

Integrating 4I Theory into Cross-Platform Social Media Strategy: A Global Communication Architecture Perspective

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Abstract: This study focuses on global application scenarios, designs and implements a cross platform social system architecture, and constructs an efficient communication system that adapts to multiple platforms and integrates content marketing. The study adopts PEST and Porter's Five Forces model to analyze the external environment and industry competition, and combines 4I theory to diagnose content marketing problems. Through observation, content analysis and other methods, the macro marketing environment is sorted out. Using the 4I theory (interest, benefit, interaction, personality) as the analytical framework, combined with three-dimensional indicators such as information provision and relationship building, the content of international media sample accounts is encoded and statistically analyzed. The results show that there are four core deficiencies in overseas social media content marketing: unstable content quality in the interest dimension and lack of creativity; The proportion of urban brand information in the dimension of interests is too high, and there is insufficient current affairs and interesting content; The interactive dimension has low account activity, single form, and lacks in-depth user maintenance; The positioning of personality dimensions is vague, and platform content differentiation has not been achieved. Based on this, a four-dimensional optimization path is proposed: unifying visual standards to strengthen short video production, introducing IP content to enhance attractiveness; Balance the proportion of content and enhance emotional resonance; Strengthen interactive design and establish an evaluation system; Utilize AI technology to achieve personalized recommendations and increase investment in emerging platforms. The innovative application of 4I theory provides a reusable architecture solution for international communication media. In the future, we can further explore the application of AI in content generation and other fields, while paying attention to technical ethics and privacy protection, to help improve the efficiency of global communication.

1. Introduction

The research on the architecture design and implementation of cross- platform social systems for

global application scenarios focuses on building an efficient communication system[1] that adapts to multiple platforms and integrates content marketing strategies. This study takes international communication media as a sample and analyzes their content marketing status on overseas social media platforms, revealing core architectural elements such as cross- platform content distribution, user interaction mechanisms, and data-driven decision support. The study uses PEST tool and Porter's Five Forces model to evaluate the external environment and industry competition situation, and combines the 4I theoretical framework to diagnose content marketing problems, proposing strategic optimization solutions based on the principles of interest, interest, interaction, and personality. The system architecture design emphasizes multi-platform compatibility, precise matching of user profiles, and the ability to generate dynamic content. By integrating marketing theory and technological optimization, communication efficiency is improved. Empirical analysis shows that optimized cross- platform social systems can effectively enhance user engagement and content dissemination, achieve efficient and accurate international communication in the context of globalization, and provide reusable architecture design and implementation paths for similar international communication media.

2. Correlation theory

2.1 The Content Marketing Mechanism of International Communication Social Media from the Perspective of Globalization

International communication[2], as a cross-border process of information transmission, involves multiple stakeholders such as governments, organizations, and individuals. Its core lies in achieving cross-border information flow and influence building through mass media. Social media, as an emerging communication medium, has broken the traditional one to many communication model of traditional media and built a two-way interactive communication network with its characteristics of participation, openness, dialogue, and connectivity. According to usage scenarios, overseas social media can be divided into five categories: instant messaging, social networking, Weibo, photo sharing, and video sharing. Its low cost, high speed, and cross-border characteristics make it an efficient tool for international communication. Content marketing focuses on attracting and gathering target audiences through valuable, relevant, and ongoing content creation and dissemination, in order to change or strengthen their behavior and achieve marketing goals. This strategy emphasizes user centrality, establishing long-term interactive relationships by providing content that meets needs, solves problems, or provides useful information, ultimately promoting information dissemination and brand building. In the context of globalization and digitization, the deep integration of social media and content marketing is driving the development of international communication forms towards diversification and interactivity, becoming a key path to enhance communication efficiency, build national image, and strengthen international discourse power.

2.2 4I theory and ICA framework for dual wheel drive

The 4I marketing theory[3]put forward by Professor Don E. Schultz of Northwestern University in the 1990s has constructed four core principles of marketing in the Internet age - the interest principle stimulates users' willingness to participate through interesting content, and it is necessary to accurately grasp the points of interest to obtain attention; The principle of benefit requires marketing activities to provide users with actual or psychological value, and guide purchasing behavior through demand insight; The interaction principle relies on mobile Internet technology to realize real-time two-way communication between enterprises and users, deepen brand awareness and enhance user loyalty; The personality principle advocates customized marketing based on user

segmentation, and meets the "focus" needs of specific groups through accurate portraits. This theory is widely used in new media marketing, short videos, webcasts and other fields because it fits the fragmented communication characteristics of the Internet, and has become an important tool for enterprises to formulate digital marketing strategies; In the field of social media content classification, the ICA (Information Provision, Relationship Building, and Behavior Guidance) framework proposed by Kristen Lovejoy and Gregory D. Saxton has significant influence. Its core includes three major content systems: information provision (focusing on knowledge transmission and fact disclosure), relationship building (emphasizing community connection and emotional resonance), and behavior guidance (focusing on user decision transformation). By refining content attributes through subcategories, it provides methodological support for systematically analyzing the effectiveness of social media communication. For example, the 2023 survey by the Content Marketing Institute (CMI) in the United States showed that 78% of American companies plan to increase their investment in short video content marketing, a significant increase from 28% in 2015, which confirms the strategic value of content marketing in enhancing brand awareness, establishing corporate reputation, and influencing target audiences; The research in the international academic community is also showing a deepening trend. Hagar et al. pointed out that audience analysis has become a key link in optimizing the content effectiveness of news editing rooms. By using algorithm models based on historical data to predict communication effectiveness, Abrahams examined the compliance issues of infant formula marketing on social media platforms using the World Health Organization's International Code of Marketing of Breast milk Substitutes as a framework. Rang Wang and Sylvia Chan Olmsted revealed the significant impact of platform characteristics and contextual factors on social media engagement through content analysis of YouTube brand channels. Amaldoss et al. explored the cross effects of media platform content strategies on platform profits and content provider revenue. These studies collectively indicate that during the transition period of Web3.0 and driven by new technologies such as the metaverse, content marketing is evolving from a simple means of communication to a strategic carrier for brand value construction, audience relationship deepening, and emotional cognition shaping. Its value has surpassed marketing content itself and become a link between brands and global audiences. Deepen the original RQ1, construct a cross- platform content marketing performance diagnostic indicator system based on the 4I theory (innovation/interaction/interest/personalization), and verify its complementarity with single platform indicators. Deepen the original RQ2 and explore quantifiable design principles that need to be followed for cross- platform architecture, such as data standardization interfaces, cross- platform mapping rules for user profiles, and content adaptation algorithms, to achieve global communication efficiency improvement under the guidance of 4I theory; Supplementing RQ3 analysis on the synergistic effects of "personalized" elements and cross- platform content adaptation strategies (language localization, cultural symbol translation) in cross-cultural scenarios to reduce information misunderstanding rates; Supplement the RQ4 exploration of the combination path between privacy computing modules (federated learning, differential privacy) and 4I "interaction" elements, to enhance user engagement while ensuring data security; Supplement RQ5 by comparing multiple cases (B2B/B2C enterprises, emerging/mature markets) to verify the implementation path of the "responsible AI marketing ecosystem" combining the 4I framework and cross- platform architecture (including interpretability models and fairness verification mechanisms). This research chain responds to research gaps, clarifying the complete path from diagnostic tools, design criteria to empirical verification, linking cutting-edge issues such as "privacy protection and fairness modeling" and "generative AI applications", and forming theoretical innovation and architecture optimization solutions with practical guidance significance.

3. Research method

3.1 Global Content Marketing Strategy of Urban International Communication Institutions

Since its establishment in 2020, the vertical field organization focusing on urban international communication has been using a new media matrix covering multiple platforms at home and abroad, such as Facebook, Instagram, YouTube, etc., to output vertical content such as historical culture, tourism scenery, food and accommodation in various forms such as original short videos, graphics and animations. It has built a multilingual communication system and aims to become a new international media benchmark with global influence. In terms of the macro environment, the global Internet users reached 5.16 billion, and the social media users exceeded 4.76 billion. User preferences were inclined to video, and TikTok and other emerging platforms rose to reconstruct the communication pattern; On the technical level, AI and big data drive the improvement of content production efficiency, forming a closed loop of "technology empowerment content optimization user connection". The practical logic can be summarized into three dimensions: cross-cultural adaptation achieves precise adaptation of "global perspective, local expression" by exploring cultural symbols and consumption habits of the target market; Data driven and multi-platform collaborative construction of a three-dimensional communication matrix, utilizing AI algorithms to dynamically adjust advertising strategies, and seizing user minds through forms such as TikTok Challenge [4] and Instagram visual storytelling; Value based marketing and ecological construction bind urban brand concepts with global issues such as sustainable development and cultural diversity. Through documentaries, public welfare projects, and KOL collaborations, they cultivate user loyalty and form a "content user brand" ecological loop, achieving sustainable growth from traffic to value. The macro driving factors are reflected in the dual empowerment of economic globalization and digital technology revolution: the maturity of global trade networks and cross-border logistics reduces the cost of content production and distribution, 5G, AI, and big data reconstruct the logic of content production and consumption, and promote users to transform into cocreators and communication nodes; At the same time, data privacy regulations, content censorship systems, and trade protectionism policies in various countries form compliance constraints, requiring companies to build a "compliance first" underlying logic, achieve dynamic balance and long-term evolution in policy fluctuations, and ultimately become the core link connecting global audiences and transmitting cultural values.

3.2 Analysis of the Current Status of Global Content Marketing

Content marketing focuses on conveying valuable information to attract potential audiences, with interest being one of the key elements. By diversifying new media products[5](such as short videos, text and images, long posters, original animations, etc.), we aim to enhance the entertainment value, especially in the field of short videos. We actively layout and combine daily and key theme planning to produce high-quality content that has gained international recognition. Interest is reflected in focusing on excellent traditional culture, using cultural tourism as a starting point to explore local cultural and tourism resources (such as intangible cultural heritage, poetry culture, historical celebrities, traditional solar terms, distinctive clothing culture, etc.), and providing a cultural experience window for global audiences. In terms of interactivity, establishing accounts on multiple platforms to carry out interactive exhibitions, online activities, and community topic discussions, attracting high-quality accounts to connect with each other and increasing participation, covering mainstream platforms at home and abroad in the media matrix, and implementing a multi-channel promotion mechanism. The personalized display content is mainly in English, highlighting the unique characteristics and cultural charm of the city (such as specialty

cuisine, traditional culture, landmark buildings, etc.), but there is a lack of targeted dissemination, and language strategies need to be optimized for compatibility with regional culture. The existing problems include: limited dissemination of interest due to insufficient platform update frequency or homogeneous content; Due to the lack of targeted and personalized content across multiple platforms, it is difficult to achieve emotional resonance in terms of interests; Interactivity is not effective due to irregular community maintenance and single activity forms; Personalization needs to be improved due to insufficient targeted communication and inaccurate language positioning. Overall, optimization is needed in terms of targeted communication, content innovation, interactive forms, and language strategies to enhance global appeal and communication effectiveness.

3.3 Empirical Study on Overseas Social Media Content Marketing in Global Cities

This study focuses on the marketing strategies of urban overseas social media content in the context of international communication. The analysis dimensions are constructed using the 4I principle (interest, interest, interaction, personality) and the ICA content classification framework (information provision, relationship building, behavior guidance). Two cities' overseas social media accounts with similar urban characteristics and cultural communication positioning are selected as research samples. Through the observation period data from January to September 2023, the forms of published content (such as graphic and text combination, video+copy), interactive data (forwarding/commenting/liking volume), and content categories (city brand information, cultural and tourism services, current affairs anecdotes, lifestyle, etc.) are encoded and statistically analyzed. The research focuses on four dimensions: content interest (copywriting humor, image viewing, video appeal), benefit (information value and demand fit), interactivity (questioning interaction, feedback response, activity guidance), and personalization (regional/age group segmentation). By comparing the performance of sample accounts in information provision, relationship building, and behavior guidance, the differences in the communication effects of content marketing strategies are revealed. Finally, practical paths for optimizing social media content innovation, interactive form upgrading, and targeted communication in international communication are proposed, providing empirical evidence for enhancing global audience participation and brand influence.

4. Results and discussion

4.1 Empirical comparison of social media marketing in twin cities under the 4I-ICA framework

This study is based on the 4I principle and ICA framework, comparing the data of overseas social media accounts (A/B) in two similar cities from January to September 2023. A posted 309 articles (1 per day), with single/multiple images/videos accounting for 34%/35%/31%, mainly short videos (79% are 1-3 minutes); B has released 418 articles (2 per day), with 65% of them featuring multiple images and only 15% featuring 30 minute live replays (an average of 4 per month). B has a significantly higher number of followers (2.6 million) and average interactions (618 times/post) than A (159000 followers, 86 times/post), but A's interaction rate (0.54%) is slightly higher than B's (0.23%). There is a significant difference in video interaction: B video has an average of 1029 interactions per video, while A only has 37 interactions. In terms of interest dimension, B video has a much higher level of interest (94%) and likes (886 times) than A (41%/40 times). In terms of interests, the proportion of B's cultural and tourism information (92%) is higher than A's (72%), and the proportion of current affairs and interesting stories is 60% compared to A's 20%. In terms of interaction strategy, B's questioning interaction (25%) and activity guidance (27%) account for a higher proportion, with outstanding effects in account based interaction (B reaching 937

times/article). In terms of personality dimension, A's regional segmentation content accounts for 0.3% (with a maximum of 995 likes per comment), while B did not detect any regional segmentation. cross- platform comparison shows that Instagram interaction is 24 times higher than Facebook, confirming the high return platform characteristics. Through quantitative analysis and cross-platform comparison, this study reveals the impact of content form, interaction strategy, and targeted communication on the marketing effectiveness of overseas social media, providing empirical evidence for optimizing international communication strategies in global cities.

4.2 Model experiment

This study takes Go Chengdu and Seoul Korea as research objects, and constructs complementary samples through four-dimensional logic: the cultural dimension highlights the contrast between "traditional and modern" (Chengdu's "panda/food" symbol vs Seoul's "K-pop/Korean drama" influence); The operational strategy dimension reflects complementary strategies (Chengdu symbol translation+event/group operation vs Seoul localization team+language/cultural translation); Quantitative comparison of platform architecture dimensions (Chengdu's "borrowing ships+shipbuilding" dual path coverage of 123 countries audience vs Seoul's standardized data interface+user profile mapping); The theoretical verification dimension focuses on the practical application of 4I theory, verifying the synergy between "personalization" elements and cross-cultural strategies, as well as the combination path of privacy computing (such as federated learning) and "interaction" elements, providing empirical evidence for the "responsible AI marketing ecosystem". This study compared and analyzed the Facebook account operation data of Go Chengdu and Seoul Korea, revealing the differences in content strategy and interactive effects between the two. As shown in Figure 1:

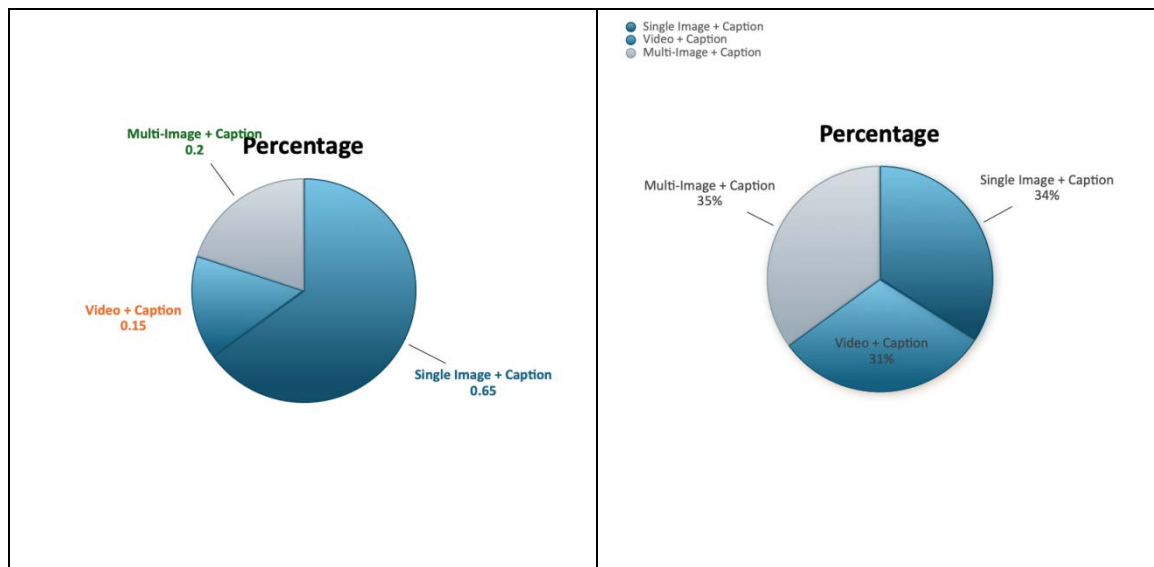


Figure 1 Comparison of Content Forms between Chengdu and Seoul Facebook Accounts

Go Chengdu has a total of 309 posts, with an average of 1 post per day. The proportion of graphic and textual content is 69% (combined with multiple images), and video content is 31%; Seoul Korea has a total of 418 posts, with an average of 2 posts per day. Table 1 shows that the average number of likes for Go Chengdu's entertaining videos is 40, far lower than Seoul Korea's 886 likes. In terms of principle of interests

Table 1 Comparison of interest Social Interaction Indicators between Chengdu and Seoul

City	Content Category	Frequency	Average Likes	Average Comments	Average Shares
Go Chengdu	interest Copy	174	111	6	15
Go Chengdu	interest Image	280	170	2	9
Go Chengdu	interest Video	39	40	2	11
Seoul Korea	interest Copy	299	787	84	61
Seoul Korea	interest Image	371	663	55	54
Seoul Korea	interest Video	58	886	163	45

The analysis of interaction strategies and effectiveness differences shows that Seoul Korea adopts a dual driving mode of "questioning interaction+activity guidance" (accounting for 52%), which stimulates users to actively participate through open-ended questions (such as "What is your favorite Seoul season?") and challenge activities (such as # Seoul food check-in), while Go Chengdu takes "link drainage" as its core strategy (accounting for 51%), achieving traffic conversion by embedding external links such as city official websites and activity pages, but users' direct interaction behavior is relatively passive. In terms of interactive effects, both parties have shown outstanding performance in mentioning content on the account, but Seoul Korea has achieved higher interaction density through 378 age segmented content (such as Z-generation trend topics and silver haired health tips), with significantly better likes/comments/shares per article compared to Go Chengdu's similar content; Go Chengdu received 995 high likes with two multilingual regional posts (bilingual in Chinese and English+dialect adaptation), verifying the effectiveness of the "precise regional positioning+language adaptation" strategy. In terms of trend verification, Seoul Korea shows a continuous upward trend in activity guidance content (with a month on month increase of 8% -12%), while Go Chengdu fluctuates significantly in link traffic content (with a month on month fluctuation of $\pm 15\%$); In the interaction of interesting content, users of Seoul Korea's interactive questioning content stay longer (average 2 minutes and 18 seconds vs Go Chengdu's 1 minute and 45 seconds); In the interaction of interest based content, Go Chengdu has a higher conversion rate for link driven content (click through rate of 18% vs 12% in Seoul Korea), but users have a weaker willingness to spread it again (forwarding rate of 6% vs 15% in Seoul Korea). This strategic difference essentially stems from the underlying logic of urban marketing positioning - Seoul Korea focuses more on building a "participatory community" to cultivate user stickiness, while Go Chengdu tends to be "traffic conversion oriented" to achieve rapid exposure. The two need to choose an appropriate path based on the characteristics of the city, such as historical and cultural cities being more suitable for Seoul Korea's interactive strategy, and tourist destination cities possibly being more suitable for Go Chengdu's drainage strategy.

4.3 Effect analysis

Based on the four principles of interest, interest, interaction, and personality, overseas social media content marketing strategies need to be optimized in multiple dimensions: visual standards should be unified, and creativity and attractiveness should be enhanced through color, font, layout, and cutting-edge technologies (such as AI/AR/VR) to create a distinctive account style and enhance recognition; Content expression needs to strengthen internet sense and humor, integrate local popular internet slang, memes or hot topics, combine interesting stories, challenge activities, etc. to enhance user resonance and sharing desire, and refer to authoritative reports (such as HubSpot trend reports) to verify the effectiveness of humorous content; Content production can be IP based[6], created through proprietary IPs or in collaboration with well-known IPs (such as cultural symbols and mascot linkage), combined with series of programs, interactive live broadcasts, and other forms to enhance content attractiveness; To meet the diverse interests and needs of users, interactive forms such as Q&A, voting, and prize guessing should be used to enhance participation, optimize the proportion of cultural and tourism related content, focus on emotional transmission and aesthetic design, and enhance user stickiness and brand influence; Matrix account operation can adopt "distribution thinking", deepen user behavior identification through community operation, create and publish the same content from multiple perspectives across accounts, and expand the coverage of dissemination; At the interactive level, social media interaction should be strengthened by actively responding, optimizing interactive content (such as asking questions, voting, and sharing user stories), regularly organizing interactive activities (such as topic discussions and lucky draws), and establishing an interactive effect evaluation system (including indicators such as interaction rate, message response rate, and viewing time, combined with professional tools such as Google Analytics analysis) to enhance account activity and user engagement; Under the principle of individuality, it is necessary to promote refined marketing, customize differentiated content based on platform tone and user profiles (such as young male groups and regional distribution characteristics), focus on the interests of Generation Z (such as trendy culture and internet buzzwords), and increase investment in emerging platforms (such as TikTok); AI technology can empower content marketing, enabling personalized recommendations and intelligent push notifications through user data analysis. At the same time, AI tools can be used to generate graphic and video content, extract popular keywords, and manage multiple accounts, improving content production efficiency and creativity; Ultimately, through digital marketing promotion [7] (such as cross- platform content promotion and data-driven optimization), the marketing effect is maximized, and a strategic path that emphasizes both "participatory communities" and "traffic conversion" is constructed, adapting to different city characteristics and marketing goals.

5. Conclusion

This study uses the 4I marketing theory as a framework and combines it with the ICA content classification framework to systematically explore the overseas social media content marketing strategies of a regional international communication media. By using observation method, content analysis method, and comparative analysis method, the macro marketing environment is sorted out from multiple dimensions such as political, economic, social, and technological environment. The four principles of interest, benefit, interaction, and personality are applied to construct analysis categories, and specific indicators are formulated based on the three dimensions of information provision, relationship construction, and behavior guidance. Sample account content is coded and quantitatively analyzed. Through comparative analysis with accounts in similar cities, it was found that there are four core shortcomings in current overseas social media content marketing: unstable content quality under the principle of interest, lack of creative themes; The proportion of urban

brand information in the principle of interests is too high, and there is insufficient current affairs and interesting news content with weak interactive effects; In terms of interaction principles, the account activity is low, the interaction form is single, and there is a lack of deep user relationship maintenance; The principle of individuality lacks precise targeting strategies and does not implement content differentiation based on platform characteristics. Based on this, a four-dimensional optimization path is proposed: unifying visual standards to strengthen short video production, introducing IP based content to enhance attractiveness; Balance the proportion of urban brand and cultural tourism, current affairs and interesting stories, and enhance emotional resonance [8]; Strengthen interactive questioning, account mentions, and user feedback[9], and establish an evaluation system for interactive effects; Utilizing AI technology and digital means to achieve personalized recommendations [10], increasing investment in emerging platforms to enhance user engagement. Although the research has limitations in sample data, methodology, and personal knowledge, and has not fully explored user feedback needs, the innovative application of 4I theory provides a reference optimization framework for similar enterprises. Future research can further explore the application of AI in content generation, precise recommendation, and intelligent interaction, while paying attention to technical ethics and privacy issues, and promoting the improvement of international communication efficiency.

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