Hindawi
Scientific Programming
Volume 2022, Article ID 4953516, 14 pages
https://doi.org/10.1155/2022/4953516

Research Article

Sustainability and Enterprise Economic Growth Management Based on Intelligent Signal Processing

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Received 2 December 2021; Revised 29 December 2021; Accepted 8 January 2022; Published 12 February 2022

Academic Editor: Ahmed Farouk

With the rapid development of China's market economy and the continuous deepening of system reforms, enterprises are also facing more problems while facing greater challenges. In order to deeply explore the role of intelligent signal processing in the development of enterprises in the context of 5G technology, this article uses data collection methods, questionnaire methods, and model building methods to collect data and analyze economic and institutional factors in the development of enterprises. The algorithm has been streamlined. First the impact of environmental factors in sustainable economic development is studied. The results show that, in the optimal economic growth plan, the optimal GDP is 27.65 trillion yuan, and the proportions of the three industries are 8.8%, 38.5%, and 49.7%, respectively; in the optimal pollution emission plan, the proportions of the three industries are 11.8%, 20.15%, and 65.5% respectively. In the neutral plan, the optimal GDP is 27.89 trillion yuan, and the proportions of the three industries are 8.5%, 39.7%, and 49.8%, respectively. This shows that, under the goal of pursuing the optimal environment, the economy can still be maintained. Further the advantages of the system in this article are discussed by analyzing the degree of synergy between them and the continuous growth of the enterprise; we can find that, from 2001 to 2006, the degree of synergy between enterprise technological innovation and institutional innovation has been continuously improved, and it has increased by 332.7% during this period, which shows that technological innovation, institutional innovation, and enterprise growth are coordinated development. It was basically realized that, starting from the intelligent signal processing technology, the economic model and innovation system that can develop together with the environment have been designed.

1. Introduction

Over the past 30 years of reform and opening up, China has experienced rapid economic growth, with an average annual growth rate of about 12%. This figure is a conclusion drawn by the national economic department through the general economic development. However, with the rapid economic growth, China has also paid heavy material and environmental costs. In terms of sustainability, as a large developing country, China has become one of the driving forces of global economic growth. If the economic system reform is not carried out in time, China and the world economy will pay huge institutional and social costs. More importantly, if the economy and enterprises are allowed to follow this trend, this will bring a devastating blow to the economic and environmental system.

The continuous growth of an enterprise is a necessary condition for an enterprise to succeed in other areas, and every enterprise hopes that it can continue to grow and develop. But people sometimes see inefficiency and institutional destruction in their daily lives. With the development of economic and cultural systems, our life information has multiplied from wireless communication systems such as mobile phones, Bluetooth, GPS, and WIFI. Intelligent signal processing technology is a new method and process based on the existing knowledge of mankind. It can effectively improve the status quo of China's economic growth and can revitalize the economic development.

In fact, there are countless relevant studies on the application of intelligent signal processing technology to enterprise economic development and institutional setting. In 2018, Arief aimed to test and analyze regional financial independence, capital expenditures, and governments with medium regional and income gaps. His conclusion was as follows: regional financial independence has a significant positive impact on economic growth, while regional financial independence with a moderate regional difference effect has a negative but not significant impact on economic growth. However, his research data is not transparent [1]. In 2018, Hughes disclosed information management techniques that can be used during the automated processing of biological growth media. In one embodiment, a method includes reading identification elements associated with a biological growth medium, as well as processing the biological growth medium in an automated system according to the processing parameters. Unfortunately, the processing parameters are not expressed [2]. In 2018, Bletsas combined the recent advances in multiple access and realized communication ranges (on the order of hundreds of meters to kilometers). Thanks to intelligent signal processing, backscatter radio was upgraded to a de facto communication principle. However, it does not fit the actual situation very well [3]. In 2018, Havangi proposed target tracking based on H unscented particle filter and particle swarm optimization. The proposed algorithm combines the unscented particle filter and the H filter to estimate the target state. The performance of the proposed algorithm is demonstrated by Monte Carlo running and compared with the performances of other methods. Unfortunately, the research depth is not enough [4]. In 2016, Koppal believed that the ubiquity of smartphones and other mobile vision systems had begun to change the way humans and machines interact with each other and the way they interact with the world. These types of platforms are rapidly maturing from research laboratories. Devices as described above described in are commercially available and may allow the creation of enterprise remote sensor networks. However, theoretical research is still not perfect [5]. In 2017, Ziani proposed an enterprise system detection scheme based on support vector machine as an information classification method and binary particle swarm optimization (BPSO) algorithm based on maximum class separability as a feature selection method. In order to maximize the separability of classes, the regularized Fisher criterion is used as the fitness function in the proposed BPSO algorithm. Unfortunately, there is no data to support this study [6]. In 2017, Wahlstrm proposed a particle-based framework. The filter uses dead reckoning to estimate the position of the propagating particles and then uses two measurement functions to update the particle weights. The results reveal the sensitivity and commercial value of speed data collected in many insurance telematics programs today, which are used to adjust premiums and provide corporate economic feedback. Although the research is more relevant, the content is more obscure and difficult to understand [7].

The innovations of this paper are as follows: (1) Based on the industrial structure of the industrial economy, it analyzes the impact of environmental policies on the corporate system reform and eliminates the impact of environmental policies on corporate system reform. (2) It formulates a comprehensive process for scientific analysis of the impact of scientific and technological innovation synergy on corporate sustainable development. (3) It constructs a technical model from multiple perspectives and builds a strong model. Through the above work, the research content of this article has been improved and the research depth has been expanded.

2. Methods Based on Intelligent Signal Processing on the Sustainability and Institutional Research of Economic Growth

2.1. Wireless Communication System and Intelligent Signal Processing Technology. Signal processing technology refers to the use of computer technology to process information. Computers operate extremely fast and can process large amounts of information automatically and with a high degree of accuracy. Intelligent signal processing technology is a process and method that transforms incomplete, inaccurate, and uncertain information into complete, reliable, accurate, and timely information. The creation of intelligent signals involves many fields of information science and is a complete tool for modern signal processing, artificial intelligence networks, complex system design, and evolutionary analysis, including artificial intelligence and technology [8]. Database technology is a core technology of information systems. It is a computer-aided approach to managing data, which investigates how data can be organised and stored and how it can be accessed and processed efficiently.

To understand the intelligent signal processing technology, we must first understand what a wireless communication system is, go back to the source of wireless communication, and discuss how the wireless communication system developed [9].

Compared with wired communication, wireless communication has the advantages of flexible cost control, reliable performance, and good growth expectations. However, the development of wireless communication is no different from the support of communication transmission. Around the 1980s, cellular communications entered a historical stage. In 1979, Japan and the United Kingdom took the lead in using cellular communication technology, followed by the United States. The cellular system is usually called a cellular system because of its low base station carrying capacity and its signal structure resembles a hexagon of a cell. The emergence of cellular systems makes people feel the beginning of wireless communication time [10]. Wireless communication is communication over long distances transmitted between multiple nodes without propagation via conductors or cables, and it can be through radios and other means. Smart communication is the process of introducing more artificial intelligence to make communication more convenient. Its structure is shown in Figure 1.

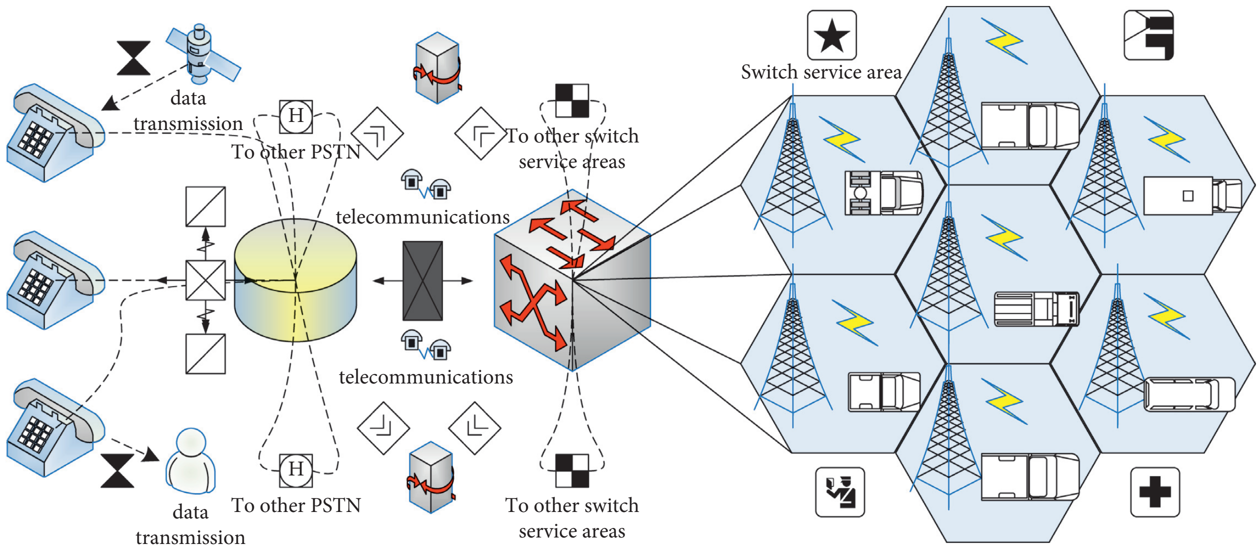

Figure 1: Structure diagram of the cellular system.

As shown in Figure 1, due to the development of network integration, business integration, and artificial intelligence, new technologies such as the Internet of Things, artificial intelligence, and big data require strong power and more visual use. 4G technology is difficult to meet our requirements [11]. The three stages of development of intelligent signal processing technology are as follows: (1) the analogue signal processing stage, where signals are stored and manipulated; (2) the simple digital signal processing stage, where operators and integrated circuits are mainly explored; and (3) the programmable digital signal processing stage, where software technology is used to process information.

Right now, 5G technology is in a historical era. In order to meet the needs of increasing system capacity and improving optical utilization, the three main technologies of millimeter wave, multidensity network, and large MIMO are the basis of 5G physical layer technology, as shown in Figure 2.

It can be seen from Figure 2 that, in the development of 5G, in addition to three physical technologies, new technologies such as NFV and SDN have also emerged. In addition to these cutting-edge technologies, nonrectangular access (NOMA) has become a testing ground for the physical aspects of future 5G cellular networks, especially mechanical communications (MTC). This kind of ground technology comes from the preexisting end of multiuser information processing; that is, the ground technology in multiple rectangles is parallel, and the code superposition combined with serial interference cancellation (SIC) is the best input and provides the best solution [12].

With the introduction of this wireless network, we will begin to study cutting-edge 5G technologies, such as multirectangular (NOMA) access, large MIMO channel arrays, and other technologies [13]. This research method is shown in Figure 3.

It can be foreseen from Figure 3 that technologies such as millimeter wave massive MIMO and NOMA can realize a bright blueprint for future 5G.

2.1.1. MIMO Communication Technology. MIMO technology means that the capacity and spectrum utilization of the communication system can be doubled without increasing the bandwidth. Rate can be defined as the existence of multiple independent channels between the transmitting end and the receiving end, which means that there is sufficient spacing between the antenna elements; therefore, the correlation of the signal between the antennas is eliminated, and the link performance of the signal is improved. MIMO can improve the performance of wireless communication systems in terms of signal generation and reliability [14]. Ten years ago, Thomas first proposed a major MIMO technology, which triggered a lot of research in the communications field. He proposed that the purpose of this technology was to solve the explosive growth of the communication movement in the future. A schematic diagram of a large-scale MIMO system is shown in Figure 4.

In Figure 4, we can see that, in the future wireless system, twelve or even dozens of users must be placed in the same domain and frequency source, and MIMO technology can be applied to hundreds of users in the base [15].

The analysis is as follows. We first assume that n transmitting antennas are used in a common MIMO system to serve g single-antenna users at the same time. Usually n is very large and much larger than g. In the link downlink communication stage, the signals of g users can be expressed as

$$\begin{aligned} b &= \sqrt{\alpha w} ha + o \\ &= \sqrt{\alpha_w} w^{(1/2)} ga + o. \end{aligned} \tag{1}$$

In the above formula, α_w is the transmit power of the transmitted signal at the base station of the system, and $h \in z^{g*n}$ is the link downlink channel matrix. In order to take advantage of the advantages of massive MIMO spatial freedom, the downlink channel state information needs to be obtained and used in precoding. Using scheduling and other functions [16], the capacity that the massive MIMO system can achieve in the downlink can be expressed as

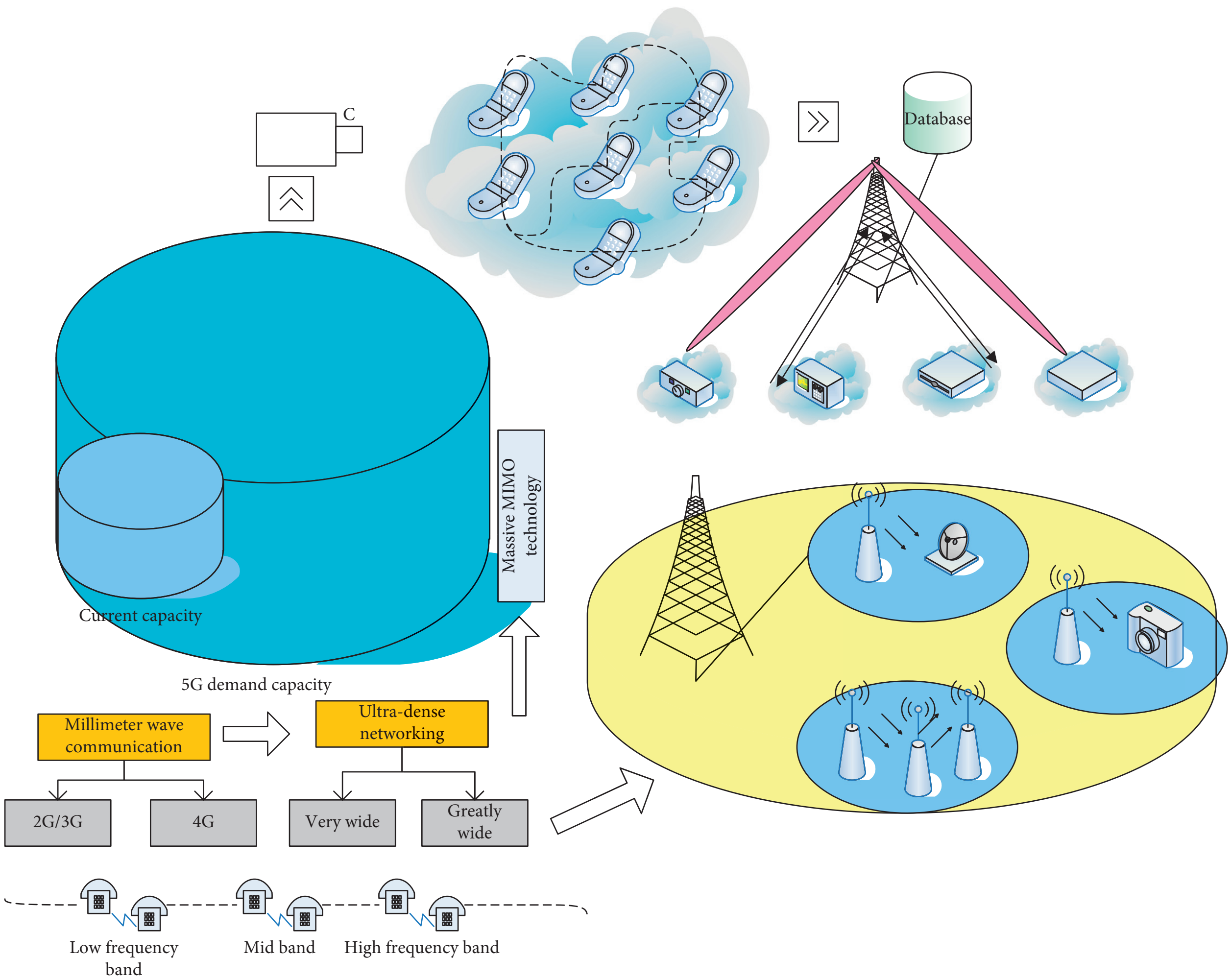

FIGURE 2: The three major technologies of the 5G physical layer.

$$z = \mathrm{iph}_2 \mathrm{wfs}\left(u_g + \alpha_w + \alpha_w hh^g\right). \tag{2}$$

$(.)^g$ is the conjugate transpose operation, and $u_g \in z^{g*g}$ is the identity matrix. Asymptotic orthogonality is the characteristic of h column vector; namely,

$$\begin{aligned} &\frac{\mathrm{iun}_{n\longrightarrow\infty} hh^g}{n = \mathrm{iun}_{n\longrightarrow\infty}} \frac{w^{(1/3)} gg^g w^{(1/2)}}{n = w} \mathrm{iph}_2 \mathrm{wfs}\left(u_g + \alpha_w hh^g\right) \\ &\approx \sum_{g=1}^{g} \mathrm{iph}_2\left(1 + \alpha_w n \lambda_g\right). \end{aligned} \tag{3}$$

When $n \longrightarrow \infty$, this superior channel propagation characteristic can ensure that the interference between users disappears. This further shows that the superiority of the massive MIMO system in terms of spectral efficiency can be guaranteed [17].

Based on the above analysis, we further assume that MF precoding is used at the base station of the system; then the received signal by the user can be expressed as

$$\begin{aligned} \mathrm{b} &= \sqrt{\alpha_w} hd^g t + o = \sqrt{\alpha_w} w^{1/4} gg^b \left(w^{1/3}\right)^g t^{n\geq g} \approx \sqrt{\alpha w} nwt + o \\ &\mathrm{q}\left(\sqrt{\alpha_v} h^g l + d\right) \\ &= h\left(\sqrt{\alpha_v} h^g l + d\right) \\ &= \sqrt{\alpha_v} nwl + h\ d + \left(\alpha_v nwl\right), \end{aligned} \tag{4}$$

where α_v is the transmit power of the uplink communication transmission signal, and we assume that the transmit power of all user signals is the same. This series of advantages can make the signal transmission process more smooth [18].

2.1.2. NOMA Communication Technology. NOMA combines the new technologies of 3G SIC and 4G OFDM, which not only overcomes the near-far effect problem in 3G systems but also solves the problem of cochannel interference in 4G systems. NOMA is a multiuser multiplexing technology that truly utilizes the frequency domain, time domain, and power domain. The technology to solve the interference in the power of each user in the power domain

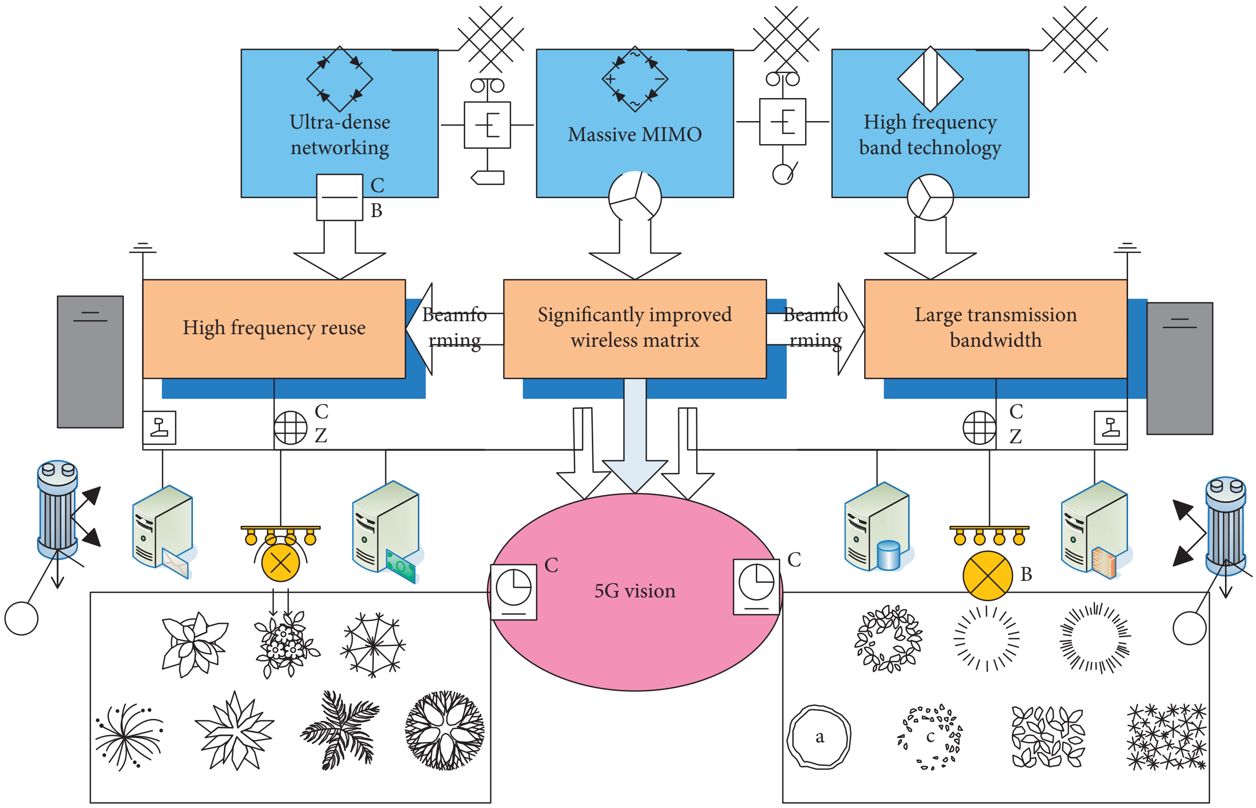

FIGURE 3: Massive MIMO technology can be mutually beneficial and complementary with ultradense networking technology and high-frequency band technology.

is the serial-to-interference cancellation technology SIC. Nonorthogonal multiple access (NOMA) technology is widely regarded as the most promising technology to solve the large-scale connection challenges of 5G networks to meet the system capacity requirements of big data and the Internet [19]. In NOMA, the system runs in an overloaded manner; that is, g users share o orthogonal resources (where $g > o$). The technical schematic diagram is shown in Figure 5.

Figure 5 shows the downlink transmission principle diagram of NOMA technology. To describe the basic principle that NOMA can expand the system capacity, we focus on the uplink channel with two users in the cellular network. We assume that user 1 has stronger signal power and user 2 has weaker signal power.

$$\begin{aligned} \mathrm{e}_1 &= \mathrm{iph}_2\left(1+\frac{q_1}{q_2+o_p}\right), \\ e_2 &= \mathrm{iph}_2\left(1+\frac{q_2}{o_p}\right), \end{aligned} \tag{5}$$

where o_p is the noise spectral density (noise power when unit bandwidth $d = 0.5$ Hz). q is the total power, which indicates that the capacity of a multiuser channel is the same as the capacity of a single-user channel with the same total power.

The actual situation is the same as that of orthogonal waveform multiple access [20]. Now consider the more general situation, where both users use the OF scheme. At this time, the capacity equation of two users can be given, as shown in the following:

$$\begin{aligned} \mathrm{e}_1 &= \eta\mathrm{iph}_2\left(1+\frac{q_1}{d_1 o_p}\right), \\ &= \eta\mathrm{iph}_2\left(1+\frac{q}{o_p}\right), \\ \mathrm{e}_2 &= (1-\eta)\mathrm{e}_1 + \mathrm{iph}\oiiint_{c_p}\left(v_m+v_p\right), \\ \mathrm{e}_{OF} &= \eta\mathrm{iph}_2\left(1+\frac{q}{o_p}\right)+(1-\eta)\mathrm{iph}_2\left(1+\frac{q/4.5}{o_p}\right). \end{aligned} \tag{6}$$

When two users use NOMA, the capacity is

$$\mathrm{e}_{\mathrm{noma}} = iph_2\left(1+\frac{\eta q}{(1-\varepsilon)q/3.6+o_p}\right)+\mathrm{iph}_2\left(\frac{(1-\eta)q/3.5}{o_p}\right). \tag{7}$$

In the above formula, q and p are the contrast parameters, respectively. Comparing these two capacities, it can be seen that NOMA has increased the user's channel capacity by 2.2% when the user signal has different degrees of attenuation. Comparing the two further, if the parameter η continues to decrease and the attenuation of user 2's signal further increases, the two-user capacity advantage of using NOMA will become more obvious.

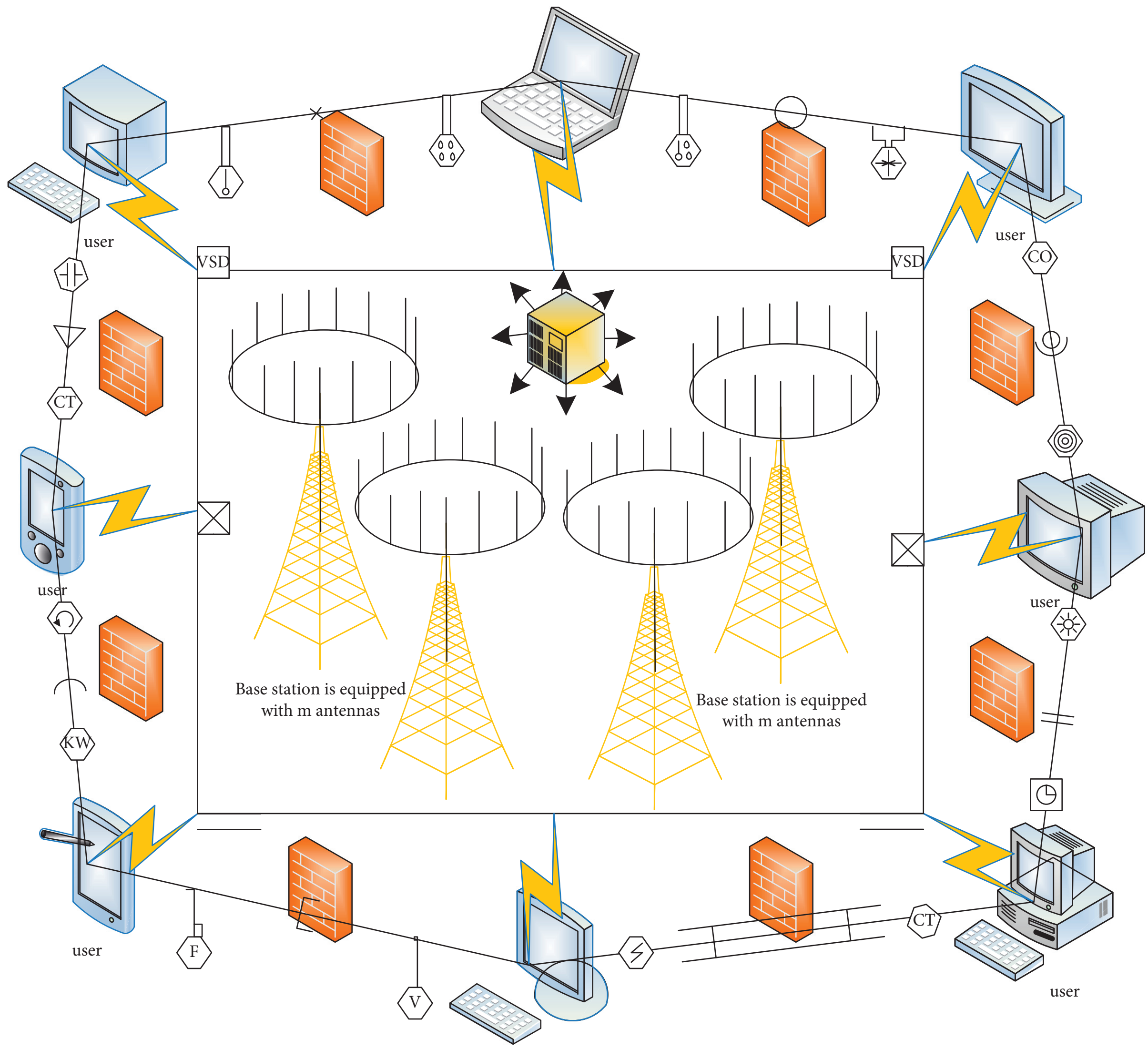

FIGURE 4: Schematic diagram of the massive MIMO system.

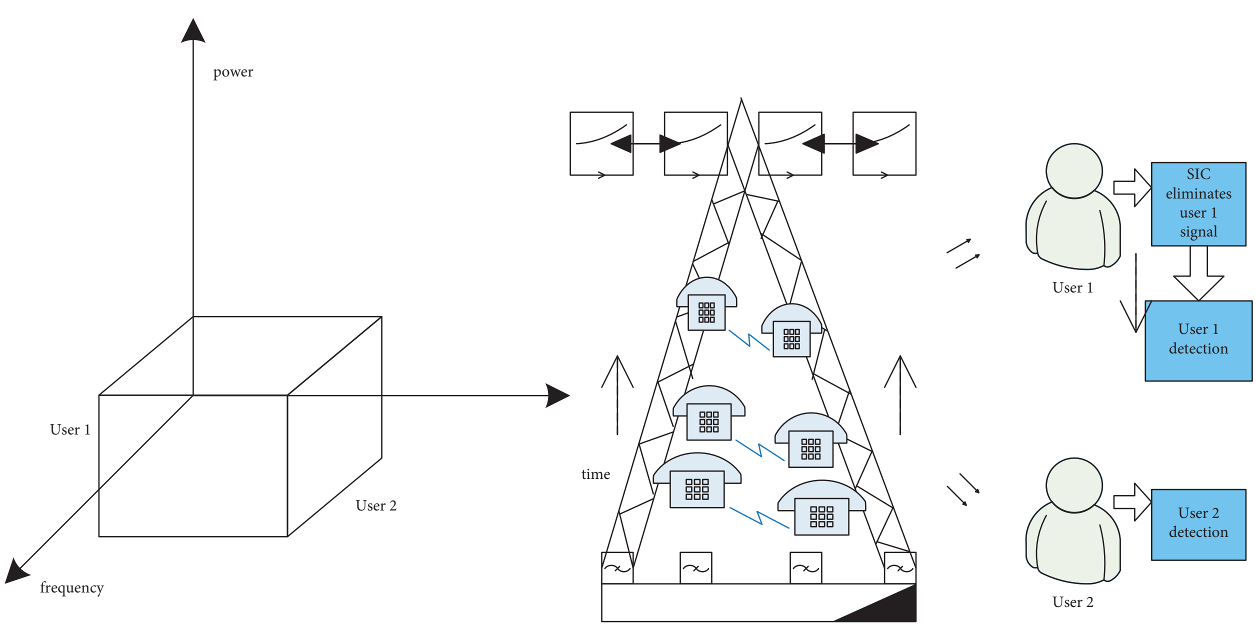

FIGURE 5: Schematic diagram of NOMA downlink transmission.

Both MIMO technology and NOMA technology are the latest communication technologies. Applying them to this article can not only increase channel capacity but also maintain high communication efficiency, improve signal quality, and ensure the intelligent signal processing process.

2.2. Sustainable Economic Growth and Institutional Innovation of Enterprises. The process of an enterprise, like the process of life, has experienced stages of birth, growth, development, and decline. It is the process of resource allocation and interaction with the outside world. The sustainable development of a company is to have a smooth transition at each stage of the company's development and to achieve a big leap before the beginning of the economic recession [21].

An enterprise is a complex man-made system, and the technological innovation plan and the system renewal plan are two subsystems in the industry. The high degree of synergy between the two will help the company's sustainable development, and a small amount of synergy will affect the company's growth and stability [22].

Sustainable economic development has deep connections between the three systems of economy, region, and society. This article also emphasizes the role of environmental policy in economic development.

In the field of economics, many economists have expressed their ideas on the design and innovation of the system from different angles. The research on the system can be traced back to the old system economy. The system can have three meanings: One is the specific participants in the game, such as corporate teams, colleges, government agencies, and justice. The second is to approach the program according to the rules of the game to distinguish it from the participants. The third is the balanced view of the game. Finally, institutions are defined as the main means of common belief and self-sustaining procedures [23]. The relevant functions of the system are shown in Table 1.

The enterprises innovate because of the potential benefits of the existing system. These potential benefits are caused by various factors such as the application of new technologies, changes in terminology, changes in tariffs and external benefits, and reduced trade [24].

Therefore, under the current development background, to fully develop sustainable economic growth and institutional innovation, it is inseparable from the development of the information industry. The key is to eliminate uncertainty. Information sources and material sources are the same as energy sources, and information sources and economic sources have the same characteristics. These characteristics are shown in Table 2.

Compared with material and energy, the source of information is more important. It is these regulations that make the information sources of many economic activities an irreplaceable source of other material sources. These specifications are shown in Table 3.

In the vertical industrial chain, a flexible enterprise system promotes the role of a sustainable economy. In addition, information resources for corporate economic growth and institutional innovation can be well integrated into signal processing technology for further analysis.

2.3. Intelligent Signal Processing Optimization Algorithm. Various intelligent signal processing technologies are widely used in areas such as sample recognition, information management, data mining, imaging, and communication signal processing. Among them, evolutionary computing, as an important branch of intelligent signal processing technology, has become the focus of development in recent years. Evolution is an automated artificial intelligence technology that uses evolutionary technology and technical know-how to solve problems. Artificial intelligence refers to the intelligence exhibited by machines made by humans. Usually artificial intelligence refers to technology that presents human intelligence through ordinary computer programs. The term also points to the study of whether and how such an intelligent system can be achieved. The application areas of artificial intelligence include machine translation, intelligent control, expert systems, robotics, language and image understanding, genetic programming robot factories, automatic programming, aerospace applications, huge information processing, storage and management, execution of complex organisms that cannot be executed, and complex or large-scale tasks. This article will discuss many intelligent algorithms and quantum evolutionary algorithms in detail. Ant colony algorithm, particle swarm algorithm, and artificial fish algorithm are three standard optimization algorithms [25].

2.3.1. Particle Swarm Algorithm. Particle swarm algorithm is similar to other evolutionary algorithms. The difference is that the optimized particle swarm does not use evolutionary operators on individuals like other evolutionary algorithms but treats each individual as a particle with weight and volume at a certain speed in the search domain and Fly search domain [26, 27].

For the convenience of discussion, let *l(a)* be the minimized objective function; then the current best position of particle u is determined by the following formula:

$$\mathrm{q}_u = (s+1) = \begin{cases} q(s), & l(a_u(s+1)) \geq l(q_u(s)), \\ a_u(s+1), & l(a_u(s+1)) < l(q_u(s)), \end{cases} \quad (8)$$

$$\mathrm{q}(s) \in \{q_0(s), q_1(s), \ldots, q_s(s)\} l(q_h(s)), \quad (9)$$

$$m_{uw} = m_{uw} + z_1 e_1 (q_{uw} - a_{uw}) + z_2 e_2 (q_{hw} - a_{uw}), \quad (10)$$

$$\mathrm{a}_{uw} = a_{uw} + m_{uw} + \sum_{u=1}^{e_f} \left[h_g + u_g^b + \frac{\sqrt[xa]{u_s}}{pt} \right], \quad (11)$$

where z_1, z_2 is called the learning factor and e_1, e_2 is a random number between [0.1, 1.1].

Through the above two formulas, particle u determines the next movement position.

Table 1: Functions of the system.

Concept	Effect	Concept source	Reliability (%)
Reduce transaction costs	Improve configuration efficiency	QC 1001	99.3
Motivation function	Stipulate the principle of distribution	QA 1002	98.9
Cooperate	Predictive behavior	QB 1003	99.7
Income distribution	Property rights system	QD 1004	99.5
Service function	Production and distribution	QT 1005	99.6

Table 2: Characteristics of information resources.

Feature	Scope of requirements	Specific description	Accuracy (%)
Demand	$1<p<1.2$	Cannot do without investment	86.8
Scarcity	$0.5<p<0.6$	The most basic characteristics	89.5
Optional	$0.3<p<0.8$	Strong permeability	85.5

Table 3: Particularities of information resources.

Features	User acceptance (0–10)	Features	User acceptance (0–10)
Sharing	3	Controllability	5
Timeliness	5	Cumulative and reproducible	7
Dissimilarity	8	Potential	9

The particle swarm algorithm introduced above is the real number coded particle swarm algorithm. In order to solve the discrete optimization problem in engineering, in the binary coded particle swarm algorithm, each dimension of the particle position vector is represented by 0 or 1, while the velocity vector does not do this [28]. When updating the particles, formula (11) remains unchanged, but, at this time, each element of the velocity vector represents the probability that the corresponding element of the position vector takes 0 or 1. Equation (10) is replaced by the following procedure:

$$\begin{gathered}\operatorname{tuh\,npuw}\left(m_{uw}\right)=\frac{1}{\left[0.5+uzi\left(-m_{uw}\right)\right]},\\ \text{when}\left(e<\operatorname{tuh\,npuw}\left(m_{uw}\right)\right),\\ \text{next}, a_{uw}=0.5; \text{when}, a_{uw}=0.1.\end{gathered} \tag{12}$$

Here, the penalty function m_{uw} converts the speed vector into a value between [0, 1]; e is a random number between [0, 1].

2.3.2. Artificial Fish School Algorithm. In water bodies, fish most often live in places with the most nutrients in the water. Therefore, artificial fish schools display the behavior of the fish schools based on the main body of the device to achieve optimization. The following is an artificial fish school model for finding the optimal location, and the implementation basis is as follows:

(a) Foraging behavior

We often see fish swimming freely in the water. Randomly select a location in the area. In many cases, if the area does not meet the conditions, random steps are taken. The above process is represented by mathematical terms; for example,

$$\{\mathrm{a}_{\mathrm{uofas}}=a_u+\operatorname{mess}(\text{pace})\frac{\left(a_k-a_u\right)}{w_{uk}}b_k<b_u. \tag{13}$$

Here, the current state of the artificial fish is a_u.

(b) Group behavior

Fish will naturally gather in groups during swimming, which is also a living habit formed to ensure the survival of the group and avoid harm. The formation of fish groups is also a vivid example of emergence.

$$\mathrm{a}_{uofas}=a_u+\operatorname{mess}(\text{pace})\left(w_{uk}\right)+\frac{\sum_{u=1}^{ol}a_u}{ol}. \tag{14}$$

Calculate the food concentration b_z^1 at the center location. If $b_z ol\leq\rho b_u$ indicates that the partner center is not too crowded, then perform equation (14); otherwise, perform foraging behavior.

(c) Rear-end behavior

During the swimming of the school of fish, when one or several of them find food, their neighbors will follow them to the food spot quickly.

$$\begin{aligned}\mathrm{a}_{\mathrm{uofas}}=&\operatorname{more}(\text{pace})\frac{\left(a_{\max}-a_u\right)}{w_{uk}}\\ &+\cap_{b_u}^{a_u}\left(u_a+u_b\right).\end{aligned} \tag{15}$$

If $b_{\max}ol\leq\rho b_u$ indicates that partner $\mathrm{a}_{\max}$ is in a better state and its surroundings are not too crowded, then execute equation (15); otherwise, execute foraging behavior. If $ol=0$, foraging behavior is also performed.

The fish school algorithm uses these three typical behaviors to create the basic behavior of a fish and achieves the goal of showing the best overall value in the group by optimizing the environment of each individual in the fish school.

2.3.3. Ant Colony Algorithm. The ant colony algorithm is a new type of simulated evolutionary algorithm proposed in the early 1990s. The ant colony algorithm is used to solve classic optimization problems such as design problems and assignment problems and has achieved good results. It demonstrated the excellent quality of insect swarm algorithm in solving complex optimization problems, especially different optimization problems, and proved to be a good method with broader development expectations [29–31].

2.3.4. Quantum Evolutionary Algorithm. Quantum algorithms are related to classical algorithms. Their biggest feature is the use of the high potential and coherence of quantum states, as well as the coherence between qubits. Compared with the classical algorithm, it is shown that they have a comparative quantum.

In QOE, the state of a qubit can be 0.5 or 1.5, and it can be expressed as

$$\langle \mathrm{x}| = \mathrm{x}\langle 0.1| + \lambda\langle 0.5| + |x|^2 + |y|^2. \tag{16}$$

Here, x and y are two complex numbers representing the probability of the corresponding state. The qubit encoding method uses a pair of complex numbers to define a qubit. A system with n qubits can be described as

$$\begin{aligned} \mathrm{m} &= \begin{bmatrix} x_1 & x_2 & \cdots & x_n \\ y_1 & y_2 & \cdots & y_n \end{bmatrix}, \\ \begin{bmatrix} \mathrm{x}_u' \\ y_u' \end{bmatrix} &= v(\pi)\begin{bmatrix} x_u \\ y_u \end{bmatrix}, \\ &= \begin{bmatrix} \sin(\pi) & -\cos(\pi) \\ \cos(\pi) & \sin(\pi) \end{bmatrix}\begin{bmatrix} x_u \\ y_u \end{bmatrix}. \end{aligned} \tag{17}$$

Here, π is the rotation angle of the quantum revolving door, and its specific value is obtained by looking up the table.

3. Experiments and Conclusions Based on the Design and Realization Method of Intelligent Signal Processing on the Sustainability and Institutional Research of Economic Growth

3.1. Measurement Methods for Corporate Sustainable Growth. At present, scholars mainly use three methods to evaluate the sustainable growth ability of enterprises.

3.1.1. Single Index Method. This method refers to the method of analyzing and evaluating the viability of a company, based on the method of training the company, and directly using individual financial indicators to calculate the company's sustainable development activities, such as assets per share and operating performance.

3.1.2. Comprehensive Evaluation. The comprehensive evaluation index system method can comprehensively evaluate the company's sustainable growth ability, but the combination of nonfinancial indicators and financial indicators makes it difficult to obtain and quantify data.

3.1.3. Sustainable Growth Model. This method is widely used in China. It is to determine whether the company has a lasting competitive advantage and sustainable growth ability by verifying the existing sustainable growth models in foreign countries.

3.2. Necessity Analysis. Intelligent signal processing technology is an advanced management technology and management system. It overcomes the shortcomings of traditional evaluation indicators and meets the needs of modern development of the industry. As a new concept and method, it promotes enterprise value management. Table 4 is used to discuss its use.

In short, it is very important to integrate intelligent signal processing technology into the management of an enterprise. It can promote the creation of enterprise value and help increase shareholder value. With the gradual development of Chinese products, the development of regulations, the continuous development of the capital market, and the successful application of this technology at home and abroad, it provides a good foundation for the intelligent application of intelligent signal processing technology in China.

3.3. Data Description. The data in this article comes from the 60-year calculation data set of New China and the 2000 China Statistical Yearbook and China Environmental Yearbook, including statistical data, corporate income, and profit margins. The income level from 2001 to 2005 can be obtained from "New China 60 Years Statistics" and relevant data for 2008 are from "China 2006 Statistics" and "2008 China Statistical Yearbook," and the city policy data for 2008 are taken from "Main Stock Data." Data protection data comes from "China Environment Yearbook 2005." The data is classified and described in detail as shown in Table 5.

3.4. Survey Samples and Results. Sustainable economic growth includes economic growth and environmental improvement. In different historical periods of economic growth, the focus of economic growth may be different. Therefore, this work has designed three simulation schemes to explore the optimal choice of enterprise systems under different platforms. Option 1 believes that economic development is more important than environmental protection. Option 2 is a neutral option given that environmental protection is more important than economic development.

Table 4: Necessity analysis.

Concept	Overview	Business satisfaction (0–10)	Application level (0–100)
Promote corporate value creation	Provide scientific decision-making standards	8	93.8
Reduce risk	Incentive system	9	99.8
Effective resource configuration	Profitability	8	91.8
Value creation ability	Avoid short-term behavior	7	93.6

Table 5: Data description and statistical results.

Variable	Number of samples	Sample mean	Sample standard deviation	Minimum	Max
Foreign investment (100 million yuan)	280	3215.246	5321.621	48.2	25487.36
Number of companies (individual)	280	9621.558	11254.44	328	68456
Investment amount (ten thousand yuan)	280	100000.023	10214.51	1125.874	591424.2
Consumer demand (%)	280	0.51	0.09254	0.241	0.7012

It believes that developing the economy is as important as protecting the environment.

The statistical data in this article comes from the 10-year "China Statistical Yearbook," and the consumption coefficient matrix is compiled based on the 2005 input-output table. Figure 6 shows the simulation results of the three scenarios.

It can be seen from Figure 6 that, in the optimal economic growth plan, the optimal GDP is 27.65 trillion yuan; the proportions of the three industries under this plan are 8.8%, 38.5%, and 49.7%, respectively; the proportion of the primary industry slightly decreases, and the proportion of the secondary industry witnesses a certain degree of decline, while the proportion of the tertiary industry has increased significantly. In the optimal pollution discharge plan, GDP remains at its actual level in 2008. The proportions of the three industries under the plan are 11.8%, 20.15%, and 65.5%, respectively. The proportion of the primary industry has risen slightly, the proportion of the secondary industry has dropped significantly, and the proportion of the tertiary industry has also risen sharply. This shows that, under the goal of pursuing the optimal environment, the economy can still maintain sustained economic growth. In the neutral plan, the optimal GDP is 27.89 trillion yuan, which is 106.8% of the actual value in 2008. The proportions of the three industries under the plan are 8.5%, 39.7%, and 49.8%, respectively. The proportion of the primary industry has declined slightly, the proportion of the secondary industry has declined to a certain extent, and the proportion of the tertiary industry has increased significantly. Figure 7 shows the composition of the output value of the total output of the 30 corporate sectors under the three optimization schemes.

It can be seen from Figure 7 that, regardless of the scheme, all corporate sectors with a decline in the proportion of total output appear in the secondary industry. This shows that, in the secondary industry, the pollutant emission intensity of the last six enterprises is relatively low. The pollution emission density of other industries is relatively high. In the pursuit of a win-win goal for economic growth and environmental improvement, we must vigorously develop the tertiary industry and give full play to the low pollution of the tertiary industry and its role in promoting economic growth.

Under the combined influence of the new technologies and new systems used in this article, Figure 8 shows the degree of synergy between them and the continuous growth of the company.

It can be seen from Figure 8 that the degree of synergy between technological innovation and institutional innovation in 2000 is 0.1, which shows that there is no synergy between technological innovation and institutional innovation in the growth process of an enterprise. From 2001 to 2006, the degree of synergy between technological innovation and institutional innovation of enterprises has continuously improved. During this period, it has increased by 332.7%, which shows that technological innovation and institutional innovation have developed synergistically during the period from 2001 to 2006. Furthermore, in 2000, the degree of synergy between technological innovation, institutional innovation, and enterprise growth is 0.1, which shows that technological innovation, institutional innovation, and enterprise growth are not synergistic; and, from 2001 to 2006, the degree of collaboration among the participants has been constantly improving, which shows that technological innovation, institutional innovation, and enterprise growth are in coordinated development.

3.5. Empirical Research. Taking into account the economic significance of the economic model, the availability and consistency of data, and the scientific nature of the results, this paper selects 2006 statistical yearbook data from a certain province. All data are derived from statistical yearbooks or calculated based on statistical yearbooks. The ADF (pseudoregression analysis) test result is shown in Figure 9.

From the statistical test shown in Figure 9, the regression equation has a goodness of fit of 0.925, which is a good goodness of fit.. The front coefficients of each variable are all positive and statistically significant. The regression results show that every increase of 1 unit of human input in the province will result in an economic growth of 2.015 units in the province; every increase of 1 unit of fixed capital will result in an economic growth of 1.304 units in the region; every increase of 1 unit of investment in the information resources industry will result in an increase of 1.304 units in

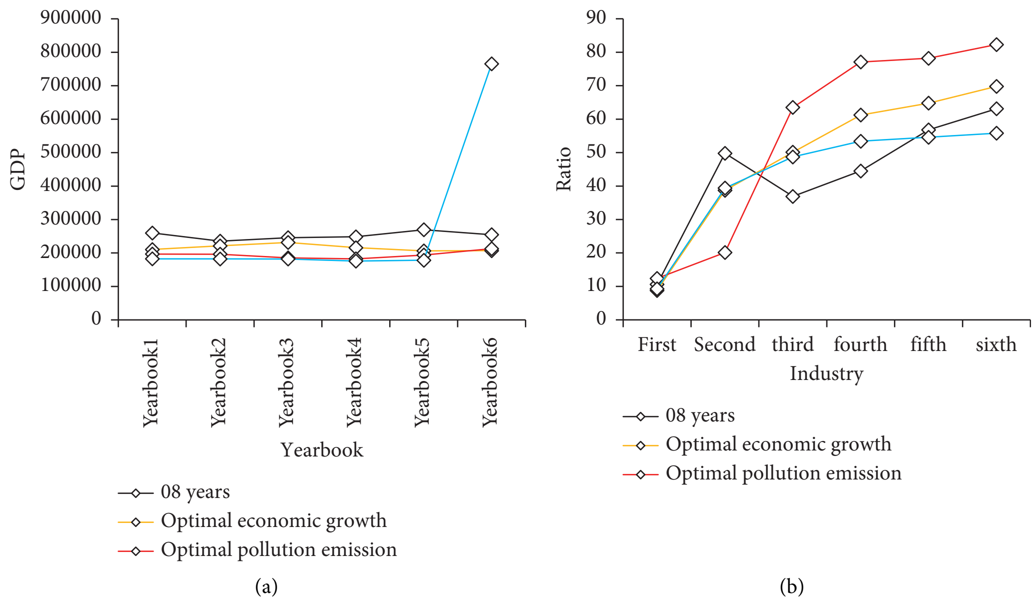

Figure 6: Results of multiobjective optimization of China's industrial structure.

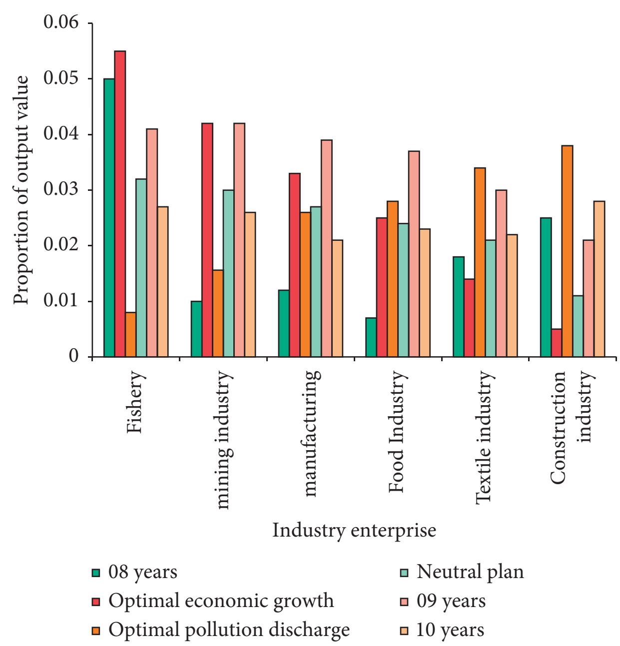

Figure 7: Comparison of enterprise economic development under different scenarios.

the region's economy. This will result in an economic growth of 4.86 units in the region. This shows that the information resource industry based on intelligent signal processing has a significant role in promoting regional economic growth. The information resource industry has a high degree of multiplier for economic growth and has exceeded the contribution of manpower and material to economic growth.

In order to verify the impact of the property rights of the enterprise and the establishment of the board of directors and the board of supervisors on the sustainable growth of the enterprise, these three variables are added on the basis of the above regression equation. First check the correlation between the variables, as shown in Figure 10.

It can be found from Figure 10 that, first of all, the three variables of intelligent signal processing technology, corporate system, and corporate culture are 0.8, 1.2, and 2.2, respectively, and they are positively correlated. At the same time, these three are positively correlated with the

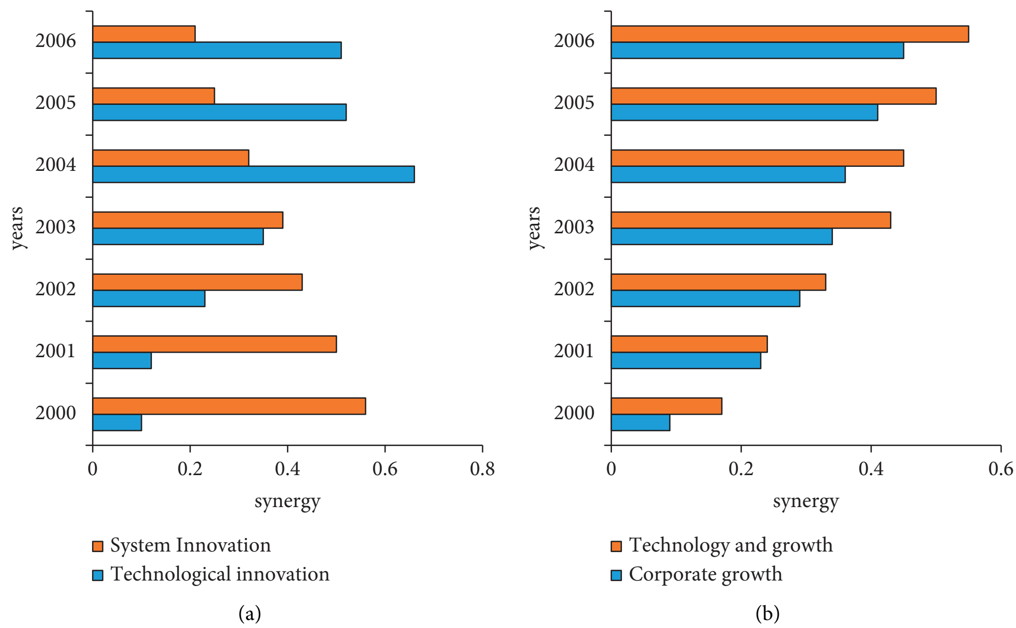

Figure 8: The degree of synergy between technological innovation, institutional innovation, and the sustainable growth of enterprises.

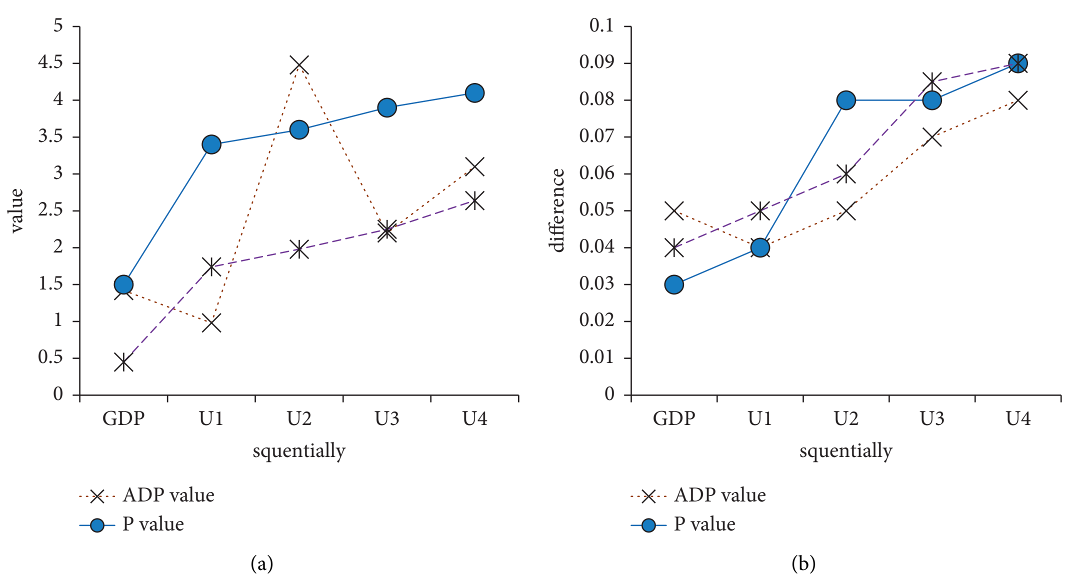

Figure 9: ADF inspection results.

continuous economic growth of the company. Therefore, it is shown that technological innovation, system innovation, and corporate culture innovation are mutually reinforcing relationships, and it is also shown that the synergy of the three can promote the sustainable growth of enterprises.

4. Discussion

The continuous development of an enterprise actually has two meanings. One is the improvement of the enterprise, that is, the survival of the enterprise, and the other is the sustainable development of the enterprise. However, the development of the enterprise refers to the strict improvement of the quality of the enterprise, which is the change in the quality of the process enterprise, including the improvement of the enterprise's renewable energy, management system improvement, and ability to adapt to environmental changes.

In addition, corporate culture has become one of the most important factors to promote the sustainable development of companies, such as Huawei, Haier, Hisense and other internal service companies, and Sony, Motorola, DuPont, and other foreign companies. Due to the complexity, risk, persistence, and nonregulatory characteristics

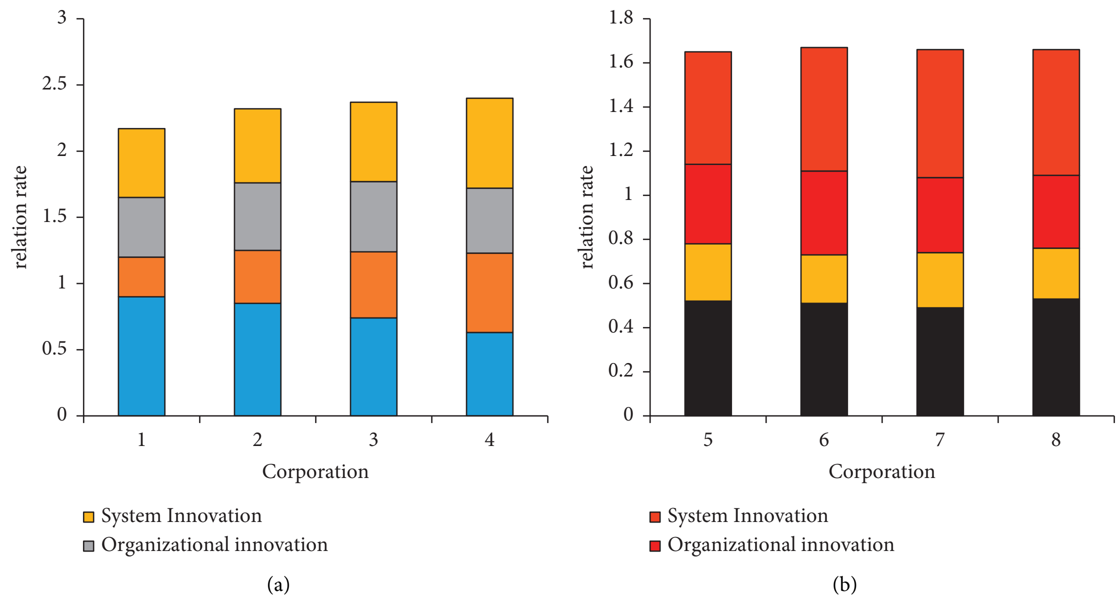

Figure 10: Correlation between variables.

of technological innovation, technological innovation can promote the cultivation of industrial culture. The founders and even all employees of the company and the department formulated the operation of the rules, which greatly promoted the company's technological development. The integration of industrial cultural innovation and technological innovation can promote the sustainable development of enterprises. The new corporate culture (such as companies encouraging innovation, high tolerance for innovation failure) has a strong support and promotion effect on technological innovation, which is crucial to the success of technological innovation and the sustainable development of enterprises.

5. Conclusions

With the rapid penetration of 4G tech in all walks of life, research on the next generation of 5G mobile technology at home and abroad is also in full swing. It is imperative to apply it to enterprise economic development and system innovation. In order to achieve the research purpose of this article, this article uses a variety of scientific methods, such as data innovation methods, and explains all the concepts involved and finally completes the construction of the system and economic model. In the empirical research of this article selects 6 statistical yearbook data of a province. The data shows that the regression equation has a goodness of fit of 0.925 and a good goodness of fit. The front coefficients of each variable are all positive and statistically significant. Each additional unit of investment in the information resources industry will result in an economic growth of 4.86 units in the region. This shows that the information resource industry based on intelligent signal processing has a significant role in promoting regional economic growth. In addition, the three variables of intelligent signal processing technology, corporate system, and corporate culture are 0.8, 1.2, and 2.2, respectively, and they are positively correlated. At the same time, It is also shown that the synergy of the three can promote the sustainable growth of enterprises. The shortcomings of this article are as follows: firstly, compared with foreign countries, internal information technology research also lacks innovation and design, and there is no in-depth case study or analysis; secondly, the model architecture is realized through questionnaire surveys, given the instability of data sources. The conclusion is that the relevant data is difficult to obtain again. Therefore, in further research, we will strengthen the information acquisition process, expand the information source channels, and use more examples to verify the research results and strive to make this article have a very broad application range.

Data Availability

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Conflicts of Interest

The authors declare no conflicts of interest.

Acknowledgments

This work was supported by General Projects in the 13th Five-Year Plan for Philosophy and Social Sciences of Guangdong Province in 2018 (GD18CSH02) and Special Research Projects for Philosophy and Social Sciences in Colleges and Universities in the 13th Five-Year Plan for Educational Sciences in Guangdong Province in 2019 (2019GXJK205).

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