An Empirical Study on the Enhancement of Urban Communication Capacity through Vertical Domain Development at Chengdu Science and Technology Converged Media Center (Postprint)

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Abstract

Currently, the construction of county-level media convergence centers in horizontal domains is being comprehensively implemented; simultaneously, how to develop vertical domain media convergence construction and strengthen media integration development has become a topic of concern in academic circles. This paper conducts an empirical study on the role of vertical domain media convergence construction in enhancing communication capabilities, using the Chengdu Science and Technology Media Convergence Center as a case study.

Full Text

An Empirical Study on the Impact of Vertical Domain Construction of Chengdu Science and Technology Media Center on Urban Communication Capacity Enhancement

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Abstract: Currently, the construction of county-level converged media centers in horizontal domains is being comprehensively carried out; meanwhile, how to develop vertical domain converged media construction and strengthen media integration development has become a key concern in academic circles. This paper takes the Chengdu Science and Technology Media Center as a case study to conduct empirical research on the impact of vertical domain converged media construction on communication capacity enhancement.

Keywords: Propaganda products; Converged media center; Statistical analysis; Science and technology vertical domain; Media integration

1. Introduction

"Promoting media integration development and building all-media has become an urgent task we face" [1]. President Xi Jinping' s important speech during the 12th collective study session of the Political Bureau of the CPC Central Committee provided a new direction for improving the soft environment. Currently, the construction of county-level converged media centers in horizontal domains is accelerating; meanwhile, how to develop vertical domain converged media construction and strengthen industry media integration development has become a key concern in academic circles. This paper takes the Chengdu Science and Technology Media Center (hereinafter referred to as "the Center") as a case study to conduct empirical research on the impact of vertical domain converged media construction on urban communication capacity enhancement.

In 1948, Lasswell's *The Structure and Function of Communication in Society* proposed the 5W model: Who, What, Which Channel, To Whom, and With What Effect [2]. The 5W model represents basic information transmission. Building upon this model, the author integrates these five fundamental elements into the production, publication, and dissemination process of propaganda products, dividing it into five stages: information collection, content processing, review and proofreading, product release, and user feedback, as shown in Figure 1 [Figure 1: see original paper]. Based on this theoretical foundation and referencing well-established media metrics, the author constructs an evaluation index system for the Center's propaganda products (drawing from Toutiao's Transmission Index), finding that communication power is primarily reflected in publication volume and readership, while communication depth is mainly manifested in interaction metrics including forwarding, bookmarking, commenting, and liking.

Based on the above process diagram and key metrics, and following the principles of systematicity, scientificity, simplicity, quantifiability, and relative independence in index system construction, combined with the characteristics of vertical domain propaganda product production, the evaluation index system is constructed as follows:

Cultural Communication Product Evaluation Index System

The system comprises 3 first-level indicators, 6 second-level indicators, and 10 third-level indicators.

(1) Independent Planning Indicators: "Original quantity" refers to the number of propaganda products entirely or primarily planned, written, designed, and packaged within a certain period. "Original proportion" refers to the ratio of original products to total propaganda products in a given period, calculated as: Original proportion = Original quantity / Total product quantity. "Average original views per product" refers to the average view count per original product, calculated as: Average original views per product = Total views of original

products / Original product quantity. "Peak readership" refers to the highest view count of a single original propaganda product within a period, representing the best performance of "original quality" for that period.

(2) Content Processing Indicators: "Total product quantity" refers to the total number of propaganda products processed and produced across all platforms within a certain period. "Product proportion" refers to the distribution of propaganda products by processing method and final format. Based on final presentation format, propaganda products are divided into two categories: single-format and multi-format products. Single-format products are further classified as image-based, text-based, or video-based products. Multi-format products include "image + text," "text + video," "image + text + video," and other composite formats.

(3) Communication Capacity Indicators: "Platform quantity" refers to the total number of platforms where propaganda products can be published, directly measuring "communication breadth." "Total communication volume" refers to the aggregate view count of all propaganda products across all platforms within a period. "Total user volume" refers to the sum of users across all platforms within a period. "Total interaction volume" refers to the collective user feedback on propaganda products across platforms, including forwarding, bookmarking, commenting, and liking.

2. Analysis of Chengdu Science and Technology Media Center Propaganda Product Indicators

Based on the above evaluation system, the author analyzed platform data spanning 36 months: 18 months before the Center' s establishment (November 2017-May 2019) and 18 months after (May 2019-November 2020).

2.1 Independent Planning Capacity Analysis

As the original product launch platform for Chengdu Science and Technology Media, the "Chengdu Science and Technology" WeChat subscription account serves as the flagship platform of the media matrix and is representative for analyzing the Center' s independent planning capacity. The analysis of relevant indicators is as follows.

The "original quantity" indicator increased 9.05-fold from 20 before establishment to 201 after establishment. The "original proportion" indicator rose by 27.19 percentage points from 2.30% before to 29.49% after establishment. The "average original views per product" indicator grew by 37.47% from 894 views per product before to 1,229 views per product after establishment. For the "peak readership" indicator, the most-viewed original product after establishment was *Authoritative Release! Full Text of "Several Policy Measures for Comprehensively Strengthening Scientific and Technological Innovation Capacity Construction" Here It Comes*, with 20,381 views. Before establishment, the

most-viewed original product was *A Special "Supermarket" Appears at UESTC —Customers Are Actually Over 100 Chengdu Entrepreneurs*···, with 2,917 views, representing a nearly 6-fold increase.

In summary, following the Center' s establishment, both "original quantity" and "original proportion" increased significantly, particularly with exponential growth in original output, demonstrating marked improvement in original production. Simultaneously, "average original views per product" and "peak readership" increased rapidly, indicating substantial improvement in original quality. Evidently, the establishment of the Chengdu Science and Technology Media Center has significantly enhanced the independent planning capacity of cultural communication products.

2.2 Content Processing Capacity Analysis

Following the processing philosophy of "one-time collection, multiple-generation production," the Center integrated resources and strengthened editorial processing capacity after its establishment. The analysis of content processing indicators is as follows.

The "total product quantity"indicator increased by 31.12% from 17,213 products before establishment to 22,569 products after establishment. For the "product proportion"indicator, single-format products increased by 20.93% after establishment, with text-based products decreasing by 98.01% and video-based products increasing by 10.38-fold. Multi-format products increased by 31.22%, with "image + text" products growing by 29.33% and "text + video" products growing by 41.22%.

[Figure 2: see original paper] Comparison of Cultural Communication Product Quantities

In summary, following the Center' s establishment, "total product quantity" increased, showing an upward trend in processing volume. While "product type"remained primarily "image + text,"products incorporating video formats increased substantially, aligning processing types with current media trends toward visualization, dynamism, and multidimensionality. Evidently, the Chengdu Science and Technology Media Center construction has enhanced the content processing capacity of cultural communication products.

2.3 Communication Capacity Analysis

The starting point of propaganda product dissemination is product release, with the process being product diffusion. The analysis of communication capacity indicators is as follows.

The "platform quantity" indicator increased by 2 after establishment, adding the "Chengdu Science and Technology" Douyin account and Zhihu account. The "total communication volume" indicator increased 7.84-fold from 6,271,198 views before establishment to 143,859,791 views after establishment. The "total user

volume"indicator grew by 73.16% from 411,690 users before to 712,869 users after establishment. The "total interaction volume" indicator increased by 75.24% from 232,671 interactions before to 407,729 interactions after establishment.

In summary, following the Center' s establishment, "communication breadth" expanded through increased platform quantity and matrix scale, with "total communication volume"growing exponentially and "total user volume"increasing substantially. In terms of "communication depth," the "total interaction volume" (including forwarding, bookmarking, commenting, and liking) continued to grow. Evidently, the Chengdu Science and Technology Media Center construction has significantly enhanced the communication capacity of cultural communication products.

2.4 Conclusion

Based on the research findings, all indicators—including "independent planning," "content processing," and "communication capacity" —improved after the Center' s establishment. Combined with Figure 2, we can conclude that the Chengdu Science and Technology Media Center construction has enhanced every stage of propaganda product development: information collection, content processing, review and proofreading, product release, and user feedback, resulting in noticeable improvements in product quality and communication capacity.

3. Analysis of Chengdu Science and Technology Media Center Construction Experience

Statistical analysis demonstrates that propaganda product quality and communication power improved after the Center' s establishment. Based on in-depth interviews and observations with Center builders and workers, the author identifies several noteworthy characteristics: institutional breakthrough, process reshaping, and model innovation.

3.1 Institutional Innovation: Forming a New Architecture of Institutional Mechanism Integration to Maximize Media Productivity

After its establishment, the Center adhered to innovation while maintaining integrity. Through structural reorganization, resource integration, and position adjustment, it formed an efficient, standardized, and convenient converged media mechanism that greatly unleashed media productivity and substantially enhanced the planning, production, and communication capacities of cultural communication products.

First, the Center innovated its management system by establishing deep cooperation with mature professional media institutions and science and technology industry associations. Using professional media structures as a blueprint and the Center' s specific business needs as a foundation, it efficiently divided labor and innovatively constructed a departmental management organizational structure

under "dual director" leadership, ensuring synchronized business advancement and management improvement.

Second, the Center standardized its management mechanisms by establishing a comprehensive internal converged media operation system. This system centers on the *General Process Specifications for Planning, Collection, Editing, Review, Release, and Accounting of Chengdu Science and Technology Media Center*, supported by the *Work Specifications for Interview and Outreach Department* and *Work Specifications for Product Editorial Department*, and features the *Performance Assessment Measures for Editorial Staff (Provisional)* and *Leave Management Details*. This "strict yet flexible" management model ensures orderly and efficient daily operations.

Third, the Center streamlined operation channels by simplifying intermediate processes and optimizing vertical communication under the premise of general process specifications. This flattened, centralized management reduces vertical loss and continuously improves the timeliness value of converged media content products. The Center established efficient docking models with supervisory departments and rapid distribution mechanisms with media channels, enabling point-to-point information delivery and effectively improving propaganda accuracy and timeliness.

3.2 Process Innovation: Constructing a "One-Time Collection, Multiple Products, Multi-Media Integration" Production Pattern

After its establishment, the Center adopted a "one-time collection, multiple products, multi-media integration" pattern. Aiming for in-depth reporting, rich product variety, and diversified matrix, it employed multi-path approaches to substantially increase cultural communication product quantity and expand dissemination channels.

First, the Center implemented a "one interview, multi-terminal drafting, multi-terminal release" model. Using interview materials from multiple angles to create drafts for publication across newspapers, websites, and client terminals, it formed converged media products that meet diverse user information needs and different media requirements. For example, in covering the Chengdu Science and Technology Innovation Conference held in June 2020, the Center produced the news product *China Western (Chengdu) Science City Is Here!* focusing on the Western (Chengdu) Science City announcement, and *Innovation! Implementing New Industrial Land (M0) Policy with Differentiated Land Prices—Chengdu Releases "18 Articles" for Strengthening Scientific and Technological Innovation Capacity* focusing on important policy information. This series of converged media products was forwarded by China National Radio, Sichuan Daily, Xinhua News Agency client, and other media, achieving positive social impact.

Second, the Center adopted a "one-time drafting, multi-terminal editing, multi-terminal release" model. Using a single interview draft, editors adapted content

according to different platform characteristics and tones to create converged media products in various formats and styles. For instance, focusing on Western (Chengdu) Science City construction, the front-end interview team transmitted text, images, and video materials to the editorial department, which then produced different products based on platform characteristics: "text + image + video" news product *China Western (Chengdu) Science City Night, Stars Have You!*, video product *Chengdu Science City*, "text + animated graphics" product *You! Don' t! Know! China Western (Chengdu) Science City*, animated product *Listen, the Sound of Technology Waves*, and others. This series was forwarded by Xinhua News Agency client, Sichuan Release, Chengdu Daily, and other media, maximizing social benefits through the "one-time drafting, multi-terminal editing" approach.

Third, the Center employed a "one-time planning, multiple follow-ups, differential expression" model. Through phased implementation of a single plan, it created series of thematic converged media products that maximized the communication effect of planning and creativity while establishing a fixed user base. For example, the Center developed a monthly "Book Recommendation with Prizes" user interaction activity using reading and book recommendation topics to promote scholarly culture and increase user engagement. This series received 4,054 reader feedback submissions and achieved over 400,000 total views, successfully forming a fixed user group in the science and technology vertical domain.

3.3 Model Innovation: Creating New Multi-Channel Distribution and Multi-Domain Cooperation

After its establishment, the Center adhered to a mobile-first strategy, continuously expanding communication channels and increasing dissemination methods. It formed a science and technology converged media distribution channel and communication mechanism with head-platform coordination and full-domain linkage, enabling propaganda products to disseminate through various horizontally and vertically connected channels.

First, the Center expanded release channels by focusing on the science and technology vertical domain. Using platforms of supporting units such as Science and Technology Daily' s all-media platform and Xinhua News Agency' s Sichuan channel as leading channels, it simultaneously attracted mainstream media at all levels including People' s Daily Online, China News Service, Sichuan Daily, and Chengdu Daily, while integrating the "Chengdu Science and Technology" government all-media platform resources. This created an "external + internal" multi-channel communication network that strengthens converged media communication capacity. The Center established a Chengdu science and technology media linkage mechanism, continuously adding various media members to broaden exchange scope around Chengdu science and technology and innovation topics, and expand exchange depth around Center-produced products, thereby enhancing Chengdu' s scientific and technological innovation activity and visibility within professional media communities.

Second, the Center emphasized multi-party cooperation by engaging in exchanges and collaboration with horizontal converged media within the city, leveraging respective characteristics to create synergy. For example, it co-produced the *New Voices* science and technology innovation interview series with a district-level converged media center in Chengdu for joint promotion. It collaborated with multiple districts and counties in Chengdu to launch the "Regional Highlights" series, initiating a new model of vertical-horizontal linkage and regional coordination for Chengdu' s scientific and technological innovation publicity. Cooperation with leading media enterprises produced the *Technology Dream Chasers* open class, *Sound Library* series, and *Smart Manufacturing Chengdu* micro-film series. The *Technology Dream Chasers* open class achieved cumulative exposure of over 8.65 million and cumulative views exceeding 1.7 million, initially establishing a Chengdu cultural IP with urban innovation characteristics.

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Note: Figure translations are in progress. See original paper for figures.