Research on the Impact of Artificial Intelligence Technology on Accounting

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Abstract—The rapid development of artificial intelligence has promoted many changes in the field of modern accounting. This paper examines the impact of artificial intelligence on accounting business, accounting theory and accounting personnel's ability in recent years through literature research. The conclusions show that: First artificial intelligence makes the accounting staff liberation from a low level repetitive work out, the original focus of financial accounting change for the company to provide information to support business decisions; Second, management accounting theory, value creation theory and management intelligence mechanism The intersection of theory and artificial intelligence promotes the development of accounting theory. Third, financial expertise of accountants demanding, complex multi-disciplinary background and with universities and businesses.

1. INTRODUCTION

With the advent of the 4th scientific and technological revolution, artificial intelligence technology is affecting the development of the whole society profoundly. The emergence and application of Deloitte financial robots, the emergence of financial sharing service centers of well-known enterprises at home and abroad indicate that the accounting industry also needs to undergo changes and seek development and transformation in the new environment.

Artificial Intelligence was first proposed at the Darmouth Society in 1956, and its development went through two major stages of theoretical development and commercialization. In the early stage of theoretical development, artificial intelligence relied mainly on logical reasoning and expert systems to solve problems, and the level of intelligence was relatively low. Thanks to the advent of deep learning algorithms (DNN), the expansion of global data, and the development of high-performance CPUs, artificial intelligence has made great breakthroughs. In 2011, IBM's robot Watson participated in the quiz show and won [1], which is a major event in the commercialization of artificial intelligence. Afterwards, various smart phones (Apple Siri, etc.), intelligent software (Google Translate, etc.) and commercial robots (AlphaGo, etc.) are constantly emerging, and AI technology will play a greater role in research, work, life and other scenarios.

Enterprise resource management plan, customer relationship management, manufacturing management, supply chain management and financial analysis system have made enterprise accounting enter the information age. The financial robot used in the intelligent financial era is an application software based on the Robot Process Automation (RPA) platform software. The company can configure software or robots to collect and interpret data through RPA technology, and also use the

technology to process transactions, manipulate data, trigger responses, and communicate with other digital systems. In the future, AI robots can achieve independent learning by comprehensively processing big data in the accounting field, and be able to do financial analysis, financial forecasting and financial decision-making.

2. ARTIFICIAL INTELLIGENCE'S INFLUENCE TO ACCOUNTING BUSINESS

2.1 Artificial Intelligence Replaces Basic Financial Work

In the traditional financial work, from the establishment of the books and the filling of the voucher to the trial balance and the preparation of financial reports, it involves multiple rounds of basic repetitive work, especially in real estate companies with large business volume, the basic work often requires a lot of human and material resources. This kind of basic work has a complete program and rules system. If this kind of work is done by financial robots, such as intelligent data collection, intelligent audit, intelligent voucher, automatic monthly payment, automatic declaration and tax payment, automatic banking reconciliation and other work, accountants will be freed from this large amount of repetitive and low-tech work.

The emergence of the Sharing Service Center solves the problem of accounting staff redundancy. The average amount of reworking that the accounting department can avoid account for up to 30% of the total time of full-time employees. For an organization with 40 full-time accountants, this is equivalent to save 25,000 hours annually, and the cost saved is $878,000[1]. The enterprise establishes a Sharing Service Center to effectively integrate the financial personnel dispersed in each subsidiary or business unit, and to platform the procurement, payment, budget, etc., and to reduce the basic workload of the offline financial personnel. In the study[2] of ScottMaddend, new financial Sharing Service Centers (SSCs) in Europe and North America have seen significant growth: in the survey of 2014, it found that 50% of organizations said they have SSC in North America, and by 2018, this number has reached 67%. In Europe, the growth is explosive, almost doubling. It can be seen that the use of financial robots and the establishment of Sharing Service Centers will become trends and replace the existing positions of basic financial personnel.

2.2 Artificial Intelligence Makes Accounting Business Automated, Accurate, and Data Authentic

Traditional financial personnel often faces a large number of original bills in the process of processing business. From the production of vouchers to the final completion of financial reports, there is a large amount of repetitive labor in the midst. The processing of accounts involves human judgment adjustment and selective disclosure of some special data, resulting in a certain degree of error rate, and it is more difficult to make adjustments when an error occurs. According to the data[3] of the Association of Certified Fraud Inspectors, the general organization lost 5% of its annual income due to internal fraud. Organizations and auditors typically only manually review 10% of expense reports, which makes most potential fraud undetectable. The application of artificial intelligence realizes the informatization and automation of the accounting process. The financial robot has fast running speed, quick response and feedback, and improves the efficiency of accounting work. Under the condition of correct programming, the financial robot can ensure the strictness and specification of each link according to the established procedures, thus it can effectively reduce the occurrence of errors.

Since the financial robot executes the established procedures, and the financial personnel only undertakes the work of entering data and completing the operation step by step, thereby it reduces the "artificial operation" in the middle of the accounting process, and largely avoids the artificial accounting fraud. Artificial intelligence platform integrates the image scanning system, network

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[1] Data Resource:
https://www.forbes.com/sites/gilpress/2019/10/10/ai-stats-news-45-of-us-consumers-want-their-physician-to-use-ai-for-better-diagnosis/#14e54562c9d4

[2] Data Resource: https://www.scottmadden.com/insight/global-trends-financial-shared-service-center-locations/

[3] Data Resource: https://www.accountingtoday.com/opinion/3-ways-accountants-can-implement-ai-today

reimbursement system, financial accounting system and bank-enterprise interconnection system organically. The corporate funds, banks and taxation can be checked at any time, and every step can be traced, so it ensures the authenticity of enterprise data.

2.3 Artificial Intelligence Provides Financial Information for Business Decision-Making

According to a recent survey[4] conducted by MIT Boston Consulting Group, more than 80% people believe that AI can provide a competitive advantage, while 79% believe that technology can increase a company's productivity. The Sharing Service Center organically integrates the business processes, accounting and management processes of the company to maximize the sharing of company information. Under the background of artificial intelligence, accounting personnel are no longer engaged in traditional accounting work, but transform accounting data into company business information, providing information support for enterprises to make business decisions.

The value of the work of financial personnel is to reprocess the data on the basis of data collection and careful arrangement, including using various financial indicators to measure the current business situation of the enterprise and predicting the future financial situation, establishing a financial early warning system to identify financial risks, determining the asset structure, making decision deductions and judgments, so as to provide reference for the company to set annual goals and strategic goals. For example, CTS Group adopts integrated ERP intelligent system to realize centralized management of capital investment and budget of the Group's various subsidiaries, and analyzes the company's budget completion status and asset storage using status by using various financial models and business models. Enterprise-level data warehouse and multi-angle business data analysis provides strong information support for group leaders' decision-making.

3. ACCOUNTING THEORY IN THE CONTEXT OF ARTIFICIAL INTELLIGENCE

The combination of artificial intelligence and accounting is not limited to the application of financial robots, but also reflects the development of accounting theory with the changing background of the times. At present, the theories in the accounting field are mainly divided into three categories: New Management Accounting Theory, Value Creation Theory and Management Intelligent Mechanism Theory.

3.1 New Management Accounting Theory

Management accounting is an accounting for internal users to provide management information needed to make correct business decisions and improve business management (Sathe[2], 1978). The New Management Accounting Theory believes that in the era of artificial intelligence, financial personnel still have a good space for survival and development. Financial robots are invented by humans, and the internal working mechanism is also pre-set by humans. Artificial intelligence technology only replaces the programmatic and mechanic work, and the accounting's mind is irreplaceable. A study[5] conducted by Accenture in 2017 found that even with the advent of robo-advisors, 68% of customers prefer to use both human advisors and robo-advisors.

In the context of artificial intelligence, the functions of accountants have been transformed from the original financial accounting to the use of financial data to provide information support for business units. This requires accounting personnel to change from "executor" to "manager", making good use of financial robots as an efficient tool for supporting work, effectively integrating business information and financial information of enterprises, and providing information consulting services for business departments. Meanwhile, the requirements for accountants have raised that they need to be more professional and master comprehensive analytical skills. The future accountants must understand both finance and management.

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[4] Data Resource:https://www.acecloudhosting.com/blog/artificial-intelligence-impact-accounting/
[5] Data Resource: https://www.business.com/articles/ai-and-accounting/

3.2 Value Creation Theory

The Theory of Enterprise Value Creation originated from the Theory of Modern Commodity Circulation. Marx believes that modern commodity circulation is that "money first conversed into commodities, and then commodities conversed into money", "the original prepaid value was not only preserved in the circulation process, but also changed its value in circulation", and finally realized the proliferation of value (HU [3], 2012). According to the theory, from the perspective of value chain, value chain accounting improves the correlation between management accounting information and managers' planning and control activities. The common goal is to "maximize value creation by coordinating and integrating various value activities". From the perspective of investor's rights and interests, the goal of accounting in business operations is to realize value appreciation and enhance the value of enterprises. Accounting should also strengthen the protection of investors, and protect the value-added of investors' investment capital from the aspects of value creation and risk control.

The theory holds the view that customer value is the premise of enterprise value creation, shareholder value is the financial result of customer value realization. Accounting work based on value creation provides information related to cash flow, risk and time to serve the cash flow management, risk management and strategic management decision-making of enterprises. The application of artificial intelligence makes the accounting enterprise value creation process clearer. Accounting work is no longer a financial review, but through analyzing and processing financial data to ensure the realization of enterprise value creation goals.

3.3 Control Intelligent Mechanism Theory

In business management, various businesses have different levels of restrict and control, the most common of which are cost control, performance control and production control. Fu [4] (2015) puts forward Control Intelligent Mechanism Theory on the basis of Control Mechanism Theory. The previous one believes that under certain control conditions and based on a good control mechanism, the organization can respond intelligently and automatically according to the adaptive system in the event of an uncertain change in the external conditions, adjusting the original strategy and measures, and achieving the stated goals. In the intelligent control mechanism, it includes three elements: target setting agent, internal report agent, and responsible person incentive agent. These agents can form large-scale, complex and dynamic financial intelligent decision-making system through effective process cooperation and control, and it will enable the robot to autonomously achieve the target.

4. RECONSTRUCTION OF ACCOUNTING PERSONNEL'S ABILITY UNDER THE BACKGROUND OF ARTIFICIAL INTELLIGENCE

Financial robots have broad application prospects and will be fully applied by enterprises and institutions in the near future. The business capabilities of modern financial personnel include four dimensions: reporting and management capability, IT and AI application capability, financial business integration capability, and decision-making and planning capability. The reorganization of financial personnel's ability not only requires financial personnel's independent study, but also the joint efforts of accounting education in higher education institutions and financial personnel training in enterprises.

4.1 Financial Staff Improve Their Own Quality

Financial management is the core of enterprises' internal management, and also the core competitiveness of financial personnel. Financial personnel need to change their own concepts to ensure that they are not replaced and seize new opportunities in the wave of artificial intelligence. In fact, it is expected that by 2026, the employment rate[6] of accountants will increase by 10%, which is above average. The core qualities of financial staff mainly include learning ability, digital ability, communication ability and thinking ability. Learning ability means that financial personnel must first have professional financial knowledge. The basic business that originally occupied a large amount of

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[6] Data Resource:https://mticollege.edu/blog/business/accounting-technician/artificial-intelligence-accounting/

time for financial personnel is replaced by robots, which puts higher demands on financial personnel's financial business knowledge and skills. Financial personnel also should participate in the development strategy of enterprises, strengthen understanding of the main business and operation management of the enterprise. Digital ability refers to that the financial personnel need to master the foundations of IT and AI, to be able to apply financial systems, and to have the ability of financial modeling and data analysis. Communication ability requires financial personnel not only to be familiar with the financial and business processes of the company, but also to communicate with all parties in a timely and effective manner, and to communicate the problems existed with different departments and assist in solving them. Thinking ability means that financial personnel need to improve their comprehensive knowledge background, and to use multidisciplinary thinking ability such as management, application, and law, to consider the direction of enterprise development.

4.2 Colleges and Universities Reform the Training Mode

Watty [5] (2012) believes that the biggest challenge in 21st century that the business school's education faces is not the technical challenge, but the ability of teachers to receive educational technology. Colleges and accounting professional teachers must change thinking, setting about from market demand, curriculum and student ability training. First, we must have supply reform thinking. Through market research and interviews with employers, we should understand the latest trends of the practice departments and understand employers' demands for students' ability, and cultivate students in a targeted manner, so as to develop a talent training program that meets the needs of the reality and the market, instead of "lost in the ivory tower" and cultivating talents which divorced from reality. Second, we must improve the curriculum system, change the teaching method, and formulate a solid and practical curriculum system through understanding the needs and the students' ability to accept, strengthen the general education of students to improve their stamina, increase the difficulty of computer courses, and economic management courses, hire off-campus practical experts into the classroom to enable students to access the latest developments in the frontiers of practice. Finally, to develop students' comprehensive ability, professional integration ability, re-learning ability, problem-analyzing and problem-solving ability, change the previous viewpoint of focusing on academic performance, and carry out practical discipline competitions, so as to help accounting students form diversified development ability and adapt to the artificial intelligence revolution in the accounting field.

4.3 Enterprises Provide A Transformational Environment

Enterprises actively adapt to the situation of artificial intelligence, apply financial information systems timely, establish a Sharing Service Center to promote the innovation and improvement of internal processes, and improve the efficiency of internal management. First, attach importance to the position of financial information in management decision-making, establish a financial intelligent decision-making data center, and gradually realize the transformation of the front office, the middle office, and the back office, realize the cross-functional and cross-business financial information sharing. Second, actively assist financial personnel to achieve transformation, encourage financial personnel to participate in the company's business decisions, so that financial personnel can better understand the company's business and promote integration of business and finance. Third, organize financial personnel training, make assessment plans for financial personnel's knowledge capabilities and make incentives. Those enterprises which have the condition can organize financial personnel to enter colleges and universities for further study in part-time training mode.

5. PART FIVE: CONCLUSION AND FUTURE STUDY

The application of artificial intelligence technology has a profound impact on the accounting field. Firstly, it affects the accounting business, which freed the accountants from the low-level repetitive labor. The focus of work shifts from the original financial accounting to offering information support to the company's operational decision-making. Secondly, it has influenced the development of

accounting theory. The New Management Accounting Theory, Value Creation Theory and the Theory of Control Intelligent Mechanism cross and integrate with artificial intelligence idea. The new environment has created new requirements for the development of accounting theory. Finally, it affects the knowledge structure of financial personnel. It not only requires higher financial expertise, but also requires a multi-disciplinary background. It also requires universities and enterprises to work together to promote the transformation and upgrading of financial personnel and financial work.

In the future, financial work will be further blurred. Financial personnel will be transformed into financial talents integrating management, finance and operation. Artificial intelligence technology will bring opportunities as well as risks to accounting development, such as accounting information security issues (Brzezicki [6] et al, 2017), the definition of legal boundaries issues and over-reliance on technology issues, and these issues are yet to be further resolved in the future so that artificial intelligence can better serve the field of accounting.

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