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Research from RPA Advancement to AI Intelligent Automation Development: Taking the Accounting Service Industry in Taiwan as an Example

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Abstract

In recent years, digital technologies and information systems for audit analysis in the accounting services industry have attracted academic attention to significant. The accompanying innovations in auditing and bookkeeping models have fundamentally changed auditing expectations and behaviors, placing enormous pressure on the accounting services industry. As a result, organizations of all types and sizes emphasize digital transformation, becoming more common and necessary across all business functions. This organizational change often maximizes results and profits in the accounting services industry. It can even complete audit checks and share accounting data to respond to market demands and gain a sustainable competitive advantage. Our findings suggest that successful digital transformation in the accounting services industry is a complex development process but an essential indicator of the future. More detailed conclusions can be summarized as follows: 1) The accounting service industry implements audit sharing under operating pressure; 2) The accounting service industry is gradually developing towards audit automation and intelligence; 3) The accounting service industry uses cloud computing, big data, and other tools to Integrate top audit accounting models to realize the digitization of audit accounting. Our findings provide a theoretical perspective for scholars studying digital transformation in accounting, bookkeeping, and auditing. Additionally, we offer practical insights to better the digital transformation of the accounting services industry.

JEL classification numbers: M15, M42.
Keywords: Digital transformation, Audit sharing, Robotic Process Automation (RPA), Cloud computing, Big data.

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1. Introduction

RPA (Robotic Process Automation) is a concept introduced in 2012 by IT startups and research institutes that develop this type of software (Viale & Zouari, 2020, July). The idea still needs to be clearly defined and is mainly driven by constant practice and word of mouth from suppliers and users. It can be understood as: replacing humans with virtual robots; RPA not only simulates humans but also utilizes and integrates existing technologies to achieve the goal of process automation (Syed, et al., 2020). Or it can be understood as software automation = human + computer. Many companies favor this non-intrusive technology deployment because it automates business processes without modifying legacy systems. To understand it better, it has some simple functions that can help us with some automation tasks. Its basic working principle is as follows.

1) The operation flow is formed by recording the operator's mouse and keyboard operation steps.
2) Program the flow by manual editing.
3) Execute the technological process.
4) After the action is executed, a new movement is generated according to the new process operation, allowing users to complete some simple functions with the help of these process changes to form automation, which can solve many repetitive tasks.

1.1 Research Motivation

Outline the development of RPA and other periods from a timeline perspective.

1) In the early and mid-1990s, computers appeared in daily office work, and some software and tools that occurred at this time already had the prototype of RPA. It can be roughly divided into screenshots, process automation tools, etc. (Met, et al., 2020).
2) Screenshot technology is the first to bridge between two incompatible systems, extracting key terms and scanning large amounts of static information and other data. This ability to collect, sort, and analyze data is a core function of RPA today.
3) In the 1990s, various workflow automation software could help process orders by collecting specific passages. First, obtain data, such as customer contact information, total invoices, order lists, etc.; then form a database, and finally, notify the corresponding staff. Process automation and data storage, rather than manual data entry, increase order processing speed, efficiency, and accuracy.
4) RPA appeared in 2000 when RPA was already different from the quasi-RPA that preceded it. Take the essence of it, introduce the old and bring forth the new, and summarize the development of this stage. It has been able to effectively combine artificial intelligence technology with automation technology, of which OCR (Optical Character Recognition) technology is the most widely used, which makes RPA software no longer rely on code but allows users to manage workflow visually and automate repetitive labor. The way the process is created.

This method lowers the user's threshold for use and can quickly acquire data and build strategies without professional coding knowledge, which is also the value of RPA.

5) As RPA begins to solve more complex tasks through a simple operating system, the operation is simple and easy to use, and more and more industries are put into use on a large scale. For example, in BPO (Business Process Outsourcing, business process outsourcing), BPOs see RPA as a critical driver of efficiency and productivity. The two complement each other. With RPA, BPO can quickly realize office automation, which has the advantages of lower cost efficiency and faster response time. At the same time, RPA has also been able to land in the outsourcing field. Then after 2010, with the Internet and AI intelligence being put on the development plan, RPA technology has achieved rapid growth in all walks of life, especially in insurance, medical care, banking, new retail, and other industries. Implementing RPA significantly reduces labor costs and increases productivity while reducing errors.

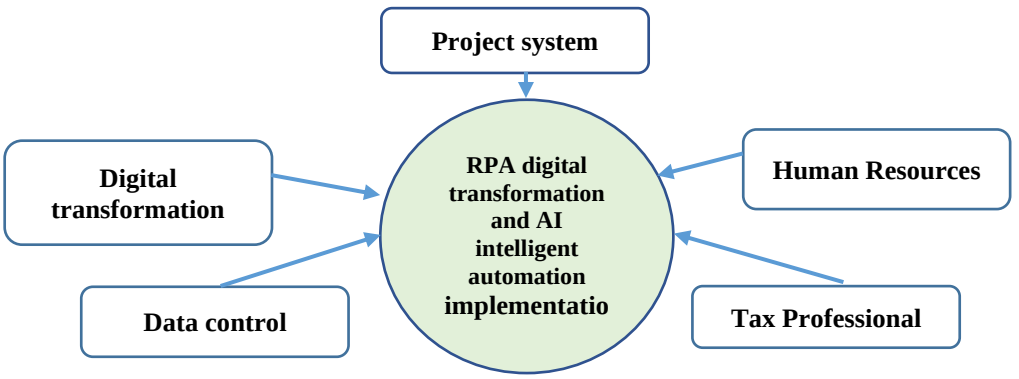

Figure 1: The core relationship between RPA digital transformation and AI intelligent automation implementation

1.2 Research Trends and Background

The popularization of RPA is an inevitable trend of social development, mainly based on the following points:

1) The demographic advantage is gradually disappearing, the aging society is accelerating, and labor shortages are emerging;

2) The increase in labor costs has brought a substantial financial burden to the accounting service industry;

3) With the rapid development of Internet technology, the old system cannot meet the demand, and the business capability needs to be expanded urgently;

4) Artificial intelligence technology is gradually moving from the laboratory to the market (Fang & Yang, 2011).

RPA will go through four stages of development. The first three generations of RPA

did not involve decision-making, just helping people execute predefined processes. Manual monitoring is required during initialization and operation to ensure accurate execution. With the increasing maturity of artificial intelligence technology, the fourth-generation RPA development stage has emerged: AI+RPA. The effective combination of artificial intelligence and robotic process automation enables intelligent decision-making in complex scenarios. Its functions are more complete, the application scenarios are more comprehensive, the scope is broader, and the RPA robot is more intelligent in four development stages (Haleem, et al., 2021).

Table 1: RPA bots in four stages of development

Stage	Content description	Literature
RPA1.0	It can be understood as additional labor. It is a simple assistant for standardized desktop tasks such as basic data entry and file opening. However, the entire workflow c can only be performed with human intervention, and it can e automated. The effect is often to help individual accounting services sectors improve slightly—work efficiency.	Davenport & Ronanki, (2018)
RPA2.0	RPA at this stage can partially save labor and automate part of the workflow in the entire business process. Robots always work through these repetitive tasks. Instead, they will complete these tasks with maximum efficiency by predetermined instructions and rules. Functions that do not require human intervention.	Kopper, Rodrigues, Zomb, & Zuccolillo (2020)
RPA3.0	It can be understood as enhanced intelligent RPA. RPA in stage 3.0 can integrate perception technology, try to acquire relevant external knowledge partially, and automatically process unstructured data in target documents. However, what RPA does at this stage is consistent every time. They don't "learn" from each repetition nor self-improve and seek better solutions in their day-to-day work. Strategy.	Zhang & Wen (2021 April)
RPA4.0	That is, through the combination of perception technology (voice, human-computer interaction, and vision), cognitive technology (intelligent decision-making), and RPA technology, an intelligent assistant robot that can simulate human beings for business decision-making and business processing is formed. Be built. RPA and artificial intelligence AI have an extensive range of applications. On the one hand, it can handle simple and repetitive tasks, such as sending emails, Excel calculations, organizing documents, etc.; on the other hand, it can also complete identity information intelligent auditing, text OCR thoughtful analysis, customer service scenarios, etc. Complex decision-making work such as assisted decision-making and automatic recommendation. Intelligent assistant robots can learn human business processing experience (data). In complex business scenarios, it can achieve a decision-making accuracy close to or even higher than humans, breaking the limitation that traditional RPA technology can only do to process business according to specific rules—in-depth coverage of business scenarios.	Madakam, Holmukhe, & Jaiswal (2019).

1) AI+RPA (Intelligent Brain) communicates with the robot through a monitoring engine, decision engine, operation research engine, control engine, etc.
2) Robots act as ears, eyes, and noses through artificial intelligence (e.g., OCR, NLP, voice interaction) to better execute operational commands.
3) The robot work data is fed back to AI+RPA (intelligent brain) through algorithm training, self-learning, and then choosing a better route to run (Oshida, 2021).

Artificial intelligence (Artificial Intelligence), proposed by Dartmouth Research Institute in 1956, is a technology designed to respond to and learn from stimuli like human responses; it is a simulation of human consciousness and thinking information flow. Simply put, the relationship between AI and RPA is like the relationship between brain instructions and hand and foot operations. Its characteristics are as follows:

1) RPA tends to repeat commands, while AI tends to issue commands.
2) RPA robots can automate simple tasks and provide extensive data for artificial intelligence.
3) AI can imitate and improve processes based on the data provided by RPA.
4) RPA is process-centric, while AI is data-centric (Li & Du, 2017).

AI combines machine learning and deep learning and has a strong self-learning ability. Its OCR, NLP, speech recognition, and other technologies enable RPA to have cognitive capabilities. It can continuously correct its behavior through big data, so it has the ability of intelligent decision-making and intelligent operations research. In the future, with the continuous development of RPA technology and the continuous implementation of AI, the integration of the two parties will be faster and deeper and then evolve into the industry's general trend (Zhang & Wen, 2021, April).

1.3 Research purposes

Computers are just a typical application of AI+RPA. A matching algorithm between policy requirements and accounting service industry conditions is constructed through artificial intelligence semantic analysis to achieve two-way intelligent matching between the accounting service industry and policies. We are delighted to find that AI+RPA computer can effectively solve the problem of information asymmetry between the government and the accounting service industry, automatic entry, automatic analysis, automatic verification, accounting service industry policy push, and a timely automatic reminder of application information. In addition, computers can intelligently evaluate the multi-dimensional development indicators of the accounting service industry, assess the distance between the industry's conditions and incentive policies quantitatively, and provide exclusive action suggestions based on professional interpretation experience to achieve RPA4.0 institutions in policy release and matching scenarios. The effect is excellent, and it will significantly improve the quality and cost of policy work in the accounting service industry (Daugherty & Wilson, 2018).

Table 2: Efficiency-enhancing RPA digital transformation and AI intelligent automation to improve quality and reduce costs

Execute project	Content description
Robotic Process Automation	Robotic Process Automation (RPA) uses soft robots to automate repetitive and routine tasks. RPA (Robotic Process Automation) is an emerging computer operation automation system, which can simulate various personnel operations in the computer system and perform repetitive and regular computer operations in the daily operations of the accounting service industry, or a high degree of system integration. For the accounting services industry, automated systems replace human entry and can reduce human entry errors. The introduction benefit can be determined according to the degree of informatization, centralized operation and scale of the accounting service industry, and there is an opportunity to reduce it by 30% to 70%. Manual work can reduce labor costs by 15% to 90%.
Automate repetitive tasks	Automating repetitive tasks saves time and money. Automated process automation robots can complete tasks at high speed, allowing the accounting services industry to perform higher-value work and extending the value of automation platforms.
Accelerate time to value	Robotic Process Automation (RPA) can accelerate time-to-value, building, testing and deploying new automation solutions in hours instead of days or months.
Reduce human error	Robotic Process Automation (RPA) can reduce human error and eliminate copy-and-paste mistakes when entering the same data into multiple systems.
Improve efficiency	Robotic Process Automation (RPA) can increase throughput, automate jobs in seconds or minutes, and deliver excellent customer value.
Get rid of repetitive tasks.	Learn how RPA bots freed the accounting services industry from repetitive manual operations.
Intelligent Information Capture	Intelligent Information Capture is an innovative evolution of standard data capture that extends Optical Character Recognition (OCR), artificial intelligence and other technologies to identify and extract information from unstructured content.

The accounting services industry generates and receives vast amounts of new information daily to make decisions, manage operations and create value. The business applications that need this information the most need access to more of it, compromising decision-makers ability to understand the opportunities and constraints affecting the organization truly. For example, the accounting services industry can standardize and automate information capture procedures to more efficiently and accurately extract knowledge and intelligence from unstructured content to create insights that accurately reflect operational realities and support more effective digital transformation recommendations. And make better business outcomes (Shim, et al., 2002).

Use AI to collect more information and modern machine learning and AI tools to

classify and capture data from more sources. Build transformational applications, inject more data into robotic process automation (RPA) projects, and leverage AI to build transformational applications. Reduce total cost of ownership and use flexible AI tools to help reduce the time, effort, and cost of information capture projects. Decryption Process Robot (RPA), in the daily operations of the accounting service industry, many processes often rely on repetitive operations between computer desktops and information systems. Process Robot (RPA) is an emerging programming software tool that simulates what users often do while sitting at a desk and automates these repetitive and tedious computer desktop operations without special hardware devices. Works in any information systems (IT) environment and can even perform virtualization work in the background of your computer. This is where process robots (RPAs) can achieve more repetitive but logical tasks in place of human input. Process robots are like giant yellow robotic arms in factories, changing the speed of business decisions by automating labor-intensive and repetitive processes—the benefits of processing robots for the accounting services industry. For internal operations, the cost of a fully loaded process robot is only about one-third of the cost of general accounting services. In applying financial accounting workflow automation, processes from journals, entries, available ledger adjustments, and conversions to various reports are suitable for process automation. In many real-world applications, the efficiency of process robots is indirect. Still, the number of operators has increased by 15 times, the quality of job execution is almost zero, and the error rate has been reduced by 15% to 90%. Process robots reduce labor requirements for indirect personnel and provide other advantages; they operate 24/7 and can generate time-sensitive reports to meet deadlines. Process robots will perform more accurately, avoiding a series of compensatory measures due to duplication of data recording and input errors and making process robotic automation a reality (Madakam, Holmukhe, & Jaiswal, 2019).

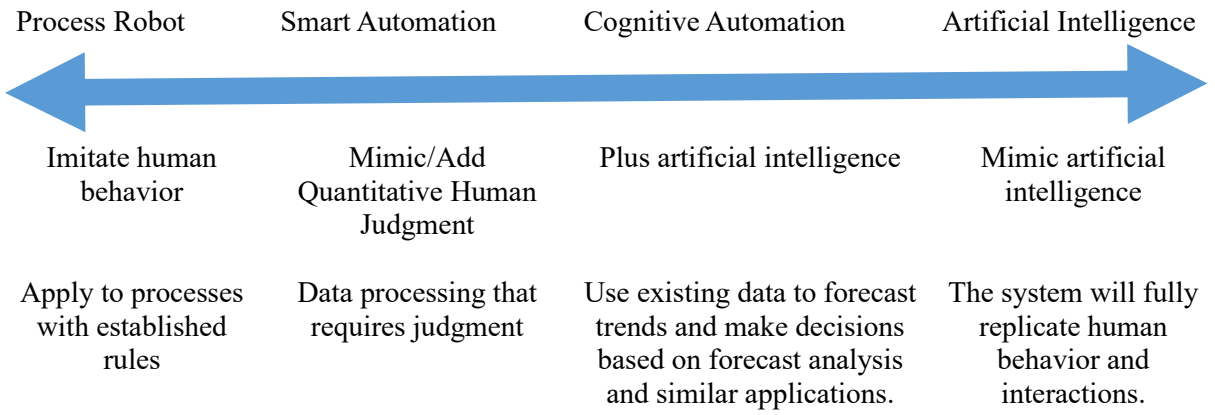

Figure 2: How to automate RPA processes

2. Literature Discussion

2.1 From Process Robotics (RPA) to Intelligent Automation (IA)

The advent of Robotic Process Automation (RPA) has started the digital transformation journey of the accounting services industry. With the popularization of process robots, the accounting service industry faces digital transformation: how to develop digital processes and establish proper digital procedures continuously. Smart digital workforce? Focus on the development and change of intelligent automation strategies. Learn how to move from process robotics to intelligent automation (IA) based on previous experience assisting with he introduction of accounting services (Jędrzejka, 2019).

2.2 Start with process robots

Digital transformation has gradually become one of the core elements for the accounting service industry to maintain a competitive advantage, and several digital technologies have emerged as the times require. Among the various solutions driving digital transformation, process robots are widely adopted by the accounting services industry due to their rapid introduction and a significant increase in digital productivity. Use. Process robots play a crucial role in automation technology and are favored by the global accounting services industry at a rate of more than 20% per year. Compared to the previous year, the number of implemented process robots has tripled. This growing trend will continue to occur around the world. As automation technology becomes more complex and easier to deploy, there will be more investment in automation solutions in the future. By re-examining the existing internal operating methods and work content, from standardization to automation, and gradually introducing process robots, many positive effects have been achieved; however, the accounting service industry is not satisfied that process robots can only process structured data and fixed rules—work tasks. Facing a future of rapid change and massive amounts of data, the accounting services industry seeks more innovative solutions to help handle more complex operational processes and extends the goal of driving digital transformation to the introduction of intelligent automation. As a result, the popularity of process robots has increased. Merely measuring the digital transformation of the accounting services industry is not enough. Follow the progress and strategic planning of intelligent automation in the accounting service industry (Cortet, Rijks, & Nijland, 2016).

2.3 Process robots advanced to intelligent automation

What is the difference between process robotics and intelligent automation? Intelligent automation combines process robotics and cognitive technologies to handle more complex work situations and capture, reorganize, analyze, and validate various structured and unstructured data. Scenarios for automating complex workflows:

1) The work of converting image information into text information, for example: extracting receipt content from paper invoices in different formats and

converting it into a text list.

2) The work of converting voice information into text information, such as altering the content of calls made by customers over the phone into text records.

3) Integrate and analyze massive and loosely structured data, for example: after converting paper receipts generated by monthly income and expenditures into digital data, extracting data in specific fields, and making monthly reports (Katti, et al., 2018).

As image recognition and language perception technologies mature, combining these technologies can identify and transform data types that were intractable in the past, further enabling intelligent automation. Compared to process robots, they are good at automating repetitive tasks with fixed rules; intelligent automation emphasizes the ability to recognize different work situations and automate tasks with loose data structures and complex logic (Figure 3)

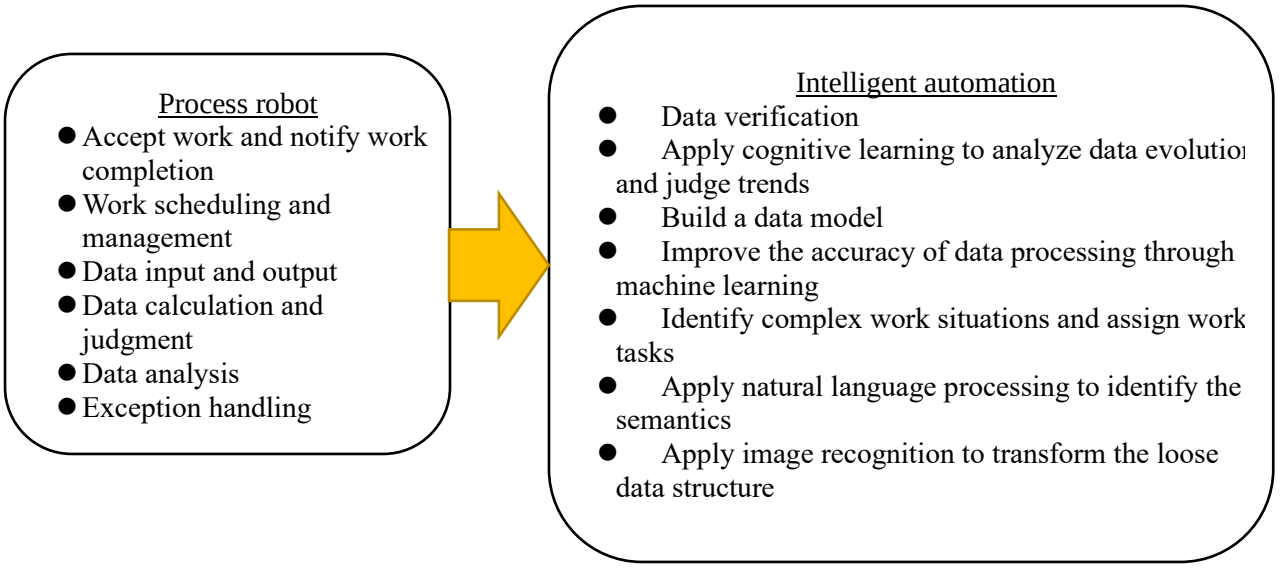

Figure 2: Process robots advanced to intelligent automation

It is recommended to import routine actions with fixed rules into process robots. Once the internal automation capabilities of the accounting services industry are established, other businesses can be revisited to assess whether the introduction of intelligent automation is feasible. Finally, a corresponding import plan is formulated to gradually improve the operation process's automation degree. Developing intelligent automation driven by process robots will be the most effective and reliable way to promote intelligent automation (Lacurezeanu, Tiron-Tudor, & Bresfelean, 2020).

2.4 The benefits of intelligent automation

Process robots can precisely automate routine tasks, significantly reducing processing time and improving operational procedures' quality and accuracy, freeing up more time for accounting services to complete more value-added tasks. As the accounting services industry moves towards intelligent automation, the advantages of process robots can be further expanded. For example, in previous surveys, improving the productivity of operational processes was the most recognized benefit of introducing process robots. The introduction of intelligent automation has enabled the continuous increase in productivity of the accounting services industry. The outstanding advantages of process robots in the past are: the control and management of standardized internal operations, increased work capacity, and improved production efficiency, quality and precision—operating procedures. Capabilities are further enhanced with the introduction of intelligent automation. For example, reducing operating costs for the first time has become an essential result of the digital transformation of the accounting services industry; it is recommended that the accounting services industry first consider the non-financial value of process robots to improve process stability, reliability, and immediacy, rather than cost-effectiveness; the more familiar the process automation, the more Extensive and comprehensive (Ng, et al., 2021).

Further, drive intelligent automation to help the accounting services industry achieve greater cost-effectiveness. Process automation in the accounting services industry shows that intelligent automation is more effective than pure process robots in improving workflow accuracy, data analysis capabilities, and customer service satisfaction. For example, accounting services using intelligent automation have achieved more than expected results in improving the accuracy of workflows and enhancing data analysis capabilities, almost twice as much as using process robots alone. Furthermore, advances in intelligent automation can extend the advantages gained in process robotics in the past and create outcomes beyond expectations (Suri, 2022).

2.5 The challenge of intelligent automation

While most people believe that intelligent automation can create higher value for the accounting services industry, a minority believe that the accounting services industry does not have a robust and innovative automation strategy to deal with the upcoming digital transformation. Since intelligent automation can recognize and analyze different operating situations, its application range will be more comprehensive than process robots. In addition to involving data applications between other information systems and departments, it also includes cross-departmental personnel collaboration. All of these factors can make automated process design more complex. Therefore, before advancing intelligent automation, a clear strategic direction and automation blueprint should be developed to avoid losing the goal of automation in complex process operations. As automation expands, intelligent automation will face dramatic changes in traditional workflows

and procedures; the accounting services industry has yet to respond, and most have not proactively responded. In addition, more than a majority of the accounting services industry believes that the need for more relevant job skills to deal with the new technologies and changes brought about by intelligent automation hinders the development of smart automation.

To promote the transformation, the accounting service industry needs to change the original work mode, specialize in the division of labor, redefine value, create a more productive digital work environment and introduce the existing operational processes into new technologies or solutions. It is suggested that when the accounting service industry faces a new working environment in the future, it should cultivate the strategic thinking ability of process automation, encourage unique creativity, and have the courage to break through the previous work thinking to have a more vital knowledge in the transformation process. Adaptability enables the accounting services industry to co-build collaborative models of workforce and robotics, proactively addressing the challenges posed by digital transformation (Paesano, 2021).

3. Research methods and application of RPA

The most important metric for AI is data. As with any accounting service, the value of data lies in quality and quantity. By 2022, 90% of accounting services strategies will be directly data-driven (Cao, 2022). Without sufficient data, this digital war can be challenging to wage in a modern age of increasingly rapidly changing environments, rules and needs. However, most accounting services require introductory knowledge to initiate any changes that come with something new. The process is like having a local working parent suddenly ditching the old-school IE browser and using Firefox or Chrome or change the OS from Windows to Linux. These unprepared situations can be compared to the resistance to working long hours in an organization and getting used to accounting services in established patterns. Even mentally prepared, the gap between reality and the ideal is always more significant than we think. I believe that many accounting service industries have begun to examine their current actual situation before they start discussing the vision of machine learning (Machine Learning), deep learning (Deep Learning), etc. Is there any compromise that can speed up the speed without changing the current office process? System RPA is the product of such a demand background. He can repeat manual computer operations very quickly and is technically just adding automation to the Graphical User Interface (GUI). From the perspective of back-end users, RPA system import consultants usually only need to put a small video to introduce the concept of RPA, such as how to quickly and automatically "key" order data into the sales system. Customers will be excited to imagine How many tedious, repetitive, and lengthy tasks you have yourself, and suggest to your advisor the possibility of delegating different types of functions to bots.

1) Most accounting services do not have a single auditing and accounting system. Even full-featured systems such as SAP, Oracle, and Salesforce are challenging to implement in various complex accounting service businesses. Need. Additionally, the entire system gets stuck in its current state while writing and developing custom programs to modify the method according to the user's needs. However, the natural environment is dynamic. Accounting services may not always have budgets and resources. Instead, they should find the original, responsible manufacturer, constantly respond to the changing climate, and develop customized solutions (Breznitz, Forman, & Wen, 2018).

2) Most accounting services have data records for at least a few applications and systems. There is plenty of top engineers in the significant accounting services industry, but we always consider the benefits first, whether to preserve the current workflow. Integrating and connecting disparate systems from scratch does not necessarily require less cost and labor to build new systems after measurement and evaluation (Rotz, et al., 2019).

3) Service-Oriented Architecture (SOA) and large-scale information system projects have yet to realize their expected business value. It is conceivable that without adequate preparation, the cooperation of all parties, and proper leadership, a vast and complex system will be shaken, and the probability of success is extremely low, not to mention that if any project is unsuccessful, the process will be more difficult.

4) Don't take risks when replacing the system; the old legacy system has been used.

The fourth point is a continuation of the third point, how RPA solves the above problems.

1) The core spirit of RPA is connection, and it is non-intrusive system software. The point is that the development cost of RPA is much lower than the modification or replacement of professional auditing and accounting (Shneiderman, 2022).

2) When a large system project fails, the accounting service industry is most tiring. There should be many white-collar workers tormented by the experience brought about by this institutional change. Choosing a process analysis starts by examining each step of the process details. Sort by size, cooperate with agile project management, shorten development time, and calculate by month; the risk will be lower (Cohn, 2005).

3) If the accounting services industry continues using legacy systems after evaluating the pros and cons, if the original repair system manufacturer has gone out of business, or if market conditions and consumer changes accelerate to the point where human resources cannot afford it.

3.1 In the new era of office automation, use RPA to enhance the competitiveness of the accounting service industry

A new wave of office automation robots is coming, and robots can even do administrative work. This way of enhancing the competitiveness of the accounting service industry has become a topic of concern to the global accounting service

industry. Shortening legal working hours has become an international workforce. Legislative trends, governments around the world are facing such issues (Skidelsky, 2019). It is a common practice to develop better software systems to help the accounting services industry. The way of AI is to use AI to help. Still, the development direction of AI is comprehensive, and the focus of each industry and application is different, so what can the accounting service industry do now? If we think from the perspective of process transformation, we have reached a critical point, and we can only deal with it continuously through system development. To find a breakthrough, rethinking process automation may be a new direction.

3.2 The new application of automation in office scenarios has become the focus of the accounting service industry in recent years

Automated machines have been used to reduce labor since the industrial age. The early application was simple, but it has become diverse and common in recent years. When it comes to robots, most people probably think of factories, such as robotic arms for automating production processes or uncrewed transport vehicles (AGVs) for logistics and warehousing operations. Now, just like the existence of simple sweeping robots in home life, in the field of work, digital applications have long been popularized and mature, and automation is developing towards a high degree of integration. It will be able to combine speech, image recognition, artificial intelligence and other technologies to handle more complex tasks. Desktop automation applications for office work are now much more advanced than in the past. In addition to the batch processing functions of the drawing software Photoshop and the macros of Office software, it is more common in the accounting service industry to automate cross-system processes through system development. Among the office automation software that has emerged in recent years, Robotic Process Automation (RPA) is the most eye-catching (Zhao, & Zhang, 2021).

In short, users sit at their desks and now use their computers to operate different applications and systems. In the future, soft robots could replace execution, especially those that are tedious and not worth the labor. This is somewhat similar to keyboard and mouse automation simulation software key wizards, automatic click software, and plug-in robots, but with more advanced RPA capabilities that provide process concepts and cross-system integration capabilities. More specifically, scenarios in the financial industry that rely heavily on manual operations, such as account opening review, credit review processes, intelligent customer service and even business processes, have been replaced by RPA and automation. Influences. The supply market for such commercial software also has a specific size. For the accounting service industry, the most direct effect of introducing this type of automation software is to reduce the highly repetitive and inefficient transaction work, improve the overall efficiency of the accounting service industry, and bring cost-effectiveness. After all, in an era of emphasis on digital transformation, staying competitive has become a top priority.

3.3 Highly repetitive, labor-intensive and inefficient administrative tasks can be handled by automated software

Making good use of new technologies has become an indispensable issue in the operation of the accounting service industry, such as ERP, BPM, etc.; the purpose is to improve quality and output efficiency, how maximize benefits and manage the situation under the automation of internal control and air compliance requirements. In the future, RPA is gradually emerging, eager to become the focus of the future development of the accounting service industry. In principle, in the daily operations of the accounting service industry, highly repetitive and regular human-machine operations can be completed by soft robots. It may take longer to complete the process. It not only drags down the efficiency of business operations but also makes customers wait longer. There are also time-consuming manual tasks such as generating reports and comparing data. Suppose these tasks are completed before the meeting. In that case, there is no time to interpret the information and digest the data, which will affect the efficiency of the forum and decision-making (Leitner-Hanetseder, Lehner, Eisl, & Forstenlechner, 2021).

3.4 The maturity of AI technology, RPA technology infrastructure construction, and the development of intelligent automation

Figure 3: The evolution of automation in four stages

Many people think of AI these days when it comes to automation, and there is indeed a relationship between the two. In short, the application development trend of RPA is developing in the direction of intelligent automation. From a Big Tech perspective, it's about RPA application development. In this regard, as technology advances, they divide the evolution of automation into four stages: desktop automation, RPA, intelligent RPA, and process automation. The earliest stage is the application of desktop automation software, but the disadvantage is that it can only be executed on this computer; the second stage, the concept of the integration process, can realize cross-system integration, but structured data and simple rules still limit the processing content. The third stage is to expand the application scope of RPA to deal with unstructured data and complex rules; the final step is to truly integrate artificial intelligence technology, including applications such as natural language processing and chatbots with complex logic, to make the automation of the actual process more refined. What RPA can solve are structured data and fixed logical processes. When it comes to human judgment, artificial intelligence is needed (Syed, et al., 2020).

Coincidentally, with the further development of technology maturity, the concept

of RPA is also getting bigger and bigger. For example, in the early days, it was only a single application of RPA, and now it is discussed with AI. The application of IA, according to knowledge and value, is divided into three stages: stereotyped operation automation, non-stereotyped operation automation and high intelligence. The general application of robotic automation processes is mainly to perform routine tasks such as report production, data recording, interpretation inspection, and data collection according to pre-written program rules. A further technical application is to add perception AI to realize information recognition of pictures, videos, and voices, as well as chat robot effects. In addition, it can identify and interpret unstructured data and apply it to business process operations or query and reply to process response content. Ultimately, it must be able to respond to natural language processing and integrate machine learning, deep learning, AI and other technologies to achieve autonomous understanding, advanced analysis, multiple judgments and processing capabilities. Some people in the industry have a similar view on RPA application development.

In contrast, in artificial intelligence, RPA is very important. AI not only helps to expand the application scope of RPA but also allows the application of AI to expand to more scenarios. The combination of these two fields can create higher accounting service value.

3.5 Drive the accounting service industry towards digital transformation and indirectly promote the change of talents

In the past, brick-and-mortar automated machines have replaced blue-collar jobs that provide manual labour. Now, soft robots can also replace some white-collar jobs. For example, the rise of the concept of financial robots before has made grassroots financial personnel feel the pressure of occupational insecurity. From this point of view, although the AI level of RPA at this stage is not high enough to reduce low-repetitive transaction work, it is still replacing labour to a certain extent. For some accounting services, it should be possible to reduce tedious, uninteresting work and free up more time to focus on more creative, critical-thinking work or to spend more time interacting with clients. But for some highly repetitive jobs, there may be endless copying, pasting, etc., all day long, evolving with the development of the times and technology. Judging from this wave of RPA and AI, it can gradually affect human life and work. For the accounting services industry, the role of people may need to be repositioned, and even thinking about how to drive talent transformation. By contrast, workers worldwide may also be ready to learn again and be prepared for their next job under the onslaught of new technology. But people probably don't need to worry too much. From the accounting service industry system perspective, there are still issues such as the power of trade unions and the social responsibility of the accounting service industry. Unless the work environment changes in another 20 or 30 years, it may not be the same. From another point of view, the human resource management department of the accounting service industry should also adjust its thinking and operation. After all,

automation could change the job content of some occupations. It also requires the accounting services industry to redefine work and business process transformation, rethinking human resources, and even change management. Because one of the hidden benefits of RPA is business process reengineering, given the rapid development of new technologies, RPA may offer significant benefits at this stage. Still, new technologies may emerge in the future. It seems that the accounting services industry should have the idea to adjust its pace at any time to remain competitive (Jędrzejka, 2019).

3.6 RPA digital transformation and critical factors of AI intelligent automation affect the evaluation of the accounting service industry

To gain insight into the impact of the core key factors of RPA digital transformation and AI intelligent automation implementation, this study evaluates the key factors affecting RPA digital transformation and AI clever automation implementation. According to the "Announcement on Auditing Standards No. 48", the relevant models involving audit risk are subdivided into "project-based", "human resources", "tax-oriented", "data management and control", and "digital transformation". Analyze the importance and performance value of multi-criteria decision-making, use the Delphi research method to remove the factors that experts consider less influential, and add the remaining items to the core key influencing factors of RPA digital transformation AI intelligent automation discussion (Micheler, 2019).

(1) Project system

AI will inevitably play an important and even decisive role in future operations. Artificial intelligence integrates human and brain power, affects the social landscape, and shapes the foundation of the prospective business model environment. Moore's Law, which dominates the current development of artificial intelligence, predicts that it will encounter a bottleneck in 2030, and its future will depend on the development of "quantum computers". 5G network development is the means of execution for future systems; the question of the future is not how to predict the impact of AI but how the digital transformation of RPA and the implementation of AI intelligent automation will respond to the changes it brings. Technological innovation drives industrial transformation and creates a new look for the business service industry. The combination of AI intelligent automation and accounting service industry technology will usher in innovative services such as robotic bookkeeping, auditing, blockchain applications, process robots, and differentiated auditing services. In addition, the lying science and technology will open up a new world of accounting services and technology applications (Xu, et al., 2021).

(2) Human Resources

Robotic process automation is critical in helping the accounting services industry improve efficiency and digital productivity. The use of process robots in human resources in the accounting services industry, along with possible risks and challenges. It also addresses HR issues and specific practices that internal audits should consider when addressing innovative technologies such as RPA digital

transformation and AI intelligent automation. Therefore, this study applies text mining techniques to analyze the unstructured content of accounting entry summaries to identify and assess their risks. , which helps auditors and bookkeepers find unusual accounting subpoenas more efficiently. Build a prototype of an accounting entry risk assessment system, and explore the feasibility of applying technology to analyze accounting subpoena risks. Its analysis program mainly summarizes the related items of a single accounting subject and uses the RPA model for classification, aggregation and risk scoring; it provides screening conditions for different risk levels, helping the accounting service industry to discover accounting services that may be misreported or intentionally hidden. Fraction. Record. Subsequently, experts will review the system prototype jointly to evaluate its effectiveness and feasibility and give feedback and suggestions (Fernandez, & Aman, 2018).

(3) Tax oriented

With the advent of big data, auditing and accounting services can be combined with emerging information technologies to analyze rapidly growing amounts of data. In this way, under the original audit accounting objectives, the effectiveness and efficiency of the audit accounting implementation plan can be effectively improved. For example, RPA can significantly reduce work time and errors and improve work efficiency, quality and flexibility. Let the robots focus on tedious jobs and let the accounting services industry continue doing creative work. RPA can be used for risk management, internal control and legal elimination. The international tax environment is changing rapidly. Under the global anti-tax avoidance trend, all countries are facing new tax information disclosure requirements. In addition, new laws and regulations are constantly introduced. Tax information should be collected, managed and reported using RPA or artificial intelligence, and then most of its resources should be used for tax analysis to improve tax collection efficiency (Faúndez-Ugalde, Mellado-Silva, & Aldunate-Lizana, 2020).

(4) Data management

In the current digital trend, everyone is talking about the application of artificial intelligence, robotic process automation (RPA) and big data:

a. Immediate direct impact: Reduce labor costs, and improve operation speed and accuracy. RPA, as someone who can work non-stop throughout the day, can increase the speed and accuracy of operations, especially in processes that require repetitive operations and multiple Excel worksheets across systems, which can bring significant benefits.

b. Direct and indirect effects: assist in process optimization and standardization.

Multi-person operation and single-robot execution: changing how the process is executed, RPA downloads all information from the system at once. Store and organize data in Excel for greater efficiency. Synergies brought about by process standardization: In the past, when different persons in charge were doing the same business, due to other personal habits, different operation interfaces, different operation methods, and even different operation principles, the operation communication between them was inconsistent. By introducing the opportunity of

RPA, everyone's operational processes can be reorganized and then unified, thereby reducing communication costs and improving efficiency. Opportunities for process optimization: Manual operations are often based on previous SOPs and operating guidelines. However, some functions may perform better over time, or the operation no longer needs to exist. These problems can be clarified during the robot automation import process (Upadhyay, Khandelwal, K., Iyengar, 2020).

c. Direct impact of continuity: future business expansion can save wages and training costs. Whether the accounting service industry is actively expanding its business and needs more workforce to cope with the expansion of business volume or passively responding to the environment and the workload that needs to be handled, automation can be used. The increased business volume is borne by robots and does not require an additional emergency workforce and training costs.

d. Continued indirect influence: from the future cooperation model between RPA and AI. AI powers RPA development: Process robots can only handle routine and logical operations. When encountering an irregular operation process, the process robot needs to call AI to intervene and use cognitive technology to assist the process robot. RPA helps the development of artificial intelligence: Based on AI learning, a large amount of data is required to improve the ability to identify and judge. The preparation and input of these massive data only rely on the work of daily personnel, the development speed could be faster, and the amount of information may need to be more. With the assistance of process robots, there is an opportunity to accelerate the development of artificial intelligence. The best-known part of RPA is its ability to provide automation in the accounting services industry. But the impact it can bring is to pave the way for the long-term development of process standardization, extensive data analysis, and artificial intelligence in the accounting service industry. Before the transformation of the accounting service industry, it is necessary to pay more attention to the future digitalization goals of the accounting service industry, formulate a management thinking model for this, and implement it from the perspectives of operators, IT and users—an essential step towards the successful digitization of the accounting services industry (JONES, IONIŢĂ, & MIHAI, 2022, April).

(5) Digital transformation

RPA can provide automation advantages and future competitiveness for the accounting service industry. Still, the successful introduction also requires the cooperation of corresponding roles in the accounting service industry. The thinking and actions of major players such as operators, IT personnel, and users must also be changed accordingly. Get a clear understanding of RPA's connection to business development and organizational vision: understand the changes automation can bring to your business, how to plan your digital transformation, how to integrate with artificial intelligence, and how to use RPA to help your business decisions. Strategic and integrated vision and thinking, not simply replacing the workforce and saving costs. People tracking and planning capabilities: Panic and unemployment rebounds can occur when automated robots replace routine, repetitive processes for existing people. Therefore, in addition to the need for operators to provide sufficient

support for automation projects, the more important point is how the accounting services industry should lead people to the next stage and how to give more training so that people can do more work. Valuable activities would be the ones to consider. Be able to identify the application scope of RPA: First, the Improvement of this process, whether the application of RPA is the best solution to the problem needs to be discussed and clarified together, and then further think about which processes can be automated with precise logic, think about those parts that cannot be automated, There is no opportunity to do further process design to make it automatic enough—positioned as a critical enabler of automation in the accounting services industry: developing possibilities to maximize the benefits of the RPA process through the professional use of relevant information and knowledge. In addition, RPA is different from traditional development methods. It simulates the user's operation on the system interface from the front end, so it must be able to adapt to the mode of short development time and long test cycles. Need to adapt to the impact of changing work habits: It may have been easy to follow previous work patterns in the past, but with the introduction of RPA, you should first consider the need for this work and then learn to think about how to speed up your workflow. From the design of the form to the transformation of the operation mode and operation logic, how to plan and unify other personnel to operate the same operation process and maximize the efficiency of the accounting service industry is an important topic. Learn to independently understand requirements and implement them using RPA tools: the information world of the future will be more user-centric. The design of RPA is closer to the user's understanding of the program than traditional program development. In the end, users can be autonomous and reduce communication costs (Ng, etc. 2021).

To sum up, this study takes system construction, human resources, tax orientation, data management and control, and digital transformation as the criteria for selecting the core model of RPA digital transformation and AI intelligent automation implementation. Below is a discussion and description of each protocol and literature under each standard. It is more important for the accounting service industry to use digital transformation and AI intelligent automation to realize the digital transformation and AI intelligent automation of core auditing. That is to say, the accounting services industry will use digital transformation and AI intelligent automation to achieve the purpose of digital transformation (Czarnecki & Fettke, 2021).

3.7 Research methods

3.7.1 Decision-Making Trial and Evaluation Laboratory

The decision laboratory analysis method (Decision-Making Trial and Evaluation Laboratory, DEMATEL) can analyze the correlation between the problems, identify the primary and secondary issues, and further describe the causal relationship between the standards. DEMATEL can effectively combine expert knowledge to clarify problem variables. Let the reader know which selection criteria are more

important and refer to the more important and relevant standards for conversion. For example, according to Fontela & Gabus (1976), the analysis of DEMATEL can be divided into five steps regarding its organizational structure and calculation steps (Lee & Hu, 2021).

(1) Define elements and judge associativity

The elements of the system can be listed and their definitions defined through literature reviews, brainstorming, etc. For example, the DEMATEL scale designed by Fontela et al. is divided into five levels (Level), where 0 means strongly disagree and four means strongly agree, as shown in Table 3 below.

Table 3: DEMATEL evaluation scale and representative significance

Evaluation scale	Influence level
0	Strongly disagree
1	Disagree
2	No opinion
3	Agree
4	Very much agree

(2) Create a direct relationship matrix

According to the influence relationship and the degree comparison criterion, when the bar is *n*, an *n* x *n* matrix can be obtained, called the direct relationship matrix, represented by X. The number of digits of X_{ij} in the matrix represents the degree of influence of criterion *i* on criterion *j*, Z_{ij} is set to 0, and the formula of Z is as follows:

$$Z=[Z_{ij}]_{n\times n}=\begin{bmatrix} 1 & Z_{12} \ldots\ldots Z_{1n} \\ Z_{21} & 1 \quad Z_{2n} \\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots \\ Z_{n1} & Z_{n2} \ldots\ldots\ldots 1 \end{bmatrix},(i=1,2,\ldots\ldots n;j=1,2,,\ldots\ldots n)$$

(3) Building a Normalized Direct Relationship Matrix

$$\text{Make S} = \frac{1}{max_{0\leqq i\leqq 1}(\sum_{J=1}^{n} Z_{ij})},$$

And multiply the entire matrix element by S to get the normalized matrix, denoted by D.

$$D=Z \text{ X } S = \frac{X}{max_{0\leqq i\leqq 1}(\sum_{J=1}^{n} Z_{ij})}$$

(4) Calculate Direct/Indirect Matrix

The total relationship matrix T = direct relationship matrix D + indirect relationship matrix ID. After normalizing the direct matrix, the complete relationship matrix T can be calculated through the $T=\frac{D}{I-D}$ formula, where I is the identity matrix.

By infinite proportional series

$$T=D+ID=\sum_{i=0}^{\infty} D^i=D+D^2+D^3+\ldots.+D^{\infty} \quad (1)$$

Multiplying left and right by D, we get:

$$DxT=D^2+D^3+D^4+\ldots.+D^{\infty}+D^{\infty+1} \quad (2)$$

(1) minus (2), we get:

(I-D) x T=D- $D^{\infty+1}$. Because the values of the elements of the normalized matrix$[d_{ij}]_{nxn}$ are between 0 and 1, so $D^{\infty+1}=0$
and finally:

$T=\frac{D}{I-D}$,$T=\left[t_{ij}\right]_{nxn}$

I, j=1,2…,n。

(5) Draw a cause-and-effect diagram

Make t_{ij}(*i*,*j*=1,2,…,n)is the element in T, the sum of each row, and the sum of straight rows are represented by d_i and r_j means; the following formula is obtained,

$$\text{Row sum d}=d_{nx1}=[\sum_{j=1}^{n} t_{ij}]_{nx1};\ \text{Straight sum r} = r_{nx1}=\left[\sum_{j=1}^{n} t_{ij}\right]_{1xn} \quad (3)$$

In,d_i: The sum of other elements (direct and indirect) affected by element i as a cause.

r_j: The sum of parts that result in element j and are affected by other factors.

The sum of rows and columns (d+r) is called the correlation degree, which is derived from (d_k+r_k), indicating that the influence caused by the element is the total influence degree, which can display the factor group of the component of the correlation strength; relatively speaking, the difference between rows and columns (*d*-*r*) is called the degree of "cause" and is derived from ($d_k + r_k$). If the value of ($d_k - r_k$) is positive, the element is biased towards the "affects" element category and classified as "cause". If the value of ($d_k - r_k$) is negative, the piece is little towards the "affected" element and is classified as "fruit". Mark the known (d+r) and (d-r) as coordinates, the cause and effect diagram takes ($d_k + r_k$, $d_k - r_k$)) as

the paired coordinates, and the horizontal axis is ($d+r$). The vertical axis is ($d-r$); that is, The upper half of the x-axis is the "cause group", and the lower half of the x-axis is the "effect group". By displaying individual elements as coordinates, the complex causal relationships of this cause-and-effect graph are reduced to an easily understandable structure, allowing researchers to gain insight into problems and provide solutions. In addition, cause-and-effect diagrams help decision-makers plan appropriate decisions based on criteria that affect a class or elements of an affected style. This study applies DEMATEL to convert the degree of interaction between complex faces or clusters into causality features, establishes the model's relational structure, and imports the population weights into the AHP step.

3.7.2 Analytic Hierarchy Process（AHP）

Analytic Hierarchy Process (AHP) is widely used because of its simple and practical theory. Analytic Hierarchy Process (AHP) systematically analyzes a problem and assigns a hierarchy to each level of consideration and factor. The decision maker's overall understanding of things is easy to grasp and implement while the work is going on. The hierarchical structure of the Analytic Hierarchy Process (AHP) has the advantages of flexibility, easy understanding and logic. As a result, hierarchical and quantitative methods can reduce the probability of wrong decisions.

(1) Analytic Hierarchy Process

Saaty (1977) pointed out the basic theory of AHP and raised the contingency planning problem for the US Department of Defense. With funding from the National Science Foundation, Saaty (1977) conducted an in-depth study of the rational distribution of electricity across industries. It is mainly used for uncertainty. When there are multiple evaluation criteria and decision-making problems, the purpose of AHP is to systematize complex problems, decompose them into different levels, find the background through quantitative calculation, and conduct a comprehensive evaluation. AHP is mainly used in uncertain situations and decision-making problems with multiple evaluation criteria. It converts complex decision problems into hierarchies and then uses pairwise comparisons. The decision maker compares the two elements, then uses the eigenvector method to get the weight of the detail, performs a consistency check on the judgment preference, and finally evaluates the element's importance. AHP can also use a tree-like hierarchy to divide a complex decision problem at one level into several simple sub-problems. Each sub-problem can be analyzed independently. Subproblems at this level can contain any type of subproblem, whether tangible or intangible, carefully calculated or roughly estimated, clearly understood or vaguely understood, as long as they can have subproblems used in the final decision. The rating scale systematically assigns relative importance weight values to each section, displays a pair of comparison matrices, and combines computed eigenvectors and eigenvalues. The feature vector represents the priority of each part at each level. Therefore, decision-makers have sufficient decision information and organize relevant decision criteria or criteria, weights and analysis to reduce the risk of bad decision-making.

(2) Basic Assumptions of AHP

Basic Assumptions of AHP The basic assumptions of AHP mainly include the following nine items:

a. A system can be decomposed into many classes or components, forming a directed network-like hierarchy.

b. In the hierarchical structure, it is assumed that the elements of each layer are independent.

c. Elements at each level can be evaluated using some or all of the previous group features.

d. The absolute numerical scale can be converted into a proportional scale in the comparative evaluation.

e. After the pairwise comparison, the positive reciprocal matrix can be used for processing.

f. The preference relation satisfies transitivity. Do Not only good ties and bad ties meet the transition (A is better than B, B is better than C, then A is better than C), but also strong ties satisfy the transition if A is better than twice B and B is better than 3 times, then A 6 times better than C.

g. Complete transfer is not easy, so the transfer is not allowed, but the degree of consistency must be tested.

h. The degree of progressive advantage of the element, the element advantage, should be obtained through the weighting principle.

i. When any element appears in the hierarchy, no matter how salient it is, it is considered to be related to the overall evaluation structure rather than checking the independence of the order.

(3) Tiers and Elements

System elements are contained in many hierarchies (groups) based on the assumption that individuals can form different aggregates. Each class affects only one other level and is only affected by one other level/level. The system structure is used to study the various elements in a story and their impact. Hierarchies can come from an overarching goal. The factors that influence the sub-goals, the people who control the factors, the people's dreams and policies, and the strategies to achieve the goals or policies, ultimately form multiple levels. The number of classes depends on the complexity of the system and analysis requirements.

(4) Dependent and Independent variables

Once the hierarchy is established, the next step is evaluation. The evaluation of AHP is based on the elements of the previous layer of each layer as the basis for evaluating the characteristics of the next layer. A knowledge-based expert system for assessing green building performance levels. In short, the relative contribution or importance of two elements to the benchmark is assessed by comparing their relative importance at a certain level based on the details of the previous story. Claw, ..., Xr, based on 0]: Compare elements such as (X_1, X_2), (X_1, X_3), (X_2, X_3)...etc. This process decomposes complex issues into pairwise comparisons, reduces the mental burden of the evaluator, and focuses on the relationship between the two elements. The AHP assessment scale was used as a pairwise comparison

between the levels of each indicator factor. In the operation of AHP, the first step is to describe the problem. The subsequent steps include identifying influencing factors, establishing a hierarchy, designing questionnaire items, and determining the relative importance of decisions. Data was collected in the questionnaire. Attributes are divided between levels. Based on the above, a pairwise comparison matrix is established, and the eigenvalues and eigenvectors of the matrix are calculated. After correcting the obtained data through consistency test feedback and hierarchical consistency test, the weight of each index can be calculated, and the most appropriate decision-making scheme can be selected.

(5) Pairwise comparison

After the hierarchy is established, the element affiliation between the upper and lower layers is determined. According to the hierarchy diagram, the *q* elements of the second level have a dominant relationship with the child elements of the next level. The purpose of AHP is to give the corresponding *r* sub-elements under element *q* according to the relative importance of the *r* sub-elements. However, for most problems that require human judgment, it is not easy to directly obtain the weights of r sub-elements. It is usually necessary to get the results using an appropriate method (the appropriate AHP method). The process is a pairwise comparison method by comparing every two elements with each other or called a pairwise comparison method.

(6) Eigenvalues and Eigenvectors

In multivariate analysis, it is often necessary to use eigenvalues and eigenvectors for analysis. In addition to discussing the properties of eigenvalues and eigenvectors, the concepts and approximate solutions of eigenvalues and eigenvectors will be explained.

(7) Consistency verification

If the pairwise comparison matrix A is a matrix of positive and negative values, it is pretty tricky for the decision maker to achieve consistency in pairwise comparisons. Therefore, it is necessary to conduct a consistency test and create a consistency index (CI) to examine the pairwise comparison matrix formed by decision-makers' responses. How reasonable is the judgment? Is it consistent? Are there still contradictions? And correct it in time to avoid making the wrong decision. Consistency testing can be used in an overall hierarchy to evaluate a decision maker's or expert's paired judgment matrix against a single benchmark. Since the importance of each level is different, it is necessary to test whether the whole story is consistent.

(8) Decision-Making Procedures Using Analytic Hierarchy

When dealing with complex problems, a systematic analytical approach is required. Analytic Hierarchy Process maintains this spirit and is a practical and direct multi-objective or multi-criteria decision-making method.

(9) Expert Preference Integration

When using AHP for decision assistance, it is often necessary to rely on experts in different fields' professional judgment and services to collect the effect of ideas. Hence, it belongs to a group or collective decision-making. Group decision-making

first involves several experts. The number of experts is related to the complexity of the decision-making problem. The available number of experts is 12. After experts are identified, we are faced with integrating expert preferences in the decision assistance process.

3.8 Research Structure

This study summarizes the factors affecting audit risk assessment through literature research, then collects literature on the impact of the big data environment on audit risk and selects the relationship of mutual influence through expert questionnaires. The five main criteria of "Project System", "Human Resources", "Tax Orientation", "Data Management and Control", and "Digital Transformation" are further divided into the most suitable risk decision-making scheme that should be selected. Other data storage databases, full participation in their governance and processes, database concepts, desktop data management and data analysis tools, tools to improve people's information skills, performance evaluation to improve productivity, in-house development of tax technology functional enhancements, mastery of tax data tools and Relevant IT governance, reduce the manual error rate and improve work efficiency, standardize and standardize the operation process, establish a centre of expertise (COE), data analysis is conducive to improving efficiency, data analysis reduces error costs, follows the trend and multiplies repurchase, improves operational efficiency and core Competitiveness, experts selected a total of 15 schemes, and the decision model scheme most suitable for the critical factors of RPA digital transformation and AI intelligent automation was obtained in the evaluation and accounting service industry factors. Finally, data simulation is carried out, and the RPA digital transformation and AI intelligent automation are most suitable for the risk control scheme of the accounting service industry. The research structure is shown in Figure 5.

3.9 Research result

The main contribution of this research is to explore the most suitable solutions for RPA digital transformation. It is AI intelligent automation for risk control in the accounting service industry; hoping to provide reference and reference for the audit environment and accounting operation of RPA digital transformation in my country. AI intelligent automation, and discuss the impact of RPA digital transformation and the risks of AI intelligent automation; looking forward to this academic contribution can be applied in practice.

However, there are still some limitations in the process. Although this research combines RPA digital transformation and AI intelligent automation analysis to explore the legal study of audit accounting risk decision-making model, it is relatively lacking in RPA digital practical experience transformation and AI intelligent automation. It is suggested that follow-up research can continue to use the viewpoints integrated into this study to further analyze the phenomenon in the actual field, reasonably analyze the overall decision-making, and provide more help

for the accounting service industry to assess risks and real situations—the area of auditing accountants. Finally, reduce the bookkeeper's bookkeeping risk.

The convenience and efficiency brought by information technology can be felt everywhere in the work environment related to accounting and auditing. However, with the development of artificial intelligence (AI) technology in the future, more and more people will start to pay attention to information technology, and machines will replace humans' jobs and eventually replace humans. In addition to actively deploying computer auditing and digital accounting services, other accounting service industries should prepare in advance to introduce RPA digital transformation and AI intelligent automation. The accounting services industry is freed from a series of repetitive, trivial and tedious tasks such as processing data, but this also means that a group of accountants who used to be responsible for this type of work will face a crisis of lack of positioning in the accounting industry. Accounting profession. Workplace. Therefore, many scholars have proposed that global accounting education needs to undergo qualitative changes, especially the use of RPA digital transformation and AI intelligent automation technology for data analysis, and even teaching students to write audit automation and artificial intelligence audit programs, hoping that students can self-study the work after graduation The direction is a shift from working in entry-level accounting, auditing and bookkeeping to performing efficient audit roles using RPA digital transformation and AI intelligent automation information technology. Therefore, the purpose of auditing and accounting is the same because the accounting services industry being audited uses different computer systems. RPA digital transformation and AI intelligent automation will lead the drive to the pace of digital change. Therefore, in the environment of RPA digital transformation and AI intelligent automation, the accounting service industry must be able to identify new risks arising in the new environment and use computer-aided auditing technology to perform audit accounting work. This paper studies the realization of RPA digital transformation and AI intelligent automation and the documents proposed by its predecessors. The conclusion is complete.

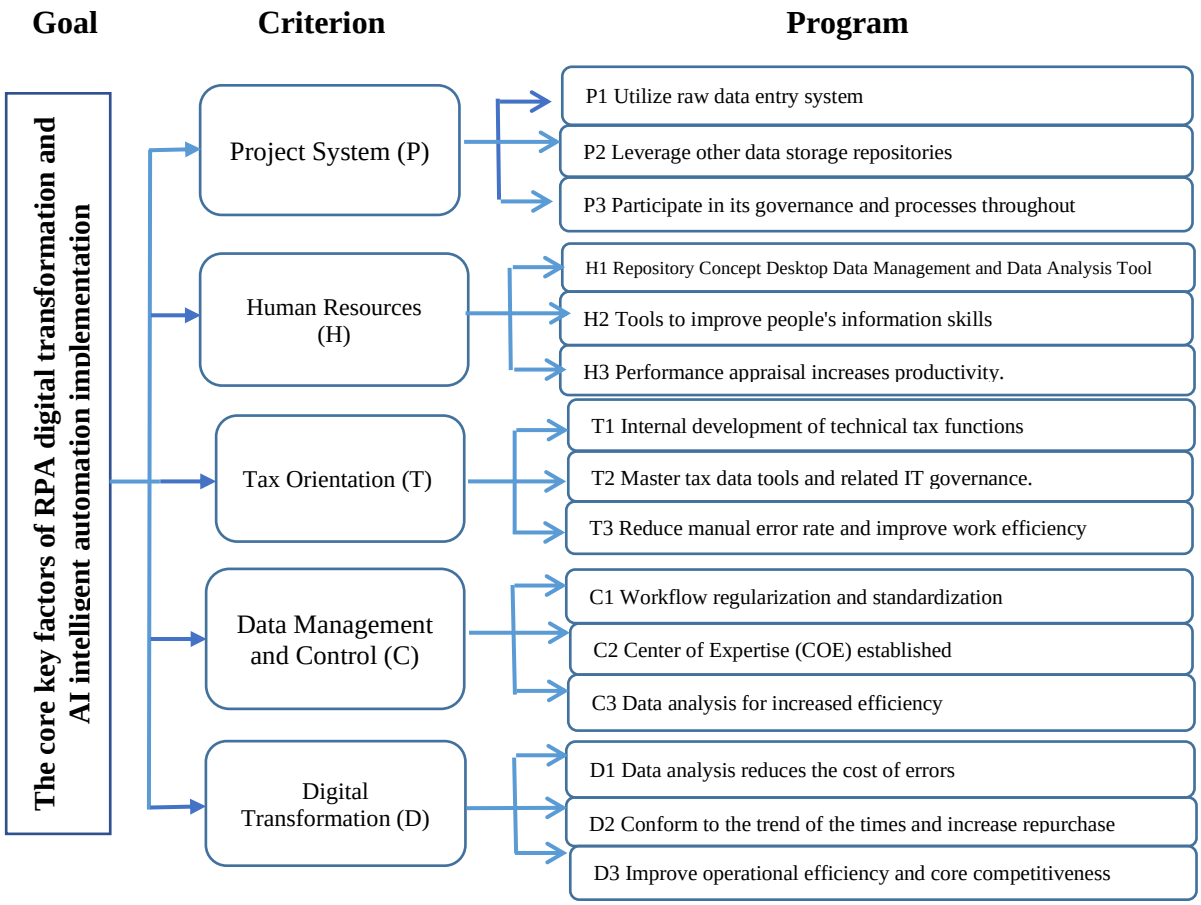

Figure 4: RPA digital transformation and AI intelligent automation implementation core research framework

4. Empirical Results and Analysis Discussion

4.1 Decision Making Trial and Evaluation Laboratory

This study uses the Decision Lab (DEMATEL) analysis method combined with AHP (calculating weights) to analyze the interaction of choice opinions and criteria to simulate the most appropriate decision analysis for audit risk. This study collected 12 valid expert questionnaires from June 1 to June 30, 2022. Compared with the version proposed by Tzeng & Huang (2011), this revised version (Revised DANP) has the following characteristics. First, relative weights can show the importance of factors such as DEMATEL and ANP yield factor importance and relative weight. Therefore, the revised DANP no longer takes priority or relative weight as the only consideration when determining key factors but uses a combination of DEMATEL and ANP messages to assess critical factors jointly. Second, Revised DANP uses the total influence matrix to draw a cause-and-effect diagram of essential elements, but not all aspects; it dramatically simplifies the drawing of cause-and-effect

diagrams. It is helpful to focus on critical causal analysis. When a key factor has an arrow pointing to another key factor in terms of factors, it means that the former is the key factor that has the most significant influence on the latter. Finally, DEMATEL has traditionally believed that relationships and positive values can be classified as causes and should therefore be critical to the most significant positive value of a factor; however, factors with positive causes can only claim that they have a positive effect on other factors, but they may not Improvement begins. Conversely, factors with negative reasons are classified as effects, but they may not have room for Improvement. In practice, the revised DANP uses cause-and-effect diagrams and goes even further by using Importance Performance Analysis (IPA) to determine the starting point rather than relying solely on the magnitude of the cause.

4.2 Choose a set of criteria

This study adopts the DEMATEL approach to elucidate the causal relationship between factors and criteria for RPA digital transformation and AI intelligent automation. First, by distributing questionnaires, a direct influence relationship matrix based on the results of the questionnaires is generated. By normalizing the natural influence matrix and entering the formula, T=X (I–X) -1, the total influence matrix T (Total Influence Matrix) in Table 4 is obtained. Let $t_{ij}(i,j=1,2,..n)$ be the elements in the total influence relationship matrix T, and the sum of the parts in each row of 89 is D. The sum of the ingredients in each row (column) is R, and D+R is defined as the importance (Prominence). The higher the D+R, the higher the degree of repetition of the standard.

Furthermore, DR is defined as the degree of cause (relation). If a standard's causal degree is positive, the middle is a positive influencer. The larger the DR value, the higher the direct influence of the factor on other factors. These standards can be considered for Improvement first; however, if the standard's cause degree is negative, the bar is affected. The smaller the value, the greater the influence of other factors on this factor. Based on the total impact relationship matrix in Table 5, the degree of importance and cause are calculated, as shown in Table 5.

4.3 Identify key factors

In this paper, the DANP operation framework is adopted, and the total influence relationship matrix of DEMATEL is used as the weightless super matrix in the ANP operation. The matrix is normalized, and the transformed result is multiplied by itself until convergence, and the transfinite matrix shown in Table 6 is obtained. A cross-boundary matrix can determine the relative weight of each criterion). For example, the results for P1 and P2 are 0.0496 and 0.0710, respectively. Since DEMATEL and ANP generate information about the importance of the criteria, the volume of DEMATEL or the weight of DANP should not be considered when determining critical factors only. Therefore, this study combines these two information blocks to choose the standard weight ranking. The importance of the

criteria and the reason for selection are added to the order of metric weights generated by DANP. Finally, the matrix algorithm removes the critical factors behind the ranking through the method of weighted scoring. It obtains lower scores, which can provide space and suggestions for further Improvement, as shown in Table 6.

Table 4: Total Impact Matrix

T	P1	P2	P3	H1	H2	H3	T1	T2	T3	C1	C2	C3	D1	D2	D3	D (effect)
P1	0.077	0.208	0.146	0.131	0.198	0.110	0.159	0.121	0.034	0.162	0.037	0.004	0.004	0.003	0.003	1.397
P2	0.099	0.116	0.201	0.147	0.161	0.120	0.221	0.126	0.046	0.222	0.096	0.010	0.009	0.009	0.008	1.590
P3	0.187	0.170	0.093	0.191	0.163	0.072	0.171	0.174	0.093	0.169	0.039	0.004	0.004	0.004	0.003	1.539
H1	0.134	0.167	0.144	0.086	0.207	0.115	0.212	0.120	0.087	0.168	0.038	0.004	0.004	0.003	0.003	1.492
H2	0.130	0.200	0.190	0.079	0.088	0.059	0.153	0.119	0.036	0.204	0.038	0.004	0.004	0.004	0.003	1.312
H3	0.125	0.148	0.133	0.176	0.143	0.054	0.150	0.114	0.034	0.149	0.032	0.003	0.003	0.003	0.003	1.270
T1	0.065	0.188	0.085	0.114	0.182	0.055	0.091	0.054	0.032	0.194	0.087	0.009	0.008	0.008	0.008	1.180
T2	0.209	0.246	0.173	0.167	0.188	0.142	0.247	0.086	0.101	0.248	0.104	0.011	0.010	0.010	0.009	1.951
T3	0.117	0.141	0.077	0.176	0.140	0.159	0.144	0.057	0.027	0.142	0.027	0.003	0.003	0.003	0.002	1.218
C1	0.209	0.194	0.216	0.170	0.186	0.185	0.240	0.140	0.100	0.141	0.097	0.010	0.009	0.009	0.009	1.914
C2	0.122	0.144	0.130	0.129	0.140	0.109	0.144	0.058	0.085	0.145	0.029	0.008	0.008	0.008	0.007	1.265
C3	0.128	0.151	0.136	0.135	0.147	0.115	0.152	0.061	0.089	0.152	0.086	0.004	0.008	0.008	0.008	1.380
D1	0.134	0.159	0.143	0.142	0.155	0.121	0.159	0.064	0.093	0.160	0.090	0.060	0.004	0.008	0.008	1.500
D2	0.141	0.167	0.150	0.149	0.162	0.127	0.167	0.068	0.098	0.168	0.095	0.063	0.060	0.004	0.008	1.627
D3	0.148	0.175	0.158	0.157	0.171	0.133	0.176	0.071	0.103	0.176	0.099	0.066	0.063	0.060	0.004	1.760
R (affected)	2.025	2.572	2.176	2.151	2.429	1.677	2.587	1.434	1.058	2.601	0.994	0.261	0.200	0.142	0.087	22.395

Note: The actual impact is calculated by summing the matrix over all powers, assuming that infinite forces of the matrix will converge to zero

Table 5: Significance Analysis and Standard Relationships

Guidelines	D (effect)	R (affected)	D+R (Importance)	D-R (Cause degree)	Ranking
P1	1.397	2.025	3.422	-0.628	9
P2	1.590	2.572	4.162	-0.983	13
P3	1.539	2.176	3.715	-0.638	10
H1	1.492	2.151	3.644	-0.659	11
H2	1.312	2.429	3.741	-1.118	14
H3	1.270	1.677	2.947	-0.407	7
T1	1.180	2.587	3.767	-1.407	15
T2	1.951	1.434	3.385	0.517	3
T3	1.218	1.058	2.276	0.160	7
C1	1.914	2.601	4.515	-0.687	12
C2	1.265	0.994	2.258	0.271	6
C3	1.380	0.994	2.373	0.386	5
D1	1.500	0.994	2.494	0.507	4
D2	1.627	0.994	2.621	0.634	2
D3	1.760	0.994	2.754	0.767	1

Table 6: Total Influence Super Matrix

W	P1	P2	P3	H1	H2	H3	T1	T2	T3	C1	C2	C3	D1	D2	D3
P1	0.0496	0.0497	0.0497	0.0496	0.0496	0.0496	0.0497	0.0497	0.0496	0.0497	0.0496	0.0496	0.0496	0.0495	0.0496
P2	0.0710	0.0710	0.0710	0.0711	0.0710	0.0711	0.0710	0.0710	0.0711	0.0710	0.0711	0.0712	0.0708	0.0712	0.0711
P3	0.0561	0.0562	0.0561	0.0561	0.0561	0.0561	0.0562	0.0563	0.0560	0.0562	0.0561	0.0559	0.0560	0.0559	0.0561
H1	0.0527	0.0527	0.0527	0.0527	0.0527	0.0526	0.0527	0.0528	0.0526	0.0527	0.0526	0.0525	0.0526	0.0525	0.0526
H2	0.0486	0.0486	0.0486	0.0486	0.0486	0.0486	0.0486	0.0487	0.0486	0.0486	0.0486	0.0486	0.0486	0.0485	0.0486
H3	0.0448	0.0448	0.0448	0.0448	0.0448	0.0447	0.0448	0.0449	0.0447	0.0448	0.0448	0.0446	0.0447	0.0447	0.0448
T1	0.0560	0.0560	0.0560	0.0560	0.0560	0.0561	0.0560	0.0559	0.0562	0.0560	0.0561	0.0563	0.0559	0.0562	0.0561
T2	0.0820	0.0820	0.0820	0.0820	0.0820	0.0820	0.0820	0.0820	0.0820	0.0820	0.0820	0.0820	0.0817	0.0821	0.0820
T3	0.0405	0.0405	0.0405	0.0404	0.0405	0.0404	0.0405	0.0406	0.0403	0.0405	0.0404	0.0401	0.0403	0.0404	0.0404
C1	0.0804	0.0804	0.0804	0.0804	0.0804	0.0804	0.0804	0.0804	0.0804	0.0804	0.0804	0.0802	0.0801	0.0805	0.0804
C2	0.0557	0.0557	0.0557	0.0557	0.0557	0.0557	0.0557	0.0557	0.0557	0.0557	0.0557	0.0555	0.0554	0.0559	0.0557
C3	0.0606	0.0605	0.0605	0.0606	0.0606	0.0606	0.0605	0.0605	0.0606	0.0605	0.0606	0.0604	0.0602	0.0607	0.0606
D1	0.0747	0.0747	0.0747	0.0747	0.0747	0.0747	0.0747	0.0746	0.0748	0.0747	0.0748	0.0749	0.0745	0.0746	0.0748
D2	0.0960	0.0960	0.0960	0.0960	0.0960	0.0960	0.0960	0.0959	0.0961	0.0960	0.0960	0.0969	0.0962	0.0958	0.0960
D3	0.1312	0.1312	0.1312	0.1313	0.1312	0.1313	0.1312	0.1311	0.1313	0.1312	0.1311	0.1313	0.1331	0.1314	0.1311

Table 7: Standard overall ranking

	Attributes	DERMATOL	D-ANP
P1	Utilize raw data entry system	9	12
P2	Leverage other data storage repositories	13	7
P3	Participate in its governance and processes throughout	10	10
H1	Repository Concept Desktop Data Management and Data Analysis Tool	11	11
H2	Tools to improve people's information skills	14	13
H3	Performance appraisal increases productivity	7	14
T1	Internal development of technical tax functions	15	8
T2	Master tax data tools and related IT governance	3	3
T3	Reduce manual error rate and improve work efficiency	7	15
C1	Workflow regularization and standardization	12	4
C2	Center of Expertise (COE) established	6	9
C3	Data analysis for increased efficiency	5	6
D1	Data analysis reduces the cost of errors	4	5
D2	Conform to the trend of the times and increase repurchase	2	2
D3	Improve operational efficiency and core competitiveness	1	1

Based on the findings in Table 7, we derive 15 critical factors for computer auditing and bookkeeping in the accounting services industry. The importance of these factors to the Computer Auditing and Bookkeeping Accounting Services industry is analyzed as follows:

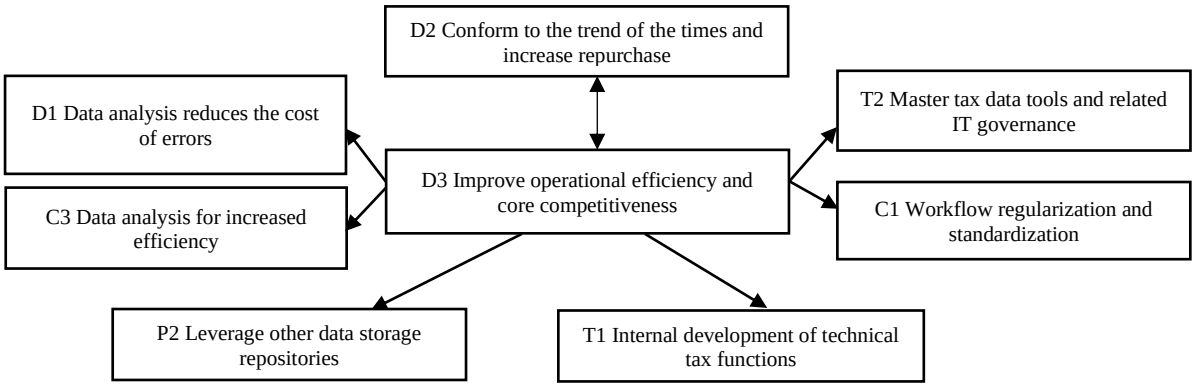

Figure 6: The critical factor

As shown in Figure 6, the critical factor analysis results are as follows:

D3 Improve operational efficiency and core competitiveness

Accounting service providers are highly digitized, which impacts data capture from audit reviews and bookkeeping. Fetching required data from accounting service provider resource planning (ERP) systems and internal systems cloud databases is a significant challenge for transaction volume. With large increases, verification methods will inevitably need to be adjusted. In recent years, data analysis in audit accounting has been promoted. Digital auditing and bookkeeping are the most widely discussed concepts, such as computer-assisted auditing, dynamic auditing, data and analytics (D&A), etc. Fueled by accounting service providers, the app upends traditional auditing and bookkeeping. Therefore, the ability and attitude of accounting service providers to use big data technology affects the control environment and operations.

D2 Conform to the trend of the times and increase repurchase.

The contents and specifications involved in computer auditing and accounting statements are pretty complex and have received extensive attention. It also affects the organizational structure of accounting service providers and brings significant changes to the auditing and bookkeeping environment. In practice, however, many accounting service providers have increased reporting responsibilities. For audit review and bookkeeping, an appropriate structure should be established by Audit Statement 48, including consideration of key areas of authority and responsibility and a proper reporting hierarchy. Therefore, the division of the head of the inspected department and the appropriateness of the internal audit department's decentralization will affect the control environment's risk and operational effectiveness.

D1 Data analysis reduces the cost of errors.

The continuous Improvement of the functions of accounting service agencies and the constant Improvement of auditing and bookkeeping conditions have put forward new requirements for the quality of auditing and bookkeeping personnel. Training a certain number of high-level and high-skilled audit personnel who are proficient in auditing and bookkeeping, master the development law of auditing, and

proficiently use modern auditing techniques and methods is the fundamental way for auditing and bookkeeping to adapt to the new situation—social development. Keep pace with the times and maintain long-term vitality. For example, possess specific business knowledge and ability to be familiar with accounting systems and standards, have professional auditing and accounting technical knowledge, and have particular understanding, analysis and judgment capabilities.

C3 Data analysis for increased efficiency

As the business environment changes, transaction information faces challenges such as quantity, variety, authenticity, rapid changes, complex laws and regulations, policy procedures, financial constraints, contracts and internal control procedures. They are also presented in digital form. Whether it is financial statement auditing, compliance auditing or operational auditing, the traditional manual bookkeeping method has been unable to adapt to this era when faced with massive data, and digitization is the only way to present it.

P2 Leverage other data storage repositories

Examining financial statements or bookkeeping by accounting services can detect material misrepresentation or fraud materially affecting inherent risks and controls. In the past, errors in financial statements were the main reason for identifying high intrinsic risk. As a result, the accounting service provider assesses reliability risk; errors in accounts receivable and inventory increase audit and bookkeeping risk.

T1 Internal development of technical tax functions

Accounting service providers are very well versed in tax technology. Thus, the division and decentralization of internal audit and accounting functions can affect the degree of risk in the control environment itself and the effectiveness of business execution. The larger the primary accounting service provider, the greater the business risk it takes. Thus, in-house tax technology development for accountants and bookkeepers can be enhanced.

C1 Workflow regularization and standardization

Workflow is the most critical operational resource for accounting service providers. For a long time, a position has faced a high turnover of middle and low-level personnel. As a result, the staff turnover rate in the peak season has brought much trouble to accounting service providers. Currently, accounting service providers face traditional manual operations. As a result, the auditing and accounting business has stagnated or even narrowed the business bottleneck, so it is necessary to use big data technology for computer auditing and accounting work. It is believed that the turnover rate of crucial accounting service providers will affect the inherent risks. The normalization and standardization of business processes can only be achieved through digital transformation.

T2 Master tax data tools and related IT governance.

After implementing the CFC, enterprises and individuals will face drastic changes in the anti-tax avoidance environment at home and abroad. It is an irreversible trend to create international transparency of tax information through the reporting and exchanging of tax and banking information. The Act, the CFC and the global minimum tax regime are affecting the structure of overseas investments by

businesses and individuals and increasing tax compliance costs. For the future investment strategy layout, the purpose and role of using overseas companies should be considered to face the future effectively. With the wave of anti-tax avoidance, it is recommended to formulate countermeasures in time series, conduct a comprehensive assessment to reduce the impact of anti-tax avoidance measures, and deeply analyze the effects of CFC on critical issues of enterprises and individuals. Accounting and bookkeeping professions impact the use of funds, tax burden and investment structure. In addition, mastering practical tax data tools and associated IT governance will incur future compliance costs and prepare for the CFC storm.

5. Conclusion and Suggestions

Creating instant decision-making and shortening decision-making time, process improvement and refinement, thereby reducing costs and improving high operational management is the goal of improving service quality for the accounting service industry at this stage.

In the day-to-day operations of the accounting services industry, many processes often rely on repetitive operations between computer desktops and information systems. Process Robot (RPA) is an emerging programming software tool that simulates what users often do while sitting at a desk and automates these repetitive and tedious computer desktop operations without special hardware equipment. Works in any Information Systems (IT) environment and can even perform virtualization work in the background of your computer. Process Robotics (RPA) can transform highly repetitive but logical tasks into Process Robotics (RPA) instead of human input. Process robots are like giant robotic arms in factories, changing the speed of business decisions by automating labor-intensive and repetitive processes. For general transactional work in the accounting services industry, a fully loaded process robot costs only about a third of the cost. In applying financial accounting workflow automation, the processes from the journal, entry, general ledger, and adjustment to various reports are suitable for process automation. In many practical applications, the efficiency of process robots is indirect. The ability to increase the number of operators by more than 15 times, and the quality of job execution with near-zero error rates, offers the opportunity to reduce costs by 15% to 90%. Process robots reduce labor requirements for indirect personnel and provide other advantages; they operate 24/7 and can generate time-sensitive reports to meet deadlines. In addition, process robots will perform a series of compensatory measures more accurately, avoiding duplication of data recording and input errors (Madakam, Holmukhe, & Jaiswal, 2019).

Currently, most RPA tools are developed based on Microsoft NET Framework's Workflow Foundation. They integrate AI technologies such as OCR and NLP to form cross-system execution; zero error rate can be achieved without changing the existing deployed software system. Technically, RPA is no longer a custom feature of personal accounting services. Instead, it has become a service that integrates AI technology, system-level software and hardware, and multiple accounts. Deeply

cultivate RPA+AI technology, launch a million-digitization plan, promote the deep integration of RPA and AI technology, improve the level of process automation in the accounting service industry, and provide the accounting service industry with safe, reliable, efficient, convenient, and deeply collaborative artificial intelligence digitization. Digital and intelligent transformation solutions for the accounting services industry. Reducing costs and increasing efficiency; will help the accounting service industry to transform from labor-intensive to artificial intelligence-intensive and promote disruptive innovation and upgrading of production models and business processes.

The popularity of process robots not only improves the productivity of the accounting service industry but also provides confidence for the accounting service industry to move towards intelligent automation. However, as we move forward, the accounting services industry will not only need to have a clear strategy but will also need to face the redefined way of working after digital transformation. Therefore, five recommendations for advancing intelligent automation can help the accounting services industry develop a rigorous and meticulous transformation plan:

1) Based on the creation of operational process value, formulate process automation transformation strategies.

2) According to the needs of the automation of the operation process, formulate a step-by-step feasible automation transformation blueprint.

3) From the perspective of data digitization, combined with intelligent automation solutions, reconfirm the accounting service industry's information system and data structure, and integrate the division of labor between digital technology and information technology projects.

4) In the process of transformation, in addition to the support from the top, the most outstanding value lies in cultivating the ability of the accounting service industry to undertake digital work.

5) Assess the success of the retrofit or calculate the return on investment? Not based on how many automated processes are introduced or how many intelligent robots are installed, but on the ability of the accounting services industry itself to drive intelligent automation (Amici, Rotilio, Berardinis, & Cucchiella, 2022).

In advancing intelligent automation in the future, the accounting services industry must understand that it is not just about introducing new technologies and solutions to automate existing workflows when applying new digital technologies. Automation or intelligence should not be synonymous with driverless cars. However, with the evolution of digital technology, the accounting service industry needs to be sensitive enough to apply digital element technology, build a relevant digital management system, integrate the accounting service industry into digital transformation, and create a more competitive accounting service industry.

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