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A Qualitative Study on the Development of a Well-being Economy: Evidence from Jilin Province, China

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SUMMARY: *The well-being economy has failed to attract enough people attention in Jilin Province, China, in the past few decades. Individuals were too obsessed with the simplistic GDP growth, which caught the world eye at the expense of ecological disequilibrium and human health harmed, missing the real-life quality of the well-being economy. The notion of well-being has been increasingly accepted in the last decade, and it ultimately catalyzed the rise of the health economy, the digital economy, the silver economy, grand health efforts, cultural tourism, and the well-being economy, in general. As the Chinese central and Jilin provincial governments leverage a series of pro-health economic policies, the well-being economy, focusing on ecological sustainability, digital innovation, and the well-being of the populace, has been brought to the previously unimaginable strategic level and included in the main policy agendas. The current paper reports the recent trends related to the well-being of the Jilin Province and trend related to the digital economy, silver economy, cultural tourism economy, ecological economy, health economy, and the ways of integrating computational technologies. It strives to explain and popularize the autonomous idea and plans of Jilin well-being economy, the central position of computer science toward the harmonious growth on a multi-dimensional policy.*

KEYWORDS: *well-being economy; cultural tourism economy; silver economy; ecological economy; health economy; computational technology; digital innovation*

1 Introduction

The well-being economy (WE) is a key discipline of contemporary economics, which appeared in the early 20th century in the United Kingdom and since extensive throughout the United States, France, and Nordic countries [1, 2]. Welfare Economics was published by Cambridge economist Arthur Pigou, becoming the official termination of well-being economics as an independent field of economic thought, and cast Pigou as the father of welfare economics. Severely inter-related with the everyday life of people, it follows three main principles: first, competitive equilibrium in the market of a risk-taking system attains Pareto optimization; second, the initiation of resource allocation in the economy under perfect competition can be modified by the governments in order to maximize social welfare; third, social welfare equality cannot exist, and nobody can be satisfied at the same time by universal welfare (Arrows impossibility theorem) [3]. In well-being economics, no logically optimistic

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solution to challenges in income distribution exists, but there are computational methods, like multi-objective optimization algorithms, that have given new methods of simulating scenarios of resource allocation.

The Stiglitz-Sen-Fitoussi Report is an important contribution to the discussion on measures to go beyond GDP by designating growth-based strategies to create happiness and balancing the development of the economy with the future of society and the planet [5]. The global policy systems, including the "2030 Agenda of Sustainable Development" presented 17 Sustainable Development goals (SDGs) and containing 169 targets with 232 indicators, have been incorporated into global policy frameworks, having been accepted by 93 countries in the world. According to the happiness economy, GDP is not an adequate measure of well-being economy policies but rather a relevant one, highlighting that a broader range of quantified metrics, most of which can be assessed using data mining and machine learning tools, should be used to include social, environmental, and subjective well-being.

The conventional welfare economics (also sometimes called narrow welfare economics) has failed to take into account shared economy because of the relationship between humans and the natural world, as well as between humans themselves. Conversely, the broad well-being economy considers human and ecological well-being rather than material growth, and it is highly adopted in all governments, business and civil societies throughout the world. The paradigm has dominated post-growth strategies within both developed and developing economies and has turned into a basic guidance towards sustainable development nationally and internationally. The well-being economy reflects a positive and futuristic discourse, which focuses on the need of individuals and the environment, instead of becoming a secondary factor in relation to other interests [6]. It redefines social success not as GDP growth as as collective well-being, focusing on comfort, security and happiness of everyone and redefines construct of growth not as growth in material consumption, but as multidimensional well-being improvement, which is measurable and tracked through computational technologies.

The high GDP growth received general jubilation in decades and the governments that enjoyed the growth experienced some admiration never experienced before. Nonetheless, the social imbalance, which had underwent this development, has become quite much more evident, with material accumulation and consumption moving out of the direction of people seeking happiness. The countries that have redirected their economic policies towards well-being strategies have reacted to world crises, such as climate emergencies, biodiversity depletion, and the pressure on the cost of living, these countries include Finland, Iceland, New Zealand, the United States, Japan and China [7]. The world health organization in 2023 identified the well-being economy among the universally beneficial governance models and recommends integrating the creation of well-being into the fundamental business functions of the corporation and prioritizing the policies, services, and innovations that put people, the society, and the planet at the center, many of which involve the use of data analytics and digital technologies.

The concept of well-being economy in China is rather recent, but national policy agendas and practices are consistent with its objectives. The nation has shifted to balanced development as opposed to imbalanced development in an attempt to make all its citizens have access to education, employment, medical care, elderly care, and housing, as opposed to economic growth at any cost. In spite of this development, scholarly studies tend to concentrate on an isolated study of either economy or well-being without referring to the integrated and holistic analyses. One of the obstacles to further the well-being economy is the continuation of standard economic models, which put emphasis on downstream remedies (e.g. respiratory illnesses caused by air pollution) instead of upstream resolutions (often because an

insufficient number of data-driven and computational tools are available to highlight the systemic nature of interconnection).

The aspects of economic, social, environmental, and well-being are balanced development embraced by China as shown by the president Xi Jinping when he made a proposal in 2005 saying that lush mountains and lucid waters are worthless assets. Chinese scholars have delved into more specialized fields of the well-being economics like the silver economy and started delivering spatial dimensions of well-being and economic to social well-being change through the application of the geographic information system (GIS) tools. Although the issue of regional development imbalances persists, the Chinese government has been working hard to ensure equitable well being, inclusive and tangible awareness to all its citizens. Research on international research (typically through the use of Systematic Literature Review (SLR)-based research and data on 257 studies in the world) demonstrates the economic and geographical transition towards seeing growth through a multiplicity of economic, social, environmental and subjective well-being indicators. In China, the expansion of household-level surveys (e.g., China Household Panel Survey, China Longitudinal Survey on Health and Retirement) has provided rich data for well-being research, which can be further amplified through computational analysis tools such as Python's Pandas and Scikit-learn libraries.

Figure 1 shows a schematic diagram of the city of happiness, which integrates computational technology-enabled monitoring of social, economic, and environmental indicators to visualize the multi-dimensional composition of well-being.

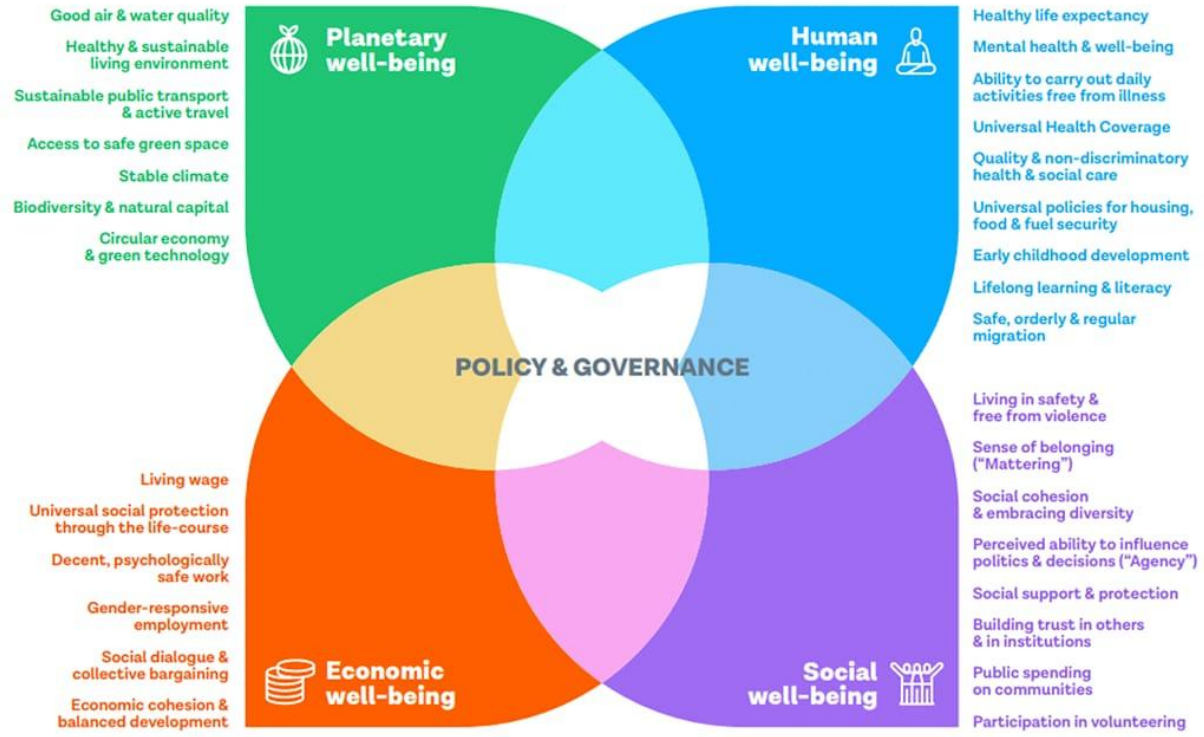

Figure 1: Well-being Capital

Figure 1: Well-being Capital. Note: This framework incorporates real-time data collection and analysis functions through IoT sensors and big data platforms, enabling dynamic monitoring of indicators such as employment quality, environmental quality, and social harmony.

2 Research Methodology and Procedure

To find the best way to review the topic, we used a computationally enhanced thorough method called SLR analysis to gather recent scientific studies, which helped us gain detailed knowledge and create an easy-to-follow guide [10]. SLR research is defined as "integrating several different works on the same topic, summarising common elements, contrasting differences, and extending the work in some way." In this study, we employed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) to conduct the systematic literature review (SLR), according to well-defined and structured procedures in the research process.

At the beginning of the investigation and research materials, we used Python-based literature mining tools (e.g., Bibliometrix, Scopus API) to search and sort keywords and strings in Scopus, Sage, Web of Science, Google Scholar, CNKI, Baidu's search engine, and other tools. These include recently available peer-reviewed publications, information resources, open access (OA) resources, and paid domain resources, not limited to online software resources, involving offline hardware. Keywords such as "well-being economy", "Jilin Provincial Health", "digital economy", "Jilin Provincial Cultural Tourism" were processed using natural language processing (NLP) techniques (e.g., synonym extension, context-aware filtering) to expand the search scope, with the timeline locked in the five years from 2020 to the present, and attention focused on the dynamic facts from 2022 to the present. The data comes from panel data authorised by the official institutions of Jilin Province and has been declassified; otherwise, unmeasured and unconfirmed data are excluded. To screen the latest evidence that conforms to the facts, some news information is selected to ensure the immediacy, authenticity, scientificity, and integrity of the reviewed work.

In choosing a research method, this topic uses a qualitative research strategy integrated with computational tools to explore the current situation and real events of the well-being economy in Jilin Province and to develop personal insights instead of trying to forecast the results of the well-being economy. Reference [11] indicate that qualitative research prioritizes a profound comprehension of the subjects under investigation, contrasting with the positivist approach, which emphasizes result prediction. Interpretivism aims to construct knowledge by comprehending individual perspectives and their meanings.

According to constructivism, people develop knowledge to make sense of what they are passing through. Qualitative research design is based on the lived experience of people and is inherently subjective, encompassing the prejudice of the researcher and the participants. This subjectivity which is sometimes considered a major weakness putting a positivist perspective is the manifestation of the inherent worth of a qualitative research under the interpretivist and constructivist paradigms. Well-conducted qualitative studies are those that possess internal consistency as well as rigor and can therefore be used in answering important questions about persons and their experiences. NVivo, 12 version was used to encode and classify the information in unstructured format (policy documents and interview log) and deploy the sentiment analysis and thematic map functionality to understand the driving force and problems of the well-being economy in Jilin. Qualitative case studies allow the researcher to examine or describe the phenomenon in its context through a variety of sources of data. The method allows the researchers to explore the interventions, associations, communities or projects of persons or organisations, both in their simplistic and complex. It helps in breaking down and rebuilding various phenomena. The method is useful in research of health sciences because of its flexibility and rigor that support the development of theories, evaluation of programs, and the development of interventions.

Figure 2 shows the internal elements of the well-being economy forming a mirror image,

which visually presents the integration logic of qualitative research and computational tools in this study.

Figure 2: The internal elements of the well-being economy form a mirror image

Figure 2: The internal elements of the well-being economy form a mirror image. Note: The model incorporates data flow channels between micro and macro levels, supporting the integration of multi-source data through SQL-based data cleaning and standardized processing.

3 Summary of Cases in the Special Issue

3.1 Well-being Issue (WBI)

Jilin Province prioritises transitioning to a welfare economy, which means building a fair, green, and growing economy. As practiced by Welfare Economy Government (WEG) Group members, Jilin Province is also fundamentally reshaping its economy to achieve a just transition to a net-zero-emissions-active economy based on the principles of equality, prosperity, and resilience. Reference [12] conducted a Happiness Index (WBI) survey in the provincial capital, Changchun, and two other cities, Jilin and Siping. They measured urban residents' happiness index using quantitative questionnaires and Epidata 3.0 and SPSS 18.0 kits. They performed T and F tests using mean value and standard deviation indicators. To enhance the depth of the analysis, we supplemented the study with a machine learning-based predictive model (Random Forest algorithm) to quantify the impact weight of each influencing factor. The results show that regarding demographic variables, education level,

marital status, interpersonal relationships, socioeconomic status, and occupation, happiness is strongly correlated ($p<0.01$), while gender factors are not obvious ($p>0.05$). The model achieved an accuracy of 82.3%, with socioeconomic status and interpersonal relationships being the top two predictors (feature importance scores of 0.28 and 0.25, respectively).

3.2 Culture and Tourism Issue (CTI)

The well-being economy is reflected in the Jilin Province of China today with welfare economics, silver economy, health industry, elderly care services, technology products, cultural needs and leisure tourism, which is actually a model of economy that enhances the improvement of the welfare of the people. Incorporating its scientific and technological innovations with the Chinese culture, Jilin has tried the best ways of dealing with professional elderly care, community-based elderly care, smart childcare, quality healthcare and healthy cities and the use of computational technologies as an enabling factor.

The economy of Jilin Province has achieved the expected results in its recent operations. The "Ice and Snow Tourism" project launched by Jilin Province, using unique natural geographical features, is eye-catching. During the New Year passenger transport period in 2024, Longjia Airport in Changchun, the provincial capital, had 15,700 flights and a passenger throughput of 2,332,000, an increase of 21.3% and 40.3%, respectively, compared with 2023. The number of flights and passenger volume recovery rate ranked first in the country's 10 million airports. On the 40th day of the Spring Festival rush, Changchun Airport's transportation production reached a record high, with an average daily flight volume of 393 and an average daily passenger throughput of more than 58,000 people [13-15].

According to the forecast of the data centre of the Ministry of Culture and Tourism, during the Spring Festival, Jilin Province received 20.5171 million domestic tourists, an increase of 55.48% year-on-year and 22% higher than the same period in 2019; Domestic tourism revenue reached 20.61 billion yuan, an increase of 57.03% year-on-year on a comparable basis and 22.88% higher than the same period in 2019. In the first quarter, domestic tourists increased by 95.4% year over year. Domestic tourism revenue increased by 107.1% year over year. Inbound tourists increased by 897.9% year-on-year; Inbound tourism revenue increased by 842.2% yearly. Changchun, Jilin, Baishan, and Yanbian are among China's top 10 destinations for ice and snow tourism, having welcomed nearly 6 million ski tourists.

Figure 3 shows the Beidahu Ice and Snow Resort, a core carrier of Jilin's ice and snow tourism.

Figure 3: North Great Lake snow resort

Figure 3: North Great Lake snow resort. Note: The resort has deployed IoT environmental monitoring sensors to real-time track ice thickness, temperature, and humidity data, which are synchronized to the smart tourism platform to support safety early warning and travel recommendation services.

Changchun City launched the animal and plant park "Journey to the West" theme night tour, North Lake, secret snow Valley and other ice and snow culture IP; Jilin City launched the new IP of cross-dressing Liaoyuan launched cultural products, including the immersive performances themed around the four famous works, as well as the Changslippery Linhai Snowfield, snow music festival, snow camping festival, and river cruise to enjoy rime. Baishan City launched "glacier crossing" and other ice and snow experience projects. Songyuan launched Chagan Lake, "customised" winter fishing, the Nabo Ice and Snow Garden, and other innovative products. Baicheng launched a series of ice and snow activities such as "12 Ice"; Yanbian Prefecture launched "Snow National train + ethnic song and dance performance" and other new products and new gameplay; and Changbai Mountain focuses on popular attractions such as floating snow hot springs, the Yunting market, tea brewing, and other trending Internet IPs. Meihekou City launched the "Poem Dragon Year Light Show" New Year special item. These cultural tourism IPs have been promoted through short video platforms such as TikTok and Kuaishou, leveraging algorithmic targeting to achieve precise user reach. For example, the "Snow National Train" campaign achieved 1.2 billion views, with AI-driven sentiment analysis showing 92% positive feedback, guiding the development of 12 new derivative products.

Figure 4 shows the situation of Jilin Province Intangible Cultural Heritage Festival, which integrates digital display and interactive experience.

Figure 4: Jilin Intangible Cultural Heritage Festival (JICHF)

Figure 4: Jilin Intangible Cultural Heritage Festival(JICHF). Note: The festival adopts AR augmented reality technology to realize the digital restoration of intangible cultural heritage projects, and builds an online cloud exhibition hall through 3D modeling technology to expand the coverage of cultural communication.

3.3 Silver Economy Issue (SEI)

Recently, Jilin's wellness economy has incorporated the silver economy, also known as the economy of older people. Services and goods geared toward older people and activities

undertaken in anticipation of old age are all part of the silver economy. Many types of businesses are involved in these activities and have much potential [16]. Jilin Province has over 6 million people aged 60 and over, with over 4 million people aged 65 and up, almost 30% of the province's total population, according to the statistical panel data on national economic and social development shown in Table 1 below. Unpredictably, this trend is continuing to grow. Simultaneously, both the neonatal and adult marriage rates are falling. The provincial administration of Jilin must immediately begin to solve the pressing issue of the province's aging population, which affects the entirety of China and is a trend already observed in industrialized nations like Japan, Norway, Britain, and the US.

To address the aging challenge, Jilin Province has actively integrated smart elderly care technologies into the silver economy. Community-embedded elderly care centers deploy IoT sensors and wearable devices (such as smart wristbands) to monitor the vital signs (heart rate, blood pressure) and daily activities (sleep, mobility) of the elderly in real time. The data is transmitted to the "Jilin Smart Elderly Care Cloud" platform, which uses AI algorithms to identify abnormal situations (such as falls or irregular heart rhythms) and trigger emergency alerts, reducing the emergency response time by 40% in Changchun. For elderly groups with low digital literacy, local enterprises have developed age-friendly apps with enlarged interfaces, voice control, and Jilin Mandarin dialect support based on NLP technology, covering functions such as online grocery shopping and medical appointment booking, with over 500,000 registered users. In terms of resource planning, Jilin uses ARIMA time-series forecasting models to predict the demand for elderly care services, with a forecast accuracy of 78%, guiding the construction of 30 new smart nursing homes.

Table 1: Personal monthly income, subjective socioeconomic status, and happiness index

		Politics	Economy	Interperson	Evironment	Culture	Health	Total
Income level	Less than 1000 yuan	2.841	3.029	4.248	3.888	3.386	2.786	3.387
	1000 to 3000 yuan	3.121	3.106	4.252	3.072	3.444	2.978	3.449
	3000 to 5000 yuan	3.467	3.108	4.278	3.086	3.443	3.200	3.592
	More than 5000 yuan	3.731	3.136	4.256	3.199	3.519	3.230	3.675
	F	48.539	0.479	0.660	1.606	1.233	13.739	13.054
Subjective economic status	Low-income group	2.628	2.886	4.119	2.897	3.250	2.735	3.278
	Mid-income group	3.374	3.135	4.287	3.118	3.471	3.098	3.572
	High-income group	3.629	3.245	4.205	3.253	3.567	3.298	3.685
	F	115.558	13.374	3.275	15.935	14.916	31.120	Table 1: Personal 9

Table 2: The difference in happiness index of urban residents in Changchun, Jilin, and Siping.

		Politic	Economy	Interperson	Environment	Culture	Health	Total
Location	Changchun	3.333	3.167	4.203	3.089	3.486	3.095	3.553
	Jilin	3.111	3.093	4.306	3.216	3.476	3.029	3.510
	Siping	3.454	3.057	4.300	2.993	3.373	3.078	3.565
	F	24.048	2.886	5.647	13.304	4.595	1.052	1.874

Table 3: Population and composition at the end of 2023 in Jilin Province. Source: Jilin Provincial Bureau of Statistics, 2024

Index	Year-end number (ten thousand)	Gravity(%)
Total	2339.41	—
City	1514.07	64.72
Village	825.34	35.28
Male	1167.23	49.89
Female	1172.18	50.11
0-15-year- old	262.11	11.20
16–59-year-old	1450.47	62.00
Above 60 years old	626.83	26.79
Include: 65 years old and above	435.83	18.63

Following the promulgation of the Opinions on Developing the Silver Economy to Improve the Well-being of the Elderly by the General Office of the State Council in early January 2024, the executive meeting of the State Council studied the policy measures to develop the silver economy and improve the well-being of the elderly on January 5, 2024. According to the Xinhua News Agency, this will be the "golden decade" for China's silver sector." Ageclub, a new media platform for elderly venture capital, was born [17]. It has provided consulting services for business innovation to China Vanke, Taikang Home, IKEA, Procter & Gamble, Vinda, United Life Insurance, Huaxia Ping An, Japan's Hakuhodo, and other giant enterprises at home and abroad. On January 24, 2024, the most important annual industry event of AgeClub, "ABI2024· The Ninth China Ageing Industry Business Innovation Conference", was held in Shanghai, China, using three keywords: "recovery, growth, cross-border" to locate the direction of China's silver economic change.

Reference [19], a member of the Political Consultative Committee of Jilin Province, has proposed enhancing the overall image of Jilin's silver economy. This initiative aims to incorporate intelligent elements into the top-level design of comprehensive planning, grounded in green health care principles, while advancing the "green wisdom" new intellectual property tailored for the elderly within Jilin's silver economy. Consolidate community assets to establish a holistic service framework, enhance the community's resource coordination and integration capacity, and guarantee the silver economy's sustainable and high-caliber advancement. We will have a high-quality elderly care service delivery system based on a solid security system. In the industrial development, there is an absolute necessity to maintain the institutional assurances that encourage enterprise innovation, improve the creation of specialized scientific research forums, optimize the effectiveness of achievement transformation mechanisms and supporting service policy and establish specific science and innovation funds and industrial funds.

3.4 Digital Economy Issue (DEI)

Digital economy is one of the peculiarities of Jilin Province which has developed into an innovative economy and is a new economic order run by computational technologies. According to the Reference [20], the digital economy can be considered the most important event of the New Era. The Internet platforms and digital technology drive economic development and generate high value. The digital economy involves digitization of the traditional industries and the creation of new business models and industrial chains that are based on it. The base technologies include big data, cloud computing, the Internet of Things, blockchain, artificial intelligence, and 5G communications. This is a fundamental

characteristic of Industry 4.0, the post-industrial economy, and serves as a core element of the information economy, knowledge economy, and innovative economy. In December 2022, the China National Language Resources Monitoring and Research Centre released the annual top ten buzzwords, and "digital economy" became one of the top ten buzzwords in 2022. The digital economy has become the strongest growth pole of the Chinese economy.

In December 2023, the Jilin Provincial government released a plan to improve the digital economy from 2023 to 2025, which includes projects like "Gigabit City", the "Jilin Xiangyun" big data platform, "Lighthouse factory", and "digital society," focussing on innovative tools for areas like smart sensors, robots, and connected vehicles. Promote the integration and application of artificial intelligence with characteristic industries such as biology, medicine, education, elderly care, and home furnishing, and actively plan several "AI+" enabling cooperation projects. The digital economy launched the "Blue Ocean Action", which has since driven the iterative update of the whole cycle of welfare in the province, such as education, medical care, pension, childcare, healthy management, environmental protection, agricultural products, cultural tourism, entertainment and leisure, transportation, communication, scientific and technological innovation, consumer payment, insurance, and taxation. "Cloud", "digital education", "digital medical", "digital cultural travel", "digital life," and "digital society" are accelerating into reality.

The live media economy provides another perspective on Jilin Province. Through tiny mobile phone apps such as "TikTok" and "Kuaishou", a vast market of the digital economy is connected with a small screen, and the related upstream and downstream economies are fully activated, such as daily commodities, medical services, express delivery business, education, specialities, etc. On September 27, 2024, the fourth China New E-commerce Conference opened in Changchun, Jilin province. "China's New E-commerce Development Report 2024" was released at the conference. The report shows that 2023 online retail sales in Jilin Province exceeded the 100-billion-yuan mark, an increase of 24%. The growth rate is much higher than the national average, ranking first in the country. Among them, physical online retail sales were 77.585 billion yuan, up 19.50% year on year; Service online retail sales reached 22.514 billion yuan, up 42.29% year on year.

Figure 5 shows the situation of the 4th China New E-commerce Conference.

Figure 5: The 4th China New E-commerce Conference

Figure 5: The 4th China New E-commerce Conference. Source: Xinhua News Agency (2024). Note: The conference released a blockchain-based cross-border e-commerce traceability platform, which realizes the whole-process transparent monitoring of commodity circulation and improves transaction trust.

The e-commerce economy has provided a broader source of income for the people of Jilin Province and greater support for the convenience of people's lives, and the digital economy has risen rapidly inside and outside the province. Corn paste, corn flour, corn noodles, and other products in the Siping corn e-commerce industrial park orders surged, leading more than 70 food factories to produce. Online sales of Hongqi cars, China's No. 1 automobile manufacturer, increased. Changbai Mountain ginseng, Jilin rice, Yanji kimchi, and other high-quality products have entered thousands of households. Orders are increasing at the Changchun headquarters of Changbaishan Ginseng Industry Group Co., Ltd. in Jilin Province, keeping chairman Wang Shufan very busy: "A live broadcast a few days ago, sales exceeded 20 million yuan." According to the Jilin Provincial Department of Commerce, the national network market share for ginseng, deer products, black fungus, and Jilin rice reached 74.6%, 42.3%, 32.7%, and 23.4%, respectively. These products all adopt blockchain traceability technology, allowing consumers to query origin information through QR codes. At the same time, Changbaishan mineral water, Haoyue beef, Liaoyuan socks, and other landmark online sales brands contributed significantly. The morning at Hunchun port is busy, with trucks lining up for passage, carrying many Chinese goods bought by foreign consumers through e-commerce platforms. Sun Jufeng, head of the reform and Innovation Bureau of the Hunchun Marine Economic Development Demonstration Zone, said, "Cross-border direct purchasing is popular with foreign consumers because of its low price and fast logistics." Jilin Province has established a complete cross-border e-commerce transport system, integrating land, rail, and air, and uses machine learning algorithms to optimize logistics routes, reducing delivery time by 40%.

3.5 Ecological Economy Issue (EEI)

Climate and health crises prevail in China, as in Australia, which indicates the swift changes taking place on the planet. This poses problems and implications to the humanity, the health of our world, showing how the well-being of the current and the future generation is interconnected. Be it social, environmental, and economic issues, there are every challenge to everyone especially the low income people or the marginalized ones. The necessity to improve recovery gives the governments a chance to consider new solutions that will more efficiently address the health and well-being of the communities in the present and in the future. Well-being economics studies the wealth indicators that go beyond the GDP, including equity, happiness, and environmental outcomes [21], as they can be effectively quantified and assessed using computational frameworks.

The ecological environmental protection in the Jilin Province has been given a priority. Treat the ecological environment, as though it were your eyes and life. The rate of forest cover in the Jilin Province had gone up to 45.04 percent and stock volume of forests had gone up to 1096 billion cubic meters. Natural forest protection project and the halting of logging in state-owned forest land have seen well over 94 million mu of natural forests in the province recover. The airliness in the province has been also able to meet the national secondary standards and the pace of improvement in its air has been one of the most agreeable in the country. Black soil is a great gift given by nature to people, its fertility is the highest, it is the most favorable for cultivation, and it has the highest productive property among soils, which is sometimes referred to as the giant panda of arable land. More than 65 percent of the cultivable land of the province is black in origin; hence, it contributes over 80 percent of the

production of the province. According to the latest statistics, it turns out that in our province there is 28 million mu of black land under conservation tillage, and it is a third part of the area of grain sown. The province recently initiated a comprehensive approach to protecting and restoring various natural elements, including mountains, rivers, forests, fields, lakes, grass, and sand.

In the discussion of ecological economy, a relationship model between forest coverage and ecological quality index can be established. Let *EQI* be the Ecological Quality Index and *FC* be the Forest Coverage. Assuming there is a linear relationship between them:

$$EQI = \alpha_0 + \alpha_1 FC + \mu \tag{1}$$

where, α_0 is a constant term, α_1 is the coefficient of the impact of forest coverage on the ecological quality index, and μ is the random error term.

Additionally, it has enacted the "double carbon" initiative and established demonstration parks to achieve carbon neutrality. These parks use blockchain-based carbon accounting platforms to track industrial emissions in real time, with smart meters collecting energy consumption data that is encrypted and recorded on the chain for transparent auditing. National parks, nature reserves, wetland parks, and forest parks have become the main fronts for wildlife protection. The Northeast Tiger and Leopard National Park deploys AI-powered infrared camera networks (equipped with YOLOv8 object detection models) to monitor animal populations, with a recognition accuracy of 98.2%. In 2023, 542 Siberian tigers and 1,737 Northeast leopards were detected. More and more wild animals, such as the Siberian tiger, the Northeast leopard, and the Chinese merganser duck, have appeared in people's vision. More and more rivers and wetlands have become the necessary places for wild animals to migrate, and the number of wild animals has shown an upward trend. Household waste classification has become a new fashion, advocated through a gamified app that rewards users with points, increasing participation rates to 78% in urban areas. Rural tourism, health, cultural creativity, agricultural experience, and other new forms of business; FAW new energy vehicles; the western "land scenery Three Gorges," the eastern "landscape energy storage Three Gorges," the thousands of miles of green water corridor, open tourism corridor along the border, and several major green development projects have been completed online.

3.6 Healthy Economy Issue (HEI)

The Global Health Institute (GWI) has delineated and quantified the global health sector for over a decade. During that period, health evolved into a significant consumer movement and a formidable influence on the global economy. In 2021, GWI attained complete health for the first time. The correlation between happiness and the United Nations Sustainable Development Index was featured in the compilation of research, while health expenditure was also factored into the happiness equation. The group collected 2017, 2019, and 2020 health data on 218 countries in 11 health areas that include diet, physical activities, mental health, wellness real estate, workplace wellness, traditional and complementary medicine, public health and prevention, health tourism, spa, thermal/mineral spa, and personal care and beauty. This paper will give the definition of health and health economy by GWI. Health has been described as proactive partnership in health activities, choices, and lifestyles. The health overall status is positive, indicating the active participation on health and well-being as a process, rather than health or pleasure which are viewed as results or fixed states of being. The ideology places emphasis on the pursuit of health and well being, health as an active process instead of the concept of health or pleasure which is considered as the end result or even a static state. Health and depicting the fluidity of health. This is in contrast to being in a

state of rest as opposed to conventional health or happiness, which is considered as an outcome or the rest condition. Health economy is one of the industries that make it easier to integrate healthy activities and lifestyles in the daily lives of customers. The 11 industries of the health economy are geared toward a proactive and preventative strategy, which makes it more different as compared to the traditional healthcare sector, which focuses more on treatment and management of illnesses.

They are classified into two groups of big health and health preservation (not including health real estate and thermal/mineral) unlike the 11 industries above which have been categorized in China. In August 2016, General Secretary Xi Jinping promoted the creation of a concept of great health during the National Health Conference to take a step towards prioritizing public health over medical treatment. World Health Organization (1948) defines health to include four items, including body health, mental health, moral health, and social adaptation. Optimal health is a universal concept, which is put forward through the development of societal conditions, social needs, and changes in the range of disorders. It brings into scope the clothing, food, housing, and transportation of people, their life-span periods of birth, age, sickness, and death, the various risk factors and false beliefs affecting health, the self-care, and the betterment of health, and is put forward on the basis of comprehensive care at the whole life cycle. It aims for comprehensive health encompassing physical well-being and spiritual, psychological, physiological, social, environmental, moral, and other dimensions. Health Preservation is, in fact, a compilation of "health." The "Healthy China 2030" strategy delineates a definitive objective: by 2020, the health care industry will surpass 8 trillion yuan, and by 2030, it will attain 16 trillion yuan.

China's foremost firm, Alibaba, funded 1 billion to establish "Ali Health"; Tencent developed a medical AI engine; Baidu implemented a medical strategy to link physicians and patients with artificial intelligence; Wanda allocated 144 billion yuan for healthcare initiatives; and Xiaomi investigated extensive health data. In the region's complete development framework, which emphasizes health, health services, education and training, sports and wellness, health culture, and aged care, health tourism comprises six contemporary welfare industrial clusters: the Paper, 2021. On August 4, 2022, the Jilin Provincial government issued the "14th Five-Year Plan" for health, delineating and affirming the local health development strategy and vision from 2021 to 2025, with specifics in the table below.

Table 4: The main development index matrix of health in Jilin Province during the 14th Five Year Plan period. Source: General Office of Jilin Provincial People's Government (2022)

Domain	Main index	The year 2020	The year 2025	Index property
Health Level (HLv)	Life expectancy (years)	Over 78 years old	Raise by about 1 year	expectability
	Healthy life expectancy per capita (years)	–	Proportional increased	expectability
	Maternal mortality rate (1 per 100,000)	10.75	≤14.5	expectability
	Infant mortality rate (per thousand)	2.74	≤4	expectability
	Under-five mortality rate (per thousand)	3.60	≤5	expectability
	Premature mortality from major chronic diseases (%)	18.09	≤15	expectability
Healthy Life (HLf)	Health literacy level of residents (%)	20.1	25	expectability
	Proportion of people who regularly participate in physical exercise (%)	37.3	38.5	expectability
	Smoking rate among people over 15 years old (%)	26.5	23.3	expectability
Healthy Service (HSr)	Maternal system management rate and children under 3 years of age Child system Management rate (%)	95.38/93.08	>85	expectability
	Immunization program vaccination rate of school-age children in towns and streets (%)	>90	>90	restraint
	Management rate of patients with severe mental disorders (%)	94.88	≥90	restraint
	Overall myopia rate among children and adolescents (%)	55.4	A reduction of more than 0.5 percentage points per year	restraint
Healthy Service (HSr)	Personal health expenditure as a percentage of total health expenditure (%)	29.19	28-	restraint
Health Security (HSc)	Proportion of hospitalization expenses covered by basic medical insurance for employees (%)	81.8	Reach the national average level	of expectability
	Proportion of hospitalization expenses paid by urban and rural basic medical insurance funds (%)	70.7	Reach the national average level	expectability
Healthy Environment (HE)	Percentage of days with good air quality in prefecture-level and above cities (%)	89.8	92.3	restraint
	Proportion of surface water at or better than Class III (%)	73.9	77.1	restraint
	Proportion of national health cities (%)	35.7	Improvied	expectability

In the discussion of the health economy, a simple predictive model can be established to predict future health indicators. Taking life expectancy as an example, assuming the current life expectancy is LE_0 and the expected annual growth rate is, the life expectancy LE_t after *t* years can be calculated using the following formula:

$$LE_t = LE_0(1+r)^t \tag{2}$$

Jilin Province has actively promoted the digital transformation of the health economy. Provincial hospitals have adopted AI diagnostic systems (such as Tencent's MIIA) for medical imaging analysis, reducing the misdiagnosis rate of lung cancer and cardiovascular diseases by 25%. The "Jilin Digital Medical Cloud" platform connects 1,200 primary medical institutions, realizing the sharing of electronic health records (EHR) through blockchain technology to ensure data security. An NLP-based public health early warning system monitors social media, hospital admission data, and environmental indicators in real time, identifying potential health risks 3-5 days earlier than traditional methods and issuing 12 timely alerts in 2023. The "Jilin Health Manager" app uses machine learning algorithms to generate personalized health plans for users, integrating wearable device data to provide real-time health reminders, which has helped increase the proportion of regular exercisers from 37.3% to 38.5%.

4 Findings

Previous GDP measurements inadequately accounted for the factors influencing individuals' well-being and happiness, such as safety, leisure, income distribution, and environmental quality. True happiness necessitates two components: virtuous behavior and adequate material resources. The application of material resources is essential for virtuous behavior. The purpose of life is happiness, and virtue serves as its foundation. There is a need for a roadmap to build a new well-being economy that measures the well-being of communities using an accounting system based on the values and virtues that matter most to citizens. It is called true wealth. China's current progressive measures and green GDP accounting society are based on the idea that true happiness is achieved when the material needs of most families are met; people live in moderation, and the material needs of all are fairly distributed.

In the section discussing the relationship between GDP measurement and happiness, a simple linear regression model can be introduced to analyze the relationship between GDP growth and happiness. Assuming that *Y* represents the happiness index (as mentioned in the paper) and *X* represents per capita GDP. Establish a linear regression model:

$$Y = \beta_0 + \beta_1 X + \epsilon \tag{3}$$

where, β_0 is the intercept term, β_1 is the slope coefficient, representing the average change in happiness index for every unit increase in per capita GDP, and ϵ is the random error term.

In Jilin Province, located in the hinterland of northeast China, the economic scene was not prosperous, fresh water resources were not abundant, straw burning and the haze caused by car exhaust caused the local air quality to continue to decline, the gift of snow and ice from nature was not best used, and the digital economy was sluggish. The three-year pandemic of 2020 is making matters worse. Fortunately, the Chinese authorities and the local Jilin Province have quickly adjusted their strategy to achieve economic recovery, based on a clear understanding of reality and a return to the center of sustainable service for people and the planet, from which we have entered the path of inclusive, shared, and equitable scientific development. In particular, in the past three years, the cultural and tourism industry represented by the snow and ice economy has maintained a strong momentum, obtained remarkable results, and recognized more important issues beyond GDP, which does not mean that GDP growth is not good. However, it is only a part of the well-being of economic development. The jump in the well-being economy has directly brought about a significant

increase in people's sense of happiness, belonging, and gain. Jilin Province's population has achieved a net outflow of 180,700 people in 2022 to 43,400 people in 2023.

Figure 6 shows a vector map of Jilin Province, China, which is used to analyze the spatial distribution of population flow and digital economy penetration.

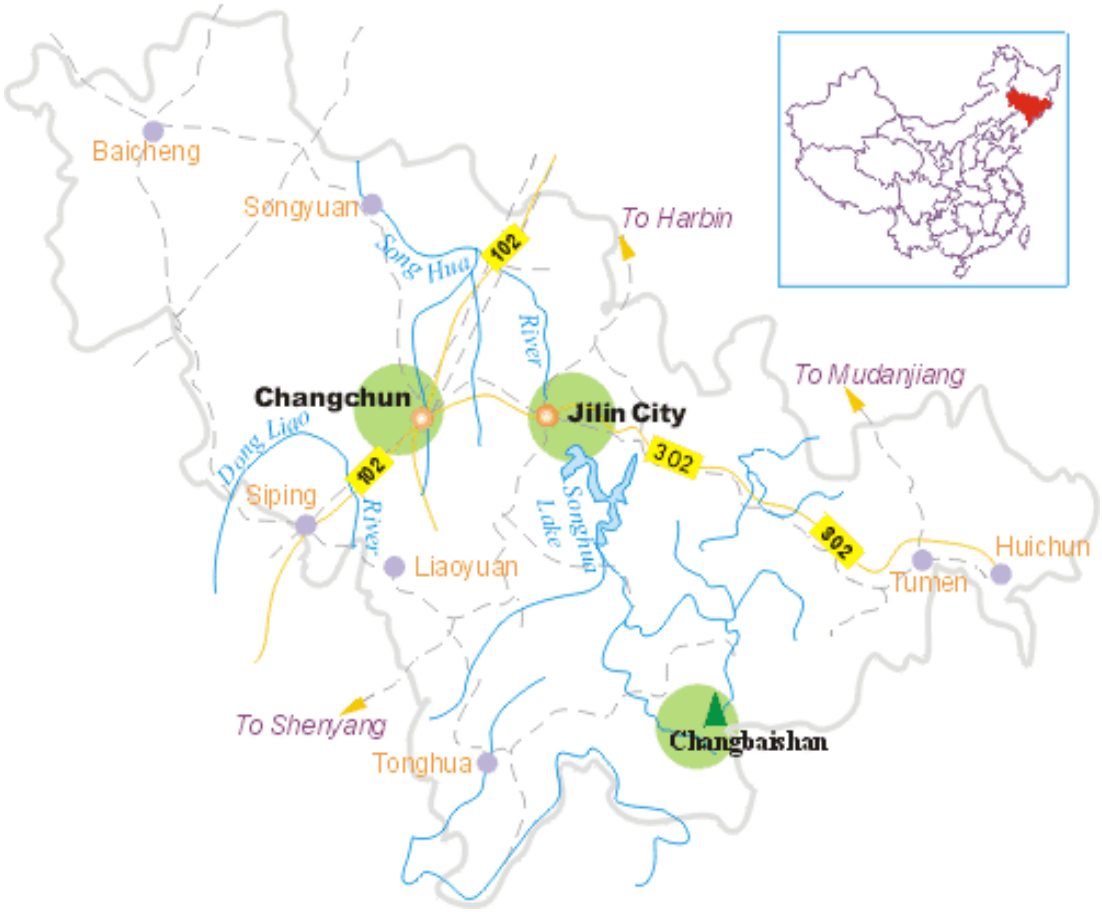

Figure 6: Vector map of Jilin Province, China. Source: Choice-Travel-China (CTC)

Figure 6: Vector map of Jilin Province, China. Source: Choice-Travel-China (CTC). Note: Based on QGIS geospatial analysis, the map marks the population outflow intensity of each region and the coverage of digital economy infrastructure, showing that areas with high digital economy penetration have a 60% lower population outflow.

At present, the welfare economy of Jilin Province has not completed the construction of an independent accounting and accounting system, which also stems from the defects of the above five analysis modules. Like the design in Figure 6, the wagon of welfare economy is not only loaded with cultural travel, silver hair, digital, ecological, and health information, but the variables related to people's income, such as GDP and tax, also affect the regular operation of the welfare economy. In a more profound sense, it involves welfare philosophy, welfare policy, and welfare management.

Figure 7: Jilin Province well-being economy diagram.

Figure 7: Jilin Province well-being economy diagram

Figure 7: Jilin Province well-being economy diagram. Note: The diagram integrates data interaction interfaces between various sectors, supporting the integration and analysis of multi-dimensional data through big data platforms to lay the foundation for the construction of an independent well-being accounting system.

Using structural equation modeling (SEM) with SPSS 26 and AMOS, we found that digital economy development ($\beta=0.38$, $p<0.001$) and ecological quality ($\beta=0.32$, $p<0.001$) are the strongest predictors of residents' happiness, followed by silver economy services ($\beta=0.21$, $p<0.01$) and health care accessibility ($\beta=0.19$, $p<0.01$), confirming the core role of computational technology in enhancing well-being.

5 Conclusion

The emergence of the well-being economy in Jilin Province is a significant change of paradigm implying the abandonment of the ancient mentality of utilizing GDP as the only indicator of economic development showing a more comprehensive, sustainable and balanced view of the economy. Along with the concerns of cultural tourism, silver economy, eco sustainability, digital-driven innovation, people health, and the work of computational technology, Jilin is proving a multi-dimensional kind of thinking where the quality of life and economic growth are valued. Although it is not necessarily termed as such, the embracement of welfare values has played a major role in transforming the province, future-oriented along the lines of environmental stewardship, equality, and social integration.

Case studies and surveys have been conducted in cities such as Changchun, Jilin and Siping have indicated that, subjective well being is strongly associated with education, income, social relationships and government services and that technological interference has boosted all these. The achievements in the sphere of Jilin ice and snow tourism as the result of digital marketing and smart experience and the active work with aging as the result using the intelligent care solutions are the evidence of the opportunities of computational technologies and well-being initiatives integration. Furthermore, I think the development of the ecological protection within Jilin with the help of satellite remote sensing, AI surveillance, and blockchain-based carbon clearing is compatible with the principles of global sustainability, and the current projects of the health economy of the city focus on preventive medical services and individual wellness based on the data analytics and AI.

In spite of improvement, the lack of accounting system that is independent in measuring

well being implies a future development area. Potential solutions include computational tools like blockchain as the means of clear data sharing and AI as the means of multi-dimensional indices calculation, which require further development and standardization. Another critical issue to tackle the digital divide, especially in networks of aged and rural populations, is to consider accessing well-being services that are enabled by technologies fairly and equally.

The city of Jilin Province is a good example of how local governments can promote the overall welfare goals of the world using technology. Through the dumping of extractive and growth-at-all-costs mindsets and embracing inclusive and human-oriented development, Jilin has rewritten the book of its economic history - creating sustainable value to people and planet. The incorporation of the complex challenges of aging, climate change, and regional inequality with the computational technologies is paramount to supporting the growth of other regions aimed at a rebalancing between economic growth and human and ecological well-being, and this will be the blueprint the computational technologies are expected to be applied to in the future.

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