Research on the Deep Integration Development of the Health Industry under the Background of the Digital Divide

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Abstract. This paper investigates the impact of the digital divide on the integration of the digital economy and the wellness industry in Sichuan Province, recognizing existing disparities that impede progress. The primary goal is to propose digital strategies and offer policy recommendations to bridge this gap effectively. The research objectives center on analyzing the influence of the digital divide, specifically focusing on digital infrastructure, talent shortages, information security, and policy awareness. Utilizing a combination of surveys and semi-structured interviews, the study seeks to provide actionable insights for policy development. The research, with an 88.99% response rate, explores the attitudes of Sichuan's elderly population towards digital integration, revealing key findings related to digital infrastructure, talent shortages, information security, and policy awareness. Results highlight challenges in these areas, including concerns about information leaks, limited digital literacy, and perceived gaps between traditional industries hindering integration. In conclusion, the paper recommends government initiatives such as infrastructure investment funds and digital training programs to address identified challenges. Strategies proposed involve enhancing talent management, improving information security, and fostering supportive policies, with the ultimate aim of facilitating the integrated development of the digital economy and wellness industry in Sichuan.

Keywords: Digital Economy, Health and Wellness Industry,Digital Divide.

1 Introduction

With the rapid rise of the digital economy and the health and wellness industry, the global digitization trend is displaying unprecedented vitality. As of 2022, the global digital economy has reached a scale of 80 trillion dollars, accounting for nearly 1/3 of the global GDP. Simultaneously, the health and wellness industry is rapidly expanding globally, reaching a market value of 4.2 trillion dollars annually. The robust development in these two sectors provides new impetus for the future economy.

The digital economy, centered around information technology and digital means, propels the digital transformation of traditional industries, creating new business models and service forms. Meanwhile, the health and wellness industry plays a crucial role in meeting the demands for health and quality of life in an aging society, becoming an emerging area of significant global economic attention.However, despite the substantial success achieved

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independently by the digital economy and the health and wellness industry, the challenge of the digital divide becomes increasingly prominent as they converge. The digital divide is widespread globally, especially in regions like Sichuan Province, where internet access still lags, and the use of digital technology exhibits significant inequality among different regions and social groups. This not only leads to disparities in information access and utilization but also affects the effective integration of the digital economy and the health and wellness industry. Issues such as unequal service access and uneven application of digital technology pose severe challenges to the deep integration.

In this context, this study aims to comprehensively reveal how the digital divide impacts the integration of the digital economy and the health and wellness industry. By analyzing data from relevant regions in Sichuan Province, we will explore the specific effects of the digital divide on various aspects of deep integration. Simultaneously, we will investigate strategies to narrow the digital divide through digital means. Building on successful cases within Sichuan Province, we will propose feasible digital strategies, including technology popularization, digital education, and social participation, to alleviate the issues caused by the digital divide. Ultimately, we will present a viable development path for the deep integration of the digital economy and the health and wellness industry, offering specific recommendations for future policy-making and industrial development based on empirical research results and a review of academic literature.

2 Literature Review

The concept of the digital economy was initially introduced by Don Tapscott in 1996 [1], but he only outlined certain features of the digital economy without providing a clear definition (Li Changjiang, 2017) [2]. Nicolas Negroponte (1996) [3] defined the digital economy as an economy that "uses bits instead of atoms." This concept distinctly emphasizes the network-based nature of the digital economy and had significant influence in its early development. The G20 Hangzhou Summit defined the digital economy as follows: "A series of economic activities that utilize digital knowledge and information as key production elements, employ modern information networks as essential carriers, and effectively use information and communication technology as a crucial driving force for improving efficiency and optimizing economic structure" (Zhang Bochao and Shen Kaiyan, 2018) [4]. However, these definitions do not provide explicit and clear industry classifications and boundaries for the digital economy.

Some scholars define the digital economy as a new economic form that revolves around digitized information as the core production element, is supported by information technology, relies on modern information networks as the primary carrier, and provides products or services through digital technology, representing a convergence of technology, industries, producers, and consumers (Zhang Liangliang et al., 2018) [5]. Some studies describe the essence of the digital economy from a measurement perspective. For instance, the Organisation for Economic Co-operation and Development (OECD) has mentioned the digital economy in its reports for several years, defining it as a shift in human production activities from atomic processing to information processing under the impact of emerging information

technologies (Wang Zhixin et al., 2022) [6]. This definition does not include new economic trade activities such as digital retail and digital content services in the broad sense.

Compared to traditional economies, the digital economy exhibits distinct characteristics. Wang Zhixin et al. (2022) [6] point out that the digital economy has strong penetrability, with data information as its primary production element, and it possesses a strong marginal revenue increment effect and features "ecological" development. In general, the viewpoint that the digital economy represents an economic form brought about by information technology and informatization has gained academic consensus.

Research on the field of health and wellnessin China first garnered widespread attention around 2009, and since 2014, there has been a gradual upward trend in research activities. During this period, the health and wellness industry resonated within both the academic and industrial communities, prompting in-depth studies on the concept and connotations of health and wellness.

In the exploration of the connotations of the health and wellness industry, various scholars have put forth representative viewpoints, offering rich references for the development and definition of this field. Yang Jirui and Lai Yuhuan (2017) regard the health and wellness industry as a collective term for the health and elderly care industry, positioning it as a vital component of the modern service industry. They emphasize the crucial role of health and wellness in meeting people's health and elderly care needs [7]. On the other hand, Li Houqiang (2015) approaches the subject from the aspects of "health" and "nurturing life," emphasizing the diversity of the health and wellness industry. It not only focuses on health maintenance but also addresses various aspects of life nurturing and healthcare [8]. Additionally, He Mang (2019) further subdivides the connotations of the health and wellness industry into the dimensions of "health," "nurturing life," and "elderly care," providing a more comprehensive and in-depth perspective for research in the health and wellness field [9]. These viewpoints collectively construct a diverse understanding of the connotations of the health and wellness industry, revealing its inclusiveness and complexity.

As domestic research on health and wellness continues to deepen, these perspectives provide robust theoretical support for relevant policy-making, industry planning, and the enhancement of public awareness of health and wellness. Future research is expected to further expand the connotations of the health and wellness industry to better meet the growing demands for health and well-being among the population.

The digital divide, as a widespread phenomenon, manifests across different countries, regions, and urban-rural divides, with a particularly pronounced impact on the elderly population. Research indicates that the elderly face a disadvantageous position in the realm of digitization, exhibiting significantly lower levels of participation and access opportunities compared to other age groups. As a heterogeneous group, a portion of the elderly population is more likely to be marginalized in the context of digital development [10].Inter-generational differences and the substantial contrast in the acceptance and utilization of information technology between the elderly and the younger population are recognized as crucial manifestations of the digital divide [11]. This age-related digital gap hinders a significant number of elderly individuals from equally enjoying the benefits of the digital era. Bridging the digital divide for the elderly has thus become a global social challenge, highlighting the need to empower the elderly population to overcome these technological disparities.

In China, scholarly research on the elderly digital divide primarily focuses on factors influencing the "human-technology gap," optimization of the digital elderly care environment, and the design of elderly care policies [12]. Studies reveal that the formation of the elderly digital divide is not the result of a single entity or a singular factor. The needs of the elderly encompass emotional, daily consumption, informational, social, and entertainment needs. However, insufficient media literacy proves to be a hindering factor for the elderly in adopting new media [13].

The integration of digital life, relying on smart devices and broadband networks, introduces factors such as cost, economic concerns, and "user preferences" in product design as reasons for the elderly's reluctance to embrace digitization [14]. Addressing the issue of the elderly digital divide requires a multi-dimensional collaborative governance system led by the government, driven by the market, supported by society, with family involvement, and active participation from the elderly. The goal is to construct a smart aging society that is shared by people of all ages.Nevertheless, relevant research in China is still in its early stages, requiring further development of theoretical frameworks. It is crucial to emphasize the subjective initiative of the elderly and analyze the generation logic and coping strategies of the elderly digital divide through a systematic theoretical perspective.

3 Methodology

This study aims to understand the attitudes and perceptions of the elderly in the Sichuan region towards the integration of the digital economy with the health and wellness industry. Key research objectives are to explore the elderly's digital needs and challenges, survey the availability of skilled professionals in health services, analyze concerns about information security and digital literacy, and examine awareness of policy support and barriers to integration. To achieve these, the research employed questionnaires and semi-structured interviews. A total of 445 questionnaires were distributed, and interviews were conducted with managers of health services and digital technology professionals. The questionnaire assessed the elderly's understanding of digital and health integration, infrastructure usage, service expectations, and information security awareness. Interviews provided deeper insights into the integration's current state, focusing on service status, talent in institutions, and security management.

4 Result

The survey commenced in late October 2023 and spanned over a month. A total of 445 questionnaires were initially distributed, and after screening out invalid responses, such as those completed in less than one minute, the final number of valid questionnaires amounted to 396. This resulted in an effective questionnaire recovery rate of 88.99%. The demographic information from the respondents is presented in the table 1 below:

Table 1. Demographic information

	term	frequency	percentage	Accumulated percentage
Gender	Male	230	58.08%	58.08%
	Female	166	41.92%	100.00%
Age	Below 50	57	14.39%	14.39%
	60-70	144	36.36%	50.76%
	70+	162	40.91%	91.67%
	50-60	33	8.33%	100%
	60-70	57	14.39%	14.39%
Income	Below 10K	8	2.02%	2.02%
	10K-30K	54	13.64%	15.66%
	30K-60K	248	62.63%	78.28%
	60K+	86	21.72%	100.00%

4.1 Digital Infrastructure and Technological Applications

Ninety elderly individuals mentioned that the digital infrastructure in their community or residence is inadequate, with insufficient internet coverage. Sixty-seven respondents indicated that, due to inconvenient digital devices, they find it challenging to use digital technology. One hundred thirty-five elderly individuals expressed that the limited application of digital technology has hindered their access to digital health and wellness services.The specific details are shown in Table 2 below:

Table 2. Key Observations on Digital Infrastructure and Technology Usage

Main Points	Number	Percentage
Inadequate Infrastructure	90	22.73%
Inconvenient Digital Devices	67	16.92%
Insufficient Application of Digital Technology	135	34.09%

4.2 Talent Shortage and Management Aspects

One hundred eighty-two elderly individuals believe that in their respective regions, there is a talent shortage in health and wellness service institutions, with a lack of professionals. Ninety respondents mentioned that the scarcity of digital technology talents in the health and wellness industry hampers the promotion of digitalized health and wellness services. Regarding cross-industry collaboration, 112 elderly individuals perceive that limitations in traditional management systems hinder the effective integration of the health and wellness industry with the digital economy.The specific details are shown in Table 3 below:

Table 3. Key Observations on Talent Shortage and Management Aspects in Health and Wellness Services

Main Points	Number	Percentage
Insufficient Professional Talents	182	45.96%
Lack of Digital Technology Talents	90	22.73%
Overly Traditional Management Systems	112	28.28%

4.3 Information Security and Digital Literacy Among the Elderly

One hundred thirty-five elderly individuals express concerns about potential personal information leakage resulting from digital health and wellness services, indicating a certain level of apprehension about information security.Two hundred twenty-five elderly individuals perceive their understanding of digital technology to be limited, with low digital literacy, potentially impacting their willingness to embrace digital health and wellness services.The specific details are shown in Table 4 below:

Table 4. Key Observations on Information Security and Digital Literacy Among the Elderly

Main Points	Number	Percentage
Concerns about Information Leakage	135	34.09%
Limited Understanding of Digital Technology	225	56.82%

4.4 Insufficient Policies and Regulatory Barriers to Integration

One hundred sixty elderly individuals believe that there is currently a lack of relevant policies and regulations to support the deep integration of the digital economy and health and wellness industry. One hundred eighty elderly individuals perceive a significant divide between traditional industries, making the integration of health and wellness services with the digital economy challenging.The specific details are shown in Table 5 below:

Table 5. Key Observations on Policy and Regulatory Insufficiencies and Integration Barriers

Main Points	Number	Percentage
Lack of Relevant Policies and Regulations	160	40.40%
Significant Gap Between Traditional Industries	180	45.45%

5 Conclusions

This study, by delving into the attitudes and perceptions of elderly individuals in the Sichuan region towards the integration of the digital economy and the eldercare industry, identifies issues in digital infrastructure, talent shortages, information security, and policies and regulations. To address these concerns, a series of recommendations is proposed. Firstly, the government could establish a special fund to enhance digital infrastructure, promote technological knowledge through comprehensive digital training programs, and drive the application of digital technology in the eldercare industry. Secondly, comprehensive measures involve establishing specialized eldercare training centers, incorporating international experiences, and strengthening the training of technical talents. Addressing information security and digital literacy, recommendations include reinforcing information security management and implementing social education programs to enhance the digital literacy of the elderly. Regarding deep integration, emphasis is placed on clear policies and regulations, cross-departmental collaboration, and cooperation between enterprises and the government. These recommendations are expected to facilitate the coordinated development of the digital

economy and eldercare industry in Sichuan, alleviate related issues, and provide more robust support.

Future research can focus on tracking the long-term effects of the proposed recommendations, particularly in the areas of digital infrastructure development, talent cultivation, information security management, and policy and regulatory support. In addition, key research directions include evaluating socio-economic impacts, conducting interdisciplinary studies, exploring technological innovation and development, examining regional disparities, studying social engagement and feedback, and analyzing emerging trends. A comprehensive understanding of the holistic impact of the integration of digital economy and eldercare industry on society, coupled with attention to the elderly population's acceptance of new technologies, will guide future policies and practices, promoting a more comprehensive and sustainable development.

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