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Research on the Application of RPA+AI Technology in the Construction of Paperless Intelligent System for Finance in Colleges and Universities

Chen Qian[1]*, Lin Jiating[1], Chen Xuan[1]*,Wang Xingle[1]*
[1] *Guangdong Eco-Engineering Polytechnic, China*
*Corresponding author: Chen Qian E-Mail:15876577408@163.com;
Chen Xuan E-Mail: Kjtmslyt@163.com ; Wang Xingle E-Mail: 18922753626@189.com

Abstract
The application of Artificial Intelligence shows stage-by-stage development with technological progress, and AI technology empowers the development and transformation of university finance in the era of big data. Through relevant literature, this paper explores the application of RPA (Bobtic Process Automation) technology to university finance systems. This paper adopts a literature review methodology and analyses a large number of reports, academic papers and articles in a comprehensive manner. By searching the Knowledge Network, Literature and Wikipedia databases, it compares the application of artificial intelligence in the field of relevant research finance, and finds out that the application of artificial intelligence and RPA technology in university finance is still in the preliminary stage, with limited application scenarios. However, in the long run, the application of RPA+AI technology in university finance is bound to be extremely important. This study identifies the significance of constructing an AI intelligent tool RPA technology model in the current transformation of financial system information digitization in colleges and universities, and the construction of the application of RPA+AI technology model in the scenarios of expense reimbursement and budgetary control business system, financial reconciliation business system, business operation system, and risk control system, etc. The study also focuses on its application in the existing intelligent information technology. And for it's in the existing intelligent information technology transformation process RPA technology in various scenarios application encountered problems and construction. This technology model provides a new perspective of digital transformation for universities and also provides an effective reference for the construction of paperless system functions. data, enhancing data security protection and risk management, and strengthening the construction of the professional team of accounting informatization.

Keywords: RPA+AI, Finance robot, Artificial intelligence, Paperless intelligence system, University finance

1. Introduction

The "14th Five-Year Plan for the Development of the Digital Economy" puts forward the development goal of China's digital economy towards full expansion by 2025. Artificial intelligence (AI) is the core of the digital economy. Guo K & Liang X (2016)[1] discussed the rapid development of AI and the digital economy. AI and informatization have been merging and intersecting with various industries and are also changing the mode of accounting applications. The introduction of robotic process automation (RPA) in 2012 provided an opportunity for the digital accounting transformation in colleges and universities (YingP Zhang &Fang Gao &Jingy Zhao (2023)[2]. The construction of paperless intelligent system should be the key focus point and reform impetus for the digital transformation of finance in universities. Green paperless is a green development strategy to achieve energy saving and emission reduction, and to realize the goal of "dual-carbon economy". Wang YunY (2024)[3] pointed out that in order to achieve the goal of "dual-carbon" strategy, the construction of an intelligent, green and efficient paperless system should be carried out to empower the financial accounting field. The construction of a smart, green and efficient paperless system to empower the digital transformation of the financial accounting field is a research topic of great significance. Based on the above, "paperless reimbursement" is the main search keyword, and the research results have explored the significance of paperless reimbursement system construction in empowering the process of digital transformation of finance, and RPA is the main technology to realize the paperless reimbursement system (Wang Yidan, 2024) [4]. "Operate like a pair of hands", it is a combination of artificial intelligence and robotic process automation. RPA technology is constructed in the construction of paperless intelligent system for finance in universities in various scenarios. This technology is to automate daily accounting operations by mimicking humans and interactions. This technology frees traditional accountants from complex, cumbersome and repetitive daily business work and devotes more time to financial analysis, data analysis and other work. In this paper, the application of RPA+AI technology in paperless reimbursement system for university finance is sorted out, and the application scenarios and problems to be encountered with this technology are initially discussed. In the face of related challenges and the current situation, the proposed innovative scenario construction provides a reference for the feasibility of digital and intelligent development of finance in the future.

2. Literature review

With the emergence of Robotic Process Automation (RPA) in 2012, the finance industry is undergoing a technological transformation, and according to Zhang Min (2020), the change in the finance industry is mainly due to these three elements: Artificial Intelligence (AI), Intelligent Tools (RPA and BI), and Big Data Analytics [5]. KDDI has combined the idea of "AI+IT" to develop robots such as reporting robots and accounting robots, thus accelerating the pace of RPA in accounting applications (Duan, Dawei &Wang, Hongxing et al. (2020))[6] In March 2016, Deloitte Consulting collaborated with the Kira system to introduce RPA into the accounting industry. In March 2016, Deloitte Consulting partnered with Kira system to bring RPA to application scenarios in accounting, auditing, financial reporting, tax planning, etc. RPA process automation robot is a blend of software process automation and AI technology. It is a responsive, efficient and cost-safe and controllable digital empowerment management technology, so the essence is that the

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combination of RPA + AI technology and financial accounting has produced financial robots, which are used in the financial field. Financial robots are defined by IT media Tech Target as the most loyal "digital employees" of an organization. It helps create transcription scripts that automate routine and predictable data processing by leveraging a combination of user interfaces and surface-level features. These transcribed scripts are then used as a virtualization workforce to replace the traditional manual workforce for a variety of high-volume; mechanically repetitive financial processing tasks. RPA also automates business processes, keeping corporate rules and work behaviors in mind. Finally, a series of specific workflows are automated by simulating the way robots work. In fact, it is a software that can complete the work according to a specific, and this software is installed on personal computers or large servers to automate the office through manual operations such as mouse or keyboard (Cheng ping, 2022)[7] . Finance Robot is a financial technology application that replaces traditional manual work with the technology of RPA combination. RPA+AI technology is beneficial to optimize the whole process work such as financial reimbursement, financial bookkeeping, financial accounting, generating financial statements and so on. This technology not only allows financial personnel, financial operations and information technology systems to integrate and collaborate, but also greatly reduces the cost of financial operations and improves the efficiency and quality of work. The financial robot completely replaces the hands of financial personnel. Du Haixia et al (2021)[8] based on practice, it is proposed that RPA can add to promote the conversion of financial functions and objectives, change the business process and financial organizational and management modes, and promote the transformation of traditional personnel to composite talents. The application of RPA+AI technology in financial data analysis can provide a good environment for financial data to empower business management.

With the development of artificial intelligence and big data, the traditional financial efficiency, transparency and data integration can no longer meet the development needs of universities. More and more colleges and universities have been transforming in this direction with the emergence of "Digital Intelligence Finance and Accounting". The current research on the construction of paperless reimbursement system and key technologies is still relatively blank. In this paper, we mainly consider the practice and challenges of applying RPA technology in paperless intelligent reimbursement system in colleges and universities. Analyzing the current situation and limitation analysis of the current RPA+AI technology application in universities, the main application scenarios considered for the intelligent process-oriented model of RPA+AI technology are the expense reimbursement and budgetary control business system, the financial reconciliation business system, the business operation system and the risk control system, the bill management, the personal tax declaration, the bank reconciliation, the travelling reimbursement and the business question and answer scenarios respectively (Huang Jiali ,2024)[9] for research and study.

3. Methodology and Procedures

In this paper, a systematic literature review method and a questionnaire survey method were used. Firstly, the literature review method involves the study of academic articles, research papers and reports. This method focuses on identifying the key terms "RPA in college finance", "paperless

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reimbursement system for college finance", "artificial intelligence and accounting", "technological innovation and accounting change", and "intelligent finance in universities" were searched in GOOGLE Academic Library, Knowledge.com, etc., and the articles were identified. Then the literature for the period 2020-2024 was reviewed with the integration of literature on the application and exploration of RPA technology in financial systems, with a particular focus on the application in smart paperless financial systems in universities. This literature review method is a repeatable and large search strategy so that it can be ensured that literature on relevant topics and specific words are searched for citations to PATTI & LORUSSO (2018) [10]. Secondly, the questionnaire method is to use a uniformly designed questionnaire, through which the questionnaire form is used to communicate with the respondents in written language to collect the questions of the research subjects about the issues that need to be investigated. Integrate the questionnaire answers to analyze the relevant reasons. The main design of this paper is based on the application of artificial intelligence RPA technology in accounting. The main respondents of the questionnaire are the administrative and financial staff of the university. The key questions of this questionnaire design revolve around "the degree of understanding of the application of AI RPA technology in accounting work" , "the prevalence of the application of Artificial Intelligence (AI) RPA technology in accounting work", " The degree of use of RPA technology in daily accounting work", "The degree of help of AI and RPA technology in daily accounting work" and other 15 professional questions, 1-2 regular questions, the questionnaire is distributed mainly by the network survey questionnaire. These questions were used to explore the current status of the application of RPA+AI technology thereby analyzing the challenges encountered by RPA technology in the practice of paperless financial intelligence building in universities. The paper acknowledges the respondents for filling the questionnaire by ensuring proper citation of the sources used in the literature review and also for filling the questionnaire. The limitations of both methods of research are if the selection of literature may be biased than may be overly dependent on the dependence of existing research findings. Also, the quality of the survey results can be affected by the respondents' perfunctory answers during the completion of the questionnaire for various reasons. And the survey questions are pr-designed to answer the answers, resulting in a lack of flexibility.

4. Application of RPA+AI technology in the construction of paperless intelligent system for finance

4.1 Analysis of the current status of paperless intelligent systems for finance

With the widespread involvement of artificial intelligence in finance, financial robots RPA, instead of human beings, automate rule-based, heavily repetitive tasks such as invoice processing, tax filing and financial statements. Enterprises and universities use PRA technology to automate operations such as business and financial reconciliation, reimbursement operations, banking and corporate reconciliation, and invoicing. Financial robots are also applied to various business processes, such as expense reimbursement, procurement to payment, general ledger to statement, tax management and budget management. At the same time, the classification of financial robots

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has become more and more refined, and today there are different types of robots such as invoice robots, reconciliation robots, tax robots, archive robots, etc. (Pan Yan, 2024)[11] . The wide application of RPA+AI technology has resulted in the systematic, paperless, and fully electronic financial processes. The implementation of the technology drastically reduces the reliance on paper documents, which in turn improves the efficiency and transparency of the entire process. The application of paperless financial intelligent system also corresponds to the policy of energy saving, emission reduction and green development. The paperless process also reduces costs and improves efficiency. Under the guidance and support of the policy, paperless intelligent system is already in enterprises and institutions to get practical application. The "2023 Invoice Index Report"[12] released by Every Moment Technology Ltd. shows that according to the annual data of 2023, the total number of circulating invoices on the reimbursement platform of Every Section is 18,971W+, of which the proportion of electronic invoices is 50.38%, which is 75.18% higher than that of the use in the year of 2022. Paperless reimbursement of documents compared to 2022 increased by 5%, this data shows that the financial industry has been transformed to intelligent paperless, has been gradually implemented and applied to show that this financial paperless application is a general trend. However, there are still many difficulties and challenges in the process of financial change, it takes a period of time to implement in order to completely change from paper to paperless financial office.

4.2 The current status of RPA+AI technology in the application of paperless intelligent system for finance in universities

In order to understand the current status of the application of RPA+AI technology in university finance, this paper adopts a questionnaire survey method, which is distributed and collected by "Questionnaire Star" or by mail and email. The survey was designed with 15 questions, all of which were multiple choices. A total of 3643 questionnaires were distributed, and all of the distributed questionnaires were collected. Through the collation and analysis of the recovered questionnaires, the current status of the application of RPA+AI technology in the paperless intelligent system of finance in colleges and universities is as follows: first of all, most of the accounting personnel in colleges and universities have a certain degree of basic understanding of the RPA+AI technology, but there is still a part of the accounting personnel who don't really understand the technology and have a limited understanding of it (see Figure 1 and Figure 2). Accountants have a weak concept of intelligence and have not yet fully shifted from the traditional accounting model to the new technology model. Universities have also not fully popularized RPA+AI technology and have not paid attention to raising awareness of smart finance learning for finance staff. The information technology level of financial personnel is still low, and there is a lack of "financial + information technology talents". Currently, some colleges and universities are still using the traditional paper-based model, the complicated and repetitive review of documents, billing and other work has taken up part of the financial staff's working time. Financial personnel have not been able to put more time on the learning of intelligent technology, it is difficult to understand the new technology and adapt to the construction of intelligent systems.

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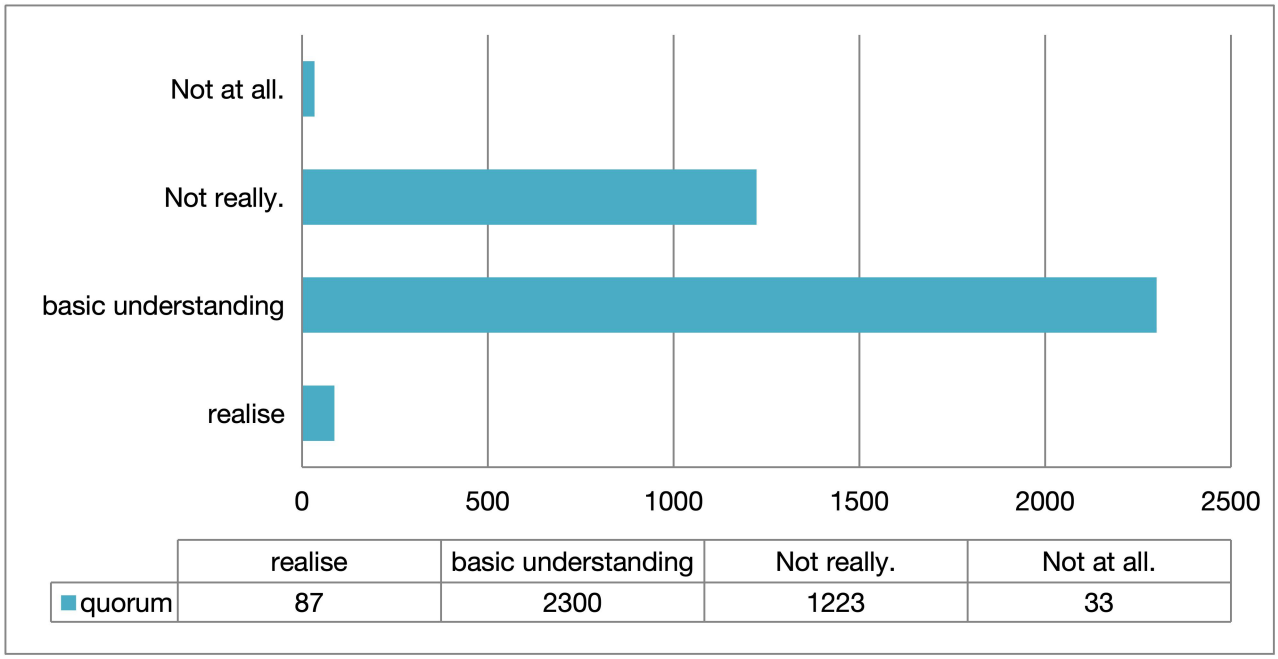
Figure 1 Level of knowledge of AI+RPA



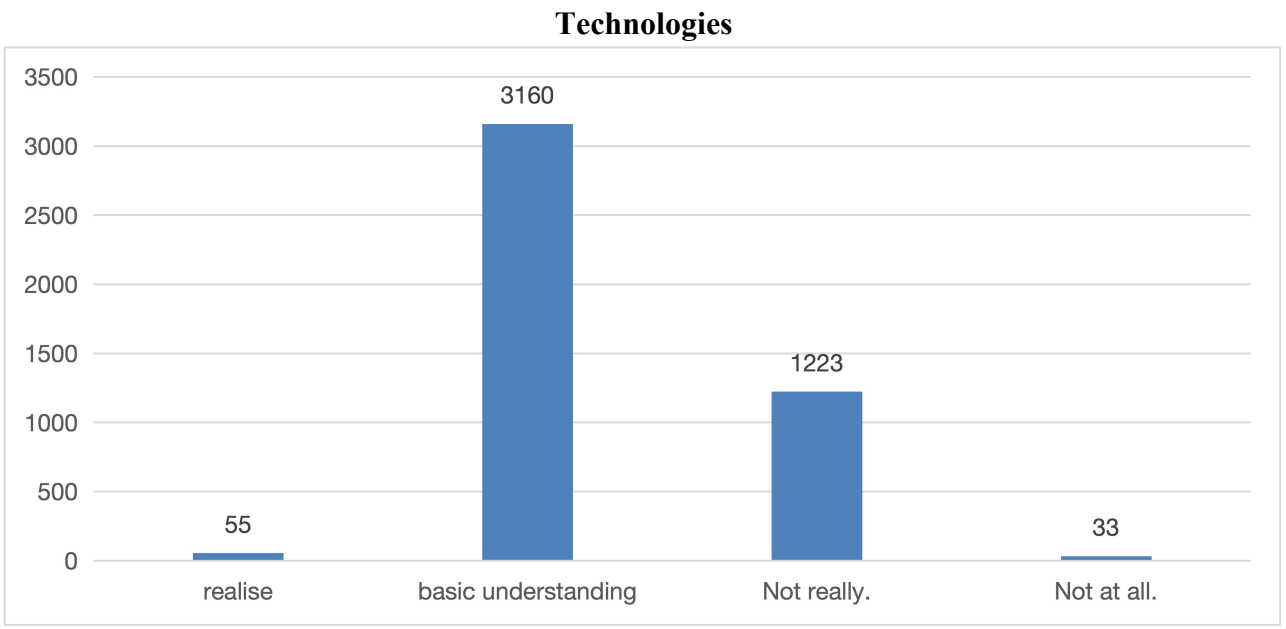


Figure 2 Knowledge of AI+RPA technologies for accounting applications

Secondly, the questionnaire (see Fig. 3, Fig. 4) found that most of the respondents believed that RPA+AI technology would be helpful in the future accounting work. Although, most of the accounting workers in universities believe that AI+RPA technology will be commonly used and will bring convenience to their work. However, the financial work of universities has been using financial robots or paperless financial systems of RPA + AI technology only 33% of universities

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and financial workers. Most of the colleges and universities do not purchase and use relevant AI RPA financial systems. The profitability of colleges and universities is not the same as that of enterprises, and the main sources of funding for colleges and universities are financial allocations and tuition income as well as research and development income from various subjects and projects. Most colleges and universities are too cash-strapped to meet the capital requirements for the construction of financial intelligence systems. This also leads to the low degree of use in universities.

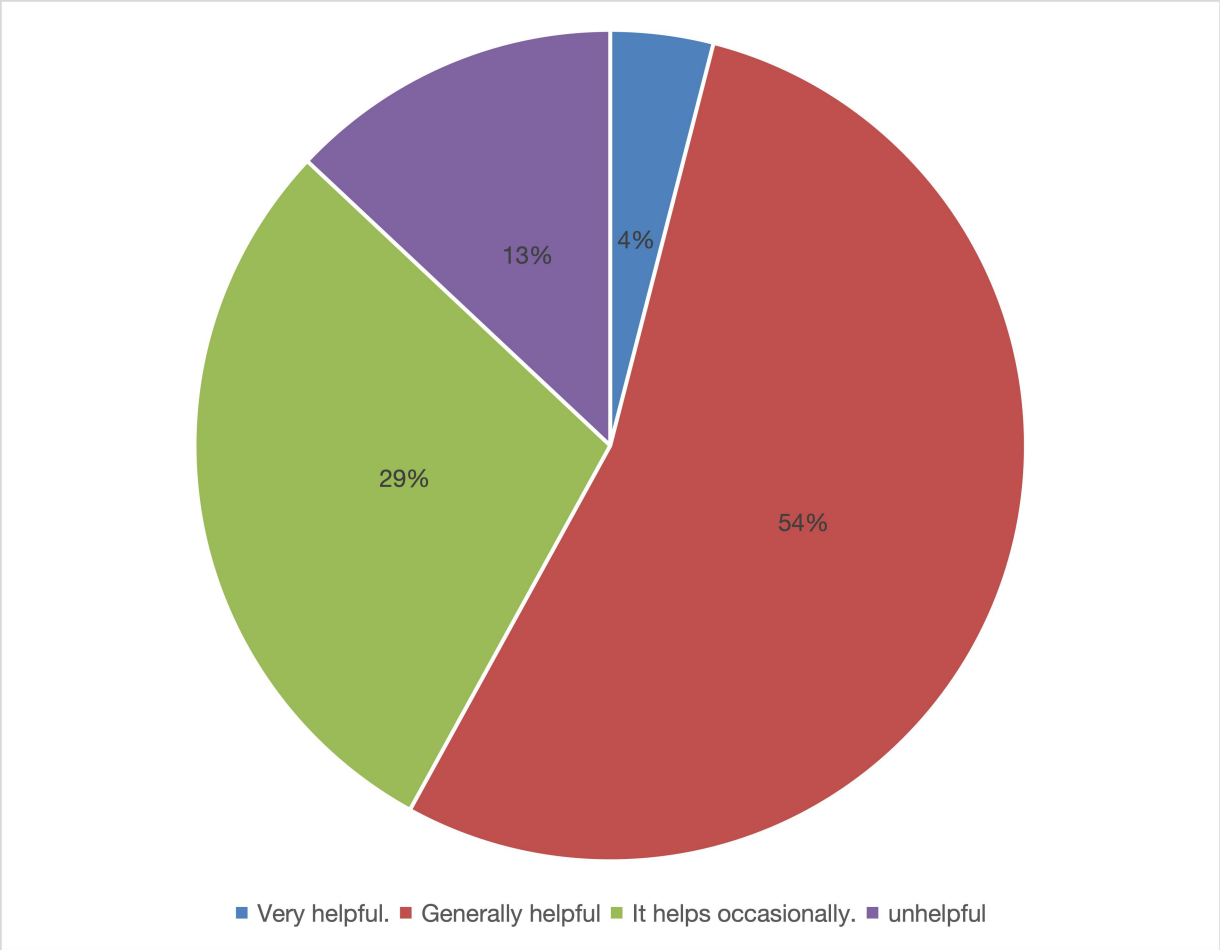

Figure 3 Extent to which Artificial Intelligence RPA technology helps in day-to-day accounting work

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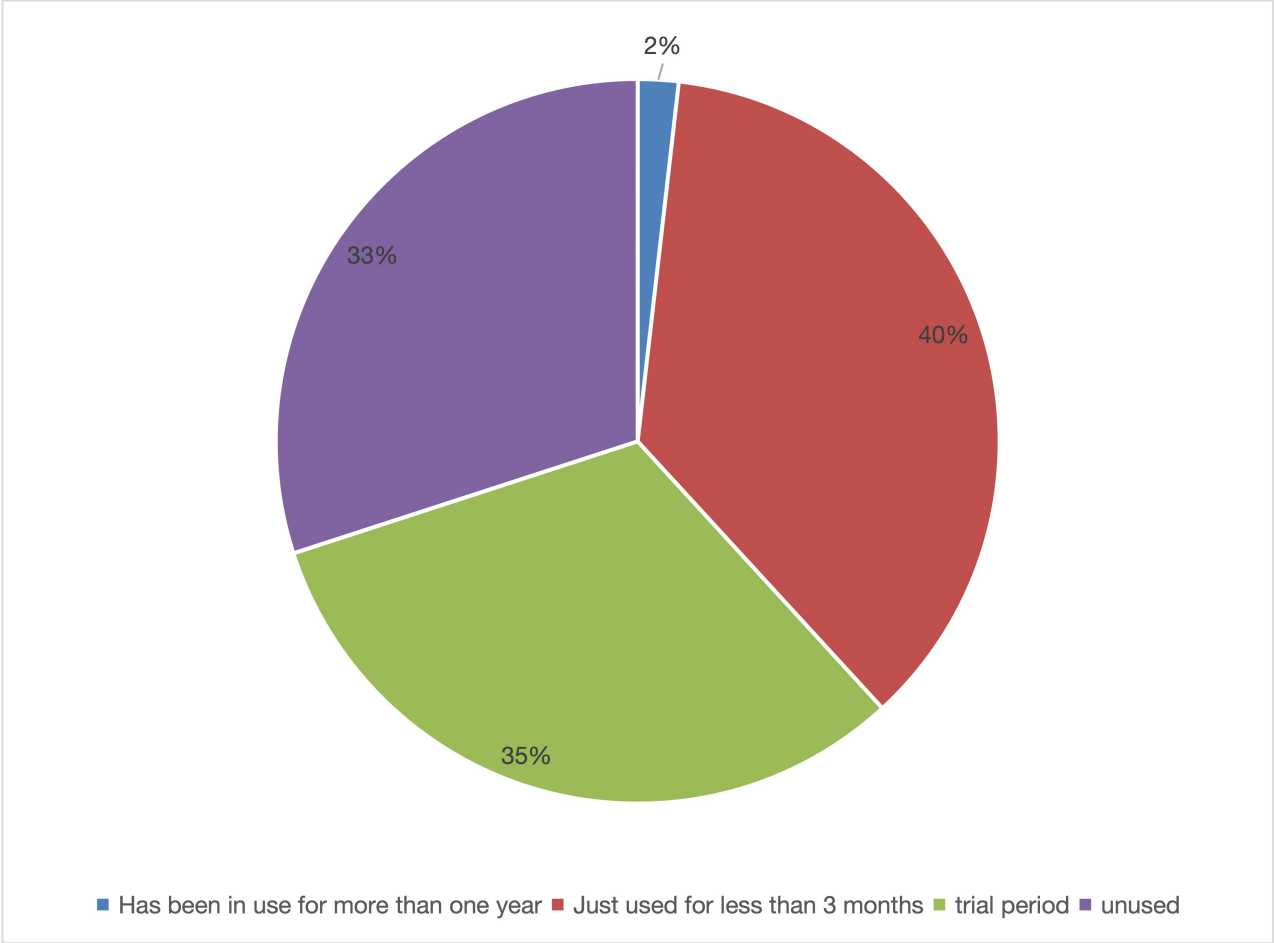

Figure 4 Extent of use of AI RPA techniques for daily accounting work

4.3 Application of RPA+AI Technology in the Construction of Paperless Intelligent System for University Finance

Colleges and universities, as a gathering place for high-quality complex talents, have more obvious advantages in financial expertise and talents. Colleges and universities in the "double first-class" construction background, higher education and talent cultivation as the country's key concerns. Although the impact of the overall economic environment, the total amount of funding arrangements to reduce the financial and project research financial investment which is still huge. At the same time, the professional development of higher education institutions and the introduction of talents are constantly strengthened to improve the performance of the use of funds, so as to achieve the precise allocation of resources. And RPA+AI technology then plays a very important role. The maturity of the Internet of Things, information technology and big data and other technologies, colleges and universities are also constantly strengthening the capacity and scope of data processing. In the construction of intelligent campuses, many colleges and universities have also gradually opened the threshold between online and offline, which has led to a reasonable and effective flow of interdisciplinary, cross-campus, cross-campus, and cross-level business in colleges and universities. In the era of big data information technology, RPA+AI technology is constantly

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changing the traditional mode.AI technology simulates the human brain thinking mode through computer and transforms the intelligent body that acquires perception and performs actions in the environment. According to Bill Gates[13] , "Artificial intelligence is just now being discovered, with computing power doubling every three and a half months. In addition to improvements in processing data, it has the ability to synthesize analyses, look at gain insights and make predictions in many more dimensions than humans can comprehend". RPA is Robotic Process Automation, the technology that can automate repetitive, standardized tasks under Artificial Intelligence (AI). After Deloitte Consulting Services launched a small financial robot "Small Deloitte people" in 2017, the application of PRA technology to financial accounting work quickly began to be applied and developed in many financial scenarios. RPA technology has also been selected in the "Top 10 Information Technology Selection Report Impacting China's Accounting Industry (Practitioners)" released by the Intelligent Finance Research Institute of the Shanghai National Accounting Institute. Gartner Internet Data Information Network (2023)[14] 's "China ICT Maturity Curve 2023" suggests that RPA is entering a trough period. In any transition to a technological revolution, there is a period of time where there is a shift in thinking, specialisms and other training. So although it is in a trough, with the development of information technology this does not mean the disappearance of the application of the technology in financial scenarios (Liu Qin & Shang Huihong, 2020)[15] . On the contrary, Zhang Limin & Bi Ying (2024)[16] pointed out that the current AI + RPA technology is still in the trial exploration stage, but driven by artificial intelligence, RPA technology in the financial voucher review, reimbursement pre-approval, billing and payment, entry, bookkeeping and other processes are still showing a wide range of application scenarios.

4.3.1. Note management scenarios

The business scope of colleges and universities is constantly expanding, and the sources of subjects are also more diversified and require more kinds of bills to be issued. It is not only the previous bills such as students' tuition fees, accommodation fees and utility bills, but now it involves other businesses such as subject income. By sorting out the entire process from the application to the issuance of invoices, the standardization of the filling criteria of the invoices reduces the error rate of invoicing. Combined with RPA technology, it can automatically and intelligently judge the types of invoices to be issued and classify the types of tax invoices to perform the corresponding invoicing actions. After the execution of the invoicing, it can automatically notify the operator by SMS or email, which can save the invoicing time and reduce the red flush work after the paper invoices are wrongly issued. At the same time, according to the national policy on 1 December 2024 to fully implement the application of digital electronic bills.

4.3.2. Personal tax declaration scenario.

Universities have a large number of employees plus off-campus laborers, and the data on labor fees are informative and complicated, although there are payroll systems and EXCEL software for automatic calculation and related tax data everywhere. However, due to the large amount of data and more, it is easy to data errors and the need to set up a special post in the Ministry of Finance

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and the Ministry of Human Resources. The payroll and personal tax processing need to set up specialize positions. The introduction of RPA+AI technology has enabled a smooth flow of information from multiple departments. Individual tax filing has adopted a human-robot combination to sort out the process of data processing and miscalculation of filing drafts, and set up multiple response modes. The robot will be able to simulate manual filing actions, and the combination of manual secondary auditing will significantly improve the efficiency and accuracy of data processing. It is expected that the overall work efficiency can be greatly improved by more than 5 times than the original.

4.3.3. Bank and school reconciliation scenario.

Bank reconciliation is an important part of the whole fund management chain, which is the focus of control of daily funds and research project funds, etc., and it is a necessary process for auditing. The traditional manual reconciliation should first log into the bank's corporate online banking through CA certificate verification, and download the electronic bank statement EXCEL format file. Then according to the bank journal data files, the data will be matched to deal with the receipt and payment records that cannot be matched, manually categorized under the category of outstanding items after the preparation of the bank balance reconciliation statement. If we only rely on the banking platform, the manual download and data matching operation of the EXCEL format file can be efficiently achieved on the platform. However, there is no way to automate the matching of a bank deposit credited in the account processing while the actual flow is multiple or batch payments. The unmatched flows can only be found through the accounting processing and initial business documents. This process is very time-consuming and reduces work efficiency, and also affects the timely issuance of subsequent relevant reports. Through the application of RPA+AI technology, the rules of manual reconciliation can be sorted out and transformed into robot language. This can automatically match the relevant business processes according to the logical thinking of the outstanding accounts, and can automatically prepare the balance reconciliation table and the status table of the relevant special circumstances. Combined with RPA+AI technology it will be possible to identify outstanding accounts and accounting problems in a timely manner. This not only improves the efficiency of reconciliation, but also guarantees the accuracy of the data, so that the original need for more than 2 weeks of manual reconciliation can be greatly reduced to half a day or even a day to complete.

4.3.4. Reimbursement pre-approval scenarios.

In the current university reimbursement process, students and faculty use paper reimbursement forms which can lead to duplicate revisions of lost reimbursement forms and other situations. Students and faculty need to go back and forth to the finance office several times to modify the documents until they are individually reimbursed. This whole process leads to a long reimbursement cycle and a cumbersome process. After the application of RPA+AI technology, students and teachers only need to upload the reimbursement materials and then the RPA technology can automatically capture the materials. Combined with OCR (Optical Character

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Recognition), the bill information captured automatically generates an electronic reimbursement form, which the claimant can initially self-check to confirm that it is correct before submitting it. The RPA technology provides a list of reimbursement information, reimbursement criteria, and other rules based on predefined reimbursement types for pre-approval. If a claim is submitted that does not meet the criteria, a warning is issued and the claim is returned directly online with an explanation of the reason. Documents that meet the criteria are automatically audited.

4.3.5. Billing and Payment Scenarios.

Within the system of finance, by breaking down the billing process into each step then RPA technology can simulate each step of the manual process. Automatically extract the required information to generate accounting vouchers and related documents, and go to the implementation of the documents to check whether they meet the standards. The application of the new technology can not only effectively reduce the errors in the preparation of documents, but also improve the efficiency of the preparation of documents to alleviate the work pressure of accounting staff. At the same time, in the traditional manual bookkeeping, accountants and cashiers need to repeatedly check the transfer unit's bank card account name, account number and bank account and other basic information, very easy to produce errors. Under RPA technology, account information can be called directly from the system database, and data matching can be completed in an efficient and error-free way. And through the docking of data with the banking system, it can directly execute the payment of money without the need for the cashier to repeat the entry and review procedures for payment. Most importantly, RPA technology can also track the payment status in real time through the preset payment process monitoring mechanism to ensure the accurate and error-free flow of funds. This greatly increases the security and accuracy of the payment process.

5. Limitations of the application of RPA+AI technology in the construction of paperless intelligent system for university finance

RPA+AI technology meets the process requirements of financial reimbursement due to its process-oriented nature, its ability to automate repetitive tasks, its strong rule-based nature, and its ability to reduce the risk of human error. As a result, the technology has become very popular among finance practitioners and researchers. Some smart finance researchers believe that RPA +AI is one of the fundamental technologies that need to be particularly explored (Dechow P,&Ge W,Larson. 2011)[17] . However, up to now, there are still many theoretical problems and application difficulties of RPA that need to be researched and solved in the practical application scenarios of finance (Liu Yang&WangYahan etl, 2023)[18] .

5.1 Business processes struggle to cope with complex scenarios

Taking the university reimbursement as an example, RPA demonstrates incomparable advantages of manual work when dealing with tasks such as high degree of standardization, clear rules and large volume. However, it is still unable to cope with the complex and changing financial

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reimbursement scenarios. For example, when teachers and students are reimbursed for their teaching and research expenses, the bills, lists, and other supporting materials that need to be provided for different expenditure items often differ in type and format. Coupled with the fact that the standard of each item of expenditure is not the same, it is difficult to form unified processing norms. As a result, many key nodes in OA reporting still require manual intervention for judgment. Current RPA technology, which usually operates on the basis of predefined rules, is not yet flexible enough to handle such unstructured data (e.g., supplementary materials that require special explanations for a particular situation) and may not be able to respond appropriately.

5.2 Difficulty with manual interaction tasks

In the financial reimbursement process of colleges and universities, the return of reimbursements from students and faculty due to various problems such as non-compliance of bills, missing materials, etc., can lead to a large number of financial inquiries. Therefore, sometimes it may even cause dissatisfaction or complaints from students and teachers. As the language expression habits of teachers and students vary from person to person in the process of counseling, RPA operates based on preset logic when dealing with this kind of high-level human language, and lacks the ability to accurately understand the essence of the problem and identify emotions. This means that RPA may not be able to effectively address the issues raised by teachers and students, or properly calm them down.

5.3 Difficulty in handling non-routine operations

In the financial process, some unconventional scenarios are often encountered, such as the reimbursement of special projects and expenditures in emergency situations. These situations usually require flexible judgment and decision-making, and RPA technology is not yet fully capable of handling such complex tasks. Especially in the face of the need to consider a variety of factors in order to make the optimal decision, the limitations of RPA are particularly prominent.

6. Innovative Construction of RPA Technology in Paperless Intelligent System in Universities

In order to comply with the trend of intelligent change, accelerate the transformation of financial intelligence. As the frontier of research and education, universities should promote the digital transformation of finance with the ultimate goal of building an intelligent financial system. The design of paperless intelligent system as the core of the financial system construction process, it is urgent to deeply integrate modern intelligent technology, and then build a set of digital intelligent structure to support the development of future intelligent financial system. Under the background of the current rapid development of artificial intelligence technology, AI technology has been widely used, with "RPA + AI" as the representative of the intelligent process automation technology (Intel - ligent Process Automation, IPA) as a cutting-edge results. Therefore, some scholars have proposed

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to construct the "ChatGPT+ RPA" technology framework, which is of far-reaching significance for creating an intelligent interactive financial system (Chen Wei, 2023) [19]. However, we also see that, in view of the current situation of "electronic + paper" co-existing in the financial system of colleges and universities, the integration of RPA and AI technology takes into account the transition needs of the digital transformation of college and university finance. Especially in financial work, data and process rigor is critical, fully automated and intelligent technology solutions are difficult to implement in the short term. Therefore, it is necessary to build an IPA technology model with appropriate human involvement. This can not only smooth the transition to fully automated processes, but also give full play to the advantages of human-computer collaboration in the transition process, and better serve the modernization process of university financial management.

6.1 Pre-approval system

The pre-approval system can greatly alleviate the pain points of "difficult, long and complicated procedures" when students and teachers make reimbursements from the source. Through the use of mature OCR technology, teachers and students can upload invoices and supporting materials to the reimbursement system in the form of pictures or scanned documents. The system converts the uploaded information into computer-readable data format through relevant technical means. It also utilizes IPA technology to intelligently capture and identify them. Based on the preset rules of the system, the system preliminary approves the completeness and compliance of the materials. For the part that does not meet the requirements, the system timely warning prompts, and feedback to the reimbursement of specific comments. The application of the pr-approval system can not only significantly reduce the workload of the financial staff, but also significantly reduce the reimbursement return phenomenon due to non-compliance of the supporting materials and other reasons.

The intelligent Q&A system mainly covers the information query, interactive Q&A part to address the claims of the reimbursement personnel in the whole reimbursement process. The system should be equipped with rich image and video recognition capabilities, text retrieval technology, and advanced language understanding and interaction technology. Users can ask questions to the system through voice commands, and the intelligent Q&A system parses the semantics with the help of natural language processing and deep machine learning, and retrieves relevant information in the financial database after understanding the user's intention. Then it combines the advantages of AI in advanced language to provide feedback to the user in the form of accurate, timely, natural and fluent language. This approach not only improves the efficiency of problem solving, but also enhances the user experience, making the entire reimbursement process smoother and more efficient.

6.2 Intelligent Business Operation System

Relying on IPA technology, the Intelligent Business Operation System assists financial staff in efficiently completing various business processing tasks, mainly document review, voucher entry, payment and other aspects. Compared with the traditional business processing mode, the system is

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more accurate and efficient in the automation of reimbursement process, information processing and financial data integration, which not only can effectively assist the financial staff in completing the tedious work of document verification, filling out and making orders, data checking and voucher production, but also helps to build a more intelligent and perfect green financial system that reduces costs and increases efficiency. The application of "RPA+AI" technology in the business process is extremely wide, which can not only realise the automation of repetitive and standard work and the intelligent collection and integration of structured data, but also cope with complex business scenarios. For example, in the budgeting of university funds, IPA technology can be combined with policy changes, the impact of the student population and other uncertain factors, rapid analysis and calculation based on the revenue and expenditure model to assist colleges and universities to make scientific budget decisions. The system can also realize the "integration of industry and finance". At present, some colleges and universities financial system still exists in the form of data silos, with the Student Affairs Office, Academic Affairs Office and other departments of the information is not interoperable, such as in the tuition fee reminder link, the student management department cannot be directly through the system real-time access to financial systems in the student payment information. This will not only cause a waste of resources, but also due to the poor flow of data between different systems, resulting in frequent reimbursement "blockage" and inefficiency. In order to completely improve this situation, through the combination of API (Application Programming Interface) technology + OA (Office Automation) system, IPA technology can unify the external data of the financial system interface. Then it can be linked to different platforms, ultimately forming a financial information sharing platform to achieve the integration of various types of business and financial processing.

6.3 Intelligent Data and Risk Control System

Intelligent Data and Risk Management System (IDRMS) are a system that monitors and manages data calls, which processing and storage performed by databases throughout the financial system using IPA technology. This is a system for risk monitoring of the reimbursement process and financial data. The system is also the fundamental guarantee and technical support for the safe realization of the whole process of paperless. The amount of financial data in universities is large and complex, and the application of IPA technology helps to improve the speed and quality of financial data acquisition. First of all, IPA technology can classify and store different data types, such as user database, financial list database, report database, business list database, etc. IPA can be used to call data from different databases with the corresponding permissions when the financial personnel need it, and present them in the front-end interface in a visual way. At the same time, in order to ensure the security and closure of the data, IPA technology can judge the user rights in the API response, and call the altered data into the data cache for legitimacy and compliance comparison to ensure the integrity and legitimacy of the financial data. Secondly, in terms of processing unstructured data, RPA technology can capture data according to the rules set by the financial staff to form samples and transfer to the data processing process, in which AI technology can screen and parse the data, and carry out deep data mining to form analysis results for decision-making. Finally, the results are presented in the form of visual financial statements, such as balance

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sheets, income and expenditure statements of universities. These analyses reveal the trends and connections behind the core data, providing valuable insights for the university departments. Finally, IPA technology enables real-time data monitoring during the paperless reimbursement process, such as automatically storing, tracking, tagging, and recording the operation records and dialogue contents in the paperless reimbursement process, so that each reimbursement can be traced back to its source and traces can be traced back to the source, which improves the efficiency of the university's financial management work, and helps in risk control and improvement of problems.

7. Conclusion

The development of the digital era has provided opportunities and brought new challenges to the financial transformation of universities. In this paper, through in-depth analysis of the current situation and limitations of the application of RPA technology in paperless intelligent systems in colleges and universities, with the support of more mature OCR, OA, API and other technologies, combined with artificial intelligence technology, big data analysis and deep machine learning, colleges and universities can build smarter and more efficient financial systems. During the period of digital transformation, the financial system of colleges and universities should take into account the level of financial personnel's education and professional skills, the existing system structure and other factors, and build a "RPA+AI" technology model with appropriate participation of human beings, which will not only help colleges and universities to transform the reimbursement business from traditional "paper-based" mode to traditional "paper-based" mode. This model will not only help the university reimbursement business from the traditional "paper-based" mode to the "paperless" mode of smooth transition. Finally, this paper focuses on how to promote the digital transformation of university finance through the effective implementation of paperless reimbursement. Through a series of initiatives, not only to enhance the level of financial management of universities and colleges of intelligence, but also for the future of the financial management system of universities and colleges of construction to provide useful theoretical reference.

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Conflict of Interest

The authors declare no conflict of interest.

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