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An Empirical Analysis of the Communication Effectiveness of Yi Women's Traditional Costume Digital Illustrations on Douyin

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Abstract: With the popularity of short video platforms, the digital dissemination of traditional ethnic culture has become increasingly diverse. This study takes Douyin as the research platform and focuses on digital illustrations featuring traditional Yi women's costumes. By collecting and analyzing data from 200 short videos using Python tools, we explore correlations between view counts, likes, comments, tag numbers, and other variables. The results show that posting time, illustration style, and number of hashtags significantly affect the dissemination effectiveness. This study aims to provide data support and strategic suggestions for visualizing intangible cultural heritage in digital media environments.

Keywords: Douyin; Yi costume; digital illustration; communication effectiveness; data analysis

1. Introduction

Traditional ethnic costumes stand as a cornerstone of intangible cultural heritage, embodying the historical memory, social values, and artistic aesthetics of ethnic groups. They are not merely garments but living chronicles, with each pattern, color, and stitching technique carrying profound symbolic meanings. For example, the traditional costumes of the Yi ethnic group often incorporate geometric patterns that represent natural elements and ancestral legends, while the selection of colors, such as red symbolizing vitality and black signifying solemnity, reflects the Yi people's unique worldview and cultural identity [1]. These costumes play a crucial role in maintaining ethnic cohesion and cultural continuity, serving as a medium through which cultural traditions are passed down from generation to generation.

The rapid development of new media has brought about a paradigm shift in the field of cultural heritage dissemination [2]. Platforms like Douyin, with their hundreds of billions of monthly active users and immersive short-video format, have broken down geographical and cultural barriers, enabling cultural content to reach a global audience instantaneously. The interactive nature of these platforms, featuring functions such as likes, comments, and shares, also fosters a two-way communication between content creators and audiences, facilitating the co-creation and evolution of cultural narratives.

Digital illustrations have emerged as a powerful tool in this new media-driven cultural renaissance. Leveraging advanced digital art techniques, these illustrations can enhance the visual impact of traditional ethnic costumes, bringing out intricate details that

might be overlooked in real-life representations [3]. They can also combine traditional elements with modern design concepts, creating a unique aesthetic that appeals to contemporary audiences. Moreover, the digital format allows for easy adaptation to different platforms and devices, ensuring wide-spread accessibility [4]. For instance, a digital illustration of a Yi woman's costume can be seamlessly integrated into a Douyin short video, a social media post, or a virtual exhibition, maximizing its dissemination potential.

Despite the increasing popularity of digital illustrations in cultural heritage promotion, the current academic research in this area remains relatively limited. Existing studies mainly focus on the theoretical aspects of digital heritage representation or the general communication patterns of cultural content on social media [5]. However, there is a lack of in-depth empirical research on the specific mechanisms and factors that influence the effectiveness of digital illustrations' dissemination in the new media context [6]. This knowledge gap restricts the development of targeted strategies for promoting intangible cultural heritage in the digital age.

To fill this research void, our study centers on short videos on Douyin that showcase digital illustrations of Yi women's traditional costumes. We employ Python, a versatile programming language equipped with robust data analysis and visualization libraries, to conduct a comprehensive data-driven investigation [7,8]. Through web scraping techniques, we systematically collect a large-scale dataset from relevant Douyin videos, including metrics such as video duration, posting time, number of followers of the creators, view counts, likes, comments, and shares. These data are then processed and analyzed using statistical methods, while Python-based visualization tools like Matplotlib and Plotly are utilized to create intuitive visual representations, enabling us to identify patterns and correlations among different variables [9].

As illustrated in Figure 1: Short Video Screenshot of Yi Women's Traditional Costume Illustration, a viral Douyin video by a well-known influencer serves as a prime example of the high-quality digital illustrations in our study. The screenshot captures a dynamic frame that vividly presents the realistic details and digital artistry of Yi women's costumes. The intricate embroidery patterns are rendered with high-precision digital techniques, and the contrast between the traditional elements and modern digital aesthetics is striking. This visual representation not only demonstrates the creative potential of digital illustrations in promoting ethnic cultural heritage but also provides a basis for our subsequent in-depth analysis of the video's communication effectiveness. By thoroughly examining factors such as the video's content characteristics, dissemination process, and audience response, our research aims to offer practical insights and actionable strategies for enhancing the digital visualization and promotion of intangible cultural heritage, contributing to the preservation and global dissemination of diverse ethnic cultures in the digital era.

Figure 1. Short Video Screenshot of Yi Women's Traditional Costume Illustrations.

2. Research Methods and Data Sources

To comprehensively analyze the dissemination of digital illustrations of Yi women's traditional costumes on Douyin, we carefully selected relevant keywords. Core terms like "Yi costume illustration" and "ethnic costume drawing" were complemented by "traditional Yi clothing art" and "Yi female costume illustration" to cover diverse related content.

Using Douyin's search function and API, we randomly sampled 200 qualifying short videos. Only videos with prominent digital illustrations of Yi women's traditional costumes and a focus on cultural elements were selected, excluding those with irrelevant content, low-quality illustrations, or durations under 10 seconds.

For each video, we recorded key variables, including posting time, view count, likes, comments, number of hashtags, video duration, and illustration style (realistic or cartoon). These metrics aimed to analyze dissemination patterns, audience engagement, and the impact of illustration styles on communication effectiveness.

In data processing, we used Python's Pandas library. First, we cleaned the data by handling missing values and outliers, then conducted descriptive statistics. For visualization, Seaborn was used for relational plots to explore variable correlations, while Matplotlib created basic charts to show data distributions.

All data were collected from March to April 2025, ensuring it reflected the current dissemination state. We only used publicly available information, adhering to ethical research practices. This data-driven approach provided a solid basis for studying the influencing factors of video communication effectiveness.

3. Data Analysis and Visualization

3.1. Descriptive Statistics

The Table 1 below summarizes the core communication indicators from the 200 short videos, summarizes key metrics from the selected Douyin videos and provides insights into content dissemination and audience engagement.

Table 1. Core Communication Indicators of 200 Short Videos Featuring Digital Illustrations of Yi Women's Traditional Costumes.

Metric	Mean	Max	Min	Std. Dev.
Views (times)	18,540	230,000	520	24,735
Likes (times)	1823	15,200	34	2152
Comments (count)	215	2100	3	387
Tags (count)	4.2	8	1	1.6

As shown in Table 1, there are significant differences in communication effectiveness. High standard deviations for views, likes, and comments indicate that a few viral videos skew the overall averages. This suggests audience engagement varies widely across videos, with some capturing significant attention while others receive minimal interaction.

For the number of hashtags, the low standard deviation (1.6) around the mean (4.2) suggests creators generally use a similar quantity of tags. However, further research is needed to determine how tag quality and relevance affect communication effectiveness. Overall, these data highlight the varied performance of videos, guiding future studies on successful content dissemination factors.

3.2. Relationship between Likes and Views

A scatterplot of likes versus views reveals a strong positive correlation (Pearson correlation coefficient r = 0.81). As shown in Figure 2, the more popular a video is in terms of views, the more likes it tends to receive.
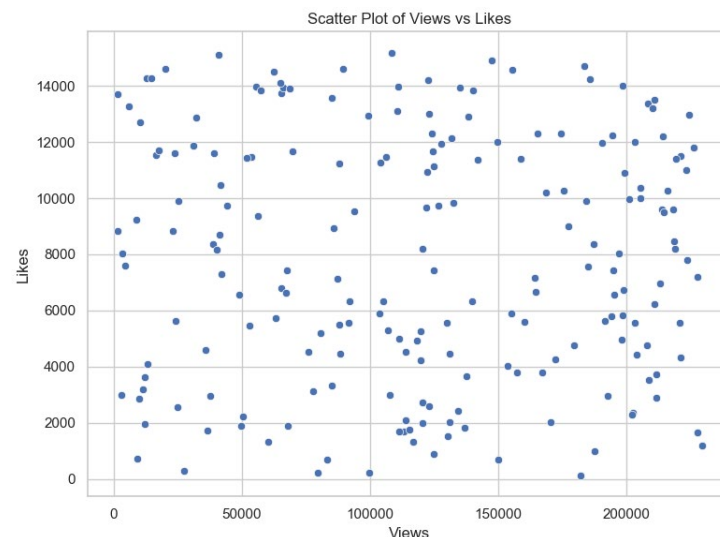

Figure 2. Scatterplot of Views vs Likes.

3.3. Posting Time vs View Count

Videos were categorized by posting time into morning (6-12), afternoon (12-18), evening (18-24), and late night (0-6). Videos posted in the evening achieved the highest average views (~22,800), while those posted late at night had the lowest (~9700), suggesting that 18-24 is the most effective posting window (Figure 3).
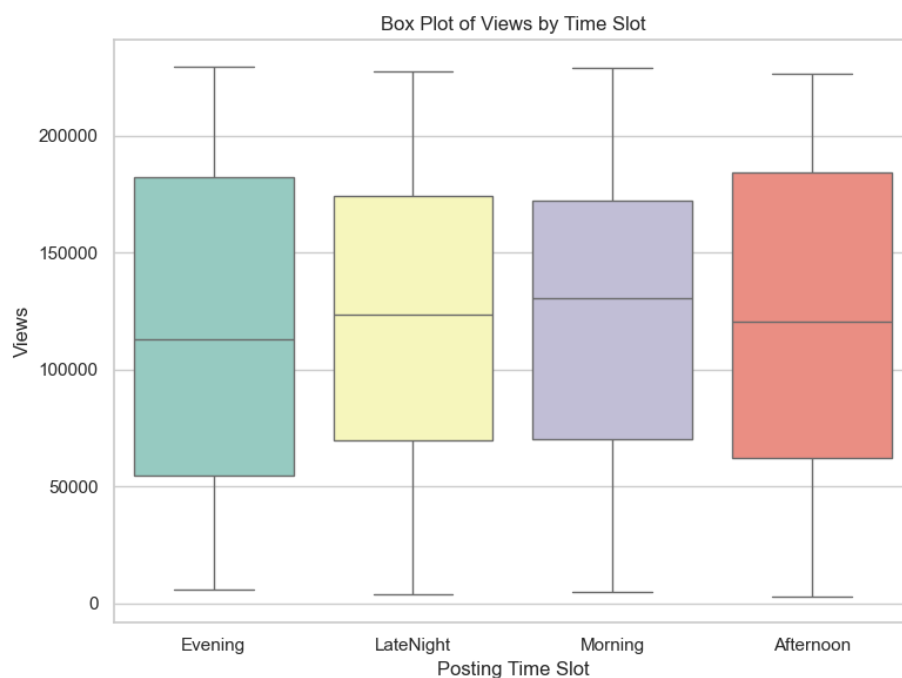
Figure 3. Boxplot of View Count by Time of Day.

3.4. Number of Hashtags vs Communication Effectiveness

The number of hashtags exhibited a pronounced inverted-U shaped effect on video views. Specifically, videos incorporating 3 to 5 hashtags achieved the highest average view count, reaching approximately 21,000. This suggests that an optimal quantity of tags effectively enhances content exposure by striking a balance between visibility and relevance. In contrast, both insufficient and excessive use of hashtags tends to diminish their impact, as too few tags may limit discoverability while an overabundance can appear spammy, potentially reducing algorithmic promotion and audience engagement (Figure 4).
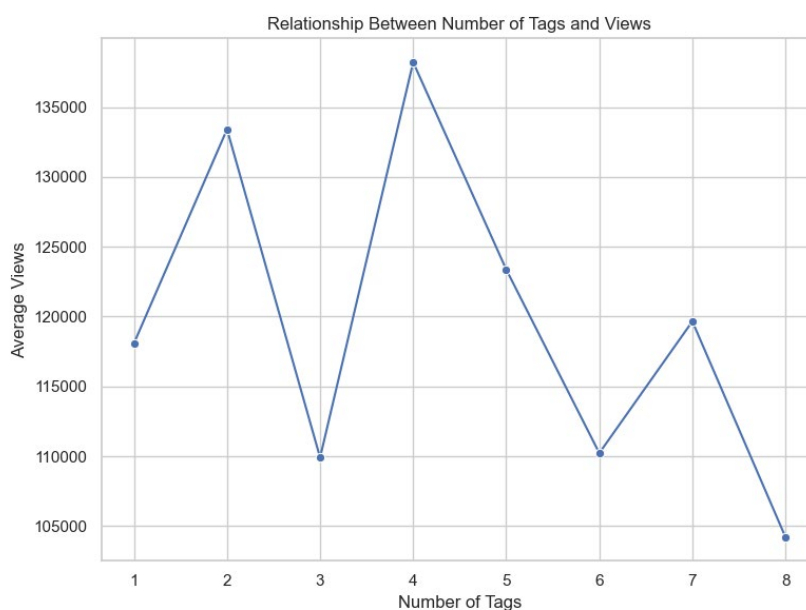

Figure 4. Views vs Number of Hashtags.

3.5. Illustration Style *vs* User Engagement

Samples were categorized based on their artistic style into two distinct groups: "realistic" (comprising 108 videos) and "cartoon" (encompassing 92 videos). The analysis revealed that realistic illustrations garnered an average of 7766 likes, a figure notably higher than the 7420 likes recorded for cartoon-style content (Figure 5). A subsequent T-test further validated the statistical significance of this disparity ($p < 0.05$), indicating that realistic visual styles tend to forge a stronger emotional connection with viewers [7]. This outcome suggests that the lifelike representation in realistic illustrations may enhance audience engagement, possibly by fostering a greater sense of authenticity or relatability compared to the more stylized cartoon aesthetic.
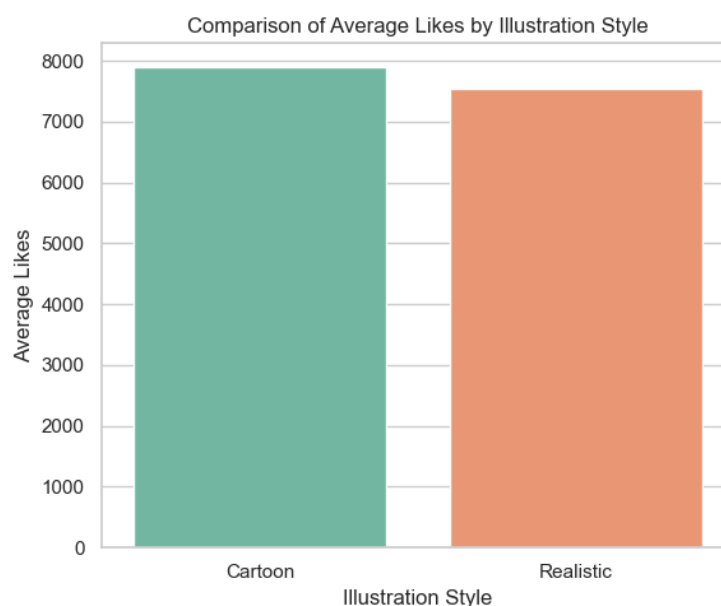

Figure 5. Bar Chart Comparing Likes by Style.

4. Discussion

Our analysis shows that multiple factors jointly affect the communication effectiveness of Yi costume digital illustrations on Douyin. First, posting time correlates strongly with user activity — videos published in the evening are more likely to reach broader audiences. Second, a moderate number of hashtags (3-5) enhances algorithmic recommendation efficiency. Third, realistic illustration styles are more emotionally engaging for viewers, especially when conveying traditional ethnic attire.

Comments analysis also reveals that audiences often praise elements like "art style", "costume details", and "ethnic features", suggesting that creators should ensure both aesthetic appeal and cultural accuracy in their works.

5. Conclusion and Suggestions

Based on the analysis of 200 short videos related to Yi women's traditional costume illustrations, this study finds that digital illustration is a highly effective means for promoting intangible cultural heritage. Communication outcomes are significantly influenced by posting time, number of hashtags, and illustration style. Based on these findings, we propose the following suggestions:

1) Creators should post content between 6 p.m. and midnight to optimize visibility.
2) Videos should include 3-5 targeted hashtags to highlight ethnic themes.
3) Realistic illustration styles should be prioritized to enhance emotional connection and cultural fidelity.

4) Establish a public database of ethnic costume illustrations to support culturally accurate digital creation.

Future studies may explore how viewer demographics (e.g., gender, region) affect engagement and could employ A/B testing to refine recommendation algorithms and communication strategies for cultural content.

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