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Research on China's Digital Divide and its Bridging

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ABSTRACT

To address the adverse impacts of the digital divide on social inequality and economic development, this study delves deeply into the causes and effects of the digital divide, particularly as manifested between the eastern and western regions of China, aiming to propose effective mitigation strategies. Employing a longitudinal data analysis approach, combined with four decades of tracking data, the study quantitatively compares the disparities in digital technology penetration, educational attainment, and economic growth between the east and west. Qualitative analysis complements this, providing insights into the dynamic changes and underlying mechanisms of the digital divide. The findings reveal that the digital divide is significantly present across regions, closely linked to educational disparities and constraints on economic growth potential. Innovative strategies, such as tailored digital education initiatives and infrastructure investment, have proven effective in promoting technological diffusion and narrowing the gap, offering more targeted and practical solutions compared to conventional one-size-fits-all approaches. This research not only deepens our understanding of the complexities of the digital divide but also provides a strategic framework that offers substantial theoretical support and practical guidance for policymakers. It holds significant theoretical and practical implications for advancing balanced regional development, fostering social equity, and facilitating digital transformation.

KEYWORDS

Digital Economy; Digital Divide; Shared Prosperity.

1. INTRODUCTION

With the rapid advancements in internet, mobile communications, artificial intelligence, and big data technologies, digitization has become the core force reshaping societal structures and economic activities, profoundly impacting people's lifestyles, occupational patterns, education systems, and modes of interpersonal communication. The digital economy—a new economic paradigm that integrates e-commerce, sharing economy, and fintech—has injected innovative momentum into traditional economic models. However, it has also highlighted significant disparities in technological access and application capabilities across regions and communities—the "digital divide." This divide not only hinders certain areas and groups from reaping the benefits of digital technology but may exacerbate social inequalities, impede local economic growth and social progress, potentially marginalize vulnerable groups, and pose a latent threat to sustainable development for society as a whole.

In light of this, identifying and mitigating the digital divide to ensure widespread benefits from digital advances has become an urgent research topic. This study is dedicated to comprehensively analyzing the logic behind the creation of the digital divide and its impact on the socio-economic ecosystem, balancing theoretical depth with practical orientation. Theoretically, by elucidating the potential

impacts of the digital divide on social justice, civic engagement, and educational rights, this study aims to raise public awareness and motivate policymakers to confront and resolve issues of inequality, fostering a more equitable and diverse digital society.

Practically, through detailed analysis of the imbalances in digital technology application and digital economic development between eastern and western regions, this study seeks to provide empirical insights and decision-making bases to aid in optimizing resource allocation, promoting regional balanced development, and ensuring that the benefits of digital transformation are widely shared.

Methodologically, this study will employ longitudinal data tracking and statistical analysis to compare the evolution of digital technology development, education accessibility, and economic growth in eastern and western regions over the past four decades, accurately capturing the current state and dynamic changes of the digital divide. Based on these findings, the study will innovatively develop a set of strategic plans aimed at targeted interventions to accelerate the adoption and innovation of digital technology in underdeveloped regions, effectively narrowing the gap. These strategies, grounded in historical data analysis and mindful of current realities and future trends, aim to offer concrete, highly specific recommendations to policymakers, contributing to the shaping of a more just and prosperous global digital future.

To visually represent the concept discussed in the text, here is an illustration depicting the digital divide and its impact on society. It shows regions with varying levels of digital access and highlights how this disparity affects economic opportunities and social inclusion.

2. LITERATURE REVIEW

Hong, J., Li, R., Yang, X. (2024) Based on theoretical analysis, combining tens of millions of business registration information of enterprises with district, county and city statistical data, empirically analyze the impact of digital economy on income disparity based on the perspective of core industries of digital economy at the regional and urban-rural levels. It provides certain reference for relevant policy making. [1] Luo Chan (2023) in-depth study of the digital economy on the common wealth of the empowerment of the rationale, in its inherent role of the mechanism and logic, based on the analysis of the reality of the dilemma faced with the obstacles, and then explore the digital economy empowered by the common wealth of the practice strategy. [2] Zhou Weizheng,Li Jia (2024) took 168 Chinese cities as samples from 2011-2019, and explored the relationship between digital economy development and common wealth under the existence of digital divide. It provides some policy insights on how to narrow the digital divide and promote digital economic development to empower common wealth. [3] Yang Chenchen,Wu Xuelin (2023) analyzes some of the problems encountered in the current digital divide for the elderly and identifies the solution paths. Through multifaceted efforts, the state, society, and families work together to help the elderly fill the digital divide, so that the elderly can enjoy their old age peacefully and live a comfortable life in their twilight years. [4] Peng Gang,Gao Jinsong (2024) explored the impact and mechanism of the digital economy on the allocation of urban and rural factors based on the panel data of 257 cities in China from 2011-2019, and put forward suggestions based on the research findings to pay attention to narrowing the digital divide, strengthening the construction of digital rural areas, and realizing the common development of the digital economy and urban-rural integration. [5] Sui Yung (2022) explores the new contradictions and challenges faced on the road of promoting common wealth in the new era of China, and gives the corresponding solution path choices from the three aspects of the change of regional development gap in the era of digital economy, the impact of the digital divide on the distribution of income, and the monopoly existing on the Internet platform in the era of digital economy. [6]

Li Li (2022) systematizes the definition, measurement and influencing factors of digital divide, constructs the global digital divide indicator system, and conducts empirical research on the

influencing factors of the global digital divide and the impact of the "Belt and Road" initiative on the global digital divide. [7] Yang Yashu (2022) summarizes the development history of the theory of digital divide, summarizes the new manifestations of digital divide in the context of the smart media era, and organizes and analyzes the specific phenomena of digital dilemma faced by the elderly. Combining the current situation of smartphone usage of urban elderly with the theory of digital divide, enriching the theoretical connotation of digital divide, and exploring how the society should utilize the advantages of digital technology to narrow the digital divide faced by the elderly, which will have a certain promotion effect on enhancing the level of social care and promoting the development of digital economy. [8] Yu Dongyang (2022) combines the inclusive governance framework of emerging technological risks, and proposes the optimization paths of establishing inclusive institutional norms, developing inclusive technological tools, and constructing inclusive subject interaction modes, so as to achieve the goal of improving the governance efficacy of the core dimensions of digital skills and digital utility satisfaction of the elderly group, and to provide decision-making references and governance suggestions for continuously narrowing the digital divide between generations. [9]

Liu Jiao-meng (2021) shifted the research perspective to intra-family, focusing on the intergenerational interaction mode of family digital feedback, aiming to analyze the value and utility of digital feedback for bridging the intergenerational digital divide, as well as the possible problems in the interaction of the feedback, and trying to explore effective paths to promote the digital integration of the elderly. [10] Chen Yaxue (2017) takes the use and adoption of WeChat by the elderly group over 60 years old in Shenzhen as an example to explore the specific manifestations of the digital divide in the levels of adoption, use, and knowledge, and in this way sketches the formation path of the digital divide from shallow to deep. [11]Wang Wu (2011) chooses hierarchical analysis and comparative analysis as the main research methods to briefly describe the background, concept, impact, causes and development of digital divide, and focuses on analyzing the important impact of digital divide on international politics and international relations, and highlights the deeper causes of digital divide and the gap between the rich and the poor as well as their related examples. By analyzing the laws of economics followed by the digital divide, the role of the digital divide in economic growth, and the characteristics of the information age, to further understand and grasp the causes of the wealth gap caused by the digital divide Through the above part of the overall analysis of the existence of the digital divide and the problem of the wealth gap caused by the digital divide, to further analyze the countermeasures according to the specific situation, and to give the relevant recommendations. [12]

Mu Xianbin (2010) analyzes the current situation, causes and adverse effects of the digital divide from the perspective of public management, and seeks countermeasures to narrow the digital divide, taking the digital divide generated by the promotion of information and communication technologies represented by electronic computers and the Internet in China as an example. [13] Li Xiao (2010) researches and establishes a systematic, comprehensive, and practicable model of digital divide influencing factors and measurement model, which has strong theoretical and practical significance. [14] Wang Qinghua and Chen Di (2006) used a variety of statistical methods to comprehensively compare and classify the level of Internet development in 31 provinces and municipalities in China, and empirically analyzed the quantitative dependence between the digital divide and the level of economic development. [15] Liu Yun (2006) designed a theoretical framework to analyze the international digital divide from an economic perspective, studied in depth the economic effects of the existence of the international digital divide, empirically analyzed the influencing factors of ICT penetration level and diffusion speed, and put forward China's ideas and countermeasures to cross the digital divide. [16]

3. ANALYSIS OF THE CURRENT SITUATION OF DIGITAL DIVIDE IN CHINA

3.1. Comparative Analysis of China's Digital Divide from the Perspective of Developed and Less Developed Regions

In the perspective of the digital divide, the gap between developed and less developed regions is evident. The former tend to be equipped with cutting-edge infrastructure, have high broadband Internet penetration, have a population that makes extensive use of the latest technological devices and demonstrate a high level of digital skills and literacy. In contrast, the latter have lagging infrastructure, low broadband access, low penetration of digital devices, and relatively limited digital skills and knowledge. Differences in the quality of education are also a major component of the digital divide. In developed regions, there is an abundance of high-quality educational resources and a high level of education, which is conducive to the mastery and application of digital technology. In less developed regions, educational resources are scarce and access to digital technology education is limited, which directly affects the cultivation and development of digital skills.

The disparity in economic strength further magnifies the digital divide. Residents of developed regions have strong economic capacity to afford the purchase of digital devices and the use of high-speed networks. On the contrary, people in less developed regions are economically constrained and limited in their ability to purchase digital devices and access quality network services. In terms of the development of the digital economy, developed regions show a more mature posture, with the digital industry becoming a driver of economic growth, while the digital economy in less developed regions is still in its infancy and the application of digital technology has not been able to adequately contribute to the rate of economic growth.

The level of digitization of public services is an indicator that distinguishes the two. Developed regions have a high level of digitization of public services in areas such as healthcare and education, improving efficiency and convenience. On the contrary, in less developed regions, the level of digitization of public services is low, which affects people's service experience and quality of life. The contrast in the job market is equally stark. Developed regions offer abundant employment opportunities in the area of digital technology, attracting a large influx of talent, while the relative scarcity of digital technology jobs in less developed regions may limit the employment options of residents.

3.2. Analysis of the Digital Divide in Less Developed Regions

The digital divide in China's less developed regions is characterized by a multifaceted approach, rooted in a series of chain reactions caused by the unbalanced development of the economy, education and infrastructure.

First and foremost is the inadequacy of digital infrastructure, which is manifested in the lack of high-speed Internet access and the inadequacy of communication networks, which directly affects the unobstructed flow of information and restricts the ability of residents to obtain information from the outside world. Secondly, the low penetration rate of digital devices reflects the shortcomings of local people in the use of modern communication tools such as smartphones and computers, and the lack of corresponding knowledge and skills, which hinders the effective penetration and application of digital technology in the local area.

The scarcity of educational resources is also not to be ignored. Less developed regions often lack high-quality education and training opportunities, which directly contributes to the low level of digital literacy and skills of the population, making it difficult to adapt to the needs of an increasingly digitalized society. At the same time, lower income levels make it difficult for residents to purchase digital devices and subscribe to high-speed Internet services, creating barriers to technology access.

In addition, the singularity of information channels is also a problem. The reliance on traditional media for information access limits residents' access to the digital world, while lower ability to apply digital technology further restricts their possibilities to enhance their quality of life through digital means. The narrow job market and low level of digitization of public services also reflect the far-reaching impact of the digital divide at the socio-economic level, reducing employment opportunities for residents and lowering the efficiency and accessibility of public services.

Addressing this challenge requires the joint efforts of Governments, enterprises and all sectors of society to gradually narrow the digital divide and ensure that all regions and populations can share in the opportunities and conveniences brought about by digitization through a series of measures, such as increasing investment in infrastructure, upgrading the quality of education, fostering economic development, broadening information channels and promoting the digitization of public services.

4. CAUSES AND DEMANDS OF DIGITAL DIVIDE IN LESS DEVELOPED REGIONS OF CHINA

4.1. Causes of the Digital Divide in Less Developed Regions

The digital divide faced by the less developed regions of China has intricate roots, mainly in multidimensional imbalances in economic strength, education level and infrastructure. The primary factor lies in the backwardness of infrastructure. In many remote areas, the slow pace of digital infrastructure construction, narrow broadband network coverage, and incomplete communication facilities have severely constrained the flow of and access to information.

Secondly, the accessibility of digital hardware is low. Compared with developed regions, people in underdeveloped regions have a significant gap in the possession and application of smart devices (e.g., cell phones and computers), which constitutes a barrier to crossing the digital age. Scarcity of educational opportunities is also a factor that cannot be ignored. Underdeveloped regions often have limited investment in education and a shortage of high-quality teaching resources, resulting in a relatively weak accumulation of digital skills and knowledge.

Economic constraints further exacerbate the digital divide. People in underdeveloped regions generally have lower incomes than those in affluent regions, which directly affects their financial ability to purchase digital tools and access high-speed networks. Narrow access to information and lack of digital skills, in turn, deepen this inequality.

To address this challenge in the future, it is imperative that multiple actors, including governments, communities and enterprises, work together to promote the process of informatization, eliminate digital disparities and ensure that all citizens can share the opportunities and fruits of the digital age.

4.2. Digital Technology Claims of Less Developed Regions

The developing regions of China have an urgent need for digital technology, which is driven by the imbalance in development between regions and the lagging behind of infrastructures. The region is in dire need of strengthening its digital infrastructure, including enhancing broadband access and optimizing communication systems, with the aim of paving the way for people to access high-speed Internet, ensure unhindered access to information and online learning, and be fully integrated into the prosperity of the digital society.

Furthermore, upgrading digital skills education and training is a priority for the region. Enriching digital technology education and expanding related learning resources aims to develop residents' digital intelligence and empower them to ride the wave of the digital age, which in turn boosts career prospects, broadens employment pathways, and directly benefits the quality of daily life.

Crucially, the role of digital transformation in the public sector is highly anticipated. Telemedicine, online education platforms, and e-government are all expected to significantly improve the quality of life and the effectiveness of public services. This will not only ease people's daily stress, but also optimize access to healthcare and education resources, bringing the benefits of digital technology to the people.

Currently, the core expectations of developing regions for digital technology focus on three aspects: first, the upgrading of digital infrastructure; second, the cultivation of digital capabilities; and third, the deep integration of digital technology in public services. These visions can ensure that local people share the dividends of digitization, help bridge the digital divide and promote a balanced and sustainable digitization process at the national level.

5. PATHS TO BRIDGING THE DIGITAL DIVIDE IN LESS DEVELOPED REGIONS

In order to gradually bridge the digital divide that exists in less developed regions, Governments and social institutions around the globe have embarked on a series of comprehensive strategies.

The first priority is to improve infrastructure and ensure full coverage of high-speed Internet. India's Digital India program is a good example, especially its BharatNet project, which aims to establish Internet connectivity in rural areas so that people in villages can enjoy the convenience of digital life. At the same time, education to improve digital literacy is seen as key. In Nigeria, the "Digital Nigeria" initiative focuses on digital technology training in schools and communities, with the aim of enhancing the digital skills of the population and enabling them to face the challenges of the digital age with greater confidence.

In terms of promoting economic development, the Ethiopian government has attracted foreign investment and built digital technology parks in the country, such as the Sediq Digital Park, which not only creates a large number of local employment opportunities, but also improves the economic income of the residents. In the field of public services, Kenya's Huduma Digital Platform has realized the electronic delivery of government services, allowing people to complete various procedures online, greatly facilitating the public and improving service efficiency.

In order to prevent the spread of digital technology from exacerbating social inequality, governments have adopted inclusive policies. In Bangladesh, the "Digital Bangladesh" program has lowered barriers to women's entry into the digital society by providing them with free digital technology training. In Egypt, through the Information and Communication Technology Development Plan, special attention has been given to persons with disabilities to ensure that they can also be trained in digital technologies and participate fully in society.

The combination of these policies and measures demonstrates that governments are actively engaged in bridging the digital divide and ensuring that the opportunities and conveniences of digitization are available to residents of less developed regions. Through infrastructure development, digital education, economic incentives, digital public services and inclusive policies, it is possible to effectively promote balanced digitalization and progress towards the goal of sustainable development.

6. CONCLUSION

This paper examines the role of the digital divide in reshaping social structures and economic activities, and how it creates significant differences in the ability to access and apply technology across regions and communities, thereby affecting economic growth and social equity. Research has shown that the digital divide not only limits the access of some regions and groups to the digital

dividend, but also may exacerbate social inequality, marginalize disadvantaged groups, and pose a challenge to sustainable development.

Based on the above analysis, this paper puts forward the following recommendations: first, policymakers should emphasize universal access to digital infrastructure, especially in remote and underdeveloped areas, to ensure that everyone has access to basic Internet connectivity and digital services. Second, the education system needs to be reformed to introduce more IT education, especially for children from low-income families and rural areas, in order to improve their ability to utilize digital technology. Further, businesses are encouraged to work with the government to invest in digital skills training programs to help adults upgrade their skills and adapt to the demands of the digital economy. Finally, a cross-sectoral collaboration mechanism should be established to integrate resources and formulate comprehensive strategies to promote the equal application and innovation of digital technologies, achieve balanced regional development, and ensure that the fruits of digital transformation can benefit all members of society. The purpose of this paper is to respond to the challenges posed by the digital divide and to lay the foundation for building a more equitable and prosperous digital future by promoting digital inclusion.

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