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Opportunities and Challenges Faced by Small and Medium-Sized Enterprises in Xinjiang's International Trade under the Background of Big Data

Yan Wang
Xinjiang University of Science and Technology, Korla 841000, Xinjiang, China

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Abstract

This paper learn the effect of large data on the global commerce development of small and average-small firm in Xinjiang in the circumstances of large data. Big data can help businesses address global business risks. However, in the application of large data, small and average-small firm in Xinjiang still have prominent problems. This paper proposes countermeasures and suggestions aimed at promoting small and medium-sized enterprises in Xinjiang to enhance their management capabilities through digital empowerment, thereby achieving transformation, upgrading, and sustainable development.

Keywords

small and average-small firm in Xinjiang; global commerce; digital transformation

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1. Introduction

The construction of Xinjiang as the centre region of the Silk roadway financial waistband has come or go in or into a new step of development, and Xinjiang has also become a tactical corridor and the lead of the country's westward first up. High-tech such as large data and artificial intelligence in the new generation of information technology are comprehensively transforming and reconstructing the global industrial chain, commerce pattern and competitive environment, providing a rare historical development opportunity to break through geographical regions and deeply participate in global market competition. As an significant piece of the nationwide small and micro firm and nonpublic financial system, Xinjiang's small and micro firm are an essential and important help for Xinjiang's financial and communal development.

However, contrast with the shut region, small and average-small firm in Xinjiang broadly have difficulty such as distant place, closed facts, shortage of high-end talents and weak digital foundation. Although Xinjiang has achieved a leapfrog in 5G coverage from 2019 to 2024, the transformation of old and new growth drivers for small and average-small firm in Xinjiang is facing even more severe challenges.

2. Overview of relevant concepts

2.1. The concept and characteristics of large data

The scholastic society has arrived at a wide agreement on the description of large data. It pass on to datasets that are distinguish not only by their huge flake but also by their sudden increase, various kind, and high value tightness[1]. From a strategic perspective, Surbakti F (2020) emphasmall that large data has become a centre element for organizations striving to build competitive advantages in today's fast-paced world[2]. SindhuDaniel(2021)holds that the development of Internetof Things,ArtificialIntelligence (AI), and blockchain (BllochChain) technologies has broken through the bottleneck for solving problems in large data applications[3].

From the perspective of core features, the "3V" (Volume, Variety, Velocity) model proposed by Laney(2001) is the most widely applied[4]. Farboodi et al. (2019), based on large data technology, placed more emphasis on the fact that large data is also an "information resource", which is a kind of valuable information asset held by firm (that is, the accumulated data can be further mined into a paid resource that can be used), and provides certain reference value for the development decisions of firm[5].

2.2. Small and average-small firm in Xinjiang and their foreign commerce characteristics

According to the "sign on topic the supplying on the categorization level for Small and average-small firm", small and average-small firm are class into three categories based on business feature: average-small firm, small firm, and micro firm[1].

From the perspective of the current situation of foreign commerce development, according to the "Urumqi Customs 2024 Annual Foreign commerce Statistical Bulletin", the total value of Xinjiang's foreign commerce imports and exports in 2024 reached 435.11 billion yuan, increasing by 21.8% year-on-year. Which exports 369.98 billion yuan (up 22.3%), imported $65.13 billion (up 18.6%), present the "stability and structural optimization of" situational. The main features of Xinjiang's foreign commerce imports and exports in 2024 are that the gap in foreign commerce scale between the north and south of Xinjiang will further narrow. The pattern of the foreign commerce market has been further expanded. The export of mechanical and electrical products has shown a strong growth momentum, while the import of copper and copper materials has doubled.

3. chance brought by large data for global commerce of small and average-small firm in Xinjiang

3.1. Precise alignment of market demand along the waistband and Road

Xinjiang has long been an important part of the "Silk Road Economic waistband" and has maintained relatively close economic and commerce relations with neighboring countries such as Central Asia for a long time. In recent years, while China's comprehensive national strength has been continuously enhanced, many countries have expressed their intention to strengthen cooperation with China, which has provided certain possibilities for the development of Xinjiang's foreign economy. Since the first half of 2023, artificial intelligence technology has been accelerating its iteration, which has made large data technology more mature and its popularity in various industries has gradually expanded. Against this backdrop, small and average-small firm can grasp market demand information more quickly and accurately through large data methods, reduce the situation of making wrong judgments and blind decisions in the context of uncertain market demand, and lower operating costs.

3.2. Empower the brand of featured products to "go global"

Xinjiang is rich in characteristic agricultural products, mainly including red berries, tomato sauce, Xinjiang beef and mutton and other agricultural and livestock products, textile and clothing, etc. All of them contain rich geographical and cultural added value. The application of cutting-edge large data analysis technology can significantly increase the added value of agricultural and livestock products and achieve the global brand building of agricultural products.

3.3. Optimize cross-border logistics and supply chain management

As the gateway to regional commerce and the Maritime Silk Road, Xinjiang plays a crucial role in the

transshipment of goods. Based on large data, achieving a perfect combination of global supply and demand matching is a complex process that requires precise large data association technology and management level to achieve timely and accurate matching. Guolian Co. LTD. 's "Duoduo Platform" has successfully realized a reasonable and effective digital and intelligent transformation at the industrial level and achieved good economic benefits. Overall, large data has a profound impact on logistics, customs clearance and supply chain in Xinjiang region, bringing competitive strength and new impetus for economic development to small and average-small firm in Xinjiang.

3.4. Improve the ability to prevent and control danger in cross-border commerce

For companies engaged in global commerce activities, there are many situations that may cause overall or partial economic and operational losses to the related firm. For instance, it may lead to operational losses or a decline in profits. many of China's overseas commerce activities have security issues caused by underdeveloped commerce, as well as sudden changes in the economic situation in some countries, etc. Therefore, with the assistance of third-party data service providers, small and average-small firm can obtain real-time and comprehensive enterprise credit reports to help them avoid credit flaws when dealing with some overseas buyer firm in later transactions. Throughout the entire process of signing cooperation contracts, firm should fully utilize large data technology to verify the credit upbringing of foreign buyer firm, and examine the reliability and revenue of overseas partners and products as well as the enterprise's assets. By doing so, they can analyze the security issues of both parties involved in the cooperation, which can effectively avoid the financial danger in credit transactions of small and average-small firm in overseas transactions to a large extent.

3.5. Facilitating integration into the new ecosystem of digital commerce in services

large data is not an ordinary technology or software, but an innovative tool that plays a leading role in the increasingly fierce global economic competition. Small, average and micro firm in Xinjiang need to utilize large data as a booster for transformation and upgrading, and actively participate in the development of China's digital commerce globalization. In the current intense trend of global commerce globalization, relatively mature digital commerce tools at home and abroad have provided support for small and average-small firm to solve professional information asymmetry, increase market coverage, and reduce operating costs.

4. Challenges countenance by small and average-small firm in Xinjiang in carrying out global commerce with large data

4.1. Cognitive bias and lack of endogenous motivation for digital transformation

Many small and average-small firm in Xinjiang are basically confined to the development model of traditional commerce, and this model has persisted for many years. The thinking of small and average-small business owners in Xinjiang regarding the application of large data is relatively backward. In the highly competitive context of the market economy, what they often rely on is their existing experience or personal connections. They are not willing to accept the more professional and precise data intelligence decision-making methods that have been recognized by society. They believe that large data is only applicable to network firm that need to process tens of thousands of data every day, and not to traditional firm. Because traditional firm have been developing until now without large data and there have been no major problems, the business owners themselves believe that large data is not applicable to traditional industries. These causes are related to traditional thinking, which has led firm to always be at a deadlock in their active transformation and development of large data. One of the bottleneck factors for them to carry out the operation and implementation of large data is their reluctance to adapt to and seek development.

4.2. Serious shortage of multi-disciplinary talents

Xinjiang is located in the western region of China and faces significant difficulties in attracting and retaining high-level talents. Meanwhile, compared with the eastern

regions, Xinjiang still faces challenges in attracting and retaining high-level talents and data professionals. The most crucial point is that the salary advantage is insufficient, which has brought considerable difficulties for Xinjiang to attract and retain high-quality data talents from outside, especially from other eastern regions. After all, most other eastern regions have more competitive advantages.

4.3. High pressure of capital investment and uncertain cost-benefit

The application of large data requires continuous and substantial investment in multiple fields. This includes purchasing advanced hardware equipment, obtaining and authorizing professional software, collecting and buying massive datasets, as well as recruiting and training technical talents. For small and average-small firm with usually very thin profit margins, the annual expenditure on enterprise-level data analysis tools often exceeds 100,000 RMB. These tools are essential even for basic data-driven operations.

4.4. Regional weaknesses in digital infrastructure

Although Xinjiang has made remarkable progress in digital infrastructure construction in recent years, there is still a significant gap compared with the eastern regions. The eastern region is more advanced and mature in terms of technology application and implementation. This significant gap not only restricts the depth of large data application but also limits its wide application in various fields. Taking the data of 2024 as an example, only about 90% of the border areas in Xinjiang have achieved 5G network coverage, which is significantly lower than the extensive coverage in the eastern regions. Some border ports and checkpoints in Xinjiang have yet to achieve gigabit-level high-speed network connections, resulting in frequent delays in real-time data transmission.

4.5. Weak multilingual data acquisition and processing capability

In Xinjiang, companies with non-English business operations, especially those from Central and West Asian countries, face multilingual issues, which affect their production and operation. The most significant problem is the extreme shortage of data collection tools specifically designed for less common teaching languages such as Russian, Kazakh, and Kyrgyz. Although languages such as Russian, Kazakh and Kyrgyzstan play a very important role in the accessibility of regional production and operation, they do not have as convenient and complete means as common languages like English.

4.6. Insufficient supply of localized large data services

Regional third-party data companies are small in scale and few in number, and they face huge challenges in effectively providing professional data services. The local data service companies, which are few in number and small in scale, are simply unable to provide the resources, knowledge and capability reserves to meet the diverse demands of firm for professional and high-end data services. Even the data service entities from the eastern part of Xinjiang, due to their inherent lack of understanding of Xinjiang firm and the basic situation of Xinjiang, have formulated plans that are overly general and simplistic. Thus, it is very difficult to actually and effectively solve the special problems and actual demands of local firm in Xinjiang.

4.7. Uneven data quality affects the reliability of decision-making

Massive data and low quality issues also pose a challenge to data processing firm. Conflicts and inconsistencies occur among multiple sources of data. In cases of data loss, errors, or expiration, conducting data cleaning and preprocessing requires strong professional technical capabilities and a considerable amount of labor. Low data quality is very likely to lead to wrong judgments and decisions in the application of large data technology, resulting in corresponding economic cost losses for itself and reducing the motivation and desire to apply large data technology. In contrast, for small and average-small firm, their resources and professional data talents and other influencing factors are not as abundant as those of large firm. The problem of low-quality data is more serious and difficult to handle. Solving and ensuring the accuracy and effectiveness of data is a very complex task, which not only involves addressing the existing low-quality issues but also requires a sufficient preventive mechanism.

5. Suggestions on promoting the use of large data by small and average-small firm in Xinjiang to develop global commerce

5.1. Improve the top-level design and policy support system

Strengthen investment in digital infrastructure and enhance regional coordination and cooperation. Vigorously develop cloud computing and Internet of Things data centers in core hubs such as Urumqi and Kashgar to enhance computing capabilities. We will carry out the construction of "Digital Frontier", improve the network quality in border areas and reasonably reduce the cost of Internet access for netizens. The Central Asia Joint Digital Corridor Cooperation Mechanism will be established to expand cross-border optical cable coverage with Central Asia and the collaborative use of cloud computing resources. Strengthen the drawing on the "East Data West Computing" model in the digital field, continue to explore cooperation with Eastern Data, achieve collaborative use of digital resources, and enhance the effectiveness of computing resource layout. Overall, comprehensive measures should be taken. Different regions have their own specific problems and chance due to their different circumstances.

5.2. Strengthen fiscal, tax and financial support

To accelerate the digital transformation of firm, the provincial level can establish a digital transformation fund, providing subsidies of no less than 30% for small and average-small firm when purchasing cloud computing services and large data tools, to address the cost bottlenecks they face during digital transformation. One-time subsidies should be provided to firm for their first purchase of data services. These one-time subsidies should encourage firm to take the first step in purchasing data services, which is particularly important for them to embark on the journey of digital transformation. At the same time, financial institutions are encouraged to develop distinctive financial products such as "data loans", using data assets as collateral to provide small and average-small firm with high-quality interest rate loans, enabling the data of small and average-small firm to be productized and "turned into money".

5.3. Establish talent training and introduction mechanism

For the "Cross-border E-commerce large Data Laboratories" established in institutions such as Xinjiang University and Shihezi University, local talent cultivation projects are carried out. Special training courses are set up to cultivate interdisciplinary talents, and 200 to 300 multilingual data analysts are trained each year. Corresponding targeted classes can be set up, and graduates can directly enter firm for employment. Innovate talent introduction policies and offer preferential policies on housing allowances and tax reductions for urgently needed large data talents. Launch the "Silver-Haired Expert Program" to introduce retired data experts urgently needed in the eastern region to work in Xinjiang for a short period of time.

5.4. Enhance enterprise digital transformation capability

Clarify the phased digital transformation strategy. In the early stage, work was first carried out through tools with low initial investment, such as a custom data query platform to establish a data culture and basic capabilities. Through pilot projects of data application such as data analysis empowerment to optimize the structure of export products, quick results were achieved, building confidence for the entire bank. In the average term, we will carry out a comprehensive and organized implementation, introduce professional data analysis tools (such as the global version of Technology, etc.), build a customer data middle platform, and achieve data empowerment for precise marketing and supply chain empowerment. In the long term, data should be managed as the core asset of the enterprise, a dedicated data team should be configured, and a data governance mechanism should be established to drive business model innovation through data empowerment.

5.5. Build a coordinated development system of industrial ecology

Construction of Xinjiang Foreign commerce large Data Center Integrate various multi-source and diverse data resources from different fields (including customs, logistics, and market data), and provide tailor-made, economically feasible data solutions for small and

average-small firm based on multilingual data query and analysis services. By establishing an industry data resource sharing mechanism, promote leading firm to jointly organize data alliances in key industries such as tomato sauce, sea buckthorn, and textiles. Establish data standards and norms to maximize the value of industry-specific data.

5.6. Expand global data cooperation channels

Establish a data cooperation alliance in Central Asia, leveraging platforms such as the Shanghai Cooperation Organization and the China-Central Asia Cooperation Forum, to enhance cooperation with Central Asian countries in areas such as commerce data standards and cross-border data mobility, and provide more convenient data services for firm. Attract high-quality large data providers from eastern provinces and cities to settle in Xinjiang and encourage them to offer tailor-made technical solutions to firm in Xinjiang.

5.7. Establish a data quality improvement mechanism

Data quality management mechanism. By establishing detailed work plans and implementation schemes, the quality of the entire data processing process can be controlled throughout all stages from multiple aspects and in all directions. It is required to clearly define each link: the quality of data collection needs the reliability and accuracy of the source and methods of data collection; The quality of data cleaning requires the deletion/verification of erroneous, inconsistent, and duplicate data. The quality of data labeling requires relevant and precise labeling to enhance the understanding and application of data. At the same time, a detailed data quality control assessment and improvement mechanism needs to be formulated, which requires real-time tracking of data quality, timely identification and filling of deficiencies, and the implementation of solutions to continuously improve data quality

Disclosure statement

The author declares no conflict of interest.

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