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The Application and Development of UGC Data in Assessing the Commercial Value of Urban Renewal Projects: A Business Analytics Perspective

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Abstract. Urban renewal has become a critical strategy for sustainable urban development, with accurate commercial value assessment being paramount for project success and viability. In the contemporary digital landscape, User-Generated Content (UGC) has emerged as a rich, real-time data source reflecting public perceptions and experiences. This paper explores the application and future development of UGC data in evaluating the commercial value of urban renewal projects from a business analytics perspective. Using a literature analysis method, this study synthesizes existing research to examine how UGC, when analyzed via business analytics techniques, can provide profound insights into consumer behavior, brand perception, and the overall commercial vitality of renewed urban spaces. The findings indicate that UGC serves as a valuable proxy for measuring commercial performance and public acceptance. However, challenges such as data subjectivity, representational bias, and verification difficulties persist. The paper concludes that future development lies in integrating UGC with authoritative data sources and advancing analytical models to mitigate these limitations, thereby enhancing the reliability and depth of commercial value assessments for more informed urban planning and investment decisions.

Keywords: Urban Renewal, User-Generated Content (UGC), Business Analytics, Commercial Value Assessment, Data-Driven Decision Making

1. Introduction

Urban renewal projects represent significant investments with profound socio-economic impacts, aiming to revitalize underutilized or degraded urban areas [1]. A core determinant of a project's long-term success is its commercial viability—its ability to attract businesses, consumers, and sustained economic activity. Traditionally, assessing this commercial value has relied on expert opinions, market reports, and structured surveys—methods that are costly, time-consuming, and may not fully capture the dynamic, on-the-ground reality [2]. Concurrently, the proliferation of digital platforms has led to an explosion of User-Generated Content (UGC), such as online reviews, social media posts, and location check-ins. This data offers an unfiltered, continuous stream of public

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sentiment and behavior [3]. From a business analytics perspective, UGC presents a novel opportunity to gauge the commercial pulse of urban spaces by analyzing the experiences, preferences, and activities of the very people who use them [4]. This paper argues that UGC, when effectively analyzed, can serve as a powerful, complementary tool for evaluating the commercial value of urban renewal projects. It aims to analyze the current application of UGC in this context, identify inherent challenges, and propose future directions for its development within the field of business analytics.

2. The multifaceted role and developmental trajectory of UGC in urban renewal

2.1. The role of UGC in urban renewal project operations

The primary value of this paper lies in elucidating the significant role that UGC data plays in understanding the operations and validating the commercial value of urban renewal projects. For project developers, operators, and urban planners, UGC provides a direct line of sight into the end-user experience [5]. This has several tangible benefits. Firstly, it enables real-time performance monitoring. Instead of relying solely on quarterly financial reports, stakeholders can track online sentiment, popular amenities, and emerging trends in near real-time [6]. For example, a sudden surge in positive Instagram posts about a new public art installation in a renewed district can immediately signal a successful placemaking initiative that enhances the area's commercial appeal. Secondly, UGC facilitates a deeper understanding of consumer behavior. By analyzing check-in data and review text, businesses can identify visitor origin, peak visitation times, and the types of activities that generate the most engagement [7]. This intelligence is invaluable for tailoring tenant mixes, designing marketing campaigns, and optimizing the overall user experience to maximize commercial return. Ultimately, this research underscores the shift from intuition-based to data-driven decision-making, establishing UGC analysis as a critical component of the modern urban renewal toolkit.

2.2. Core analysis

2.2.1. Analysis of current application status

Currently, the application of UGC data in assessing commercial value is gaining traction, primarily because this data inherently reflects consumption experiences and holds demonstrable commercial value for cities. Analysis of online restaurant reviews on platforms like Yelp or Dianping can reveal which dining concepts are thriving in a renewed neighborhood, indicating successful commercial clustering [3]. Similarly, sentiment analysis of tweets mentioning a newly opened shopping complex can gauge public perception and its early commercial traction. Businesses are increasingly using geotagged social media data to understand footfall patterns and consumer demographics, treating this information as a key performance indicator for location-based commercial success [4]. This data provides a nuanced, granular view of commercial activity that traditional metrics often miss, showcasing the real-world economic heartbeat of a regenerated area. The widespread application of UGC in the commercial value assessment of urban renewal projects is not accidental, but is supported by a solid theoretical foundation, which further confirms its rationality and necessity. These theoretical underpinnings not only explain the inherent logic of UGC's role in commercial value assessment, but also closely integrate the practical application scenarios mentioned in Section 2.2.1 with academic theories.

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First, consumer behavior theory serves as its fundamental theoretical basis. This theory holds that consumer experience and feedback are core indicators for measuring the commercial value of products or spaces. As a direct reflection of consumers' real experiences in renovated urban spaces — including restaurant reviews, social media check-ins, and comments-UGC intuitively captures their preferences, satisfaction levels, and demands. For instance, the analysis of restaurant reviews on platforms such as Yelp and Dianping, as mentioned earlier, is essentially an application of this theory: consumer evaluations of dining experiences directly reflect the commercial attractiveness of the renewed communities, which is critical for judging the effect of commercial agglomeration.

Second, the data-driven decision-making theory aligns with the core perspective of this study. This theory emphasizes that scientific decisions should be based on objective data rather than subjective experience. As a real-time, massive, and authentic data source, UGC can be transformed into valuable decision-making information through business analytics technologies, meeting the needs of urban renewal projects to grasp commercial dynamics in a timely and accurate manner.

Third, urban vitality theory reinforces the value of UGC in commercial value assessment. This theory states that the commercial value of urban spaces is closely linked to urban vitality, and the public activity frequency, emotional tendencies, and activity preferences reflected in UGC serve as important manifestations of urban vitality. The detailed perspective on commercial activities provided by UGC essentially embodies the commercial vitality of the regenerated areas, further verifying the feasibility of applying UGC in commercial value assessment.

2.2.2. Analysis of problems and future development

The application of UGC technology in assessing commercial value is primarily focused on three areas.

Firstly, natural language processing (NLP) technology serves as the core technical support for UGC text analysis. As mentioned in section 2.2.1, sentiment analysis of tweets and analysis of restaurant reviews rely on NLP techniques. Specifically, this technology enables text segmentation, sentiment orientation judgment, and keyword extraction of UGC content. For instance, in the analysis of restaurant reviews, NLP techniques can identify positive keywords such as "delicious" and "convenient," as well as negative keywords like "disappointing" and "expensive," and extract the core needs of consumers regarding food types and service quality. This helps accurately determine the popular dining patterns within the community after updates, reflecting the commercial clustering effect. When analyzing tweets mentioning newly opened shopping centers, NLP techniques can effectively identify the sentiment orientation of the text, aiding in grasping the public's initial perception of the shopping center and its commercial appeal. Relevant research indicates that NLP technology significantly enhances the efficiency and accuracy of UGC text analysis, providing reliable support for commercial value assessment.

Secondly, geospatial analysis technology is primarily used for processing UGC data with geographical tags. This technology combines the geographical location information of UGC with spatial analysis methods to analyze visitor origins, passenger flow distribution, and popular areas within updated urban spaces. For example, by analyzing geotagged check-in data on social media, businesses can gain a clear understanding of visitor geographical distribution, identify peak traffic areas, and assess the commercial appeal of different locations within the updated area. This information is crucial for optimizing the business mix and layout of the updated area, as well as for developing targeted marketing strategies. Geospatial analysis of UGC data has become a vital tool for businesses to gauge the success of their location-based businesses and to address the shortcomings of traditional passenger flow statistics.

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Third, data cleaning and integration technology is a crucial support for ensuring the reliability of UGC analysis. This is closely related to the challenges of verifying authenticity mentioned in the subsequent section. UGC data exhibits characteristics of being chaotic, highly subjective, and mixed with both genuine and false information, which significantly impacts the accuracy of commercial value assessments. Data cleaning technology is primarily used to filter out fake reviews, eliminate irrelevant comments, and remove redundant content and other invalid information, as well as standardize data formats to ensure the reliability of UGC data. For example, in the case of fake reviews generated through promotional incentives, data cleaning technology can identify and remove such reviews by analyzing the posting time of UGC, the user's credibility, and content similarity. Despite its potential, the application of UGC is fraught with challenges. The most significant is the inherent subjectivity and potential lack of objectivity in user-generated content [8]. UGC is often produced by a self-selecting, vocal minority, who may not represent the broader population. Reviews can be overly negative due to isolated incidents or excessively positive due to promotional incentives, thereby leading to a skewed perception of commercial reality. Furthermore, verifying the authenticity of UGC—distinguishing genuine experiences from fake reviews or orchestrated campaigns—remains a significant hurdle [2].

Addressing these issues requires a multi-pronged approach for future development. Firstly, integrating UGC with other, more structured data sources is crucial. Combining sentiment trends with actual sales data, foot traffic counters, or demographic surveys can provide a more balanced and verifiable picture [1, 5]. Secondly, advancing analytical methods, such as natural language processing (NLP) techniques capable of detecting sarcasm, identifying fake reviews, and weighting contributions based on user credibility, can help filter noise and enhance data reliability [6]. Finally, developing hybrid evaluation models that blend quantitative UGC metrics with qualitative expert assessments could offer a more robust and comprehensive framework for commercial value evaluation, paving the way for more resilient and successful urban renewal outcomes [7].

3. Conclusion

This paper has explored the application and development of UGC data in assessing the commercial value of urban renewal projects from a business analytics perspective. The central finding is that UGC offers a transformative, albeit supplementary, tool for understanding the commercial dynamics of renewed urban spaces. By providing real-time, experiential data directly from consumers, UGC enables stakeholders to move beyond traditional, static metrics and gain a more nuanced understanding of commercial performance, consumer preferences, and placemaking success. The analysis of current applications reveals its utility in monitoring footfall, gauging sentiment, and informing operational strategies. However, the journey towards fully leveraging UGC is impeded by significant challenges, primarily its subjective nature and authenticity concerns. The paper posits that the future of this field hinges not on the isolated use of UGC, but on its intelligent integration. The path forward involves developing sophisticated analytical frameworks that triangulate UGC with structured business data and employing advanced AI techniques to filter bias and detect inauthentic content. This integrated approach promises to create more robust, reliable, and holistic models for commercial value assessment, ultimately supporting more informed investment and design decisions that foster vibrant, economically sustainable urban communities. The successful synthesis of UGC insights with traditional evaluation methods represents the next frontier in data-driven urbanism.

This study is primarily based on a literature analysis, which, while providing a solid theoretical foundation, lacks empirical validation through primary case studies. The conclusions, therefore,

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represent a synthesis of existing thought rather than new, empirically tested findings. A key limitation is the inability to assess the practical effectiveness of proposed solutions for mitigating UGC subjectivity within specific urban renewal contexts. Future research should address this by conducting in-depth case studies of specific urban renewal projects. Such studies could involve collecting and analyzing UGC data from these sites and simultaneously gathering primary data through surveys and interviews with visitors and local businesses. This would allow for a direct comparison and validation of UGC insights against reported experiences and commercial performance, thereby testing and refining the hybrid evaluation models proposed in this paper.

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