Improving the Quality and Efficiency of Tourism Public Services Based on Value Co-creation in the Context of Smart City

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Abstract. The construction of smart city is a hot topic of continuous global attention, and the intelligent transformation of tourism public services in this context is a powerful tool to solve the current dilemma of the imbalance between quantity and quality in China's tourism industry, and to promote its high-quality and sustainable development. Based on policy, theoretical and practical analysis, this article clarified that the three core entities for improving the quality and efficiency of tourism public services are government departments, business organizations, and the community public, then deeply analyzed the value co-creation logic among them. Based on this, by further focusing on data-driven strategies and their execution framework, a system structure including organization, regulation, system construction and operation has been constructed, and the quality and efficiency improvement paths for infrastructure, information services, security, environment, administration, etc. have been clarified.

Keywords: Smart city; Value co-creation; Travel public services; Quality and efficiency improvement

1 Introduction

The theory and practice of smart city construction are a hot topic of continuous global attention, and this is also the case in China: the new theme of urban development in national planning is smart city. The 18th National Congress of the Communist Party of China proposed to promote urbanization with informatization, and the 19th National Congress further emphasized the integration of urbanization and informatization. It can be seen that smart city is a high-level phase in the process of urban development, which is of great significance in solving the problems of big cities and improving the efficiency of urban management [1]. Nowadays, the connotation of smart city has gradually expanded from a narrow focus on the application of information technology to urban governance plans and new development models, and has become a social ecological concept involving multiple industries.

As a typical industry with strong comprehensiveness, the intelligent transformation of public services in tourism industry is a pilot and framework layout for building smart city. Targeted in-depth discussions on this will not only improve the quality and efficiency of tourism public services, but also help solve the difficulties and bottlenecks in the construction of smart city, thereby enabling China to complete this social and ecological transformation faster.

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2 The Development of China's Tourism Industry and Public Services

In recent years, the development of China's tourism industry has entered a new historical stage of high-speed and high-quality, its continuous appreciation of comprehensive contribution to GDP reflects the industry's driving support for domestic demand to drive the economy and its engine role in economic growth. At the same time, high-quality tourism development, as a key strategy for current national tourism development, is an inevitable choice for the transformation and upgrading of the tourism industry and the modernization of the national tourism system [2]. In this situation, tourism public services are the foundation and prerequisite for the growth of the tourism economy. Establishing a sound tourism public service system can promote the improvement of industry operation efficiency, industry comprehensive quality, and cross-regional linkage benefits, which is of great significance for achieving industrialization, marketization, internationalization, and modernization. To this end, the country has also introduced multiple promotion policies: improving the quality and efficiency of tourism public services has become a crucial issue for the high-quality and sustainable development of tourism industry.

Against this backdrop, China's tourism public services are facing a practical dilemma of dual imbalance between quantity and quality. As one of the world's largest and most popular countries for tourists China's total reception has steadily increased. On the other hand, China's tourism development is facing the bottleneck of transformation and upgrading: with the huge tourism reception, there is also a continuous increase in the number of complaints, indicating that China's tourism public services are facing a contradiction between rapid demand growth and insufficient effective supply. It can be seen that the extensive path of relying on the increase in quantity to drive consumption growth has made the problems of uneven supply, low efficiency, and unsustainability in public services such as environment, transportation, and safety more prominent. The "growth bottleneck" urgently needs to be solved: how to better utilize the tourism industry to meet people's demand for a better life, We need to innovate overall around the upgrading of tourism public services in smart city and explore coordinated development models.

3 Literature review

3.1 Smart city

In the 1990s, the concept of smart city gradually emerged abroad. Graham believe that the rise of information and communication technology should be introduced into urban construction and management [3]. In 2007, the European Union proposed to build smart city from economic development, social management, and other aspects. Under the dual promotion of the international development and domestic needs, academic research on smart city has begun in China since IBM proposed "Smart Earth" in 2008. At present, considering that smart city cover various concepts such as people, technology, industry, and management, and new concepts are constantly being integrated, a consistent definition of smart city has not yet been formed. Existing viewpoints are usually elaborated from three dimensions: technology, urban

development, and society. Relevant research topics include the level of smart city construction, development process, technical support, and information security.

3.2 Tourism Public Services

The research on tourism public services in China started relatively late, and although there is no consensus on its connotation, a certain consensus has also been reached. Firstly, tourism public services can be seen as a special form of public service in the tourism field, which refers to the service improvement and resource integration aimed at meeting the needs of tourists on the basis of existing urban or social public services [4]. Secondly, the composition of tourism public services covers both tangible products such as transportation and safety facilities, as well as intangible services such as information consulting and tourist protection [5-6]. Foreign research on tourism public services is often found in the quality improvement of specific branches such as tourism public transportation, information, and policies. Among them, the supply analysis of leisure services has reference significance for domestic research. Sessoms believes that its supply channels usually include forprofit institutions, non-profit institutions, and third-party institutions [7]. In summary, this study suggests that tourism public services refer to non-profit oriented, clearly non-competitive and non-exclusive tourism products and services provided by the government, with the participation of enterprises, third-party organizations, or individuals to meet the common needs of tourists.

In terms of the research on the content composition of the tourism public service system, Wang believes that the system content is composed of elements such as tourism public information, safety, environment, transportation, and assistance [8]. Chang divided the content into three categories: hardware services, software services, and regulatory services [9]. And in the latest “Opinions on Further Improving Tourism Public Service Work”, the content is decomposed into five dimensions: transportation infrastructure services, information services, safety guarantees, environmental services, and administrative services.

Additionally, early research on tourism public services was limited to exploration within the administrative system, which is different from the actual situation of the government’s role in the development of tourism destinations in the new era, as well as the relationship between the government, the market, and society. Subsequently, Li began to propose that tourism public services are a supply process led by the government and jointly participated by multiple entities [4]. Some scholars also realized the interconnectedness between tourism development and local residents and communities [10]. At this point, although some studies have focused on the importance of different social entities such as government, enterprises, and communities participating in the supply of tourism public services, there is little research on how to drive social members to participate in creating value together. A few studies have focused on the participation and cooperation of a single entity, but lack a holistic understanding of the roles and behaviors of multiple entities.

3.3 Value Co-Creation

In the context of social transformation, the traditional government administrative management and public service supply model is no longer able to adapt to the practical needs of social management and the tourist market. Relying solely on the government for tourism public services supply and comprehensive destination management also poses challenges to the

sound, perfect, and sustainable development of the tourism public service system. The comprehensiveness of the tourism industry determines that it includes a wide range of service categories and rich content, many of which elements cannot be separated from public participation [11]. For tourism destinations, it's necessary to promote the transformation and improvement of the supply mode of tourism public services through mechanism innovation and path optimization. The value co-creation of diverse subject is not only a practical requirement for the development of tourism public services, but also a feasible path to solve the above difficulties.

The value co-creation theory has been extensively explored around commercial services, with two important branches: the consumer experience value co-creation theory proposed by Prahalad and Ramaswamy, and the service led logical value co-creation theory proposed by Vargo and Lusch. In contrast, the non-competitive nature of public services results in insufficient attention to the participation of the demand side, leading to a significant lag in research on value co-creation in this field. In 1983, Brudney proposed views on how the government and the public can achieve joint cooperation, including public participation through resource cooperation [12]. Entering the 21st century, Vargo and Lusch proposed that the value co-creation theory can be applied to public goods or services provided by the government. Magno and Cassia also pointed out that the public oriented concept of public service providers has a positive impact on the willingness and level of value co-creation. Domestic scholars such as Yang believes that the value co-creation theory can re-examine the essence of public services and proposed six key elements of value co-creation [13]. It can be seen that the application of value co-creation theory in the field of public services has great potential.

In summary, as a multi industry social ecological concept, smart city has pilot and layout significance for the intelligent transformation of tourism public services. At the same time, the comprehensiveness of tourism industry also determines the necessity of multiple entities participating in value co-creation. But existing researches remained focus on discussing the importance of different social entities participating in the supply of tourism public services, lacking exploration of the mechanisms driving the co-creation and analysis of collaborative models. In this regard, this article is based on the urban development positioning of national planning, starting from the fundamental practical problems of the tourism industry, and focusing on building a mechanism for improving the quality and efficiency of tourism public services in the context of smart city.

4 Improving the quality and efficiency of tourism public services based on value co-creation

4.1 The Value Co-creation Mechanism among Multiple Subjects of Tourism Public Services

As an important component, the value of tourism public services is reflected in their resource contribution to the social system, and there are three core entities involved in this process, namely government departments, business organizations, and the community public. In the quality and efficiency improvement model, those three are engaged in value co-creation based

on their differentiated functional positioning. Government departments use policies, rules at the upper level to plan and layout. Business organizations are in the middle to promote construction and application through products, services, and other means, while community public use demand and feedback to carry out reverse adjustment at the end. The overall system is market-oriented, which can reduce the blindness of technological innovation, as well as reduce risks and costs, highlighting the innovation 2.0 trend characterized by collaboration, openness, and efficiency in the knowledge society environment.

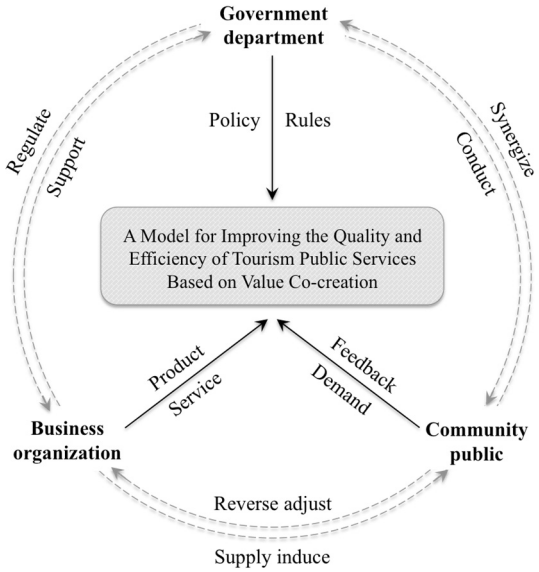

Fig. 1. Value co-creation mechanism of tourism public services

In this process (Fig 1), government departments need to regulate business organizations, and also conduct the community public to participate in system construction. Business organizations need to respond to and support the planning and layout of government departments, carry out production and construction activities, and also shape the behavior habits of the community public through commercial supply. The community public, on the other hand, needs to comply with and collaborate with the practical guidance of government departments to adjust their awareness and behavior, and also combine user experience to implement reverse regulation of production activities organized by enterprises.

4.2 A data-driven model for improving the quality and efficiency of tourism public services

Based on the value co-creation logic of the above mentioned three entities, the quality and efficiency improvement model of tourism public services under the guidance of smart city is data-driven and has three major components: organization, regulation, system construction and operation (Fig 2), effective implementation of data governance can ensure the scientific decision-making of management and improve system operation efficiency [14].

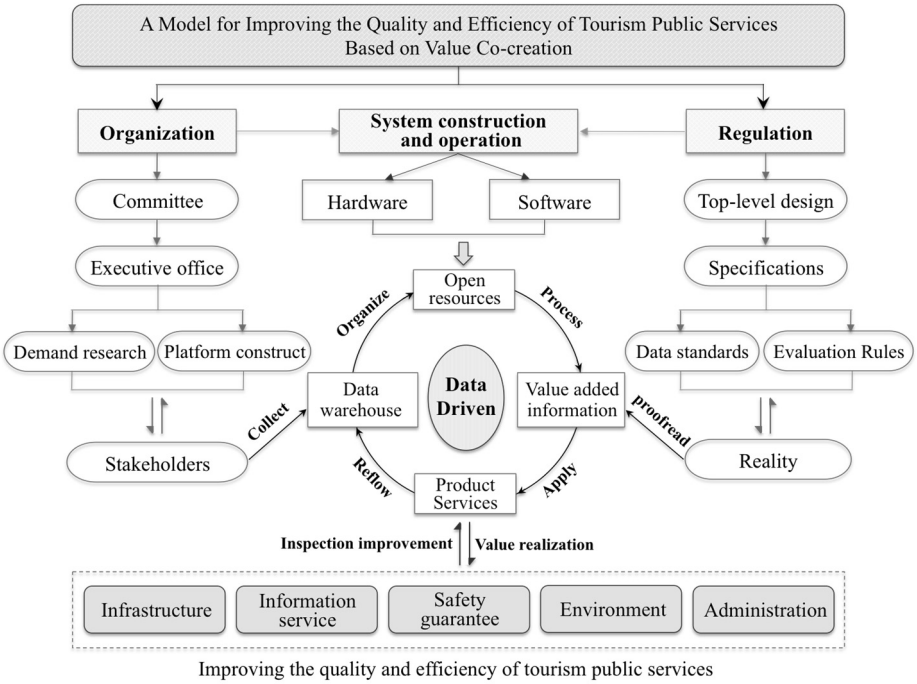

Fig. 2. Model for improving the quality and efficiency of tourism public services

4.2.1 Organization

In the organizational structure, it's necessary to clarify the responsibility subjects and define their scope of authority, which is the fundamental guarantee for improving the quality and efficiency of tourism public services. Establishing a governance committee is the top priority, it's usually composed of representative management personnel from government departments and industries, all of whom are advocates of data-driven strategies, which enhances the certainty of leadership and the power source of execution. As the highest decision-making body of the project, the responsibility of the governance committee is to formulate strategic goals, grasp the overall direction, and promote collaborative construction with other interest departments from top to bottom [15].

Directly led by the committee, the Executive Office is the practical organization responsible for implementing project plans, including developing management standards, holding a series of activities, and deploying personnel. Specifically, it has a demand research group and a platform construction group to promote the implementation of special business. To improve the efficiency and effectiveness of work, the office must report to the committee in a timely manner and adjust the direction of work as needed.

The demand research group is responsible for investigating and obtaining the data holding status, demand situation, and usage plan of relevant entities. The research objects cover three major stakeholders: government departments, business organizations and the community public, and the research methods are not limited to questionnaires, focus interviews, etc.

The platform construction group is responsible for system construction and operation maintenance related to the data platform, including providing software and hardware environment support, configuring manpower and technology, etc. Given the unique nature of functional departments and the limited skills of personnel, platform construction work is generally carried out by introducing professional information technology companies [16].

Stakeholders generally refer to the entities that need to provide or use data in the process of tourism public services. These entities must assume the responsibility of maintaining and updating information according to the principle of "who is in charge, who provides, and who is responsible", ensuring the integrity, accuracy, and timely availability of data. Secondly, the principle of "whoever handles, uses, manages, and is responsible" must be followed, consciously fulfilling the obligation to use shared data in accordance with the law and regulations, and jointly maintaining the platform and data security.

4.2.2 Regulation

From the perspective of regulation, it's necessary to establish normative documents and organize the overall logic. The top-level design is the leading document of the project and the basic principle for various actions. It refers to the fundamental overall planning of various aspects, levels, and elements of the data-driven tourism public service quality and efficiency improvement model using system theory methods. A charter is usually a general form of top-level design, covering the nature, purpose, task objectives, scope of responsibilities, etc.

Management norms are the execution documents of top-level design, with a particular emphasis on operability. Due to the cross-departmental and multi-personnel nature of the tourism public service system, which has obvious collaborative characteristics, setting unified operational standards can help achieve consensus among members. Corresponding to the lifecycle management of data, the management specifications here focus on addressing the issue of "how personnel use", so they should at least include collection specifications, organizational specifications, storage, sharing and security specifications, etc [16].

The data standards and evaluation rules are jointly committed to solving the problem of "how data is evaluated". The establishment of data standard is the key to achieving cross-departmental data docking and sharing. This process requires the joint participation of platform technical and departmental business personnel, and can be adjusted adaptively based on national or landmark terms, combined with the convenience of data storage and business needs.

The evaluation details mainly revolve around data quality and governance work. The former specifically refers to the measurement and monitoring of data authenticity, accuracy, completeness, timeliness, and other aspects, which is the core prerequisite for the realization of data value. The latter refers to measuring and evaluating the current situation, level, and gap of data governance work in departments and enterprises, in order to evaluate improvement methods and optimization paths.

Finally, the reality is the wind vane of the regulation, and relevant entities should provide real-time feedback during the implementation of the plan. For internal problems such as plan design, root cause analysis should be conducted, and timely corrections should be made and reported for filing. In response to the problems caused by complex changes in the external

environment, it's necessary to systematically view and carefully interpret them, then collectively negotiate and reasonably layout them.

4.2.3 System construction and operation

In the construction and operation of the system, it's necessary to clarify key supporting elements and accurately organize their operational processes [17].

Hardware devices are the physical environment that supports the system, including servers, switches, and other network facilities. The servers are mainly used to deploy database systems and provide a running environment for software systems. Network facilities such as switches are mainly used to connect database systems and users.

Software technology is a necessary element for data storage and usage, including database software and data processing systems, the former used to store data, such as MySQL, Oracle, etc. The latter is used to perform data computing tasks, including data analysis, visualization, and other computing scenarios, such as the Hadoop distributed computing framework.

The operational process is the execution framework of data strategies and the logical foundation of system operation. After reviewing the data governance processes of various departments and enterprises, it was found that data warehouse, open resources, value-added information, and products/services are the four key forms in data flow.

Data warehouse is the primary form of collecting complex data through multiple channels. When collecting data, in addition to being provided by stakeholders, resource support can also be obtained through methods such as web crawlers. When storing data, the data types can be vertically divided into attribute, relationship, behavior data according to their nature, and combined with the horizontal department for network storage for easy query and use.

Open resources are the preliminary form of data collection that has been organized and identified. Due to differences in data sources and purposes, data differences are a norm. In this regard, it's necessary to follow normative documents such as data standards for preprocessing of data collection, and improve the availability and reliability of data through steps such as cleaning, filtering, and typing.

Value added information is the completed form of each entity's on-demand processing of open resources, with key links including data analysis, processing, and proofreading. The former refers to the analysis and processing of data through methods such as data mining, association analysis, knowledge graph, and deep learning, which is a necessary path to obtain useful information. This process requires particular vigilance against data-driven tendencies, linking practical experience, and valuing factual structures. Therefore, on the basis of analyzing the information obtained from processing, it is necessary to conduct proofreading and research in conjunction with the actual situation, and distinguish the logical connection between the information referred to and the fact expressed.

Products/services are practical forms based on the development and practice of value-added information. Value added information essentially refers to the unmet demand status, underlying reasons, and internal mechanisms reflected through data. Based on this, developing corresponding products and services is a good way to improve governance. Its value realization is reflected in the improvement of governance capabilities such as infrastructure, information services, and security, which is the complete embodiment of data-driven strategies.

In addition, the above products/services will be tested and improved in practice [18], and the resulting data will continue to flow back to the data collection, entering the next Deming cycle.

4.3 The Implementation Path for Improving the Quality and Efficiency of Tourism Public Services

Corresponding to the value co-creation mechanism and action logic of tourism public services, the execution path for improving its quality and efficiency depends on the application of value-added information and the development of products/services based on it, as shown in Fig 3.

Quality and efficiency	Underlying logic	Data driven and its strategies
Infrastructure	- Explore requirements - Design production - Application launch	Dynamic perception, pattern recognition, social discovery, etc.
Information service	- Improve online - Auxiliary offline - Dual line linkage	Intelligent query, mobile services, human-machine interaction, etc.
Safety guarantee	- Early warning and prevention - Process control - Feedback and follow up	Risk warning, public opinion monitoring, effect feedback, etc.
Environment	- Identify problems - Identify causes - Match countermeasures	Data visualization, knowledge graph, deep learning, etc.
Administration	- Obtaining policies - Analyzing connotations - Implementing division of labor	Network monitoring, semantic analysis, information push, etc.

Fig. 3. Data Strategies for Improving the Quality and Efficiency of Tourism Public Services

5 Conclusion

Based on the construction background of smart city, facing the practical dilemma of bidirectional imbalance between quantity and quality in tourism public services, this study deeply analyzed the value co-creation logic among multiple entities, and constructed a data-driven model for improving the quality and efficiency of tourism public services. It not only proposed the internal structure and operational principles of this model, but also clarified the content dimensions and improvement paths of tourism public services. To optimize the implementation environment of this model, it's also necessary to reshape value concepts, optimize resource allocation, and innovate governance tools to promote psychological, structural, and technological empowerment [19].

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References

[1] Shen L, Huang Z, Wong S W, et al. A holistic evaluation of smart city performance in the context of China. Vol. 200, pp. 667-679. Journal of Cleaner Production. (2018)

[2] Zeng B W, Cheng J Y. The Path of Tourism Reform under the New Economic Development Pattern. Vol. 36, pp. 11-13. Tourism Tribune. (2021)

[3] Graham S, Marvin S. Telecommunications and the city: electronic spaces, urban places. London: Routledge, pp. 1-11 (1996)

[4] Li S, Huang F C, Li J Z. Tourism Public Services: Connotation, Characteristics, and Classification Framework. Vol. 25, pp. 20-26. Tourism Tribune. (2010)

[5] Li J P. Accelerating the Improvement of Tourism Public Service System. Vol. 27, pp. 4-6. Tourism Tribune. (2012)

[6] Xu J F, Pan Y R. Theoretical Cognition and Practical Judgment of Tourism Public Service: A Discussion with Li Shuang. Vol. 29, pp. 27-38. Tourism Tribune. (2014)

[7] Sessoms H D. Leisure Service (the 6th Edition). Englewood Cliffs: NJ Prentice Hall, Inc., pp. 236-237 (1984)

[8] Wang X Z. Tourism Public Service System and Tourism Destination Construction. Vol. 1, pp. 2. Tourism Tribune. (2012)

[9] Chang W J, Xiong Y B, Fu Y. On the Construction of a Universal Tourism Public Service System. Vol. 31, pp. 7. Ecological Economy. (2015)

[10] Li S, Gan Q L, Liu W B. The Construction of a Theoretical Framework for the Tourism Public Service System. Vol. 032, pp. 8-15+30. Journal of Beijing Second Foreign Language Institute. (2010)

[11] Wang J C, Li T Y. Public Participation: New Trends in Tourism Public Management. Vol. 29, pp. 2. Tourism Tribune. (2014)

[12] Brudney J L, England R E. Toward a definition of the coproduction concept. Vol. 43, pp. 59-65. Public Administration Review. (1983)

[13] Yang K, Gao X, Yang H L. The concept and effective implementation of public service value co-creation. Vol. 1, pp. 4. Management Observation. (2014)

[14] Shen Y B, Wei Z J, Guo J X, et al. The Current Landscape and Future Prospects of Education Governance Research in China under the Background of Informatization. Vol. 13, pp. 6. China Education Informatization. (2021)

[15] Zhang S M, Peng X F, Huang X H. Research on the Data Governance Framework of Open University. Vol. 8, pp. 11. China Electronic Education. (2018)

[16] Zuo M Y, Wang P P. Building a Cross departmental Government Data Governance Framework from the Perspective of Data Sharing. Vol. 64, pp. 116-123. Library and Information Work. (2020)

[17] Stockdale S. Deconstructing data governance[EB/OL].
https://repository.unm.edu/Handle/1928/31583.

[18] Morgan G. Riding the Waves of Change: Developing Managerial Competencies for a Turbulent World, pp. 59. San Francisco: Jossey-Bass Publishers. (1988)

[19] Li Z Z. “Empowering” Approach to Modernization of Higher Education Governance Ability from the Perspective of Value Co-creation. Vol. 1, pp. 59-65. Jiangsu Higher Education. (2022)