

Original Research Article

New strategies for the governance of digital divide in the rapid development of digital economy

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Abstract: The rapid development of digital economy not only releases the technological dividend, but also aggravates the complexity and concealment of the digital divide. At present, the digital divide shows new characteristics, such as the transition from the access gap to the intelligent gap, the deep intertexture of urban-rural intergenerational differences, and the unbalanced development of digital ecology. Governance is faced with such dilemmas as the disconnection between infrastructure coverage and high-quality use, the lagging cultivation of the literacy of vulnerable groups, and algorithmic discrimination to strengthen digital exclusion. In this regard, we should systematically bridge the digital divide and help build an inclusive digital society by promoting the sinking of inclusive digital infrastructure, building a life-cycle literacy improvement system, and strengthening algorithm governance and platform responsibility.

Keywords: digital economy; digital divide; algorithm governance; pluralistic co governance

1. Introduction

The rapid development of digital economy has profoundly reshaped the social mode of production and the picture of people's lives, and has become the core engine driving high-quality development. However, the release of technology dividends is not balanced and inclusive. With the acceleration of the digital process, the problem of the new digital divide has become increasingly prominent. The transition from the early access gap to the smart gap, superimposing urban and rural, intergenerational and other factors, makes the vulnerable groups face the risk of marginalization. How to effectively control the digital divide and ensure fair participation in the digital age has become a major practical issue to be solved. This paper aims to systematically sort out the new characteristics and governance difficulties of the current digital divide, and then put forward new strategies for targeted governance, in order to provide theoretical and practical reference for the construction of an inclusive digital society.

2. Contemporary evolution and characteristics of the digital divide

2.1. Transition from access gap to smart gap

With the popularity of digital infrastructure, the "first kilometer" problem of network access has been significantly improved. The core contradiction of the digital divide is shifting from the physical level of access gap to the skill and thinking level of intelligence gap. At present, the deep application of digital technology requires users not only to be able to "surf the Internet", but also to "use the Internet" and "understand the Internet". The intelligence gap is reflected in the differences in individual understanding, mastering and innovation ability of emerging technologies such as artificial intelligence and big data. Some groups are excluded from smart government, online medical and other efficient services because they cannot adapt to the new digital ecology such as human-computer cooperation and algorithm interaction^[1]. This kind of morphological transition makes the gap from the obvious lack of equipment to the implicit lack of ability, which poses a more hidden and far-reaching challenge to the fair participation in the digital age.

2.2. Deep interweaving of urban-rural and intergenerational differences

In the context of the rapid development of digital economy, the digital divide presents a composite feature of urban-rural regional differences and intergenerational differences. On the one hand, urban areas continue to lead by virtue of the advantages of technology iteration, while rural areas have basically

achieved network coverage, but there are still significant gaps in the depth of digital technology application and industrial digital transformation. On the other hand, the elderly and youth groups have formed a significant ability fault in the identity separation between digital aborigines and digital immigrants. The elderly face the dilemma of "digital disability" such as complex operation and difficult information screening, while some teenagers may fall into the "digital loss" of excessive entertainment and algorithm addiction^[2]. The interweaving of urban and rural and intergenerational factors makes the digital divide no longer a single dimensional gap, but a complex social structural problem.

3. Main problems faced by current digital divide governance

3.1. Disconnection between infrastructure coverage and high-quality use

Although China has built the world's largest digital infrastructure, there is still a significant performance gap in the actual use level. In some areas, especially in remote rural areas, problems such as unstable network signals and substandard speed still exist, which makes it difficult to convert hardware investment into effective use. More importantly, the matching degree of existing infrastructure and people's livelihood needs is insufficient, and the construction of private networks for public services such as health care and education is relatively lagging behind. Although many elderly and rural residents have access to the network, due to the lack of appropriate digital application scenarios and guidance, they can only stay at the basic communication level and can not enjoy high-quality online services^[3].

3.2. The digital literacy cultivation system of vulnerable groups lags behind

At present, the cultivation of digital literacy for vulnerable groups lacks systematic institutional arrangements and long-term support mechanisms. The existing training mostly relies on short-term projects or volunteer activities, with emphasis on basic operations and lack of training in-depth abilities such as information screening, privacy protection and risk prevention. The elderly, the disabled and the people with low education background are faced with practical difficulties such as limited learning channels, poor adaptability of teaching materials and weak continuity of training^[4].

3.3. Algorithm discrimination and information cocoon room strengthen digital exclusion

The wide application of algorithm technology not only improves the efficiency, but also derives a new form of digital exclusion. Based on the consideration of commercial interests, some platforms make differentiated pricing and service classification for users through algorithms. Elderly users or low digital groups are often pushed with low-quality content or placed on the edge of services^[5]. More covertly, the personalized recommendation mechanism of the algorithm is easy to trap users in the information cocoon room. The limited access to information for vulnerable groups has been further narrowed, and the opportunity to contact multiple information and flow upward has been lost.

4. New strategies to bridge the digital divide in the era of digital economy

4.1. Promote the construction and sinking of inclusive digital infrastructure

And use efficiency. Based on the theory of inclusive development, the construction logic of infrastructure should shift from "technology center" to "user center", focusing on the precise adaptation of terminal access and the deep embedding of service scenarios. This means that on the basis of the traditional broadband network, it is necessary to superimpose special facilities for people's livelihood needs, such as telemedicine private network, smart education platform, etc., and by reducing the threshold of use and optimizing the interactive experience, make the technology dividend truly transform into the feasible ability of vulnerable groups, so as to lay the material foundation for bridging the digital divide from the starting point.

Taking the "upgrading and upgrading of rural digital infrastructure" project in Zhejiang Province as an example, the province further promotes the functional sinking of infrastructure on the basis of realizing the full coverage of 5g network in administrative villages. In Yu village, Anji County, the local government not only laid high-speed optical cables, but also built rural digital micro consulting rooms and smart elderly care stations, equipped with aging self-service terminals and remote inquiry system. The village committee trained a number of "digital micro housekeepers" to provide on-site assistance to the left behind elderly. At

the same time, through the deployment of Agricultural Internet of things sensors, tea farmers can monitor soil moisture and diseases and pests in real time to achieve precision irrigation and fertilization.

4.2. Building a life cycle digital literacy improvement system

The whole life cycle digital literacy promotion system is rooted in the lifelong learning theory and the ability gradient development model. The theory emphasizes that digital literacy is not a fixed skill acquired at one time, but a collection of abilities that evolve dynamically with individual growth stages and technological iterations. In the young stage, we should focus on Computational Thinking and information ethics enlightenment, strengthen digital skills and professional application in the youth stage, and focus on life service adaptation and risk prevention in the middle-aged and elderly stage. Systematic literacy cultivation needs to break through the fragmented limitations of the traditional training mode, and build a closed-loop digital ability development that covers all staff and runs through life through the seamless connection of multiple channels such as school education, vocational training and community assistance for the elderly, so as to realize the qualitative change from "digital literacy" to "digital empowerment".

Taking the "digital citizen" cultivation project in Nanshan District of Shenzhen as an example, the district has built a full cycle digital literacy curriculum system covering children to silver haired people. At the kindergarten stage, logical thinking is cultivated through programming block games; In primary and secondary schools, the general course of artificial intelligence will be included in the compulsory content; For college students and new employees in the workplace, Tencent and other enterprises jointly carry out digital vocational skills certification. The most specific is the "silver age digital classroom" project, led by the community party and mass service center, which organizes college students' volunteers and elderly university teachers to teach together. The teaching content gradually advances from wechat payment and appointment registration to short video production and AI anti fraud knowledge.

4.3. Strengthen algorithm governance and platform social responsibility regulation

From a theoretical perspective, the strengthening of algorithm governance and platform social responsibility is rooted in the theoretical framework of technology ethics and public value return. Under the traditional market logic, the efficiency maximization oriented algorithm design of the platform is prone to negative externalities such as information cocoon house and differential pricing, which leads to the deviation between technical rationality and public interest. Based on the theory of social responsibility, the platform is not only a commercial subject, but also a quasi public infrastructure in the digital age. Its algorithm logic should be embedded in the dimensions of fairness, inclusiveness, transparency and other public values. This requires the introduction of an ethical review mechanism at the source of algorithm design, and the promotion of the platform to include the protection of vulnerable groups in the algorithm parameters through regulatory means, so as to realize the transformation from passive compliance to active performance of responsibilities, so as to build a strong institutional barrier to prevent digital exclusion at the algorithm level.

Taking the "special action on algorithm governance" carried out by the state cyberspace office as an example, the action focused on the problems of indulging addiction and big data maturity in some platforms. In practice, the "elderly mode" and "juvenile protection mode" have been launched on platforms such as dithering and fast hand, which reduce the push of addictive content and increase the weight of positive content such as popular science and culture through algorithm adjustment. The meituan take out platform optimizes the algorithm scheduling system for riders, and introduces "anti fatigue mechanism" and flexible delivery time to avoid excessive squeezing of workers by the algorithm. At the same time, many e-commerce platforms have publicly promised to eliminate price discrimination against elderly users and increase the exposure weight of aging goods in search recommendations.

5. Conclusion

In the era of digital economy, the digital divide has evolved into a complex problem of interweaving access, use and intelligent literacy. To overcome this gap, it is urgent to go beyond the traditional infrastructure thinking and turn to strategies covering facilities' universal benefits, literacy improvement, algorithm regulation and so on. Only by putting the concept of inclusive development throughout the whole process of technological evolution and promoting the coordinated efforts of the government, the market and

society, can the "gap" of digital technology be transformed into a "bridge" for inclusive sharing, and the co construction and sharing of digital civilization be truly realized.

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