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Postprint: Subdivision and Attribute Analysis of Elements in Multimedia Network Public Opinion Information Dissemination

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Abstract

[Purpose/Significance] This study analyzes the types and attributes of multimedia network public opinion information dissemination elements from different dimensions, thereby effectively enhancing the processing efficiency and utilization value of multimedia network public opinion information. [Method/Process] Through the literature research method, it examines the subject, object, noumenon, media, and environmental noise within multimedia network public opinion information dissemination elements from both typological and attributional perspectives, and systematically organizes the data forms and content generated during the development and evolution of multimedia network public opinion. [Results/Conclusions] Multimedia network public opinion information exhibits diverse data types. Analyzing the types and attributes of multimedia network public opinion information dissemination elements contributes to providing theoretical foundations and research ideas for the integration of multimedia network public opinion information systems and database construction.

Full Text

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Research on the Types and Attributes of Dissemination Elements of Multimedia Network Public Opinion Information

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Abstract

[Purpose/Significance] This paper analyzes the types and attributes of multimedia network public opinion information dissemination elements from different dimensions, aiming to effectively enhance the processing efficiency and utilization value of multimedia network public opinion information. **[Method/Process]** Using literature research methodology, this study examines the subject, object, ontology, media, and environmental noise within the dissemination elements from both typological and attributional perspectives, systematically sorting out the data forms and content generated during the evolution of multimedia network public opinion. **[Result/Conclusion]** The data types of multimedia network public opinion information are diverse. Analyzing the types and attributes of multimedia network public opinion dissemination elements provides a theoretical foundation and research framework for the integration of multimedia network public opinion information systems and database construction.

Keywords: multimedia network public opinion; information dissemination elements; public opinion information types; public opinion information attributes

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1 Introduction

The development of multimedia technology has provided richer and more diverse forms of expression and dissemination modes for network public opinion information. Against the backdrop of the big data era, the volume and complexity of multimedia network public opinion information have reached unprecedented levels. Extensive research on multimedia network public opinion has been conducted both domestically and internationally, primarily focusing on dissemination mechanisms, monitoring and early warning systems, response strategies, control and guidance mechanisms, and information mining. For instance, L.J. Zhang et al. studied a social network information propagation model

based on individual behavior, analyzing personal behaviors related to information dissemination and factors influencing sharing behavior, which can be used to predict the scale and speed of multimedia network public opinion propagation [1]. Tan Guoxin and Fang Yi examined control mechanisms for multimedia network public opinion in emergencies from a problem-solving perspective [4]. X.R. Wang et al. employed a clustering algorithm that does not require calculating all similarities—a more efficient approach than traditional methods—to identify themes through data mining for multimedia network public opinion research [5]. Regarding dissemination elements, scholars have investigated the elements and operational mechanisms of multimedia network public opinion propagation, revealing the inherent operational patterns of network public opinion information dissemination in multimedia technology environments and constructing an overall relational framework for the propagation mechanism [6]. However, research specifically analyzing the types and attributes of multimedia network public opinion dissemination elements remains scarce.

Given the massive and complex nature of multimedia network public opinion information, systematically sorting out the types and attributes of its dissemination elements can compensate for difficulties in comprehension and standardization, thereby effectively improving processing efficiency and utilization value. This research primarily addresses three questions: (1) systematically organizing multimedia network public opinion dissemination elements from multi-dimensional and multi-perspective viewpoints; (2) analyzing the role of each dissemination element in the propagation process; and (3) examining the types and attributes of each dissemination element.

2 Analysis of Multimedia Network Public Opinion Information

2.1 Characteristics of Multimedia Network Public Opinion Information

2.1.1 Multi-modal Audio-Visual Form Features

Multimedia network public opinion information exhibits diverse forms, typically comprising combinations of text, images, audio, and video. Images, audio, and video possess higher audio-visual capacity, enabling subjects to gain clearer and more intuitive understanding of public opinion objects. Consequently, multimedia network public opinion events with higher audio-visual degrees are more likely to provoke intense discussion among subjects.

2.1.2 Complex, Confrontational, and Mutation-Prone Content Features

The complexity of multimedia network public opinion content refers to the numerous elements involved and the multiple complex factors influencing its cyclical evolution from emergence to decline. Confrontation indicates that information content published by subjects may exhibit adversarial relationships due to differing viewpoints. Mutation-proneness refers to the susceptibility of subjects'

emotional attitudes to change, as well as the potential for rapid shifts between positive and negative public opinion.

2.1.3 High-Outbreak, Fast-Divide Short-Cycle Features

The lifecycle of multimedia network public opinion can be roughly divided into incubation, outbreak, maturity, and decline phases [7]. The topical sensitivity and propagation characteristics of multimedia network public opinion events enable rapid outbreak in short periods. For various reasons, events quickly enter the decline phase after outbreak, demonstrating short-cycle characteristics.

2.1.4 Fast and Wide-Range Propagation Features

Traditional public opinion propagation follows linear patterns with single-directional and relatively slow dissemination [8]. Multimedia technology enables subjects to achieve divergent propagation through multiple platforms and channels, further enhancing propagation speed and scope.

These characteristics are influenced by the interaction of various dissemination elements.

2.2 Multimedia Network Public Opinion Information and Its Dissemination Elements

This study defines multimedia network public opinion information as massive information assets in noisy network spaces where public and government netizen groups, as subjects, express viewpoints and attitudes toward public opinion objects through multimedia technology, represented and rapidly disseminated through diversified multimedia ontologies. Based on Lasswell's "5W" communication model [9], this study extracts five dissemination elements: subject, object, ontology, media, and environmental noise. As shown in [Figure 1: see original paper], these five elements interact within the multimedia network public opinion environment space.

3 Dissemination Element Subdivision and Attribute Analysis

3.1 Subject Elements of Multimedia Network Public Opinion Information

The subject refers to entities that create topics or express cognition, emotions, attitudes, opinions, and other statements in multimedia form within network spaces under big data contexts [10], serving as the primary receiver and disseminator of information.

3.1.1 Types of Subject Elements

Based on roles in the dissemination process, subjects can be categorized as free subjects, leader subjects, control subjects, and stakeholder subjects. Based on functions in topic development, they can be divided into pioneering subjects, promoting subjects, controlling subjects, and analyzing subjects. According to

emotional stance, subjects can be classified as supportive, neutral, opposing, or spectator subjects [11]. As shown in [Figure 2: see original paper].

3.1.2 Attributes of Subject Elements

Subject attributes include identity recognition features and information publishing features. Identity recognition features comprise real-world social attributes (demographics) and cyberspace attributes (online behavior characteristics). Information publishing features refer to attributes exhibited during information release. See .

3.2 Object Elements of Multimedia Network Public Opinion Information

The object refers to the public opinion event itself—the stimulus that directly triggers public opinion occurrence and propagation [12].

3.2.1 Types of Object Elements

By impact scope: single-regional vs. multi-regional. By manifestation: news events, hotspot phenomena, or public topics. By nature: natural disasters, accidents, economic disputes, or ideological/political issues. By cause: endogenous, exogenous, or dual-origin. By stakeholder interest consistency: interest-consistent vs. interest-conflict types. As shown in [Figure 3: see original paper].

3.2.2 Attributes of Object Elements

Attributes are divided into objective (factual descriptions) and subjective (involving human consciousness) [13]. See .

3.3 Ontology Elements of Multimedia Network Public Opinion Information

Ontology refers to the carrier of basic content expressed by subjects regarding certain issues, phenomena, or events, including cognition, emotions, attitudes, opinions, and behavioral tendencies.

3.3.1 Types of Ontology Elements

Two dimensions are abstracted: information content and information form. Information content determines popularity and impact, comprising event elements, attitude evaluation, behavioral intention, and in-depth causation [10]. Information form affects propagation mode and efficiency. As shown in [Figure 4: see original paper].

3.3.2 Attributes of Ontology Elements

This study focuses on attributes of expression forms, including text, images, audio, and video. See .

3.4 Media Elements of Multimedia Network Public Opinion Information

Media refers to the channels and means of information transmission from sender to receiver.

3.4.1 Types of Media Elements

By device: PC-based vs. mobile platforms. By interaction mode: public platforms (open) vs. personal platforms (semi-open). As shown in [Figure 5: see original paper].

3.4.2 Attributes of Media Elements

Propagation modes are categorized as “one-to-many” (unidirectional) and “many-to-many” (interactive). Media functions include “event revelation,” “netizen commentary,” and “heat indication” [10]. See .

3.5 Environmental Noise Elements of Multimedia Network Public Opinion Information

Environmental noise refers to any unwanted additions during information reception and conversion [16] that reduce information absorption capacity.

3.5.1 Types of Environmental Noise Elements

By source location: transmitter noise vs. propagation process noise. By existence mode: external environmental noise (policy changes, new events) vs. internal environmental noise (low-value fragmented information, rumors). As shown in [Figure 6: see original paper].

3.5.2 Attributes of Environmental Noise Elements

Attributes are analyzed from two dimensions: noise information itself and its relationship with public opinion information. See .

3.6 Summary

This paper systematically organizes the types and attributes of five dissemination elements from multi-dimensional perspectives, as summarized in [Figure 7: see original paper]. The classification provides theoretical support for information integration and database construction.

4 Empirical Analysis

This study selects the widely-discussed “Chongqing Wanzhou Bus Falling into River Incident” (October 28, 2018) as a case to validate the classification framework.

4.1 Empirical Process

4.1.1 Subject Elements

Applying the subject typology to the incident, subjects are classified as shown

in . For attribute analysis, user @ 陌上花盛开 is selected as an example. Most attribute information can be obtained directly from Weibo profiles, while other information can be collected through questionnaires. See .

4.1.2 Object Elements

The incident is classified as multi-regional, a news event, an accident disaster, dual-origin, and interest-conflict type. Attribute analysis shows high attention, value, sensitivity, public concern, and destructiveness, with strong official response. See and .

4.1.3 Ontology Elements

Sample information from the incident is analyzed according to the ontology typology. See . Using a People's Daily post as an example, ontology attributes are analyzed, with specific attributes of images, audio, and video obtained indirectly. See .

4.1.4 Media Elements

Media platforms involved are classified as public or personal platforms. Some users posted via PC (web.weibo.com) while others used mobile devices (iPhone 7 Plus). Platform attributes are summarized in and .

4.1.5 Environmental Noise Elements

Noise is classified as transmitter noise (e.g., false claims about the female driver) or propagation process noise (e.g., unclear videos). External noise includes other major events (China International Import Expo), while internal noise includes false information (e.g., "bus driver retaliated against society"). See and . The longest-lasting noise (blaming the car driver) persisted for approximately 7 hours, causing strong negative interference through rumor propagation due to unverified information.

4.2 Results Analysis

Based on the classification framework, data from Sina Weibo regarding the incident were collected and analyzed from the five-element perspective. The empirical analysis demonstrates the feasibility of the proposed typology and attributes, providing validation for the theoretical framework.

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Author Contributions

Huang Wei: Formulated research propositions and framework, revised manuscript, finalized version.

Xu Ye: Drafted and revised manuscript.

Zhu Zhenyuan: Collected English literature and translated abstract.

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Keywords: multimedia network public opinion; elements of information propagation; types of public opinion information; attributes of public opinion information

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