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Application Exploration of Efficient Generation of Thematic Visualizations (Postprint)

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Abstract

With the advent of the mobile internet era, visual journalism and visual special features have become increasingly prevalent. This paper, based on engineering practice, explores and elaborates on how to enable ordinary editors—without professional designers or technical personnel—to efficiently produce high-quality visual special news products. The discussion encompasses establishing an efficient and reusable template system, adopting navigation-based services, integrating visual components, implementing linked publishing for content fusion, and establishing a robust security mechanism.

Full Text

Exploring Applications for Efficient Generation of Visual Features

Abstract: With the advent of the mobile internet era, visual news and visual features have become increasingly prevalent. This paper, grounded in practical engineering experience, explores how ordinary editors can efficiently produce high-quality visual news features without professional designers or technical staff. The discussion covers establishing an efficient and reusable template system, adopting navigation-based services, integrating visual components, implementing integrated publishing with content fusion, and establishing robust security mechanisms.

Keywords: visual news; visual features; visual components

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2. Visual Features in the Context of Visualization

The application of visualization in journalism began with experiments by media outlets such as *The Guardian* and *The New York Times*. From initially presenting information through simple maps or charts to today's interactive experiences, news visualization has entered an era of tremendous growth. News organizations increasingly adopt visual methods to present stories to audiences, resulting in a proliferation of dazzling visual news features.

Fragmented visual news has gained widespread popularity in the mobile internet landscape, firmly securing its place through rich expressive power. However, compared to relatively scattered individual stories, visual feature news offers greater analytical depth and broader perspective while retaining other advantages of visual journalism, and has gained increasing attention and adoption by news organizations. *The New York Times*' digital feature "Snow Fall," published on December 20, 2012, achieved remarkable success through its innovative multimedia reporting approach, generating 3.5 million clicks and 2.9 million visitors within a week, sparking tremendous excitement in the long-quiet traditional media circle. "Snow Fall" told a compelling story through diverse methods including interactive images, interview videos, and biographies of renowned skiers. Veteran technology journalist Om Malik wrote on his GigaOm platform that this type of digital reporting model could mark the beginning of a new business model that redefines journalism.

How to enable ordinary editors to efficiently produce high-quality visual news features without professional designers or technical staff is an important challenge facing news organizations.

1. The Mobile Reading Era Belongs to Visual News

As mobile network bandwidth continues to increase, we have long entered the mobile internet era. According to TalkingData, by December 2016, China's mobile intelligent terminal scale reached 1.37 billion devices [1], approximately one device per capita. With the popularization of mobile terminals, people's reading behaviors and habits have undergone significant changes. First, paper-based reading populations are gradually shifting to electronic reading, with people becoming more accustomed to obtaining information and reading from various screens. Second, fragmented reading trends are evident, with people increasingly utilizing fragmented time such as waiting, commuting, or even riding elevators for reading. Third, higher demands are placed on reading content—not only must more information be acquired within extremely short fragmented time frames and broader topics covered, but the presentation must also be more lively, engaging, and attractive.

According to the "2017 China Mobile Internet Industry Development Analysis Report," news app user scale continued to grow rapidly in 2017, reaching approximately 180 million DAU (Daily Active Users) by year-end, representing over 80% growth since the beginning of the year, with news ranking fifth in user scale

across all mobile internet sectors [2]. In this new media environment, the most effective measure for enhancing news communication effectiveness is visualizing news information and disseminating it as visual news through news websites, news apps, WeChat, Weibo, and other channels to continuously attract large numbers of users. In 2017, Xinhua News Agency launched visual news products such as “How Are Delegates to the 19th CPC National Congress Made?”, “The Concern in Our Hearts,” “The Journey of the Great Road,” “The Light of the BRICS,” and “Our Confidence,” all of which achieved over 100 million online views.

3. Application Exploration for Efficient Generation of Visual Features

The rise of visual feature news signifies a transformation in news operation philosophy. The production of visual feature news imposes higher requirements on technical systems, while traditional feature production suffers from issues such as high specialization, high labor costs, long production cycles, and complex personnel coordination. How can technical means enable ordinary editors to quickly and visually create visual feature news products that support both web and mobile platforms, free from dependence on design and technical staff, shorten production cycles, and reduce labor costs? This paper presents the following explorations.

3.1 Establishing an Efficient and Reusable Template System

Templates are derived by selecting well-structured, uniquely styled, and representative visual features from completed products, abstracting them into public resources that can be quickly cloned and modified to generate similar features. Establishing an efficient and reusable template system can significantly reduce the difficulty of producing visual feature news while substantially improving production efficiency, making the work of designers and ordinary editors relatively independent.

An efficient and reusable template system should meet the following requirements: First, it should have a considerable number of templates that can be gradually enriched through continuous accumulation. Second, it should have a scientific classification system enabling editors to filter needed templates by selecting several classification conditions, while also providing search functionality for quick location of specific templates. Third, template creation should fully consider the different characteristics of PC and mobile terminals, requiring compatibility with various mobile device screen sizes by creating either adaptive templates or specialized templates for specific devices. Fourth, the template creation system and template usage system should be independent of each other to reduce user difficulty.

3.2 Reducing Usage Barriers Through Navigation-Based Services

While reusing templates can significantly improve production efficiency, enabling ordinary editors to proficiently use templates and independently complete visual feature production requires substantially lowering the system's usage barrier. First, at the entry point, users should be distinguished: for senior editors or professional designers proficient in visual feature production tools, a “custom” production mode should be provided with rich tools and components; for general editors, a “rapid mode” should be offered, providing navigation-based services that enable streamlined, intuitive workflow, allowing general editors to complete desired editing effects through minimal steps and produce a visual feature at the smallest cost and in the shortest time.

3.3 Integrating Rich Visual Components

Components are the most basic and important elements in web design—any webpage is created through combining and nesting various components with properly set parameters. Therefore, integrating rich visual components to generate highly expressive templates is also key to rapidly creating visual feature news.

The system integrates visual chart components: editors need only input or import relevant data and select appropriate visualization methods, and the system automatically generates visual views such as line charts, bar charts, radar charts, pie charts, or donut charts, inserting them into designated positions in the feature. The system integrates third-party visual components such as Baidu Maps, Sina Weibo, stock K-charts, and social sharing—editors can achieve corresponding visual effects and insert interactive components through simple drag-and-drop and information input. The system integrates production and upload components for images, photo galleries, carousels, GIFs, videos, and animations, truly achieving one-stop visual production.

3.4 Implementing Integrated Publishing with Content Fusion

Excellent visual features require substantial news materials, which often come from long-term accumulation by news organizations. Only when the visual feature system achieves true content sharing with the editorial system's database and complete integration with multi-channel publishing systems can its functionality and timeliness be maximized. At the content level, the visual feature system should be able to directly call all manuscripts from the editorial system in static or dynamic ways and achieve visual effects on pages. At the publishing level, the visual feature system should implement integrated publishing with content fusion—when certain dynamic data changes, the system automatically republishes all visual feature pages related to this data according to settings, making visual features “dynamic” and “alive.”

3.5 Implementing Robust Security Mechanisms

For any application system, security is an element that can never be ignored, and visual feature systems are no exception. To ensure system usability and security, considerations must be made from various aspects including role division, permission allocation, component protection, and data security.

References: [1] Zhao Meng, Wang Liying. Transformation Strategies for Traditional Media in the Digital Age [J]. China Media Technology. 2016(09): 45-46.

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

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