

RPA Development Initiatives in JFE Steel

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Abstract:

In 2018, JFE Steel started using RPA to improve labor productivity. In addition, as a means of business restructuring, we maximized the effect by eliminating unnecessary work and standardizing work. In 2019, we built an operation management system to keep track of RPA operations. This system has been used to periodically follow up on business improvements and the reduction of unnecessary licenses. In 2020 August, we started the RPA citizen development and are expanding the range of labor saving.

1. Introduction

RPA is an abbreviation for Robotic Process Automation and is a technology in which software robots are deployed on personal computers to perform business work with predetermined procedures in place of people. Use of this technology has spread rapidly in Japan since around 2018. In JFE Steel, “creation of high quality time” by eliminating routine work time is also necessary and indispensable in order to respond quickly and flexibly to various management challenges. Therefore, RPA was introduced to create time for problem-solving, improve labor productivity, and contribute to workstyle reform by reducing total working time. This article introduces JFE Steel’s RPA initiatives from FY 2018 to FY 2021.

2. Key Points of RPA Development

2.1 RPA as a Means of Business Restructuring

RPA is not simply applied to existing businesses in their current form, but is applied after the businesses are restructured by the business operation departments and IT department. This also provides an opportunity to reexamine the necessity of the work for which business operation departments are responsible. **Figure 1** shows the approaches used in business restructuring, that is, elimination, combination, rearrangement and simplification.

2.2 From “Effective x Speedy x Easy” Items

It is important to decide how items for RPA are to be selected, given the limitations of a company’s human resources, physical resources and financial resources. JFE Steel decides the priority order of items for application of RPA based on the three elements “Effective,” “Speedy” and “Easy.” The first element, “Effective,” is evaluated in terms of the contribution to workstyle reform by releasing employees from the stress of routine work and shifting the peak of work demand during busy seasons, the second, “Speedy,” is evaluated based on the system of the business operation department and the degree of difficulty of RPA, and the third, “Ease,” is evaluated by the “investment effect,” i.e., how much time is created by RPA. A company-wide questionnaire survey was conducted to invite employees to propose candidate work for RPA, and the three above-mentioned elements were then quantified and evaluated, as shown in **Figure 2**. In FY 2018, RPA was applied to 109 jobs and created a total of 12 505 hours/year of time.

2.3 Bottom-Up and Top-Down

In FY 2018, RPA was promoted by a bottom-up approach led by the persons in charge of the actual work. However, slow speed of business restructuring was a problem, because the persons in charge were

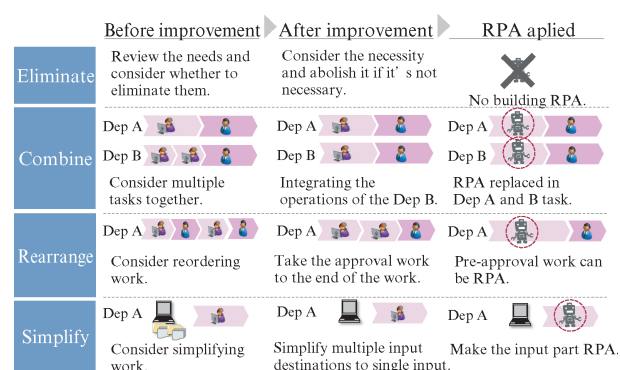


Fig. 1 Business restructuring before RPA

† Originally published in *JFE GIHO* No. 51 (Feb 2023), p. 40–42

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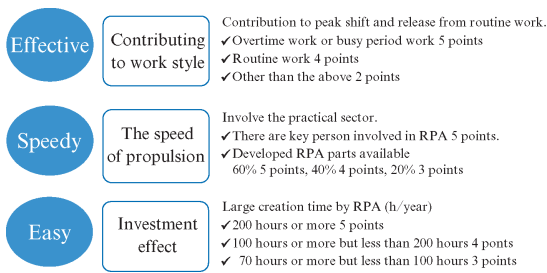


Fig. 2 Priorities for RPA conversion

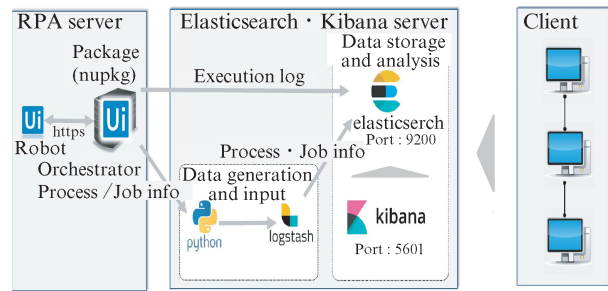


Fig. 4 Overview of RPA management system

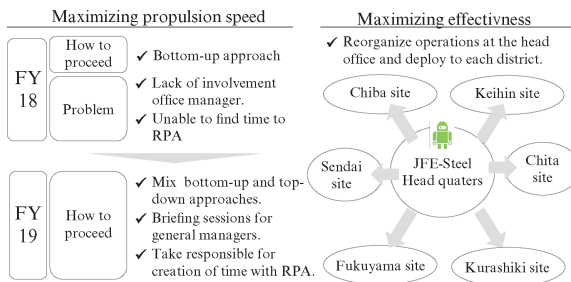


Fig. 3 To maximize implementation speed and effectiveness

unable to make time for business restructuring due to inadequate communication with the section/plant managers, who are responsible labor management in the business operation departments. Therefore, in FY 2019, we held briefing sessions to explain the usefulness of the time that can be freed up by applying RPA to the section/plant managers, and also gained their understanding that arranging the time to study application of RPA and follow-up are responsibilities of section/plant managers, who made commitments to time creation by RPA (Figure 3, left).

2.4 Deployment of Work Integration Department

As part of application of RPA, a work integration department was created for similar work which is carried out in the Head Office and each district, such as accounting work and purchasing work, and RPA was applied after these operations were restructured by the integration department. This made it possible to reuse developed RPA processes at other sites and maximized the investment effect of RPA (Fig. 3, right). As a result, creation of time by RPA in FY 2019 could be greatly extended to 99 jobs with a total time creation effect of 21 227 hours/year.

3. Development of RPA Management System

3.1 RPA Management System

Although RPA development was carried out in FY

2018 and FY 2019, the only way to confirm how the RPA robots were actually being used and whether robots stopped when an error occurs was to conduct interviews on the status of operation in the business operation departments. However, with the expanding use of RPA robots, checking the operational status of the robots by regular interviews was labor-intensive and inefficient. To break through this situation, a system which is capable of confirming RPA utilization based on the execution logs of the RPA robots was constructed in November 2019. The execution logs of the Orchestrator, which is an RPA management tool, are collected in data storage after being processed to an easily-analyzed form by python. The free software Kibana is used in the data analysis and graphs the utilization status of robots. In this system, the graphed utilization status can be accessed freely from client PCs, and analyses can be performed by flexibly changing conditions such as the department, extracted time or other target information (Figure 4).

3.2 Value of Realizing the RPA Management System

Using the RPA management system, RPA processes that were unused for a half-year period were detected, and interviews were held with the departments in charge of those RPA processes to determine the reason why they were not being used, thus contributing to improvement follow-up (Figure 5).

As a result of these interviews, there were some cases where the RPA itself was no longer necessary due to large changes in the work. In this way, unnecessary licenses were eliminated and costs were optimized by periodically conducting inventory counting using the RPA management system. For RPA processes in which errors frequently occurred, the causes were investigated and identified from the logs and countermeasures were taken, also contributing to an improved success rate of RPA processes (Fig. 5).

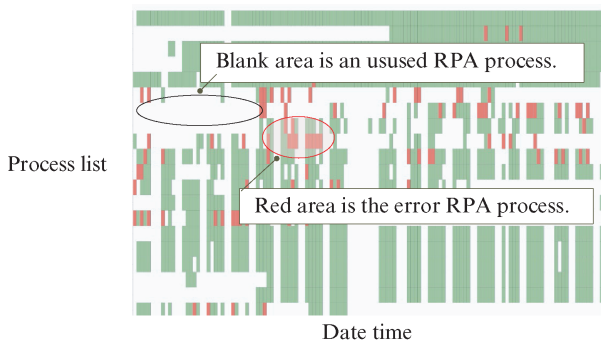


Fig. 5 RPA utilization (heat map)

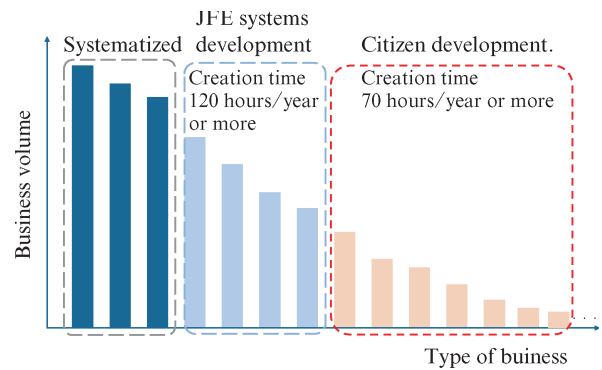


Fig. 6 Scope of RPA coverage

4. Change of Main RPA Developers

4.1 From Development by SE to “Citizen Development”

Beginning in August 2020, in addition to the development by JFE Systems, Inc. (system engineers: SE) up to that time, we also began “citizen development,” in which RPA processes were developed by the users themselves. Until that time, use of SE to develop RPA for small-scale work had been considered impractical from the viewpoint of cost effectiveness, even for routine work with peak periods and work with a high frequency of work changes. Therefore, citizen development was encouraged with the aim of achieving further labor-savings. Citizen development by the users themselves also contributed to mastery of business restructuring skills and improvement of IT literacy (Figure 6). However, in FY 2020, development by JFE Systems created 13 793 hours/year of time in 82 jobs, but among the 30 types of work planned for citizen development, application of RPA was limited to only 8 jobs.

4.2 Plans for Promotion of Citizen Development

In addition to the fact that the number of jobs in which RPA was applied through citizen development fell short of expectations, the build time required in citizen development was also long, averaging 5 to 6 months. A questionnaire survey on the circumstances responsible for slow progress in citizen development indicated that there were two main issues: First, users could not spare the time necessary for citizen development of RPA because actual on-site work was a higher priority. This accounted for nearly 80 % of the questionnaire results. To solve this problem, we held 3-party meetings with the citizen developers, superiors of the citizen developers and the Secretariat which supports RPA implementation. Through these 3-way talks, we obtained the understanding of the superiors concerning the types of work to which the citizen-developers who were their subordinates were attempting to apply RPA,

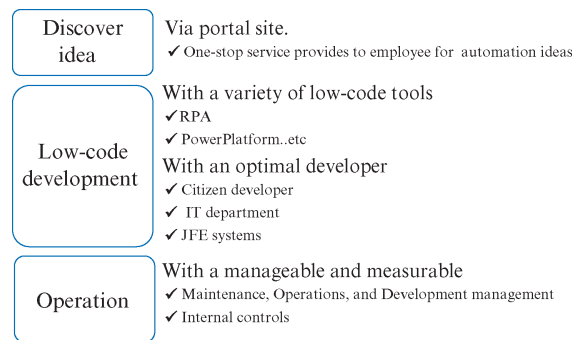


Fig. 7 Support policy for low-code development

and convinced them of the effects that could be expected by application of RPA. With the understanding of their superiors, citizen-developers were able to make the time for citizen development of RPA during working hours. The second issue was the difficulty of taking time to attend RPA study seminars, which was similar to the first point, i.e., it was not possible to make time for RPA development. This issue was resolved by enabling the users to participate in seminars at any time by making the seminar content available in a video format, and providing support, for example, by helping users complete the course by giving reminders at appropriate times corresponding to the status of their studies. As a result of these measures, the development time in citizen development of RPA was shortened to about 2 months on average. As of the end of March 2022 (end of FY 2021), 101 persons had completed the study curriculum on citizen development of RPA, and RPA processes for 102 jobs had been built by citizen development. The time created by RPA in FY 2021, as obtained by the RPA management system, reached a total of 53 379 hours as the combined result of development by JFE Systems and citizen development. Furthermore, citizen development is progressing at a faster pace in FY 2022 than in FY 2021.

5. Conclusion

In order to respond flexibly to changes in the current environment, with its enormous changes, it is important to create “high quality time” by eliminating routine work and to respond to changes with agility. In the future, together with promoting the develop of

RPA, and based on the knowledge cultivated in RPA development, we will also promote the use of low-code development tools and the creation of an environment that supports easier citizen development by the persons in charge in business operation departments, with the aim of achieving more advanced RPA utilization management using IT technologies (**Figure 7**).