Hitachi Research Institute Report

Work Style Innovation Improving Added Value

Hisato Kessoku, Associate Senior Researcher, 2nd Research Department

Triggered by formulation of the "Action Plan for the Realization of Work Style Reform" in the Japanese government's Council for the Realization of Work Style Reform in March 2017, companies have been intensifying initiatives for work style reform. Initially, initiatives were mainly aimed at correcting the long working hours of employees. However, to enable companies to enhance competitiveness and increase profits sustainably, maximizing added value for the injection of human resources, in other words, improving productivity is essential.

This paper examines the background where further productivity improvement is required in companies and considers specific measures of work style innovation toward the improvement of added value.

1. Background Behind the Necessity of Productivity Improvement

1.1 Rise in the Necessity of Productivity Improvement due to the Changing Business Environment

The working age population (15 to 64 years old) of Japan continues to decrease after peaking in 1992, and the ratio of working age population to total population is expected to decrease to 57.7% in 2030 from 63.8% in 2010. The recent effective ratio of job offers to applicants (May 2017) is 1.49, which exceeds the 1.46 ratio in July 1990 at the peak of Japan's economic bubble (Fig.1). Due to the declining birthrate, fierce competition for human resources among corporations is expected.

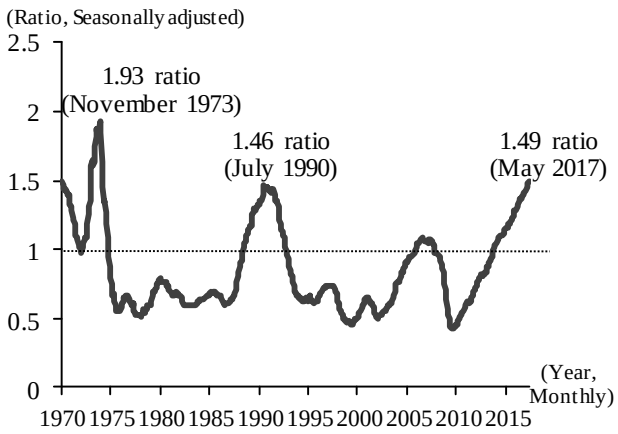

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Figure 1 Transition of Effective Ratio of Job Offers to Applicants (Seasonally Adjusted)

The Japanese government's "Action Plan for the Realization of Work Style Reform" demands companies correct long-hours of work by introducing regulations for the upper limit of overtime work with penalties. Due to these regulations, covering manpower shortages by increasing the overtime work hours of existing employees becomes difficult. Companies need to improve productivity by using manpower more efficiently than before based on the precondition that there will be restrictions in labor input in both aspects of human resources and working hours.

1.2 Productivity Improvement by Enhancing Added Value

Due to enforcement of the Amendment of the Labor Standards Act in 1988, etc., companies have reduced working hours (Fig.2). According to the OECD, Japan's average annual hours worked per worker decreased by 8.8% (1,884 hours to 1,719 hours) in the past 20 years (1995 to 2015) which is the second largest decrease in OECD member countries. In fact, the working hours of Japan (1,719 hours) are below the OECD average (1,766 hours), and Japan's working hours are not necessarily excessive when viewed internationally. On the other hand,

the employment rate of part-time workers significantly increased in Japan in the past 20 years from 14.2% in 1995 to 22.7% in 2015 (Growth rate 60%. OECD average is 22%), and the change in the composition of the employment format is considered to have made a major contribution to decreasing working hours.

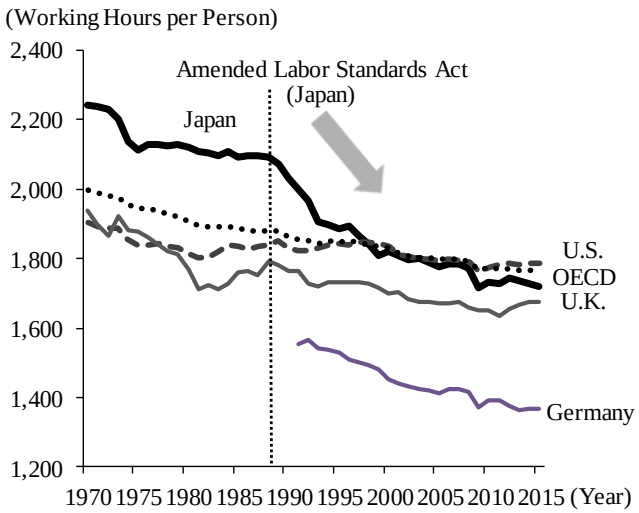

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Figure 2 Transition of Annual Average Working Hours per Worker

In the meantime, the OECD reports that Japan's labor productivity measured by GDP/working hours on a Purchasing Power Parity (PPP) base is 42.1 dollars, which puts Japan 20th out of 35 member OECD countries and positions the country near the bottom. Compared to the 68.3 dollar labor productivity of the U.S., Japan's labor productivity is only 60% of the U.S. (Fig.3). Japan's labor productivity has been increasing, but this growth mainly resulted from a decrease in the labor productivity denominator due to the decline in working hours caused by the growth of part-time workers rather than growth of GDP which is the numerator of labor productivity. In addition, the CAGR (Compound Annual Growth Rate) of labor productivity for the last 10 years (2006 to 2015) is 0.8%, and compared to 1.9% for the 10 years up to 2006, the CAGR of Japan's labor productivity slowed down. Therefore, the effect from the reduction of working hours is limited. On the other hand, in the U.S., working hours decreased by 2.9% (8.8% decrease in Japan) for the past 20 years (1995 to 2015), but labor productivity increased by 40.3% (31.6% increase in Japan), which shows the growth of added value (labor productivity numerator) has a great impact on the increase of labor productivity.

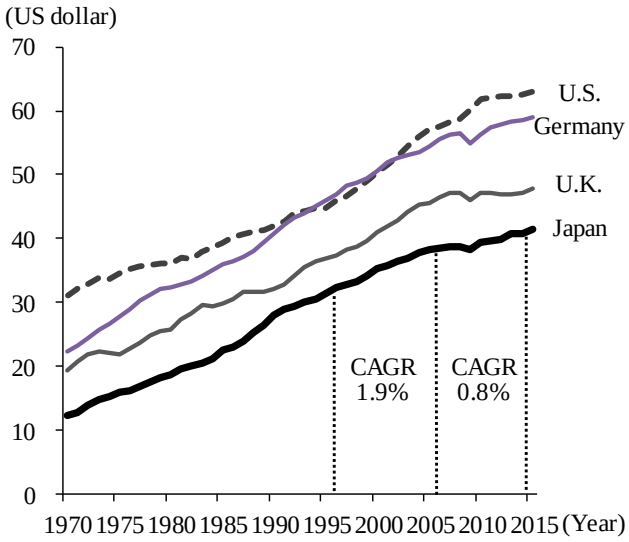

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Figure 3 Transition in Labor Productivity per Working Hour

Japan cannot improve its labor productivity without reducing the labor input (denominator) and improving added value (numerator). For this purpose, Japan needs to transition its human resources to intellectual labor with high added value, and the challenge is securing an intellectual workforce.

While digital technology such as AI and IoT is spreading (digitalization), those who engage in intellectual work require "hard skills" handling specialized technology, namely, artificial intelligence and IoT. In addition, "soft skills" including creativity and communication ability necessary for the creation of service ideas and new business development are also important abilities for these personnel.

2. Policies for Securing Highly skilled human resources

Demand and supply of highly skilled personnel (hard skills, soft skills) is tight around the world as well. Therefore, for the acquisition of high skills (hard skills, soft skills), efforts to promote human resource development in the entire industrial world as well as collaborative initiatives among industry, academia, and government that get government and universities involved are essential in

addition to initiatives by individual companies.

In Europe, the European Commission and governments of countries such as Germany and the U.K. are promoting policies for the development of highly skilled human resources (Table 1).

Table 1 Policy for the Development of Highly Skilled Human Resources in Europe

Country & International Institution	Policy & Report Name	Outline
EPSC[Note]	Future of Work (June 2016)	・Provision of skill education according to changes in industrial structure is important.
Germany	Arbeiten 4.0 White Paper (November 2016)	・Shift of labor and social policies in response to industrial digitalization is essential. ・In particular, importance is placed on review of occupational training contents and creation of learning programs for getting a job.
	Academy Cube (From 2013)	・Job matching between individuals and companies. ・Offering of education by industria-academia-government collaboration.
U.K.	Working Futures 2014-2025 (April 2016)	・Trend for the manufacturing industry requiring human resources with skills will be stronger.

Note: EPSC is the European Commission's in-house think tank

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Germany has been promoting Industrie 4.0 and deploys measures for the development of human resources with skills. The country established the Academy Cube website where industry, academia, and government cooperate by operating a platform that supports education (school education and re-education of workers) in the entire career of individuals from school graduation to retirement. The website provides opportunities for individuals to master the skills they lack in university against conditions of hard skills and soft skills needed by companies. Furthermore, the website also assists with job matching (employment and allocation) between individuals and corporations.

Japan also just began to examine policies for the development of highly skilled human resources including a policy to support recurrent education which means workers are re-educated in universities as part of the "revolution in human resources development," and the embodiment of support measures while also referring to initiatives in Germany, etc. is expected.

3. Development of Highly Skilled Human Resources and Job Matching

3.1 Education for Highly Skilled Human Resource Development by Non-Japanese Companies

To enhance competitiveness by improving added value, initiatives by companies are also indispensable in addition to efforts by industry-government-academia collaboration.

The U.S. telecommunications company AT&T recently shifted its flagship business from the cable and hardware business to the media and entertainment business, and required skills (hard skills) for employees also changed to data science and cloud computing, etc.. AT&T launched the "Workforce 2020" initiative in 2013. Required skills of employees are clarified and quantified according to new business portfolios, and the company offers online lessons to enable employees to master skills they lack. For example, AT&T provides re-education to employees who worked in network support so they can switch job duties and become data scientists.

For the launch of Workforce 2020, AT&T expanded the budgets for the education and ability development of employees by 25%. Already half of all AT&T employees in technical positions took re-education.

3.2 HR Technology Optimizing Internal Job Matching within Companies

In order to implement employee education for development of highly skilled human resources, the potential abilities of employees need to be identified from their current skills, and matching of skills acquired by employees in re-education with jobs required by companies needs to take place.

Conventionally, managers and human resource departments of companies evaluate the abilities of employees by reviewing the performance results of employees and the processes leading to their achievements when understanding the suitability of employees in job duties and considering human resource allocation. However, identifying the potential ability of employees has proved difficult with such a conventional method.

Now, the use of HR Technology is spreading. HR Technology reveals the potential ability of employees by creating data with employee information such as background, qualifications, and work history, and analyzing the data.

When management personnel and managers use the visualized data and analysis results, the accuracy matching the human resources and work, more specifically, the allocation of employees to job duties suitable for their skills and assigning of employees to well-suited departments, can be improved. In addition, re-education following the identification of the potential abilities of an employee can be implemented.

A great deal of current HR Technology analyzes the correlation of data based on various human resource data, but in the future, the progress of technologies such as analytics will enable HR Technology to predict problems such as discrepancies between skills needed by companies and the skills of their employees and make recommendations to avoid problems (Fig. 4).

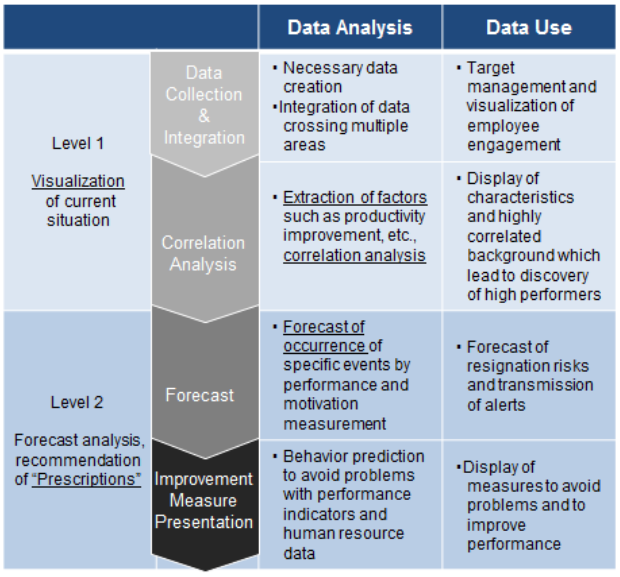

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Figure 4 Current Status and Prospects of HR Technology

4. Concentration on Value Creation Work

To maximize the performance of employees, the establishment of an environment where highly skilled human resources can focus on their original value creation work is also required.

4.1 RPA Minimizing Standard Routine Work

Companies have been reducing routine work by IT use. However, in some cases time and cost beyond the expected effectiveness were incurred on work standardization and manual creation which are preconditions of routine work reduction.

To resolve this problem, RPA (Robotic Process Automation) which is software to assist the automation of routine work is becoming popular. RPA can automatically record work processes performed by a human on a computer and reproduce and execute the work process. Unlike work by humans, RPA does not make mistakes in the process and can work 24 hours a day. Therefore, accuracy improvement, work time reduction, stable quality, and visualization of work progress are possible. Examples are automating the approval work of line managers for travel expense requests, etc. (Whether or not requested travel expenses are appropriate is automatically checked with a travel expense system and automatically approved if there are no problems with the request.) and extracting and sending alert notifications for workers with long working hours that is conducted by human resource divisions. RPA use has been significantly growing mainly in the financial industry such as insurance companies and banks since 2016.

4.2 Next Generation RPA Assisting and Upgrading Value Creation Work

In the future, RPA will be able to support and upgrade intellectual work by adding technologies including pattern recognition and machine learning. Next generation RPA will be capable of analyzing uncertain information and large types and quantity of information and predicting the future. For example, RPA will be able to predict the market and business environment based on unstructured information such as the economies of emerging countries and assist investment decisions by management personnel. Currently, the development of next generation RPA is accelerating mainly in companies developing elemental

technology such as machine learning.

RPA will enable the time that has been spent on routine work up until now to be allocated to creative and high added value work such as new business planning and examination of product and service ideas. If commercialization of next generation RPA progresses, the efficiency of intellectual work processes will increase, and acceleration in improvement of companies' added value is also expected.