Preparation of Camera-Ready Contributions Analysis of the Application and Effectiveness of Artificial Intelligence in Modern Taxation Work

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Abstract: With the continuous improvement and development of artificial intelligence, big data and other emerging tec hnologies, the efficiency of government finance and taxation work is constantly improving. Using the metho d of case study, this paper starts from the different status quo of governments' current use of AI to assist gov ernment tax work, and selects a number of cases to be analysed with the aim of exploring the impact of AI o n the modern financial and tax work, and finally concludes that AI has already brought great convenience to the tax work of governments. It is found that AI fuelling the high-quality development of the sports industry has ushered in development opportunities in terms of technology, data, policy and market, but it also faces r ealistic challenges in terms of technology, security, talent and ethics. Finally, this paper attempts to propose a partial solution to the risks of AI as an emerging technology, establishing a multi-party collaborative co-m anagement system and resolving ethical conflicts.

1 INTRODUCTION

In recent years, there have been impressive breakthro ughs in the application of artificial intelligence. 2023, OpenAI, a U.S. artificial intelligence research labora tory, released version 4.0 of ChatG-PT; in the same y ear, Baidu released version 4.0 of the Wenshin Big Model. Artificial Intelligence is based on a data + ari thmetic-driven approach to build a large number of A I models through multiple calculations and simulatio ns with existing data, capable of generating highly re alistic and valuable content in multiple fields and sce narios, and bringing about a profound change to curr ent business models and productivity growth.

At present, with the rapid development of artifici al intelligence, artificial intelligence models and thei r deep learning functions have been widely used in fi nance, education, healthcare and other fields, and go vernment departments in many countries have also in troduced artificial intelligence technology to assist in their daily work, which not only streamlines the wor k process and improves work efficiency, but also use s the advantages of the Internet to monitor the tax ris ks and safeguard the safety and stability of governme nt finance.

Countries have different national conditions, diff erent technological levels, and different methods of o riginal government tax management. This paper aim s to use the method of case analysis to select more ty pical cases in each country, analyse the similarities i n the successful experiences of each country, explore the positive impact of AI technology on the govern ment's fiscal and tax work, and try to put forward de velopment proposals with general applicability.

2 CHARACTERISTICS AND ROLE OF ARTIFICIAL INTELLIGENCE

Traditional artificial intelligence is mainly through a fixed programming language to make feedback on th e user's needs, providing convenient browsing and st atistical functions, but due to its lack of imitation, lea rning, and creativity, it can only respond based on ex isting data, and has certain limitations in its use.

With the development of technology, ChatGPT, a dialogue-based chatbot based on AIGC technology a nd presenting the characteristics of generative substit

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utability and high efficiency and convenience, has attracted wide attention from the society.

This new type of AI is able to capture user needs through dialogue, synthesize database content and various algorithmic models, and output innovative and constructive content. In addition, the new AI is also able to take full advantage of the Internet to capture data fluctuations and provide effective data monitoring for users. More interactive, flexible and intelligent, it is a strong learning application paradigm based on human feedback content with both digital twinning, editing and authoring capabilities (Li Eveningxia, Liu Xingxin, 2024).

3 DEZHOU WUCHENG COUNTY TAXATION BUREAU CASE

In the past, during the office process of traditional tax departments, it often happened that taxpayers had to go back and forth several times to make up for the materials because they did not understand the tax process. With the development of artificial intelligence technology, more online channels are being fully utilised.

Wucheng County Taxation Bureau of Dezhou City, in response to the taxpayers' demand for business, comprehensively integrates network tax resources, and gradually builds and improves a new "five-in-one" diversified taxation pattern with online taxation as the main focus, self-service taxation as a supplement, third-party agency as a supplement, mobile taxation assistance, and window taxation as the bottom of the pocket (Shandong Provincial Taxation Bureau of the State Administration of Taxation, 2020). For example, upgrading the electronic numbering system, combining mobile phone reservation queuing with offline numbering to reduce the waiting time of taxpayers; and establishing an online community for taxpayers who were not clear about the tax process in the past, so that the business staff can solve taxpayers' questions online in shifts. This way of handling greatly saves the waiting time of taxpayers, so that the masses can actually experience the intelligent tax handling, so that "one trip for nothing" becomes "only one trip". In addition to the convenience brought by the online applet, the business hall has also introduced a self-service robot, which can help taxpayers obtain the services they need more quickly through voice operation, route guidance and other functions for those who have difficulties in handling business offline.

In addition, the Tax Office of the Wucheng County Taxation Bureau in Dezhou City has actively explored new ways of serving the masses with artificial intelligence, based on the construction of an online tax platform, one-on-one counselling for enterprises, and encouragement of taxpayers to handle registration, approval of invoices, filing of financial accounting systems and other businesses through the Internet, transferring more than 60 per cent of the business volume of the window. At present, about 90 per cent of taxpayers receiving invoices have applied online and received them at self-service equipment terminals, but the traditional tax window is still retained to undertake the remaining 10 per cent of business in special circumstances, effectively realizing that the tax business can be done in the vicinity of the taxpayer's home, that it can be done at multiple points, and that it can be done less frequently and more quickly.

Nowadays, the construction of digital government is a key hand in promoting Chinese-style modernisation and the modernisation of the national governance system. With the reform of China's market economic system and the continuous innovation and development of artificial intelligence technology, the construction of China's digital government has achieved remarkable results. According to statistics, China's e-government ranking has risen from 78th in 2012 to 43rd in 2022, one of the highest increases in the world. Among them, China's online service ranking in 2022 will be 13th in the international rankings, and its telecommunication facilities ranking will reach 47th. This series of achievements demonstrates that China is constantly changing its role in building digital government, gradually transforming itself from a "participant" to a "leader", and opening up a path of digitalisation with Chinese characteristics.

4 GOVERNMENT AND BUSINESS CO-OPERATION IN BUILDING "SMART TAX"

In 2017, Beijing Municipal Bureau of National Taxation signed a strategic cooperation agreement with Ali Cloud Computing Co. The two sides will promote the application of cloud computing, big data and artificial intelligence technologies in the field of taxation through complementary advantages and resource integration, and jointly promote the construction of "intelligent taxation". This is an opening for the government and enterprises to explore a new path of cooperation, which will jointly promote the deep integration of Internet innovations and tax work, and carry out in-depth cooperation in the areas of infrastructure, business centre, data centre, intelligent customer service,

data innovation and intelligent office. It will also set up a joint research centre for intelligent tax management, explore the application of algorithms for intelligent case selection in auditing, dynamic credit score management, and tax risk management for large enterprises, and jointly build a "smart tax information platform" for Beijing State Tax.

Beijing State Taxation will focus on the introduction of an enterprise-level Internet architecture and the construction of a hybrid cloud-mode business centre and data centre to realise the "storage, communication and use" of data. It will also innovatively introduce ET intelligent customer service to provide taxpayers with the convenience of consulting and handling business without leaving their homes.

Nowadays, Beijing State Tax has cumulatively launched 31 optimisation projects in 11 categories, which have reduced the burden of the physical tax service hall by 51%, reduced the hall's human flow by more than 30%, and reduced the average waiting time of taxpayers by more than 40%, and gained the praises of the majority of taxpayers. By joining hands with Aliyun, the two sides will further give full play to their respective advantages, cooperate in good faith, and achieve mutual benefits and win-win results, so as to jointly accelerate the construction of tax modernisation, enable taxpayers to experience a more efficient and effective tax service, and create a more stable, fair, and transparent business environment of high quality.

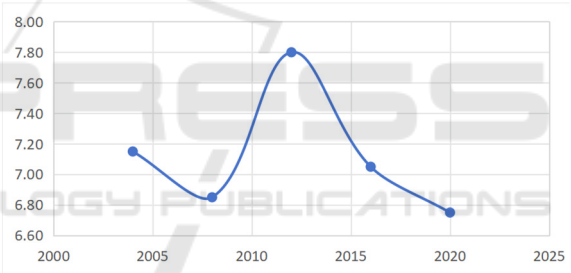
5 BIG DATA ANALYSIS HELPS HENAN INCREASE FISCAL REVENUE

In 2017, Beijing Municipal Bureau of National Taxation signed a strategic cooperation agreement with Ali Cloud Computing Co. The two sides will promote the application of

As an important part of the tertiary industry, the service sector plays an important role in expanding the Government's fiscal revenue; in terms of tax contribution, the proportion of tax revenue from the service sector in the total tax revenue has exceeded 50 per cent for many years in a row, making it the most important source of tax revenue.

Henan tax department analyses the tax big data and provides targeted reminders and guidance assistance on tax-related matters matching the business development for the cultural and tourism sector. As early as 2022, relying on tax big data, Henan tax department carried out tourism data analysis, put forward suggestions on various aspects such as developing tourism cultural and creative products and creating immersive performing arts projects, and formed a special report. Giving cultural relics, documents, oracle bone records and other new expressions of the times, and innovating communication methods through artificial intelligence, multimedia and other digital technologies (State Administration of Taxation, 2024).

Artificial intelligence plays an important role in the current period for the government to develop the tertiary industry, especially the service industry. Through data collection, only the indicator of tax cost rate is used as a reference [Taxation cost rate = Taxation cost in a certain period ÷ Taxation revenue in a certain period × 100% According to this indicator, the collection cost rate of a certain region or a collection unit, a certain tax system or a certain tax type can be calculated specifically]. After 2004, the cost of tax collection in China has remained above 6 per cent, which shows that "high cost and low efficiency" in tax collection and management has become a difficult problem in the field of tax collection and management in China.



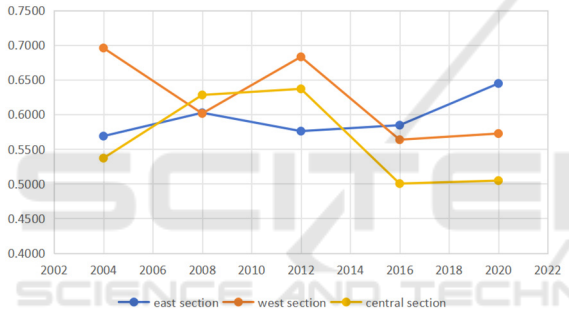
Data source: Zhi.com - "Wang Di, Shao Xuefeng. Institutional Efficiency with the Addition of Digital Technology.

Figure1: Tax cost ratio.

Based on the tax cost rate, this paper draws on the treatment method and some data of existing literature, and refers to the tax collection and administration efficiency model (TCAE) of its service industry (Figure 1), and makes preliminary calculations on the data of the tax collection and administration efficiency of the east, west and central China between 2004 and 2020(Figure 2) (Di Wang, Xuefeng Shao, 2023).

On the whole, China's service industry tax collection and management costs show a decreasing trend, but the tax costs are still high, and there is still a greater space for service industry tax collection and management efficiency to rise. Secondly, the service industry tax collection and management efficiency in the eastern and central regions both show certain fluctuation changes, while the eastern region shows a rising

trend in general, and there is no obvious increasing t rend in the central region; and the service industry ta x collection and management efficiency in the weste rn region shows a certain decreasing trend in general (Li Jianjun, 2011). It can be surmised that since the 21st century, the eastern region, as the main port of f oreign exchange, can have access to more new techn ologies from different countries, and thus take the lea d in launching technology pilots and gradually expan ding them to the whole country. In addition the impa ct of digital transformation and the application of AI technology is significant. in September 2015, the Sta te Administration of Taxation (SAT) implemented th e "Internet+Tax" action plan, which greatly accelerat ed the application of digitalisation in the field of taxa tion, and AI technology and intelligent big data have been more and more widely used in tax collection an d management of the service sector. after 2016 , the i ncrease in tax revenues and the decrease in cost rate of the service industry have shown large changes.



Data source: Knowledge Network - "Li Jianjun. Assessment and Analysis of Tax Administration Efficiency.

Figure 2: Descriptive statistics of tax administration efficiency in the East, West and Central regions.

6 EXAMPLES OF ARTIFICIAL INTELLIGENCE IN INTERNATIONAL GOVERNMENT

The development of artificial intelligence technology has accelerated the process of building a digital gov ernment in China, which has led to a qualitative impr ovement in the efficiency of modern financial and ta x work. And in the international community, AI tech nology has also gained the eye of many governments.

In Southeast Asia, on 5 February 2024, the Indian Ministry of Finance reported to Parliament that the c ountry's tax department had achieved great results in monitoring and identifying high-risk taxpayers suspe cted of inflating input tax credits using advanced dat a analytics and artificial intelligence models. An aud it of data for the period April-December 2023 alone i dentified 14, 597 cases of tax evasion, with a suspect ed inflated input tax credit of Rs 1, 800 crore, and 98 arrests were made in connection with the cases (Nati onal Board of Revenue, 2024). The Indian tax depart ment says it will continue to upgrade these tools, usi ng big data analysis to improve efficiency and build a better system of intelligent tax risk monitoring to e nsure government revenue.

In Europe, Austria, as an important member of th e European Union, attracts many foreign enterprises to invest. Austria also has a sound tax system and a s trict tax supervision mechanism, and a major feature of its government finance work is the establishment of a relatively perfect tax big data supervision syste m, in which the Predictive Analytics Competence Ce ntre of the Austrian Federal Ministry of Finance mak es use of big data and artificial intelligence to identif y tax risks and carry out real-time assessment and ris k push. In terms of coverage, Austria's tax big data s upervision basically covers all groups of the employe d population, and more than 6 million people can be assessed for tax risks in a year, which can greatly red uce the risk of fiscal revenues and expenditures and maintain the smooth operation of government work. The Austrian Federal Ministry of Finance's Compete nce Centre for Predictive Analytics The Competence Centre for Predictive Analytics of the Austrian Fede ral Ministry of Finance is responsible for identifying tax risks using, among other things, big data and artif icial intelligence, as well as tax risk pushing through the assessment of tax-related data in real time. Accor ding to statistics, only for payroll tax, Austria can ac hieve tax risk assessment for more than 6 million peo ple in a year through tax big data regulation, account ing for about 67 per cent of the total Austrian popula tion, basically achieving full coverage of the employ ment group.2022 Since 2022, Austria has recovered as much as 540 million euros of tax through big data risk assessment (National Tax Administration, 2024).

Austrian tax inspections are more varied and hav e a relatively strong big data regulatory capacity, and they use big data, both internal and external data sou rces. In particular, internal data sources consist mainl y of basic data stored in the Ministry of Finance, suc h as taxpayer registration data, tax assessments, decl arations, customs declarations or vehicle data; extern al data sources consist mainly of data from business registers, land registers or trade registers.

At the same time, the Austrian tax authority detec ts tax data anomalies through its self-developed math

ematical model, thus laying the foundation for tax risk assessment. The author suggests that Chinese enterprises investing in Austria should keep abreast of the requirements of the relevant Austrian tax laws and regulations and the latest developments, strengthen the importance of tax management, and do a good job in tax compliance management, so as to avoid abnormal reduction of sales data, abnormal increase of expenses, and significant reduction of tax burden, etc., which are easy to be judged as abnormal by the system, and thus to reduce the risk of being inspected by the tax authorities.

Elsewhere in the EU, the Danish Tax Administration automates the valuation of real estate with the help of robots, i.e. machine algorithms that automatically calculate or validate the pricing of real estate without any manual inputs from tax officers; the valuation model includes a total of 19 variables, such as proximity to amenities, such as schools and parks, and the level of pollution in the area (Kim Willsher, 2024). The Italian tax authority developed the VeRa algorithm to cross-reference financial data with tax returns, income, property records, bank accounts, and other electronic payment information to monitor taxpayers at higher risk of nonpayment; 1 million high-risk fraud cases were identified in 2022 alone. The Spanish Tax Administration has been using an automated debtor analysis program since 2015, which mines and analyses the amount of tax owed and the complexity of the case to classify debtors into five categories, which it uses to determine which collection methods to use (Joyce Beebe, 2024). Other EU member states use AI and big data to analyse granular features of taxpayer behaviour and carry out predictive analytics, enabling regulators to develop more precise regulations and policies based on taxpayer profiles (Jie Chen, 2024).

7 RISKS AND CHALLENGES

The development of artificial intelligence technology has accelerated the process of building a digital government in China, which has led.

The combination of artificial intelligence and government financial management is both an inevitable trend of the booming development of science and technology and an important element of the construction of the current social governance system.

As an emerging technology, artificial intelligence has two sides, on the one hand, in the current society to improve the efficiency of the government's tax collection work of the general demand for increased, emerging industries continue to increase, the tax work has become more complex and diverse, artificial intelligence technology with the help of data sharing, intelligent analysis of the tax work of the string together, can improve the government's ability to understand the public opinion, decision-making assistance and service supply capacity.

On the other hand, with the increasing level of network information sharing, the current network information is also facing more serious security problems, and the openness, complexity and high-speed iterative nature of artificial intelligence will also bring the administrative supervision of the object is difficult to identify, the main body of the lack of capacity, and the process of the governance of the more closed problems. As an emerging product, the current law on the regulation of artificial intelligence is not yet perfect, and the lack of legal regulation and the omission of regulatory procedures also pose a greater risk.

In addition, the development of AI will inevitably bring about changes in the structure of the workforce, according to a press conference of the Ministry of Human Resources and Social Security, by the beginning of 2017 China's unemployment rate reached 4.05%; by the end of 2023, the recruitment ratio of financial and tax positions at all levels of government across the country has reached 39:1, with the development of AI, more basic and repetitive work will inevitably be replaced, and the government and even society as a whole will further expand the competitive pressure on employment.

8 CONCLUSIONS

China's development of AI technology has a unique advantage, the implementation of the strategy of science and education, the strategy of strengthening the country with talents, and the strategy of innovation-driven development has provided a favourable policy environment for the development of AI technology, and China, as the world's largest country in terms of population, has created the necessary conditions for the combination of AI and the government's fiscal work with its diversified social needs. It can be learnt through the case study that AI has a positive contribution to maintaining government revenue and improving the efficiency of tax collection, and can be realised by reducing the cost of tax collection and management.

Based on the above analyses, this paper makes the following recommendations:

First, Continuing to improve the breadth and depth of the application of artificial intelligence in the area of modern finance and taxation work, following t

he development step of "from point to point", focusing on the balance of technological development in various regions, narrowing the technological gap, and sharing the experience and effectiveness among local governments. The vertical and deep development of digital technology is being actively promoted, especially in the relatively backward regions of central and western China, where new-generation digital infrastructures, such as big data, artificial intelligence and the Internet of Things, are being actively developed, and the application of digital technology in the field of tax collection and administration and the integration of digital technology with the tax system are being actively promoted.

Second, Doing a good job of the aftermath of technological innovation and paying attention to changes in the structure of the labour force. In improving work efficiency and exploring new ways of cutting costs in government finance, we should do a good job of bridging the gap between old and new ways of working, pay attention to changes in the relationship between AI and employment, adhere to the people-centred work ideology, change the structure of employment, and reshape career planning, so that AI can actually be used for people rather than replacing them.

Third, Innovate government management concepts and build a perfect working system. The government should do a good job of top-level design and guidance, formulate corresponding tax collection and management processes for emerging industries, strengthen theoretical training for business personnel, realize the online business process and intelligent data application, use the advantages of digital platforms, through the collection of tax information for data analysis, to understand the situation of the tax source and the relevant regulatory deficiencies, to reduce the loss of the tax source, and to effectively solve the problem of asymmetry of information.

Fourth, between the government and enterprises. The problem of information asymmetry between the government and enterprises is effectively solved.

Fifth, Strictly formulate rules and crack down on violations. The people's congresses at all levels have improved and revised local laws and regulations such as the Tax Administration Law as soon as possible, clarified the rights of tax authorities to collect tax-related information at the legal level, strengthened the management of the quality of tax-related data, and constructed risk management platforms; technologically, they have ensured that the digital means are "usable, controllable, and knowable", and that digital technologies used in the process of tax administration are safe and sound, and that technological security is maintained throughout. Technically, it ensures that digital means are "available, controllable and knowable" and that the digital technology used in the process of tax collection and management is safe and sound, and that technical security is maintained throughout.

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