Exploration of Urban Development Models and Sustainable Development of Urban Economy in the Digital Process

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Abstract. With the advent of digitization, China's urban development has entered a new era marked by growth of excellent quality. Properly addressing the public's hopes for a better quality of life is crucial when proposing urban development ideas that adhere to a people-centered development strategy. An urban development theory grounded on the fundamental principles of digitization is developed by studying the ever-changing trajectory of technological progress. The concept of urban development influenced by the ever-changing interactions and feedback processes between digitalization and sustainable economic growth is explained by this framework. More specifically, it delves into the possibility of attaining high-quality development objectives by means of structural shifts and actionable understandings of sustainable urban economic growth. Consistently improving urban economic quality and boosting resident happiness, the goal of digital progress is to create a living environment that meets the expectations of urban inhabitants.

1 Introduction

Encapsulating the whole modernization process, the urban development model is a crucial role in urban planning and building. Both basic and sophisticated urban services, such as conventional infrastructure and smart city technology, fall under this umbrella. The government has also commissioned relevant departments to promote digital transformation to achieve high-quality development. The urban development model has been an essential tool for gauging regional advancement since the advent of reform and opening up, when urbanization became an important component in social development. Therefore, this essay discusses urban development models within the framework of digitalization, drawing attention to the ways in which smart cities provide new perspectives on the long-term improvement of city economies. Digitalization is a byproduct of IT-centric city planning, which in turn triggers a shift in the urban economy by radically altering long-established urban frameworks. Through a theoretical integration of technology innovation with urban management, digitalization seeks to modernize cities by improving the efficiency of space usage, as seen through the prism of urban structure. Today, China has implemented a path of urban development with Chinese characteristics. A number of things have changed as a result of digitalization's rapid advancement: the ways in which urban economies expand, new ideas about how cities should be planned, how cities are physically laid out, and how sustainable their expansion may be. So, we need to be thinking globally and futuristically when we talk about urban development patterns.Therefore, the proposition of sustainable development of urban economy has been put forward in the context of digitalization [1].

In conclusion, digitization is very important since it guarantees and lays the groundwork for sustainable growth in urban economies. China has made progress in the development of digital cities, but with shortcomings. The urban development model has not yet fully identified an effective path to adapt to digital transformation and is still striving to move forward. Therefore, further study on urban development models is urgently required, as these models are fundamental to the survival of city economies and the realization of people's hopes for better living conditions. In order to promote high-quality economic growth in urban areas, this article presents a theoretical framework that draws on the presented research to study urban development models and the sustainable evolution of urban economies in the face of digitization. Through systematic analysis and case study methods, the integration of digitization and urban economy is solved. Its main contents include digital infrastructure construction, industrial innovation, and urban governance, effectively addressing the challenges of sustainable development of urban economy, and having both theoretical and practical significance [2].

2 Urban Development Models in the Digital Process

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2.1 The Construction and Characteristics of Smart Cities

A smart city is an evolving idea that represents a future where technology innovation determines the course of urban development; it has developed in tandem with digitalization as a whole. It is a representation of the urban modernization policy that China has been implementing, especially during the reform and opening up period. Traditional urban criteria often fall short of capturing the distinctive qualities and complexity of smart cities, making it difficult to define and comprehend them. For better city administration, better public services, and more sustainable development, smart cities use data analytics and cutting-edge technology. The notion of smart cities is always developing, so it's important to define it in a way that covers all the bases. Smart cities are complex, but they're also helping with modern urban problems and making people's lives better.

2.2 The Impact of Digitalization on Urban Spatial Structure

A crucial component of urban planning, urban spatial structure depicts the geographical arrangement of urban forms. By looking at urban spatial structure through the prisms of social organization and economic activity, Castell and Hall were able to examine many meanings of the term. Their research shows that the way cities are laid up is a reflection of the way society and economy interact. Some scholars believe that urban spatial structure reflects the degree of urban functional layout or the rationality of urban land use. It is precisely because of the dynamism and flexibility of digitization that it belongs to space science aimed at improving efficiency. Information technology, which includes data collecting, processing, and analysis, is associated with the impact of digitalization on the geographical organization of metropolitan areas. Digital transformation is strongly related to bettering the spatial structure of cities, both in theory and in practice. This link demonstrates how innovations in technology make it possible to reorganize city areas for better efficiency and utility. Through information technology, spatial optimization has become an important responsibility of urban planning. The main contribution of urban spatial structure theory in the digital era is the provision of new planning tools and methods. Therefore, the concept of digitalization in urban spatial structure initially focused on spatial measurement based on efficiency and functional standard attributes [3].

2.3 Digitization and Urban Economic Growth Models

At its foundation, the idea of digitalization and the model for urban economic growth revolve on the idea of using technology to propel economic development. Incorporating new methods into the urban economic environment is what digitization is all about. With its fresh perspective, the digital economy is venturing into uncharted academic territory in an effort to overcome the shortcomings of traditional growth models. This framework is based on the idea that economic development should be focused on four main areas: making the most efficient use of resources, creating standards for the output of the knowledge economy, taking advantage of opportunities presented by big data and related technologies, and evaluating growth potential using the "Internet Plus" method. The digital economic framework has reconstructed the urban economic growth model, emphasizing enhancing innovation capabilities and building a flexible, diverse, open, and sustainable economic structure [4].

3 Challenges and Opportunities for Sustainable Development of Urban Economy

Fig. 1. Framework system and structural diagram of challenges and opportunities for sustainable development of urban economy

3.1 Economic Restructuring Brought About by Digitalization

A key part of modernization is the economic restructuring that digitalization initiates, as shown in Figure 1. This restructuring is essential for establishing sustainable urban economic growth. As a result, digitalization is mostly responsible for the long-term growth of urban economies; it is the driving force behind economic structural changes and is crucial for improving the industrial framework. At present, China is strengthening digital control from a policy perspective in three forms: first, top-level design, clarifying the effective connection between digitalization in traditional and emerging industries. The second part of managing digital transformation methodically is standardization, which comprises creating service and technological standards and openly sharing assessment criteria with the market. Internal process reengineering is the subject of the third part. Many enterprises have been using digital means to improve production efficiency and enhance market competitiveness. However, compared with developed countries, the penetration of digitalization in China still needs to be further improved [5].

3.2 Integration of Digitalization and Green Economy

The integration of green economy among residents mainly takes the form of satisfaction evaluation, but in reality, there is a lack of relevant information and feedback mechanisms for green development, and the core of this problem is information asymmetry. In the context of digitalization, the green economy, also known as the sustainable development economy, directly reflects the urban environment's improvement and urban economic sustainability. However, much of the current data pertains to resource usage and lacks thorough assessments of the green economy's development. Often, the long-term impacts of a green economy are challenging to obtain or quantify. Issues like asymmetric information and an inadequate evaluation system significantly obstruct the integration of green economic practices.

3.3 The Impact of Digitization on the Urban Employment Market

From the perspective of the labor market, the efficient allocation of labor resources has been hindered by the ongoing mismatch of skills. Improved information exchange has revolutionized the job market since the turn of the century, thanks to digital technologies that combine the Internet with big data. The optimization of employment arrangements is still impeded by the inadequacies of the conventional labor market. Due to the impact of poor skills and regional differences, the digitization of the job market still needs improvement. In the context of digital transformation, online recruitment is regarded as a straightforward method to enhance employment efficiency. Nevertheless, the true impact of online platform-based recruitment on facilitating employment still requires further

examination. Meanwhile, difficulties in data privacy have led to a lack of precise matching in the job market. Therefore, digital recruitment does not always promote employment. The impact of digitization on the job market is not only a technical challenge but also a matter of social equity [6].

4 The Path of Digitalization Promoting Sustainable Development of Urban Economy

4.1 Strengthen the Construction of Digital Infrastructure

Enhancing digital infrastructure is crucial for fostering the sustainable development of the urban economy, emphasizing the importance of service capabilities and management standards within cities. Through information transmission and processing capabilities, it directly reflects the modernization status of the urban economy and residents' lives. Some key elements of digital infrastructure construction are gradually taking shape, such as 5G networks, big data centres, and various intelligent application evaluation systems, which are also gradually receiving attention. However, from a practical perspective, the construction of digital infrastructure in some cities is still in its early stages, which contradicts the logical framework and generation mechanism of sustainable urban economic development, leading to problems such as unreasonable resource allocation and low utilization rate.

4.2 Promote Innovation and Development in the Digital Industry

From the perspective of industrial development, promoting innovation and development in digital industries is a fundamental link for sustainable urban economic growth and a core manifestation of industrial structure optimization. As a result, technological innovation is a major force propelling the urban economy toward sustainable growth. When it comes to reorganizing industries, the digital sector is crucial and acts as the principal engine of economic development. At present, China has three forms of policy to strengthen industrial innovation control: the first is top-level design, which clarifies the effective integration of digital industries between traditional and emerging industries. The second is standardization formulation, which achieves standardized control of industrial innovation by formulating technical standards, market standards, and publicly evaluating standards for society. Reengineering internal business processes is the third component. Many IT companies have increased product competitiveness and market presence in the last few years by using digital technologies. However, digital technology adoption in China's sector still needs more work compared to industrialized countries [7].

4.3 Application of Digitalization in Urban Governance

The fundamental difference between digitalization and traditional urban governance lies in their technology-driven attributes. The digital governance standards and operational guidelines aim to improve efficiency, and urban development mainly reflects intelligence and service. In the governance framework of smart cities, accurate perception, rapid response, effective decision-making, and transparent feedback are the core values and highest principles of urban governance development. A complex terrain for urban management has emerged as a consequence of the wide range of contemporary urban concerns and the varying demands placed on government. Despite the continuous advancement of digital technology, an imperfect governance system has led to a lack of self-optimization mechanisms in urban governance, resulting in shortcomings in digital governance and affecting the overall effectiveness of urban governance.

5 The Correlation between Urban Development Models and Sustainable Urban Economic Development in the Process of Digitization

5.1 The Interactive Relationship between Digitization and Urban Economic Growth

When thinking about urban economic growth, the traditional development paradigm falls short of providing the essential stimulus. A major indication is the level of satisfaction with urban economic development among inhabitants. However, there is a lack of data and feedback mechanisms that deal with how digitization affects economic growth. The problem stems from an imbalance of knowledge. In the process of digitization, economic growth is often described as digital economic growth, and its driving effect on urban economic development directly reflects the effectiveness of digitization. However, most of the existing data is about output growth and other information, lacking an assessment of the deep impact of digitization. Estimating the monetary effects of digitalization in the long run is notoriously difficult. The correlation between digitization and city economic growth is severely hindered by the existence of information asymmetry and an inadequate assessment framework.

5.2 The Impact of Digitization on the Efficiency of Urban Spatial Utilization

From the perspective of spatial utilization, traditional urban planning has long constrained the improvement of spatial utilization efficiency. Since the 21st century, the digitization of information technology has reshaped the spatial structure of cities through data analysis and intelligent planning. However, the drawbacks of traditional urban planning still constrain the efficient

utilization of space. Not only due to technological gaps but also due to the impact of policy implementation, the role of digitization in space utilization still needs improving. Under the premise of digital transformation, smart city planning is a direct way to improve spatial utilization efficiency. However, the practical role of technology-driven smart city planning in space utilization remains discussed. Meanwhile, difficulties in data privacy have led to a lack of precise matching in space utilization. Therefore, digitization does not always improve space utilization efficiency. Not only does digitalization provide a technological barrier to efficient urban spatial usage, but it also poses problems with regulatory enforcement and privacy protection [8].

5.3 Digitization and Improvement of Urban Residents' Quality of Life

Digitization plays a core "smart" role in urban development models. In the context of city planning, digitalization is a game-changing innovation that improves city services in profound ways while simultaneously including social and technical aspects. As a result, digitization has become an important tool for improving city dwellers' quality of life, especially in the context of smart cities. The practical interpretation of digitalization is generally a sustainable development path gradually formed based on technological innovation, although this path includes continuous attempts. From infrastructure to public services, digitization is essentially focused on what inhabitants need. By improving their living conditions, digitization aims to raise the quality of life for locals. But the digital gap is becoming more apparent as people rely more and more on technology. There is still a lot of room for improvement in terms of service coverage and other aspects of digitalization, and its overall effect may need some more work. This difficulty is an essential part of developing models for city planning.

6 Conclusion

The sustainable growth of urban economies has been profoundly affected by the digitally structured urban development model, which in turn has introduced new demands and problems to urban planning and construction. One of the most important ways to boost urban economies is via digitization, which also signifies the "modernization" of smart cities. Reflecting the fundamental requirements of urban development, it is crucial for attaining social fairness and maintaining the quality of life for people. In light of recent developments in digital technology, this research presents a theoretical framework as well as practical procedures for models of urban development and sustainable economic growth. Modern advancements in areas like as artificial intelligence and big data have strengthened digital infrastructure, which in turn has empowered urban services and improved the accuracy and scientific foundation of city administration. Sustainable urban economic development holds that this is the way to go. In light of this, the digital-centric urban development paradigm provides a fresh perspective on how to accomplish long-term economic growth in cities. In conclusion, raising digitalization levels may help urban economies transition to high-quality development and more successfully meet residents' hopes for higher living conditions.

References

1. Liu H, Zhou G, Wennersten R, et al. Analysis of sustainable urban development approaches in China[J]. Habitat international, 2014, 41: 24-32.
2. Guo B, Wang Y, Zhang H, et al. Impact of the digital economy on high-quality urban economic development: Evidence from Chinese cities[J]. Economic Modelling, 2023, 120: 106194.
3. Zhu W, Chen J. The spatial analysis of digital economy and urban development: A case study in Hangzhou, China[J]. Cities, 2022, 123: 103563.
4. Bayat A, Kawalek P. Digitization and urban governance: The city as a reflection of its data infrastructure[J]. International Review of Administrative Sciences, 2023, 89(1): 21-38.
5. Li Q, Zhao S. The impact of digital economy development on industrial restructuring: evidence from China[J]. Sustainability, 2023, 15(14): 10847.
6. Bührer C, Hagist C. The effect of digitalization on the labor market[J]. The Palgrave Handbook of managing continuous business transformation, 2017: 115-137.
7. Wang P, Cen C. Does digital economy development promote innovation efficiency? A spatial econometric approach for Chinese regions[J]. Technology Analysis & Strategic Management, 2024, 36(5): 931-945.
8. Wang Z, Cao X, Ren X, et al. Can digital transformation affect coal utilization efficiency in China? Evidence from spatial econometric analyses[J]. Resources Policy, 2024, 91: 104940.