality-Conscious Professional

Content Strategy: Invest resources in producing high-quality short dramas featuring workplace suspense and in-depth social issues, emphasizing script logic, acting prowess, and cinematic quality.

Services and Benefits: Offer a “commercial-free + HD/4K quality” membership service, complemented by exclusive behind-the-scenes footage, creator insights, and other value-added content. Partner with enterprises to launch “Lunchtime Theater” for targeted content delivery.

Brand Building: Position these series as the platform's signature offerings and reputation pillars to attract and retain high-value users.

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