

# AI-RPA's Enabling and Supporting Role in Jingdong Group's Financial Processes

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**Abstract.** With the acceleration of the process of digital transformation in the financial industry, improving the quality of service, reducing costs and increasing efficiency have become the primary appeal of banking enterprises. AI-RPA technology has an increasingly significant influence on global economic growth. It has a wide coverage and can be complemented by most financial industries, which greatly saves manpower and increases revenue. Jingdong RPA is a typical success story. This paper mainly studies the technical advantages and operation mode of the Jingdong RPA robot and uses specific scenarios to discuss the role and effect of the RPA robot in finance, logistics, service and other aspects of Jingdong under this operation mode. Therefore, it can be concluded that, on the one hand, it improves the information and automation management level of the financial department of the company, and helps the company to deeply reduce costs and increase efficiency; on the other hand, it ensures the smooth and safe operation of the whole system. JingdongRPA provides a reference for the development of artificial intelligence technology and the transformation of the operation mode of other companies.

**Keywords:** Jingdong; RPA robot; AI-RPA.

## 1. Introduction

With the progress of the Internet, cloud computing technology, the new generation of artificial intelligence, blockchain technology and other new technologies, the application of robotic process intelligent technology (RPA) is also more mature, and a new round of technological revolution is rising. At present, the global use of AI-RPA is increasing, and the service scope includes banks, insurance companies, customer service, finance, manufacturing, human resources and other industries, but there are different requirements for AI-RPA in different operation modes. This paper mainly takes JD Group as an example to study the enabling and supporting role of AI-RPA in the financial process of JD Group. JD.com's AI-RPA aims to create efficient, non-intrusive solutions to achieve intelligentization in the work process by simulating and enhancing the interaction between human and machine and processing a variety of regular cross-system, complex, long-duration and error-prone action processes. JD AI - RPA has passed the certification of the JD inside of the finance department, provides the financial department to the customers and business partners with scenes of RPA business and ability, tells his story in the financial field to realize the intelligent finance, improve the informatization, automation management level of the company's financial department, to help companies depth authors efficiency, at the same time to ensure the smooth and safe operation of the whole system.

## 2. Specific applications of AI-RPA in finance and accounting

RPA refers to Robotic Process Automation, a software solution that facilitates financial transformation by performing repetitive and tedious tasks based on certain rules. RPA, also known

as Digital Workforce, is a digitally-enabled intelligent software that replaces manual finance operations with automation and assists finance staff with basic operations, thereby improving the efficiency and quality of business processing, and reducing financial compliance risks. Many industry sectors are also able to adopt RPA, such as finance, insurance, retail, automotive manufacturing, travel, telecommunications, and healthcare [1]. The main work of RPA financial robots is across process control operations from procurement to payment and process to report. Specifically covered in finance are accounting voucher entry, account processing, and audit and verification operations; invoice issuance, query, and verification operations; operations on tax processing, expense reimbursement, bank reconciliation, and budget aggregation; and operations to analyze, cleanse and maintain data.

AI is artificial intelligence, the simulation of human intelligence processes by computer systems or "machines". These processes include learning how to access information and contextual rules for using it, using the context and rules to conclude, and self-correct. RPA is used to work with humans to automate repetitive processes, while AI is seen as a form of technology that replaces human labor and automates end-to-end. While RPA uses structured input and logic, AI uses unstructured input and develops its logic.

The combination of the two provides great value in creating solutions that use a technical knowledge base to streamline the interaction between processes and applications. The ensuing solution is faster, more accurate, and helps to achieve four efficiencies: (1) Increased productivity: which makes automated applications and run faster. (2) Reduced costs: according to Deloitte, "will reduce costs by an average of 22-27%". (3) Increased accuracy: ensures better decisions, less human intervention, and more accurate results. (4) Enrich the customer experience: better understanding of customer needs [2].

### **3. Financial research on JD RPA in Jingdong Group**

#### **3.1 Overview of JD Group's financial development**

JD is a self-run e-commerce enterprise in China. Its founder Qiangdong Liu serves as the Chairman and CEO of JD Group. It has JD Mall, JD Finance, Paipai.com, JD Intelligence, O2O and an overseas business division [3].

JD's 2021 financial performance as a whole is mixed. On the plus side, JD Group's full-year net revenue in 2021 was 951.6 billion yuan, up 27.6 percent year-on-year. Compared with Alibaba (10%), JD.com has a slight edge in terms of numbers; However, in the fourth quarter and the whole year of 2021, profit turned to loss, revenue growth continued to decline, and there are still challenges in the development outlook [4].

#### **3.2 Background and overview of JD RPA**

##### **3.2.1 Background**

From the perspective of industrial transformation and technological change, JD Group started selling scientific and technological products such as optical discs in Zhongguancun in 1988, transformed into a commercial company in 2005, and a comprehensive online retailer in 2010. JD RPA came into being around 2020 [5]. JD RPA technology also replaces all kinds of assembly line tasks originally completed by human beings, but it is established under the background of information and intelligence. It can simulate the basic operation of the computer, with high efficiency instead of being human to complete the work.

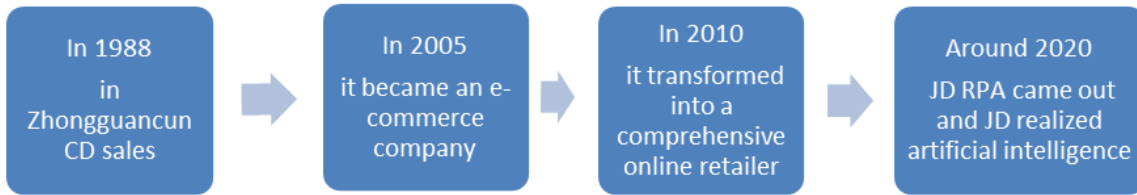


Figure 1. Background of JD RPA

### 3.2.2 Overview of Jingdong RPA

JD RPA is a technology independently developed by JD Group, which has invested a lot of time and manpower. Its principle is to simulate and enhance the process of human and computer interaction, to solve the repeated but regular cross-system, cross-platform, time-consuming, error-prone workflow, and to provide enterprises with fast, non-invasive solutions to achieve automation in the workflow.

### 3.2.3 Technical advantages of JD RPA

JD's RPA technology has three technical advantages:

The core technology is 100% independent and self-developed: JD RPA deeply explores the bottom of the system, accumulates a lot of experience, and finds a new way to interact directly with the handle of the internal control of the software, abandoning the concept of "fake" RPA, to achieve real process automation [6].

Dual technical advantages of RPA+AI: JD RPA integrates common AI technologies such as OCR, image recognition and big data in the RPA field to provide real one-stop RPA+AI services. In the invoice, voucher identification and other scenarios by the majority of users trust and favor.

Support for integrated cloud service delivery: JD RPA provides public cloud, private cloud and other RPA cloud deployment modes. Supported by a natural self-built cloud, cloud desktop and private cloud can ensure platform stability and data security to the greatest extent. The advantage is that the 24-hour after-sales team can be on call at any time, which is conducive to the optimization of resources, environment, operation and maintenance issues;

### 3.2.4 Components of JD's RPA technology

JD RPA is mainly composed of three parts: robot designer, robot console and robot operation client. As shown in the figure, the designer realizes the simulation of human operation; The console implements work allocation, monitoring and permission control.

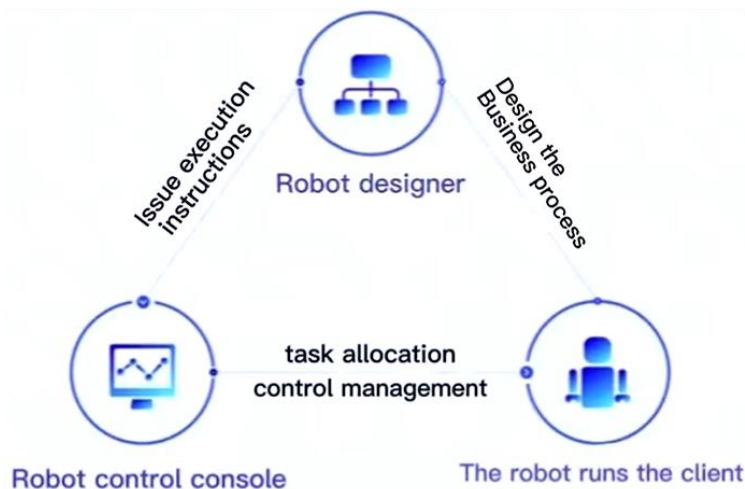


Figure 2. Components of JD RPA technology

### 3.3 Extensive application and influence of Jingdong RPA

JD RPA integrates self-developed super AI ability to provide scenario-based RPA services for customers in retail, finance, logistics and other industries. The comprehensive one-stop RPA service can help enterprises reduce costs and are effective in improving the level of enterprise informatization and automation processing.

In terms of specific applications, the RPA individual tax declaration robot is taken as an example. It can automatically log in to the individual tax client for information filling and data verification. This fully automated process greatly improves work efficiency and accuracy. In the past, the input of business information required a lot of repetitive manual work, but the RPA robot can automatically log in to the bank client to download the bank flow details, and automatically generate flow statements [7]. Compared with the traditional mode of manual input, it saves time and effort and ensures the correct rate.

## 4. Development of the accountancy profession in the context of digitalization

### 4.1 The convergence of finance and accounting with AI-RPA financial robots

By reading the above we clearly understand the impact and influence of JD AI-RPA on JD's financial development and the company's overall strategic layout. The integration of AI-RPA and accounting is not the first of its kind in JD. For example, Deloitte & Touche, a leading accounting firm, has always been committed to digital transformation, combining traditional accounting technology with AI-RPA to replace traditional manual operations with automation, assisting the unit's accounting staff to complete tedious, but highly standardized work.

### 4.2 A side-by-side comparison of Jingdong's RPA technology with other companies

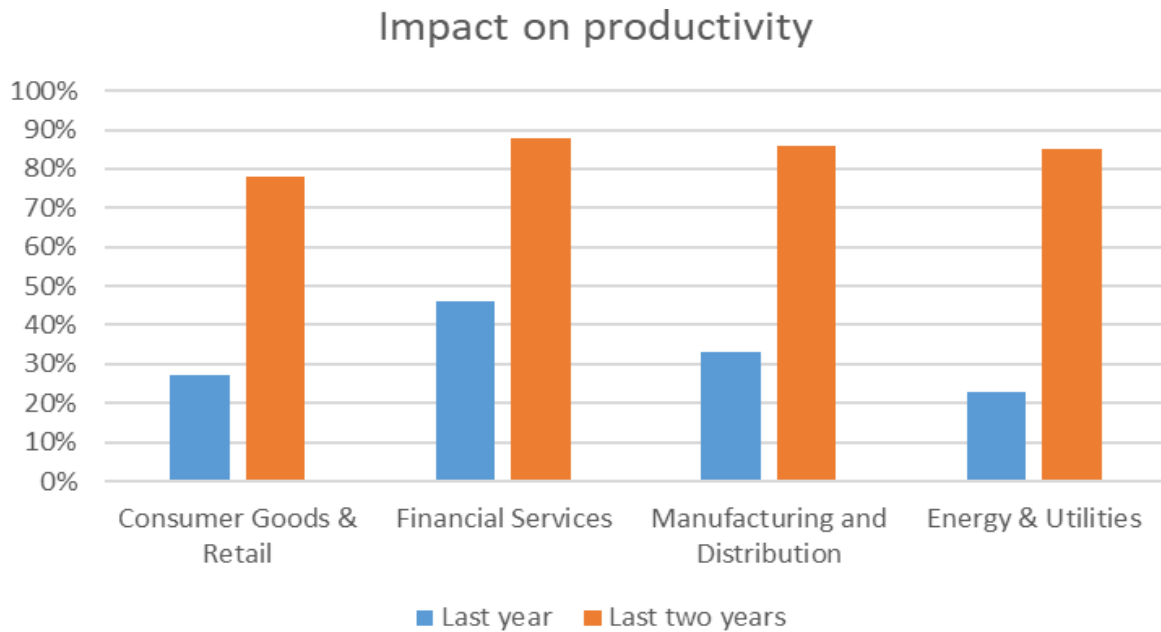
Having introduced JD's RPA technology in the previous section, we need to realize that RPA technology can be of great benefit to the development of all types of small, medium, and large enterprises and that as the market economy of society continues to develop the traditional human-intensive is hardly sufficient to meet the needs of the ever-changing business.

Firstly, we look at the widespread small and medium-sized banking sector in China, which is generally far less individual in scale than the BOE, but we cannot ignore the fact that as banks operate their businesses, they are complex, cumbersome, labor intensive, and error-prone. Nowadays, many small and medium-sized banks are actively working with relevant high-tech companies to introduce RPA+AI intelligent automation platforms that meet their characteristics to merge and process multiple existing business processes, greatly reducing the number of errors and improving efficiency, as shown in Figure 3[8]:



**Figure 3.** Example - China Postal Savings Bank Corporation Shanghai Branch

Instead, as shown in Figure 4, if RPA technology is widely adopted, it will facilitate the further transformation of small, medium, and large enterprises, but some enterprises face past pain points such as business system integration difficulties, business data lagging and did not adopt RPA in time, further losing the competitive advantage of product sales.



**Figure 4.** Example - 2021 Fuhun survey report on RPA technology [9]

### 4.3 Problems and challenges

Having analyzed the benefits of RPA technology for businesses above, it is also important not to overlook the preparatory work for RPA. In the case of the widespread SME sector, we first understand from the previous concepts that not all business processes require RPA technology, but rather a lot of effort and time is required to differentiate between their individual and unique business processes and those that are relatively solid. Secondly, RPA technology is relatively new and unfamiliar to most employees in the business and they will need a period and relevant knowledge to orientate them to the use of RPA technology and the changes to their positions and functions, and there may be a possibility of non-acceptance of the new technology. Finally, with new technology, the initial investment costs and deployment costs cannot be ignored. Companies need to fully consider their cost outlay and the existence of a payback period, and fully consider all possibilities before deploying RPA technology. Companies need to fully consider their cost outlay and the existence of a payback period, and fully consider all possibilities before deploying RPA technology.

Are large state-owned enterprises then immune to the problems of themselves and the application of the technology? The answer is no. In this paper, we can focus on the problems and challenges faced by large state-owned commercial banks, mainly the following two points. Firstly, relative to the application of the technology, China is facing a relative shortage of technical and information personnel in the country, making large state-owned enterprises also appear to be stretched in the talent solution module. The second point is that the technology has not been introduced into China and the world for a long time, and the data technology base is relatively lacking, so we must consolidate the relevant database to better play the role of the relevant technology.

## 5. Conclusions and recommendations

In today's rapidly growing business, the use of "human + robot" in the workplace is not only an improvement in efficiency but also an innovation in work patterns. In the context of the coming smart era, with the continuous development of RPA technology and the implementation of AI, the integration of the two sides will become more rapid and deeper and will evolve into a major trend in the industry [10]. The transformation and upgrading of the "digital intelligence" of finance have also put forward higher requirements on the quality and skills of finance staff. Finance staff must continue to innovate, transform and reengineer themselves, and reinvent their financial concepts and

knowledge systems to meet the requirements of the times and the needs of enterprises to improve efficiency and empowerment.

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