# A Catalyst for the High-Quality Development of Enterprises: Open Public Data

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**Abstract.** High-quality development represents the principal objective of establishing a modern socialist country in all respects. In this context, the opening of public data serves as an important measure for China to reform its public governance and stimulate the high-quality development of enterprises by leveraging data elements within the new developmental landscape. This paper offers a theoretical analysis concerning how the opening of public data can empower enterprises towards achieving high-quality development. Our study reveals that opening public data effectively enhances the high-quality development of enterprises through several mechanisms: promoting the transformation of production factors, facilitating a shift in driving forces, reducing transaction costs, and expanding knowledge horizons.

**Keywords.** Open public data, High-quality development of enterprises, Digital transformation.

## 1. Introduction

High-quality development of enterprises is a multidimensional concept that encompasses various levels, including high-level competition among enterprises, production momentum driven by production factors, output of products and services, and comprehensive value creation. This development is primarily propelled by resource-driven initiatives, innovation-led strategies, and the creation of value for diverse stakeholders. The openness of public data represents not only a novel approach to public governance but also introduces a new technical and economic paradigm characterized by the interplay between "data elements - technical foundation - digital governance - digital ecology." This paradigm is grounded in public data, technology, and derivatives thereof while being shaped collaboratively with the digital economy, digital society, digital government, and even the broader context of digital ecology. As a significant strategy for advancing the construction of both digital government and the digital economy, the openness of public data can seamlessly integrate data into the entire value creation process of enterprises. By extracting valuable insights from open public data, businesses can generate visualized knowledge that supports their production activities. This enables the application of public data at the micro-enterprise level, driving a wide array of empowering effects on the high-quality development of businesses. These effects include

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value creation, enhanced capabilities, and a variety of other positive impacts on business performance. So, this paper will thoroughly analyze the underlying logic behind how opening public data can empower high-quality enterprise development.

## 2. The key prerequisites for empowering the high-quality development of enterprises through open public data

Firstly, data-driven elements serve as the foundational prerequisite for public data openness to empower the high-quality development of enterprises. The rapid expansion of public data resources has made large-scale accessibility a reality, endowing public data with the core qualities of a production factor. At the same time, the rapid development of digital technologies such as blockchain, artificial intelligence, and cloud computing— within the context of the third wave of informationization — has facilitated extensive connections both within and outside enterprises, fundamentally reshaping production entities, objects, and tools, and driving significant changes in production methods. As an innovative application of these digital technologies, the launch of public data platforms allows public data to permeate the entire value creation process of enterprises. By extracting valuable insights from open public data, enterprises can generate visualized knowledge that supports production activities, creating new application scenarios for public data at the micro-enterprise level. This, in turn, fosters a wide range of empowering effects, value-enhancing impacts, and other positive outcomes, driving the high-quality development of enterprises.

Secondly, the potential value transformation of public data is the intrinsic driver for public data openness to empower the high-quality development of enterprises. On a macro scale, China is currently undergoing an economic structural transformation. The efficiency with which data is transitioning from production factors to innovation factors and, ultimately, to capital factors is generally lower than the optimal level expected in a steady-state economy. However, the return on investment generated by data as a production factor is significantly higher than the diminishing returns associated with traditional production factors. Utilizing public data elements to empower traditional industries can accelerate their transformation and upgrading, while also reshaping the competitiveness of various industries within the modernized industrial system. Specifically, "integration" refers to the ability of enterprises to deeply mine, process, and analyze different types of public data, allowing it to be flexibly applied across various scenarios. The "value" of public data lies in the collection of business data and information from government departments at all levels, as well as public management and service areas. What makes public data unique is its evolution within the "technology-economy" paradigm, where public data elements undergo a transformative process— from being technology-driven to becoming production factors, then to integrated development, and ultimately contributing to shifts in economic patterns. As a result, even a small amount of public data can hold significant value for specific domains. "Openness" refers to the ability of public data to be shared and circulated within government agencies, between the government and the market, and between the government and society. This openness helps enhance government transparency and balance the interests between government, enterprises, and other market participants. Therefore, the ability to access and leverage as many public data resources as possible, and to unlock their intrinsic value, has become a key strategy for enterprises to establish competitive advantages in the digital economy era.

## 3. The Impact of Public Data Access on High-Quality Enterprise Development

### 3.1 Open public data can promote changes in corporate production factors

Data elements are widely recognized as a key driver for high-quality development of enterprises. Generally, data elements can significantly alter the traditional production functions of enterprises, thereby facilitating the enhancement and evolution of total factor productivity, which in turn propels the development of enterprise. From the perspective of neoclassical economics theory, production factors include land, labor, capital, technology and other types of factors. Enterprises build their own unique combination of production factors based on the above production factors and try to supply products and services in the form of optimal production functions, striving to maximize production efficiency. Amidst the ascendancy of the digital economy, data has emerged as a novel and pivotal production factor. Open public data has effectively reshaped the production factor attributes and functions of public data, providing a new type of data production factor for the high-quality development of enterprises. The reason for the phenomenon is that, from the government data to public data, the scope of data collection is constantly expanding, and the functions of data are also changing accordingly. Specifically, the primary function of government data is to improve the transparency of public governance and satisfy citizens' right to know. It has the attribute of "governance element" but not the attribute of production factor. In contrast, public data can not only be used to improve the public governance and public services with the "governance" attributes but can also be applied to the production operations and service innovations of enterprises, showing the attribute of "production factor". Therefore, as the carrier of public information and knowledge, the analysis of public data can help enterprises make more effective use of factor endowments, the analysis of public data can help enterprises to make production decisions more effectively[1], and provide a new information and knowledge base, reshape the resource base for enterprise to participate in the market competition, so that the firms are able to increase their competitiveness in ways that are difficult for other competitors to imitate or surpass.

For the high-quality development of enterprises, the opening of public data provides a new resources pool for enterprises to improve their input-output structure, and this brand-new elemental resource also has its own special characteristics. Firstly, public data elements is value-added. With the accumulation of scales and types of open public data, the intrinsic value of public data elements will continuously improve, because the information they contain is more abundant than the general data elements, which can more comprehensively reflect the changes in external policies and market environments and providing a new knowledge base and decision support for enterprises. Secondly, public data elements have dual attributes of public goods and information. The public goods attribute of public data elements can alleviate the data acquisition dilemma for enterprises, allowing them to obtain data resources without charge. At the same time, public data resources with public goods attributes are "small data" that is of support to corporate decision-making [2]. Furthermore, the non-rivalrous nature of public data also allows it to be combined with other production factors, thereby overcoming the "tragedy of the commons" in the use of resource-based public goods. Thirdly, public data elements possess a wealth of application scenarios and can be extensively utilized across various facets of enterprise production, operations, and sales services. This enables the realization of "invisible" circulation and the creation of value through the circulation process. Fourth, public data elements have synergistic effects with other factors of

production. Public data elements can be integrated into the production process to achieve adaptive adjustment of production allocation ratio, improve the synergy between factors by connecting other kind of factors such as labor and capital, and finally realize the optimal combination of production factors, and drive the high-quality development of enterprises by factor allocation effects [3].

## 3.2 Open public data can reshape business productivity dynamics

From the perspective of production kinetic energy, innovation is an important foundation for the new and old transformation of enterprise production kinetic energy. Under the new techno-economic paradigm shaped by opening public data, public data elements can reshape the production function of enterprises and promote the formation and evolution of new production dynamics with digital innovation. Specifically, the essence of public data is still data, which not only has the substitution effect on traditional factors of production such as capital, labor and land, but also has the optimization effect on traditional factors of production. Through the platform of public data, public data elements can enter the production function of enterprises, which helps to realize the new combination of various factors in the production function and realize the "creative destruction" to the original equilibrium system [4], thus promoting the overall leap and upgrade of the enterprise's production kinetic energy and drive the enterprise's high-quality development with the innovation of production kinetic energy. The hypothesis of technological progress points out that once the factor endowment is upgraded, the pressure of profit and market competition will make enterprises spontaneously carry out technological development and product service upgrading, and the technological progress will favor the production factors with better efficiency, the allocation of factors will be tilted to the high-efficiency production factors. As efficient factors, the public data will promote the original factor allocation structure upgrade, so that enterprise development can match the direction of technological progress and market demand better, because the policy information and the immediacy of market information which the public data contains can strengthen the insight and prediction ability of enterprises, coupled with profit and competitive pressure, enterprises will improve the existing products, services and user experience proactively. This provides a broad economic space and innovation space for enterprises to carry out production innovation for the digital economy, forming multiple innovation modes such as product innovation, technological innovation and business model innovation driven by public data elements.

On the other hand, Schumpeter's innovation theory explains economic development in terms of "innovation" and "new combinations" and believes that enterprise innovation is essentially a recombination of production factors [5]. Public data can enter the enterprise production function as a production factor, providing a forward-looking research boundary and scientific research tools for enterprise innovation [6]. High-value density of public data enables enterprises to use data productivity as a driving force, which promotes the transformation of enterprise production and operation modes, leads to an all-round transformation and resource allocation, updates business models and expands enterprise value creation paths [7]. These transformations are the changes in the composition and structure of the elements in the existing production function, that is, the process of "new combinations" derived from the enterprise industry model, business form, management process and value creation, which is also the innovation process of the enterprise's production kinetic energy. For example, after the Guangdong Provincial has launched the Public Data Open Platform, China Electronic Information Group and

the Guangdong Provincial Government jointly explored a new model of open public data utilization and formed the Digital Guangdong Company, further expanding the digital business landscape.

### 3.3 Public data openness helps businesses save the transaction costs

Based on the theory of transaction costs, the high-quality development of enterprises can be regarded as the process of maximizing benefits by minimizing costs, and the opening public data has a significant effect on reducing the transaction costs of enterprises. Specifically, enterprises are bound to face friction with the public system and market players in the process of production and operation, thus generating various types of transaction costs, which are the key factors affecting the expansion of enterprise boundaries. Among them, the cost of friction with the public system is mainly caused by the complicated administrative approval, biased judicial protection, non-market resource allocation and other institutional barriers to transaction costs; the friction with market players is reflected in the information asymmetry triggered by the   limited rationality of the management-type transaction costs, the object of the transaction opportunism and the market environment caused by uncertainty of market-type transaction costs. All kinds of transaction costs will inevitably crowd the limited production resources of enterprises, which make an adverse effect on the high-quality development of enterprises.

At the same time, the opening of public data yields several cost-saving benefits by reducing transaction costs associated with the friction between enterprises, the public system, and market participants. From the perspective of institutional transaction costs arising from the friction between enterprises and the public system, the openness of public data can enhance government administrative functions and improve the public service system. This helps to mitigate the institutional transaction costs encountered by enterprises. Theoretically, institutional transaction costs represent a manifestation of market failure arising from the interplay between human factors and the transactional environment. The establishment of a robust institutional framework can significantly mitigate these transaction costs, thereby playing a crucial role in fostering the high-quality development of enterprises. Public data encompasses the resources generated, collected, and acquired by government departments in the execution of their public management and service functions. This data serves as a comprehensive reflection of the actual information pertaining to public policy. On the one hand, by collecting and identifying public data, enterprises and other market participants can more effectively oversee the mechanisms of government decision-making, implementation processes, and outcomes. This enhances public accountability through increased supervision and participation, compelling local governments to improve transparency in governance [8]. Such improvements are conducive to optimizing the institutional environment, facilitating smooth market operations, and enhancing resource allocation efficiency.   On the other hand, feedback from enterprises and other market actors regarding the utilization of public data fosters a two-way interaction model of governance. This reciprocal relationship not only improves endogenous governance efficiency but also promotes innovation in collaborative governance models at the governmental level. Consequently, this leads to advancements in public policies such as enhancements to government service systems and administrative reforms while simultaneously reducing systemic transaction costs for enterprises [9].

From the perspective of friction between enterprises and market participants, the openness of public data can enhance the efficiency of information collection and

matching for businesses. This improvement creates opportunities and conditions conducive to reducing both market-based and management-related transaction costs. In the era of data-driven factors, the information asymmetry inherent in the modern market system can result in a deficit of decision-making information resources. Furthermore, the imperfections within the data factor market may lead to inefficiencies in the circulation of data resources, exacerbating the challenges of information asymmetry that enterprises face. This situation complicates efforts for businesses to effectively identify customers, explore potential market demands, and enhance management oversight. Public data openness facilitates the efficient circulation and real-time sharing of enterprise information resources. This approach enhances the efficiency of information collaboration and integration, thereby effectively reducing performance costs, negotiation expenses, and management expenditures. Specifically: Firstly, enterprises can analyze a diverse range of real-time customer credit data, as well as industrial and commercial administrative penalties and other publicly available information. This approach enables them to effectively mitigate the opportunistic behaviors of trading partners and avoid performance costs associated with incomplete information and uncertain risks [10]; secondly, Enterprises can extract information regarding their locations from public data resources, thereby gaining insights into consumer preferences, as well as trends in enterprise innovation and sales. This practice enhances the efficiency with which enterprises assess market demand while simultaneously reducing costs associated with commercial operations and business management. By improving the efficiency of market demand assessments, organizations can mitigate uncertainty and address incomplete information during business negotiations. Furthermore, this approach minimizes both the informational and temporal costs incurred by both parties involved in fulfillment processes [11]; thirdly, public data openness can enhance the intensity of stakeholder supervision over enterprises and assist them in reducing management costs. Capitalists and regulators can leverage open public data to gain insights into both the status of individual companies and broader industry dynamics, as well as factors that may influence a company's performance [12]. By juxtaposing this information with that disclosed by the company, external investors and regulators will be better positioned to assess the company's operational conditions more accurately. Moreover, such transparency facilitates the exposure of opportunistic behaviors exhibited by managers, thereby effectively mitigating risks associated with managerial opportunism stemming from principal-agent problems. This process ultimately fosters a mechanism for cost savings within enterprise governance structures.

### 3.4 Public Data Openness Boosts Enterprise Knowledge Boundary Expansion

Based on knowledge base theory, knowledge serves as a fundamental source of sustainable competitive advantage and is crucial for enterprises aiming to achieve high-quality development. Furthermore, the availability of open public data presents a novel paradigm and mechanism that enables enterprises to absorb, integrate, and innovate knowledge effectively [13]. This openness, characterized by generativity and integration through digital technologies, creates a new digital environment that facilitates enterprise knowledge search, knowledge acquisition, and knowledge integration. In this context, the openness of public data enhances data availability, thereby enabling enterprises to integrate diverse sources and types of data. This integration allows for the combination of public and private datasets, facilitating mutual verification among various data forms. Enterprises can also transcend the limitations associated with intra-enterprise and inter-

enterprise knowledge acquisition, learning, integration, and innovation. By reshaping their channels for knowledge acquisition and learning, they can facilitate the generation of new information and knowledge. The openness of public data can enhance the absorption, creation, and dissemination of knowledge, thereby fostering organizational innovation. The integration of public data into production factors such as labor and capital facilitates a synergistic effect among these data-driven elements. This integration enables the optimal allocation of innovative resources—including data, capital, and talent—and stimulates new collaborative efforts among enterprises and even across entire industries. The knowledge overflow generated by cooperative innovation is rapidly disseminated along the industrial chain to both upstream and downstream dependent enterprises. This process fosters an open interaction mechanism for innovative outcomes, thereby facilitating the development of new products, services, and business models. For instance, public environmental data can be utilized in the research, development, and production of solar environmental protection battery modules. Additionally, demographic data may serve as a basis for assessing technological advancements and the feasibility of technological transformation, among other applications.

## 4. Conclusions

This paper examines the fundamental logic behind how the openness of public data facilitates the high-quality development of enterprises from a macro perspective. The findings indicates that such openness can enhance high-quality enterprise development by reshaping production factors, driving transformations in production dynamics, assisting enterprises in reducing transaction costs, and expanding the boundaries of knowledge innovation within enterprises. These insights hold significant implications for investigating the influence of data elements on the high-quality development of micro-enterprises. Future research should incorporate econometric methods to provide further empirical evidence supporting the theoretical analysis presented herein.

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