

A Comparative Analysis of National Policies and Enterprise Practices for Enterprise Digital Transformation

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Abstract: Under the current trend of the growing digital economy, the process of digital transformation is gaining significant importance. The disparity in government policy and business implementation of digital transformation is fairly notable. Anyway, there are still a bunch of problems emerging in this fast-developing era. The government has already implemented relevant policies to address these problems, such as attracting and training experts, enhancing digital infrastructure, and promoting data analysis. Following the outbreak of the Covid-19 pandemic, there has been a gradual shift towards digital transformation in the business sector. In order to facilitate a seamless transformation, it is imperative for the organization to ensure the reconstruction of its enterprise structure and update its corporate culture. The objective of this essay is to examine the extent to which business developments are in line with government policies. After conducting a comprehensive analysis and evaluating the data, the findings can be summarized in a framework table and presented through various charts that illustrate the methods used in Technology, Organization, and Environment (TOE) research. By making reference to the provided formula, a novel model can be formulated for the computation of the digital degree of enterprises. Additionally, we can construct a table based on the data and policies obtained from the business. Thus, according to a sample of 672 enterprises' annual reports submitted to the Shenzhen Trading Securities Exchange, we can conclude that government policies and enterprise developments encompass three fundamental dimensions: technology, organization, and environment. These dimensions are all essential components in the process of fostering digital transformation. Technology plays a crucial role in the digital transformation of enterprises, they need effective organizational management and the government has recognized this importance. Additionally, the government provides substantial support to businesses.

Keywords: Digital transformation, Government policy, TOE, Business operation

1. Introduction

In recent years, the rise of the digital economy has provided new impetus for large enterprises, enabling them to stand out in the increasingly fierce market competition in order to achieve digital transformation, enterprises need to seize the opportunities brought by the development of the digital economy, the use of new technologies such as the Internet of things, cloud computing, big data, mobile artificial intelligence, etc., to complete their own digital transformation Digital transformation not only brings new development vitality to enterprises, but also provides enterprises with opportunities to comprehensively improve operational efficiency, thus opening up a new way to improve the efficiency of technological innovation ^[1].

As we all know, in terms of R&D cost and technology, enterprises with high innovation efficiency are more competitive than those with low innovation efficiency. If companies only pursue quantitative growth while ignoring the quality and efficiency of technological innovation, it will not only waste R&D investment, but also increase sunk costs. Therefore, in this case, systematic research on the impact of entrepreneurs' digital transformation can help enterprises better improve the efficiency of technological innovation. Some researchers believe that the factors affecting the speed of enterprise innovation are knowledge reserve decision-making process, industrial sector, corporate strategic

information processing structure, R&D expenditure infrastructure, and national environmental and financing constraints. At the same time, at the macro level, researchers believe that the important factors determining technological innovation are income import, institutional quality of human resources, financial development, debt financing, corruption, knowledge spillover and investment in research and development. In recent years, scholars have gradually begun to pay attention to the various impacts of digital transformation on innovation, but there are relatively few studies on the impact of digital transformation on enterprise innovation. From the perspective of research, digital transformation mainly affects the output of technological innovation of enterprises. Scholars advocate that digital transformation is able to increase the number of enterprises' innovations by enhancing their resource integration capabilities, information acquisition capabilities and data analysis capabilities.

In addition, digital transformation also enables repeatability and flexibility in a company's R&D activities. With the help of digital technology, enterprises can add new functions at different stages of the product life cycle, and promote innovation iteration based on digital technology, thereby greatly improving the innovation output of enterprises [2,3].

However, the process of digital transformation is not easy, and the reason for this is that it faces three different kinds of difficulties. First of all, the enterprise digital technology foundation is weak, lack of relevant knowledge and supporting facilities, can't carry out effective digital transformation. Secondly, digital transformation requires a lot of basic investment in the early stage, which leads to the lack of sufficient funds to support digital transformation. Finally, the enterprise digital transformation cycle is long, which leads to enterprises often face the risk of cost listing, so that enterprises can't bear the loss caused by the digital transformation. Therefore, we can conclude that resource consumption is the biggest problem facing enterprises in digital transformation, and enterprises do not know how to reduce resource consumption, so how to solve resource consumption has become an important issue at present. In this context, digital economy has become an important direction of current financial development, which can improve the efficiency of financial services. Therefore, more reasonable allocation of resources has become an important method to solve the problem of digital transformation. Therefore, we can conclude that resource consumption is the biggest problem facing enterprises in digital transformation, and enterprises do not know how to reduce resource consumption, so how to solve resource consumption has become an important issue at present. In this context, digital economy has become an important direction of current financial development, which can improve the efficiency of financial services. Therefore, more reasonable allocation of resources has become an important method to solve the problem of digital transformation.

Researchers have also analyzed digital finance, mainly from the perspectives of digital finance development measurement, economic benefits, income gap, poverty reduction effect, environmental effect, residents' happiness, and enterprise innovation. These studies have also achieved rich results, elaborated the impact of digital finance on the digital transformation of enterprises and its mechanism, and tested the role of digital finance on the digital transformation of enterprises. Simultaneously, this article employs the TOE framework and references multiple scholarly articles to examine the influence of enterprise digital transformation on national policies.

2. Literature review

2.1. Digital transformation

Digital transformation is the tendency of future development of businesses in the world, and it becomes a heated topic among the public. Some scholars have formulated digital maturity models that encompass four key dimensions, namely culture, organization, insight, and technology [4]. The digital maturity of enterprises has been evaluated by various researchers through the examination of three key dimensions: IT technology, application of digital technology to enhance business operations, and the integration of business information communication and processes [5]. Early digital transformation refers to the continuous integration of digital technologies into the day-to-day activities of an organization [6]. Some scholars argue that enterprise digitization involves the integration of mobile internet, embedded devices, and other digital technologies and equipment into business operations [7]. Others believe that enterprise digitization is not only the application of digital technology [8], but also the process of organizational reform within the enterprise. The digital economy, as the current pattern of the economy, relies on Internet technology and encourages the creative development of the traditional economy. Under the context of the digital economy, countries thrive through technological innovation, thereby enhancing their competitiveness. However, there are issues for small and medium-sized businesses in

China, such as the lack of experts in certain fields, the idea of digital transformation, and the weakness of the digital infrastructure. Thus, it is imperative for the government to formulate appropriate policies in order to effectively tackle the aforementioned issues. In reality, governments have a crucial role in facilitating digital transformation; however, this role has evolved over time. In contrast to decisions made by traditional governments, decisions made by governments in the digital era exhibit a distinctiveness. The processes involved in policy-making are typically characterized by a scientific and democratized approach, which entails comprehensive analysis, efficiency, and thorough preparation. The reason for this phenomenon can be attributed to the presence of diverse, voluminous, highly valuable, and rapidly increasing data. Additionally, the data can be analyzed holistically, considering all sample data, to identify the relevance between different variables. This process can generate knowledge that informs government decision-making.

Governments in all countries are actively promoting the application of big data in public decision-making, and some research is leading the way in the international academic world. Especially with the breakthrough development of artificial intelligence technology based on data, data is not only an assistant tool for implementing public policy. There are many countries that are utilizing big data analytics in their government decision-making processes. By harnessing the power of big data technology to analyze textual content, emotions, and patterns, governmental entities can optimize the effectiveness and results of deliberations, agenda formulation, and decision evaluations. Despite the substantial repercussions of the COVID-19 pandemic on various industries, including the catering sector, governments are making efforts to mitigate the financial losses experienced over the course of the global health crisis spanning four years. Under the guidance of the "14th Five-Year Plan for Chinese National Economic and Social Development," the State Council has released the "14th Five-Year Plan for Digital Economy Development" with the aim of facilitating the comprehensive integration of the traditional economy and the digital economy, thereby enabling digital transformation^[9]. According to a recent announcement, a comprehensive quantitative analysis was conducted to assess the magnitude of the digital economy in 47 countries, encompassing prominent nations such as the United States, England, China, Japan, and India. The findings indicate that the global digital economy has surged to an astounding value of 32.6 trillion dollars. This figure signifies a 3.0% rise in comparison to the nominal value and constitutes 43.7% of the Gross Domestic Product (GDP) as stated in the White Paper on Digital Transformation of Enterprises in 2021. Despite the Chinese government's continuous efforts to implement policies aimed at promoting new business models, there remain certain challenges in this endeavor. The government's limited capacity for improvement will have implications for business development, and there is currently no consensus on the extent to which big data can inform public decision-making.

2.2. Businesses patterns in the context of developing digital transformation

For businesses, the process of digital transformation typically involves three distinct stages. Firstly, it is imperative for them to prioritize ensuring the quality of their products through the utilization of technology, which can effectively minimize superfluous expenses and enhance production efficiency. Secondly, the crux of digital transformation resides in the establishment of a robust brand and the proficient utilization of its channels. Finally, it is imperative for businesses to allocate resources towards technological support and organizational transformation. This entails the implementation of specialized technology teams, enhancement of infrastructure, and resolution of pivotal technological obstacles. Several researchers have discovered that the utilization of information technology has a notable and positive influence on the performance of enterprise innovation^[10]. Additionally, digital technology has been found to facilitate the advancement of business model innovation^[11]. In order to facilitate the seamless advancement of digital transformation, enterprises must undertake appropriate reorganization and updates within their organizational structure and corporate culture. This will promote the improvement of their dynamic capabilities^[12-14]. Furthermore, in order to achieve digital transformation, enterprises should focus on utilizing their existing digital assets and effectively leveraging diverse platforms. Although the advantages of digital transformation and advanced digital technology are obvious, the risks are often hidden. Therefore, it is necessary to address the risks associated with digital transformation^[15]. As a result, government policies become even more significant.

2.3. Research Purpose and Method

This study aims to examine the extent to which business developments are align with government

policies. The research will acquire the annual reports of various businesses operating in diverse sectors, including production, agriculture, and information services. The subsequent analysis will involve examining the frequency of words in order to derive insights regarding the developmental trajectories of these businesses. Meanwhile, in accordance with the compilation of governmental policies pertaining to the digital transformation across diverse industries, the study is employing the use of the Technology-Organization-Environment (TOE) framework to categorize and analyze these articles. In the end, the study will analyze whether given businesses match to the requirements provided by the government.

This paper builds upon the explanations provided by other scholars regarding the connotation of the TOE framework. It discusses how national policies can serve as a significant driving force for economic development and foreign trade during the period of enterprises' digital transformation. Additionally, it explores the systematic study of the impact of enterprises' digital transformation on the efficiency of technological innovation. This study aims to effectively guide enterprises in enhancing their technological innovation efficiency and leveraging the advantages brought about by digital transformation and advanced digital technology. In order to facilitate the digital transformation of small and medium-sized enterprises (SMEs), this study employs the Technology-Organization-Environment (TOE) theoretical framework to analyze the digital transformation process. The analysis involves categorizing enterprises based on their technological, organizational, and environmental aspects. We conducted an analysis of the sample entries from the policy literature, utilizing the TOE form analysis. The TOE form, which stands for Technology-Organization-Environment, was initially introduced by Tornatzky and Fleisher in 1990. Additionally, the study examines national-level policies related to the digital economic transformation of enterprises, in conjunction with the TOE framework. Furthermore, the TOE model is utilized to construct a comprehensive framework that identifies the factors influencing the development of digital trade. These factors are then classified in detail to determine their varying degrees of impact on the digital transformation of enterprises.

3. Research Process

3.1. Policy Analysis

Table 1: TOE for government policies.

TOE	Category	Sample Items	Item statistics
T	Technological innovation	1-5 Small and medium-sized enterprises need to conduct a digitization assessment that encompasses the level of digital infrastructure, the current state of enterprise operations and management, and the availability of internal and external transformation resources.	22
	Technical support	7-1 applies new generation information technologies such as 5G, cloud computing, blockchain, artificial intelligence, digital twin, Beidou communication, etc. It explores and builds a new IT architecture model, such as a "data center" and a "business center," to adapt to the business characteristics and development requirements of enterprises. The goal is to create an agile, efficient, and reusable new generation digital technology infrastructure. This will accelerate the formation of a group-level digital technology empowerment platform and enhance the digitization of the enterprise. We will build an agile, efficient, and reusable next-generation digital technology infrastructure. We will also expedite the establishment of a group-level digital technology empowerment platform, improve the level of independent research and development of core architecture, and deliver efficient data and integrated service support for digital innovation in business.	23
		8-3 Cultivate a digital ecosystem. Breaking the traditional business model, the cross-border integration of industries such as finance, logistics, trading markets, and social networks is being pursued. The focus is on promoting service-oriented innovation in agriculture and industry to foster new business models.	
O	Talent security	8-4 Accelerate the R&D and development, as well as the application, of common technologies and key technologies for digital transformation. Support the adoption and integration of new-generation digital technologies, such as big data, artificial intelligence, cloud computing, digital twins, 5G, Internet of Things, and blockchain, etc., within industry-leading companies and enterprises with the necessary conditions.	3
	Information service	2
	External cooperation	3-3 Enhancing the level of intelligent manufacturing. For typical application scenarios in small and medium-sized enterprises, encourage the innovation of industrial Internet, 5G, artificial intelligence, and industrial APP application modes and technologies	5
	Organizational management	6-1 Strengthening the primary position of enterprises in digital transformation, fostering the enthusiasm and creativity of businesses, harnessing the leading	13

		<p>role of digital innovation, and facilitating a substantial enhancement of core competitiveness.</p> <p>6-2 The focus should be on addressing the pain points and challenges faced by small and medium-sized enterprises (SMEs) during their digital transformation. It is important to effectively solve the issues of SMEs' reluctance, fear, and inability to undergo transformation. The goals should be centered around improving quality, increasing efficiency, reducing costs, minimizing inventory, promoting sustainability, and ensuring safety. This will help enhance the supply capacity of digital transformation services, lower the cost of transformation, and ensure that SMEs achieve tangible results from their digital transformation efforts.</p> <p>1-3 Insufficient funds for transformation are one of the core challenges of digital transformation for SMEs. It is necessary to increase financial support and lower the threshold for digital transformation for SMEs.</p> <p>.....</p>	
E	Organizational management	<p>Strengthen the linkage between fiscal and financial policies and guide financial institutions to increase support for the digital transformation of small and medium-sized enterprises.</p> <p>8-18 In conjunction with the construction of the National Shuangchuang Demonstration Base and the National Pilot Zone for the Innovative Development of the Digital Economy, efforts should be made to promote the sharing of digitized means of production, reduce the barriers to flexible employment, and harness the benefits of diversity.</p> <p>8-22 In line with the development of the National Pilot Zone for Innovative Development of the Digital Economy, there is a need to explore the creation of a mechanism that promotes cooperation between government, financial institutions, and small and medium-sized micro-enterprises. This mechanism should aim to provide equitable support to these enterprises, including the provision of special funds and financial assistance, to enable them to access technologies such as cloud computing, big data, artificial intelligence, and other digital means of production. Additionally, it should encourage the establishment of equal cooperatives and the provision of virtualized digital production services.</p> <p>8-23 In conjunction with the establishment of the National Pilot Zone for Innovative Development of the Digital Economy, the pilot zone is encouraged to collaborate with financial institutions to investigate the possibility of offering low-interest or subsidized loans to small and medium-sized enterprises (SMEs) that have stable operations and good creditworthiness. These loans would be based on the extent of cloud service usage, investments in intelligent equipment and digital transformation, which are considered as assets that can be used as collateral, as well as on research and development (R&D) investments. Additionally, the exploration of tax exemptions and rebate facilities is also encouraged.</p> <p>.....</p>	22
	Financial support	<p>5-10 Ensuring financial support. Innovative ways of financial support strengthen the integration of various types of funds to guide. Give full play to the role of the National Industry Integration Cooperation Level and guide financial resources to support the development of digitization in specific sectors.</p> <p>6-16 The central government will provide fixed incentives to pilot cities. Among them, the total amount of bonus funds for provincial capital cities, cities with separate plans, and corps shall not exceed 150 million yuan. Other prefectural-level cities and counties under the direct administration of the central government will receive a maximum total of 100 million yuan.</p> <p>.....</p>	3
	Operation support	<p>6-6 Cities with feasible implementation plans and a strong driving force will be recommended to the two departments. These departments will then organize experts to conduct a competitive evaluation and select pilot cities, taking into consideration the regional distribution of the East, Central, and West.</p> <p>6-9 Support special small and medium-sized enterprises to enhance collaboration with anchor enterprises and industry leaders, leveraging the expertise and resources of these anchor enterprises and industry leaders to achieve synergies in areas such as orders, design, production, and supply chain management. Encourage chain owners and leading enterprises to empower SMEs through industrial partnerships, collaboration, and support in both upstream and downstream activities. This includes providing open application scenarios, technology diffusion, and incubation support. These efforts aim to help SMEs accelerate their digital transformation and upgrade their core business operations. The goal is to promote a "chain-type" digital transformation and enhance the ability to strengthen and replenish the supply chain.</p> <p>.....</p>	16

The analysis of the policy text is based on the “The Overall Layout Plan for the Construction of Digital China, Notice on Carrying out Pilot Work for Digital Transformation of Small and Medium sized Enterprises in Cities, Guidelines for Digital Transformation of Small and Medium sized Enterprises, Implementation Guidelines for Promoting Enterprise Cloud Access (2018-2020), Special Action Plan for Digital Empowerment of Small and Medium sized Enterprises, and Implementation Plan for Promoting the Action of ‘Cloud Access, Digital Empowerment’ to Cultivate New Economic

Development”to write the research on enterprises' digital economic transformation, and to find out which policies of SMES' digital economic transformation adopt the method of rooted theory, to extract the specific requirements and support of enterprises' digital transformation from the policy texts, and form nine categories for this paper's analysis. Table 1 is the Formulating a policy analysis table.

Professor Lv Tie has highlighted that the current challenges in the field of study include the advancement of talent, core technology, and core equipment, as well as the establishment of an industrial information security system. The table presents a breakdown of cumulative items in various fields. Specifically, there are 45 cumulative items in the field of technology, accounting for 41.28% of the total; 23 cumulative items in the field of organization, accounting for 21.1%; and 41 cumulative items in the field of environment, accounting for 37.62%. In total, there are 109 cumulative items (Figure 1).

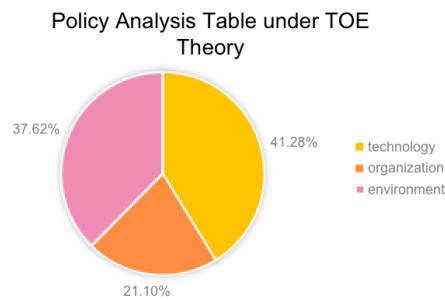


Figure 1: Pie chart about TOE proportion for each part.

At the time of its proposal, this theory underwent rapid development. Initially, the focus was primarily on the influence of information technology itself on technology adoption. However, as the theory evolved, scholars began to incorporate the impact of organizational factors and external environmental factors. Consequently, the theory was applied to explain the technology integration and adoption behavior within organizations.

We employ a method that involves dividing the content into nine distinct sections. These sections encompass various aspects such as technological innovation, technical support, talent security, information service, external management, organizational management, policy support, financial support, and operational support. Upon analysis, it has been determined that the pertinent entries pertaining to technology primarily emphasize the utilization of cutting-edge information technology, such as 5G, cloud computing, blockchain, artificial intelligence, digital twins, and Beidou-Communication, to facilitate digital transformation within enterprises. The organization has the capability to enhance talent development and improve the efficiency of talent training through the utilization of the Internet. Enterprises can achieve digital transformation by collaborating with third-party institutions or cloud platform service providers. This collaboration provides the necessary support to complete the transformation process. The overall policy environment of the government aims to provide specific concessions and enhance the connection between fiscal and financial policies. Financial institutions are encouraged to increase their support for the digital transformation of small and medium-sized enterprises, with the goal of ensuring the investment of funds. On the other hand, the operation aims to provide support to small and medium-sized enterprises in order to enhance their collaboration with the main enterprise in areas such as design, production, and supply chain. This synergy is intended to foster cooperation and promote overall development.

The chart presented below illustrates the distribution of entries for each policy, totaling 109 entries. Among these, the technology field has the highest number of entries, with a total of 22 entries for technological innovation, representing 48.89% of the technology category or 20.18% of the overall entries. Additionally, there are 23 entries for technical support, accounting for 51.11% of the technology category or 21.11% of the total entries (Figure 2).

In the field of organization, there are a total of 3 accumulated entries for talent security, accounting for 13.04% of the organization or 2.75% of the total entries. Additionally, there are 2 accumulated entries for information service, accounting for 8.70% of the organization or 1.83% of the total entries. Furthermore, there are 5 accumulated entries for external cooperation, accounting for 21.74% of the organization or 4.59% of the total entries. Lastly, there are 13 accumulated entries for organization management, accounting for 56.52% of the organization or 11.92% of the total entries. Out of the total entries, 11.92% were recorded.

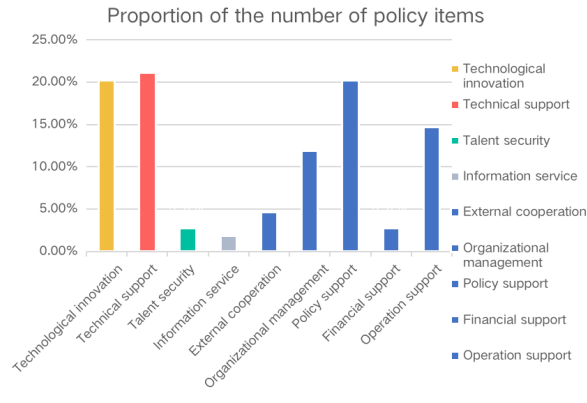


Figure 2: Bar graph for the proportion of the number of policy items.

On the contrary, the small and medium-sized enterprises in operation support aim to enhance collaboration and growth with the main chain enterprises in various areas such as design, production, and supply chain.

Hence, with regards to technological advancement, it is advisable for enterprises to disrupt the conventional business model, initiate changes from within the organization, and enhance their digital capabilities. Let enterprises acquire proficiency in core technologies and foster the development of a digital ecosystem. In the context of technical support, it is imperative for enterprises to effectively utilize the existing technologies such as 5G and artificial intelligence applications, in conjunction with collaborative efforts, to facilitate the process of digital transformation. Information services and technical support, in essence, involve leveraging existing cloud management and third-party cloud platforms to optimize the efficiency of digital transformation. Strengthening training in the field of talent security, collaborating with financial support, and partnering with enterprises are essential steps towards achieving a comprehensive industrial digital transformation.

3.2. Businesses Analysis

3.2.1. Data Collection and Research Method

The research team downloaded annual reports of enterprises from the Shenzhen Stock Exchange and found 672 samples in the transportation and warehousing, construction, health, real estate, finance, business services, and accommodation and catering industries. Among them, the information technology industry is the largest, with a total of 248, accounting for 35.3% of the total. After screening, removing ST risk, and reviewing quarterly statements to obtain final reports. Each company is numbered and then analyzed using Python to crawl the annual reports, based on the digitization consulting dictionary from Wu Fei and Yang Baibing (Table 2).

Table 2: TOE dictionary about digitization.

Technology	T1 Artificial Intelligence Technology	Intelligent, AI, Image understanding, Investment decision, Identification, Marginal intelligence, Intelligent robots, high-end technology, Mobile intelligence, Intelligent terminal, Artificial intelligence mobile, Intelligent technology, Intelligent networking, Intelligent system, Robots learning, Deep studying, Semantic search, Biological recognition technology, Face recognition, Voice recognition, support system, Automatic driving, Natural language processing, Intelligent data analysis, Business Intelligence, Intelligent computing, Human-computer interaction, Distributed computing.
	T2 Big Data Technology	Heterogeneous data, Digital technology, Visualization of data, Data exploration, Credit reporting, Augmented reality, Combined reality, Virtual reality, Context exploration, Data management, Big data
	T3 Internet Technology	IMobile Internet, Industrial, Solution of Internet, nternet technology, Industrial Internet, Mobile interconnection, Internet medical treatment, Internet logic, Internet action, Internet business, Internet movement, Internet strategy, Internet platform, Internet pattern, Interney application, Internet ecology.
	T4 Blockchain technology	Intelligent financial contracts, Differential privacy technology, Distributed computing, .Blockchain, Digital currency
	T5- Automation and Intelligent production	Automation, Automobile control, Automobile detection, Automobile monitoring, Automobile production, Integration, Integration solution, Integration control, Integration system, Industrial intelligence, Industrial information, Industrial communication, Digital industry, Virtual production, Unmanned production line, Precision manufacturing, Lean production, Agile manufacturing, Collaboration manufacturing, Manufacturing execution system, Lighthouse factory, Future factory.
	T6-	Cloud computing, Stream computing, Graph computing, Internal storage computing, Multi-part

	Cloud computing	secure computing, Brain-like computing, Green computing, Recognition computing, Integrated structure, Billion-level concurrency, EB level storage, Internet of things, Information physical system, Private cloud, Industrial cloud.
Environmental support and Service supply		Online offline, Online and offline, Online with offline, from Online to offline, Online+offline, On-line, B2B, To B, O2O, 2B, 2C, CRM, C2M, Internet sales, Internet marketing, Internet business pattern, Intelligent marketing, Intelligent service, Intelligent logistics, Intelligent logistics warehousing, Intelligent marketing, Precision marketing, Precision service, Digital marketing, Supply-chain marketing, E-commerce, Electronic business, On and off the Internet, Integration of two industrialization, Individuation, Customization, On cloud.
Organizational management		PSI, ERP, SAP, MES, WMS, System of information managing, Unmanned management, Cockpit management, Intelligent management, Intelligent working, Intelligent operation, Intelligent control, Intelligent decision, Intelligent operation management, Lean management, Lean operation, Fine management, Refined management, Precise management and standardized management, Online management, Digital operation, Lifecycle management.
Technology	T1 Artificial Intelligence Technology	Artificial intelligence, Business Intelligence, Image understanding, Investment decision support system, Intelligent data analysis, Intelligent robots, high-end technology, Mobile intelligence, Intelligent terminal, Intelligent mobile, Intelligent technology, Intelligent networking, Intelligent system, Robots learning, Deep studying, Semantic search, Biological recognition technology, Face recognition, Voice recognition, Identification, Automatic driving, Natural language processing, Marginal intelligence, AI, Intelligent computing, Human-computer interaction, Distributed computing.
	T2 Big Data Technology	Big data, Data exploration, Context exploration, Visualization of data, Heterogeneous data, Credit reporting, Augmented reality, Combined reality, Virtual reality, Digital technology, Data management.
	T3 Internet Technology	Internet technology, Solution of Internet, Mobile Internet, Industrial Internet, Mobile interconnection, Internet medical treatment, Internet logic, Internet action, Internet business, Internet movement, Interney application, Internet strategy, Internet platform, Internet pattern, Internet ecology.
	T4 Blockchain technology	Blockchain, Digital currency, Distributed computing, Differential privacy technology, Intelligent financial contracts.
	T5- Automation and Intelligent production	Automation, Automobile control, Automobile detection, Automobile monitoring, Automobile production, Integration, Integration solution, Integration control, Integration system, Industrial intelligence, Industrial information, Industrial communication, Digital industry, Virtual production, Unmanned production line, Precision manufacturing, Lean production, Agile manufacturing, Collaboration manufacturing, Manufacturing execution system, Lighthouse factory, Future factory.
	T6- Cloud computing	Cloud computing, Stream computing, Graph computing, Internal storage computing, Multi-part secure computing, Brain-like computing, Green computing, Recognition computing, Integrated structure, Billion-level concurrency, EB level storage, Internet of things, Information physical system, Private cloud, Industrial cloud.
Environmental support and Service supply		Online offline, Online and offline, Online with offline, from Online to offline, Online+offline, On-line, B2B, To B, O2O, 2B, 2C, CRM, C2M, Internet sales, Internet marketing, Internet business pattern, Intelligent marketing, Intelligent service, Intelligent logistics, Intelligent logistics warehousing, Intelligent marketing, Precision marketing, Precision service, Digital marketing, Supply-chain marketing, E-commerce, Electronic business, On and off the Internet, Integration of two industrialization, Individuation, Customization, On cloud.
Organizational management		PSI, ERP, SAP, MES, WMS, System of information managing, Unmanned management, Cockpit management, Intelligent management, Intelligent working, Intelligent operation, Intelligent control, Intelligent decision, Intelligent operation management, Lean management, Lean operation, Fine management, Refined management, Precise management and standardized management, Online management, Digital operation, Lifecycle management.

After analyzing this data and referring to the formula provided by Xiao Tu Sheng, Sun Rui Qi, Yuan Chun, and Sun Jian in their research paper, we have developed a new model for calculating the digital degree for businesses.

The Digitization Index = Keyword total word frequency / Annual report paragraph length * 10000 (1)

Following the application of regression analysis by Wu Fei and Yang Baibing in various industries, businesses have been able to align their developments with government policies. The study will download annual reports of businesses in different industries, such as production, agriculture, and information services. It will then analyze the word frequency to draw conclusions about the developmental routes of these businesses. The paper conducted a regression analysis on 152 keywords using formulas, developed an index, and computed the index. Then, the TOE table is analyzed to form the framework for analyzing digital transformation in grassroots governance.

3.2.2. Data Analysis

We analyzed the thesaurus of common words by applying the TOE theoretical framework, in which the technology thesaurus has the highest percentage of 52.56%. After that, we categorized the technology domain in a more nuanced manner. In T1, the term "artificial intelligence" had the highest frequency of occurrence, accounting for 26.69% of the total T1, 7.90% of the total technology domain, and 4.16% of the total thesaurus. In T2, the term with the highest frequency of occurrence is "Big Data," which accounts for 41.01% of the total T2, 10.23% of the total technology thesaurus, and 5.38% of the total thesaurus. In T3, the word with the highest frequency of occurrence is "Mobile Internet,"

which accounts for 31.93% of the total T3, 3.47% of the total technical thesaurus, and 1.82% of the total thesaurus. In T4, the word with the highest frequency of occurrence is blockchain, accounting for 82.98% of the total T4, 3.63% of the total technology thesaurus, and 1.91% of the total thesaurus. In T5, the word with the highest frequency of occurrence is automation, accounting for 57.73% of the total T5, 8.86% of the total technical thesaurus, and 4.66% of the total thesaurus. In T6, the most frequent word is IoT with 48.28% of total T6, 7.16% of total technical thesaurus and 3.77% of total thesaurus. Among the most occurring words are Big Data, Automation, and Artificial Intelligence, which account for 10.23%, 8.86%, and 7.9% of the total technical thesaurus, which in turn account for 5.38%, 4.66%, and 4.16% of the total thesaurus, respectively. Organizations accounted for 11.41% of the total technical thesaurus, of which refined management, life cycle management, standardized management for high-frequency measurement in the organization category accounted for 28.93%, 10.40% and 7.72%, respectively. In total, the thesaurus accounted for 3.30%, 1.19%, and 0.88% respectively. While the percentage of environment in the total technology thesaurus is 36.02%, where 2B, online and personalification are high frequency words its percentage in the environment category is 22.65%, 14.40% and 9.75%. The percentages of the total thesaurus are 8.16%, 5.19%, and 3.51% respectively. With this data, we can conclude that technology has the most prominent impact on the digital transformation of enterprises. Enterprises use technology to drive innovation, develop and accelerate the basis for the development of digital transformation. The upgrade of enterprise technology can better promote the development of enterprise digital transformation. In terms of organization, enterprises pay more attention to their standardized management, life cycle management and fine management combined with manpower to promote the development of enterprise digital transformation. In terms of the environment, enterprises are mainly through the Internet environment, strengthen 2B, online and personalized, to help improve the information technology aspects of a good hardware and software environment, and further help enterprises to achieve the digital transformation.

4. Comparison analysis

According to data given above, we construct a table as the comparison between government policies and data from businesses (Table 3).

Table 3: Comparison between government policies and enterprises' analysis

Dimension	Government Policy	Data Analysis of Enterprises
T	<ol style="list-style-type: none"> 1. Cloud Computing 2. Blockchain 3. Artificial Intelligence 4. The Internet of Things 5. Digital Twins 	<ol style="list-style-type: none"> 1. Cloud Computing 2. Blockchain 3. Artificial Intelligence 4. Internet
O	<ol style="list-style-type: none"> 1. New Digital Consumption formats 2. Operational management 3. Networked Intelligence 4. Digital Empowerment 	<ol style="list-style-type: none"> 1. Digital Marketing 2. Refined Management 3. Intelligent management 4. Integration of IT 5. Application with Industry
E	<ol style="list-style-type: none"> 1. Online 2. Online and offline 3. On cloud 4. Combination 	<ol style="list-style-type: none"> 1. Online 2. Online and offline 3. On cloud 4. 2B

The government primarily focuses on technological development. Additionally, it aims to facilitate comprehensive digital transformation. As a result, the government is making plans for businesses of all sizes, with a particular emphasis on medium and small-sized businesses. The government provides guides for businesses, such as "The 14th Five Year Plan for the Deep Integration of Informatization and Industrialization" and "A Guide to Digital Transformation for Small and Medium-sized Businesses". Under the data from annual reports of businesses, it is evident that businesses are primarily focusing on technology to facilitate their digital transformation. Through the table above, businesses' development routes align with government policies, or at least most of them do in technology. In terms of organization, although the keywords may not be identical, the fundamental patterns are similar. There are also keywords related to the environment, and businesses require support from the government to meet their needs and align with their development direction. Thus, enterprises are increasingly reliant on technology for development, particularly in the areas of artificial intelligence, big data, and mobile internet. The government should focus more on development of organization and environment to facilitate digital transformation of more enterprises.

5. Conclusion

This paper examines the implementation of government policies and guidelines regarding the digital transformation of enterprises. It analyzes a sample of 672 enterprises' annual reports submitted to the Shenzhen Trading Securities Exchange, using the TOE framework and data analysis to compare the policies and developmental routes of these enterprises. The study draws several conclusions based on the findings.

First and foremost, it is crucial to acknowledge that government policies and enterprise developments encompass three fundamental dimensions: technology, organization, and environment. These dimensions are all essential components in the process of fostering digital transformation. The successes achieved by certain enterprises in digital transformation can be attributed to the facilitation provided by three key factors.

Furthermore, the strategic direction of enterprises aligns closely with government policies in general. Notably, technology plays a crucial role in the digital transformation of enterprises, and the government has recognized this importance. Consequently, the government allocates the highest investment towards enhancing technology for medium and small-sized enterprises.

Additionally, the government provides substantial support to businesses, enabling them to embark on their own digital transformation initiatives. For instance, private clouds and public clouds provided by governmental entities serve as platforms through which enterprises can share their data, thereby enhancing accessibility for medium and small-sized enterprises to engage in digital transformation.

In for context part of organization, it is imperative for organization, the to should concerted efforts. This is because, although the general objectives may align, there are nuanced differences in the specific details on need to be addressed different. The absence of effective organizational management can impede the success of enterprises in their digital transformation endeavors. This issue poses a significant challenge and acts as a barrier, hindering enterprises from initiating their digital transformation initiatives.

Relying on the analysis of government policy and enterprises development patterns, several suggestions can be made: First of all, the national policies should be more specific to enterprises precisely, medium and small-sized enterprises in particular, so that they will be more likely to develop in the best route for them to continue their digital transformation. Then, the data shows that government policy has not yet fully addressed the development of businesses. Therefore, the government should conduct further detailed researches on the development path in enterprises' organizations. Finally, the technology aspect is the most mature one, and businesses are more likely to prioritize its development. It is crucial for businesses to have a blueprint for their future direction, particularly when it comes to technology, as it plays a critical role in digital transformation.

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