Research on Power supply office management based on RPA intelligent video technology

Sachurila*, Wanying Liu, Wenbo Zheng, Bo Hu, Heliu Sun

state grid east inner mongolia electric power supply supervisory and support center

*15754930518@163.com

Abstract: With the acceleration of digital construction process, robotic process automation technology is more and more applied in the company's digital business, in order to achieve the goal of reducing cost, improving quality and increasing efficiency. By analyzing the scenarios where robotic process automation is required in the daily work of regional power supply services and command centers, this paper provides solution ideas and designs for key software functions of robotic process automation to assist the labor force. Combined with the actual application effect analysis. Put forward relevant conclusions and suggestions. Against the "three a" national power grid operating space after transforming the defect of operations management, through the intelligent video monitoring equipment installed in open space, intelligent video analysis technology is used to collect subregional traffic statistics, studies the VIP customers recognition and customer behavior analysis, and other functions, under the condition of without changing the original structure, further enhance the level of intelligent management of power supply business hall, Standardize the service quality of the staff of the power supply business hall, conduct the operation efficiency analysis of the power supply business hall, save management and reduce costs, improve the on-site control function, and improve the company image.

Keywords: Robot process automation; Power supply service and command; Customer flow statistics VIP customer identification customer behavior analysis

1. Introduction

Today, the reform of electric power system is deepening in the complex and changeable environment. For enterprise management as an enterprise, the need to reduce costs, improve quality and improve efficiency is becoming more and more urgent. RPA, robot process automation, is a software or platform that can automate workflow, simulate and improve human-computer interaction processes, and perform large-scale task propagation and direct effects that can be repeated according to predefined programs based on certain rules. [1.2.3]RPA has been applied and verified in multiple industries, and many cases have been obtained. It can be seen that it can give full play to its characteristics in the application of power grid companies and form a lot of good applications. 20% of the effort generates 80% of the profit. In the traditional power supply greenhouse, the general function division is usually carried out according to the region, each region is set up with a number of service personnel, in which the counter clerk and usher account for the majority. With the transformation of "three types and one type" business halls, many business halls have removed some manual counters and increased the number of mobile staff. However, due to the lack of relevant flow monitoring equipment and data support, the current scheduling of business offices mainly relies on manual experience. If the staff arrangement of business offices is not reasonable, there may be a situation that the staff in some areas are too busy, and some areas are not visited. In addition, because the staff are busy with their own business, they have no time to take into account the distribution of the flow of people in the business hall, especially the number of customers in the "marketing experience area", and whether they meet the marketing requirements of "three types and one transformation", it is difficult to conduct data statistics and analysis. The scheduling scheme of the business office cannot be dynamically adjusted according to different seasons and changes in the flow of people, and the fixed mode is often used, which cannot optimize the human resource structure of the power supply business office. In the business halls transformed by "Three types and One Transformation" of State Grid, some hardware and software devices of

flow technology have been installed, which can count the number of queuing and the usage flow of self-service terminals in the business halls. To a certain extent, this provides convenience for the analysis of customer flow data in the business hall. However, as these data only target some self-service terminals, they cannot give feedback on the flow of people in various areas of the business hall, especially in important marketing areas such as "online experience zone" and "State Grid Mall", so they cannot meet the requirements of intelligent and market-oriented management of the business hall [2]. Electrical equipment management information systems perform the entire equipment management life cycle, from design, manufacturing, installation, operation, decommissioning to disposal, through data sharing and business collaboration with planning, infrastructure, scheduling, marketing and other modules. Figure 1. Display. Through the horizontal connection of manpower, financial resources and material resources, the collection of equipment inspection fees and the optimal allocation of resources. Data sharing is achieved through the integration of multiple business systems to avoid duplication of effort. Break through business barriers, meet the needs of integration of operation and distribution, integration of inspection and shipping business, and coordination of finance and material business.[4.5]
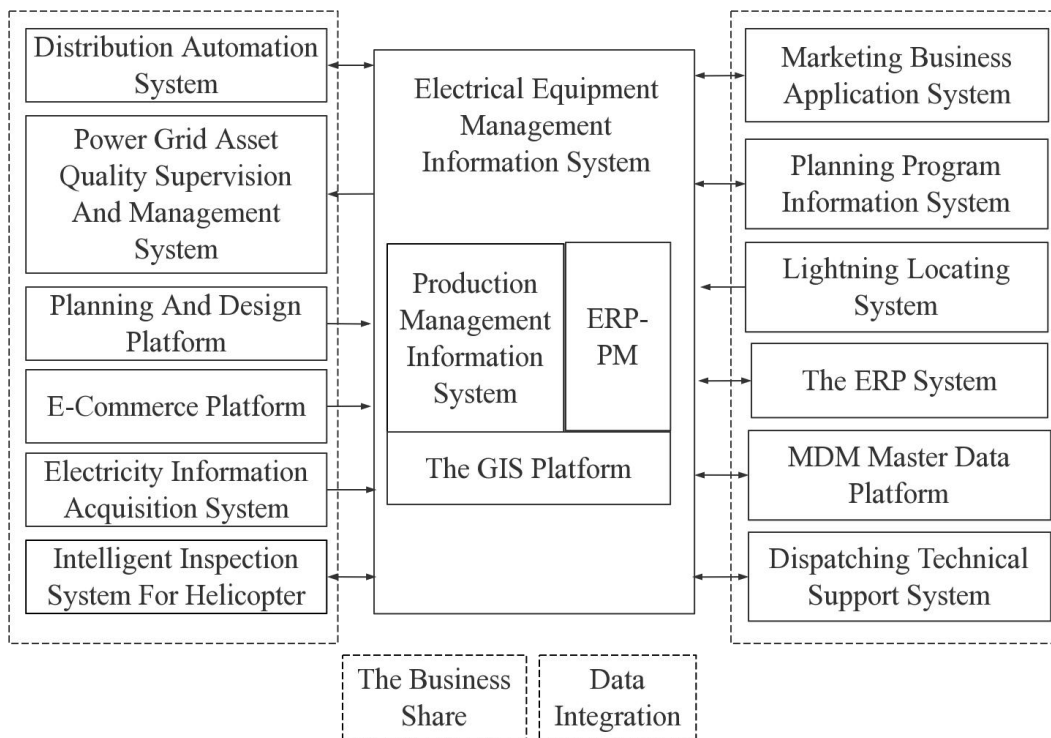

Figure 1. System relation diagram

2. Functional design

In recent years, in accordance with the principle of personnel concentration, information integration and intensive management, provincial power companies have built prefecture-level power supply service management centers and improved the power supply and emergency repair management system. Service monitoring and service response open a new mode of integrated battalion and division power supply service. The power supply control center processes 95,598 different work orders every day, which is obviously unbalanced, and sometimes centralized firing or random work orders arrive. Therefore, it is more suitable for scenarios where the robot process is well automated. Through analysis, improvements in the following aspects can be found:[6.7.8]

(1) There is room for improvement in work order processing efficiency. Due to the different division of labor, complex and inconsistent rules, and the random arrival of work orders to the dispatch department of each power supply company, the power service control center must organize special personnel to process work orders. The sustainable development of service industry has always been a contradiction that is difficult to reconcile.

(2) Improve the quality of work order processing. On the one hand, the organizational structure and management mode of enterprises in different cities have adapted to the market; Work order review process compares cost reduction and quality improvement to ensure that customer requirements are fully met.

3.   Solutions

Firstly, the working principle of robot process automation technology is analyzed: RPA software is placed on the client of the existing business system in a plug-in way without intervention, and the automatic operation is carried out in the system interface according to the business processing rules. RPA integrates different business systems without adding interfaces and does not affect the existing IT infrastructure. Make clear business processing rules, all business must be online, can not be offline, non-e-paper processing robot. Interaction with business systems is done by running a scripting language on the desktop of a computer screen, replicating people's business activities. Log the audit and implement error alerts before and after running the script.

For example, in order to solve the automatic scheduling of work orders, the automatic detection of incoming work orders can be realized by using RPA robot process automation technology in the terminal computer of the agent system to realize the robot process automation software. Find the latest work order based on the work order information obtained in Steps 1 and 2, and then enter the corresponding predefined flow according to the related information of the work order. According to the daily manual processing flow of this kind of work order, they are respectively flow A and flow B. Because the caller can quickly obtain information and organize the information chain is relatively complex, the logic may contain judgment script and there is no way to follow the judgment result. Finally, all results are sent to the data center. The server is prepared as a parameter of the RPA program, and the work order is processed and sent to its specific location to the disposal department.[9.10]

4. System design

4.1 Network Architecture

The RPA software uses small database applications such as MySQL or SQLAnywhere as local storage media. Unlike many management systems hosted on servers and accessed through a browser, the RPA software runs on the client's operating system and can be distributed to any client as an application. It can also be used to open multiple A-bot programs in one client, thus significantly increasing productivity. The connection between the program and the database is created locally and does not allow external access. To ensure data security. If necessary, data can be developed to an additional configured master server. Isolation or encrypted key data can be RPA. For example, network node devices for centralized configuration and management.See the process model diagram in Figure 2 below.[11.12]
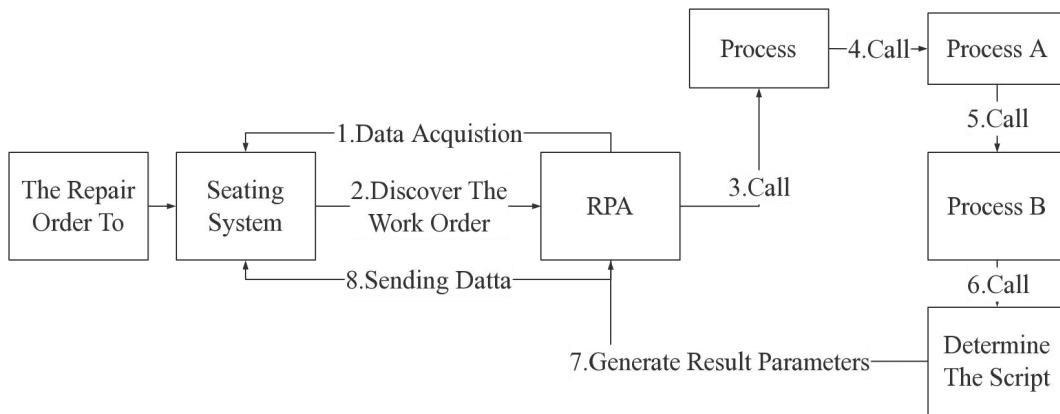
Figure 2 The RPA Process Model

4.2 Software Functions

Using RPA and computer programming technology, aiming at the problems in the current power supply service work, the following five modules are designed，See Figure 3 for details.
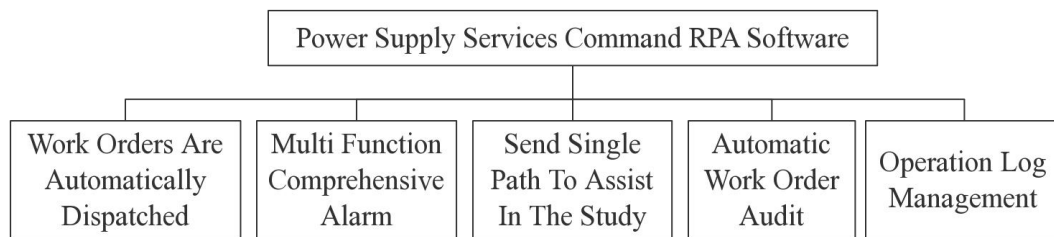

Figure 3 module design

1. Automatic work order scheduling module. The active maintenance work order information mainly includes "work order number", "work order type", "User number", "location and address", "receiving content", "receiving time", "delivery time" and other information. The above data comes from the automatic request and capture of work order data by RPA robot software. In order to ensure timely data storage, the time collection service is enabled to obtain real-time data.[13]

2 Multifunctional integrated alarm module. In order to ensure the normal and stable operation of service orders, abnormal delivery, time-out delivery, non-acceptance of field orders, abnormal situations, etc. are carried out through various ways such as E-mail and telephone. Need warnings and reminders to run, host allocation, etc. It can support voice prompt and email notification to send and receive work order notes, and automatically notify employees when no work order is sent. The work order sent to the head of the processing department can be notified by SMS or email. Support the early warning of work order suspension, notify the field staff of undelivered and due work orders through different detection methods (timing, receiving comparison, etc.) through sound signals. Inform the relevant staff by telephone, record the voice, key and other information of staff response; It can support the network monitoring of the dispatching host. When the dispatching host does not work or the network is interrupted, it can inform the staff through the information signal (or short message) in time to ensure the normal operation of the dispatching room.

3. Auxiliary research module of scheduling mode. For work orders that cannot be routed by the system, you can access the work order information with one click. After the arrival of the work order, it can automatically analyze the main customer information, relevant application form information, power responsibility information, user payment information, etc., to reduce the time of manually entering the system to find information one by one, and improve the response ability of the control center agent and purify the efficiency of the service.[14]

4. Work order automatic review module. Automatically SEGMENT and combine the contents of receipt, evaluate receipt, screen out non-standard and unreasonable answers and words, make the agent respond to the content of work order correctly, reduce errors, omissions, inaccurate words and so on. Can support the collection of municipal receipt confirmation content, and in a concise, standardized way to display; It can support the analysis of the contents of the receipt confirmation in this city, analyze and check the correctness and standardization of the contents of the receipt. Put forward the handling suggestion to the provincial enterprise receipt standard document.

5. Transaction log management module. The steps, events, states, error messages, etc. performed by the robot are recorded to obtain information about the number and accuracy of automatic schedules. You can save it. Monitoring of scheduler logs can be supported. If the scheduler log is abnormal, it will inform the staff in time through the information signal (or short message) to ensure the normal operation of the scheduler.

5. Conclusion

The application of RPA technology in power grid marketing business can realize the functions of automatic delivery of work orders, one-click retrieval of relevant information, automatic review of work orders and so on. By implementing 24-hour duty, personnel flow and errors can be reduced. From the point of view of promotion application, for higher human input, longer time consumption and rapid R&D in the near future, work scenarios with higher error rate of manual operation should be prioritized, which will help enterprises to further reduce costs. To improve quality and efficiency. Based on operational experience, the creation of a large number of RPA applications leads to a certain load on the back-end system, so it is important to create a unified enterprise authentication platform for the RPA process. On the one hand, it can reduce the load of RPA on the system. On the other hand, RPA can effectively receive broadcast messages of changes in the back-end system, thereby updating the build part in time and reducing process phenomena. Don't block it.

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