Research on changes in occupations of persons with disabilities due to technological advances such as AI

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[Keywords]

Work of persons with disabilities

Changes in occupations of persons with disabilities

Use of digital technology

Employment of persons with disabilities

Digitization of work

Impact of AI and other technological advances

Recruitment of persons with disabilities

Human resource development

[Abstract]

The purpose of this research was to gain an understanding of the current state of work in which persons with disabilities are employed, and how the job fields of persons with disabilities are changing with the advancement of AI and other technologies, and to look ahead to future changes in the job fields of persons with disabilities in light of AI and other technological advances.

The company questionnaire (valid responses: 3,693 from general companies and 235 from special subsidiary company "special subsidiary" (In case that an employer establishes a subsidiary company which gives special consideration for employing persons with disabilities in order to promote and stabilize their employment, and fulfills certain requirements, the workers employed at the subsidiary can be deemed to be employed by the parent company for calculating the employment rate.)) assessed the status of inclusion of persons with disabilities in digital-related work, the reasons for such inclusion and efforts, and the impact on the employment of persons with disabilities. Regarding the impact of digitization on employment of persons with disabilities to date, general companies felt no particular impact or a slightly positive impact, while about half of the special subsidiaries felt a positive impact.

In the company interview survey (16 target companies), the content of digital-related work in which

persons with disabilities are engaged, the motivation for engaging in such work, the impact of digitization on the employment of persons with disabilities, the methods of recruiting persons with disabilities and acquiring their skills, the efforts related to work assignment and human support, and the problems and future prospects were identified. In addition, we classified digital-related work into four patterns and organized the content of the interviews.

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2 Research period

FY2021 - FY2023

3 Composition of this research report

4 Background and Objectives of this research

In recent years, the development of new technologies such as artificial intelligence (AI, IoT, big data, robotics, etc.) has led to a change in the industrial structure itself, which is expected to have a significant impact on employment and also to change the occupations for persons with disabilities.

Therefore, this research was conducted to understand the current status of work in which persons with disabilities are employed and how the job fields of persons with disabilities are changing with the advancement of AI and other technologies, as well as to look ahead to future changes in the job fields of persons with disabilities in light of the technological advancement of AI and other technologies.

5 Methods of this research

(1) Conducting interviews with experts

In 2021, we conducted 23 interviews with academic experts, companies, and support organizations to obtain basic information for conducting this research. The information collected mainly included "examples of efforts by companies, support agencies, etc.", "the impact of technological advances in AI, etc., on the structure of employment in Japan and changes in the field of work areas of persons with disabilities," and "the status and examples of the utilization of AI and other technologies in the employment of persons with disabilities," which served as the basis for discussion in the Research Committee described below and as a reference for conducting and compiling the survey.

(2) Organizing Research Committee

In order to obtain knowledge from experts to advance this research, we established the "Research Committee on Changes in Workspaces for Persons with Disabilities due to Technological Advances in AI, etc.," consisting of academic experts and company officials, and held seven Committees from October 2021 to July 2023. The Research Committee extensively discussed the contents of this research, the contents of the company questionnaire, the contents of the company interview, and the methods for analyzing the research results.

(3) Company questionnaire survey

The company questionnaire survey was conducted from August to September 2022 using a web-based form to a total of 15,000 companies (14,438 general companies (sampling) that employed at least one person with disabilities as of June 1, 2021 and 562 special subsidiaries) to gain an overall understanding of the status of the companies with regard to the impact of technological developments such as AI on the employment of persons with disabilities in their companies.

(4) Company interview survey

For the company interview survey, based on the results of the company questionnaire survey, 16 companies that use digital equipment, etc., for work by persons with disabilities were selected from among the companies that cooperated in the questionnaire survey to obtain specific examples of the status of changes in the work areas of persons with disabilities due to digitization, etc., and the survey was conducted from December 2022 to May 2023 by visiting company sites or using an online conference system.

6 Summarized results of this research

(1) Results of company questionnaire survey

The number of valid responses to the company questionnaire survey was 3,693 for general companies and 235 for special subsidiaries, for a valid response rate of 25.6% for general companies and 41.8% for special subsidiaries. The following are the key findings of the survey.

(a) Status of digital-related work engaged in by persons with disabilities

According to the company questionnaire survey, about 70% of general companies employ people with disabilities in some kind of digital-related work, suggesting that the employment of people with disabilities in digital-related work is already widespread. In addition, it was found that a certain number of companies have employees with disabilities who perform tasks that require planning, coordination, and judgment, such as data processing and systems development, and there were examples of employees who perform a variety of core tasks that are characteristic of each industry, as well as back-office tasks that are relatively common across industries.

About 80% of the special subsidiaries had employees with disabilities engaged in some type of digital-related work, indicating that the companies are more proactive and aware of the need for employees with disabilities to engage in digital-related work. Among the special subsidiaries with employees with disabilities engaged in back-office work, which often involves planning, coordination, and decision-making, there were examples of employees engaged in system development, website construction, RPA development, etc.

From additional analysis of the company questionnaire survey, the characteristics of the group of companies (advanced information processing group) in which persons with disabilities are employed in work involving planning, coordination, and judgment, such as data processing and system development, in general companies include large size, a high percentage of information and telecommunications companies, and a high percentage of person with physical disabilities or mental disabilities employee.

However, a look at the characteristics of the group of enterprises that promote the digitization of work for people with disabilities as a job development or new job areas (job development group) shows that a high percentage of these enterprises employ people with mental and developmental disabilities, and they do job carving for them and making them work. There were no notable trends by industry or size, and overall, a high percentage of organizations employed workers in office jobs.

(b) Impact of digitization on employment of persons with disabilities

Looking at the results of the company questionnaire survey on the impact of digitization, about 20% of general companies believe that there has been a positive impact, and half of them have no particular impact, while about 40% of companies believe that there will be a positive impact in the future, and 20% have no particular impact. Special subsidiaries were more positive than the general companies, with half of them having a positive impact both to date and in the future (Figure 1).

In terms of specific impacts, a high percentage of both general companies and special subsidiaries responded that the following items were true in common: the efficiency and accuracy of work has improved, work procedures have become simpler, productivity of the entire organization has improved, and the type and volume of work has increased. In addition, a higher percentage of companies in the special subsidiary category responded that the following items were also true: the persons with disabilities were able to maintain and improve their motivation, and the persons with disabilities were able to perform more advanced work. On the other hand, a high percentage of special subsidiaries also

responded that the time and frequency of support for persons with disabilities increased, and that it took longer to train and prepare manuals before they were able to perform new tasks. This finding suggests that the burden of support increases as well as the positive effects when new employees are assigned to digital-related work.

(c) Characteristics of general companies that see the impact of digitization on the employment of persons with disabilities as positive.

Among general companies, the characteristics of the companies that see the impact of digitization as positive were larger size, higher percentages in the wholesale/retail and information/communications industries, higher percentages employing persons with physical or mental disabilities, and higher percentages employing them in office-related tasks.

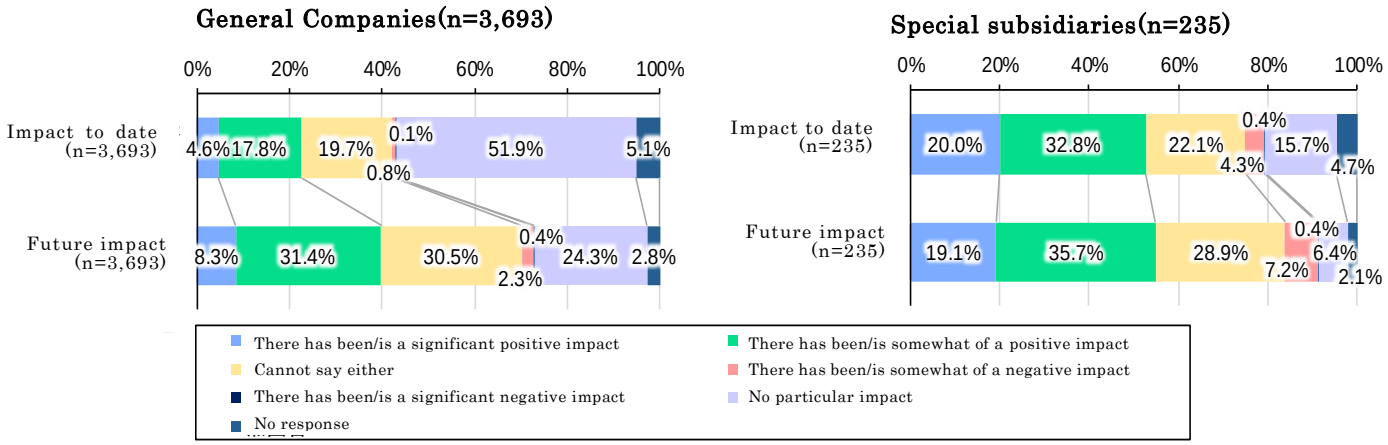

Figure 1: Impact of digitization on employment of persons with disabilities to date and in the future

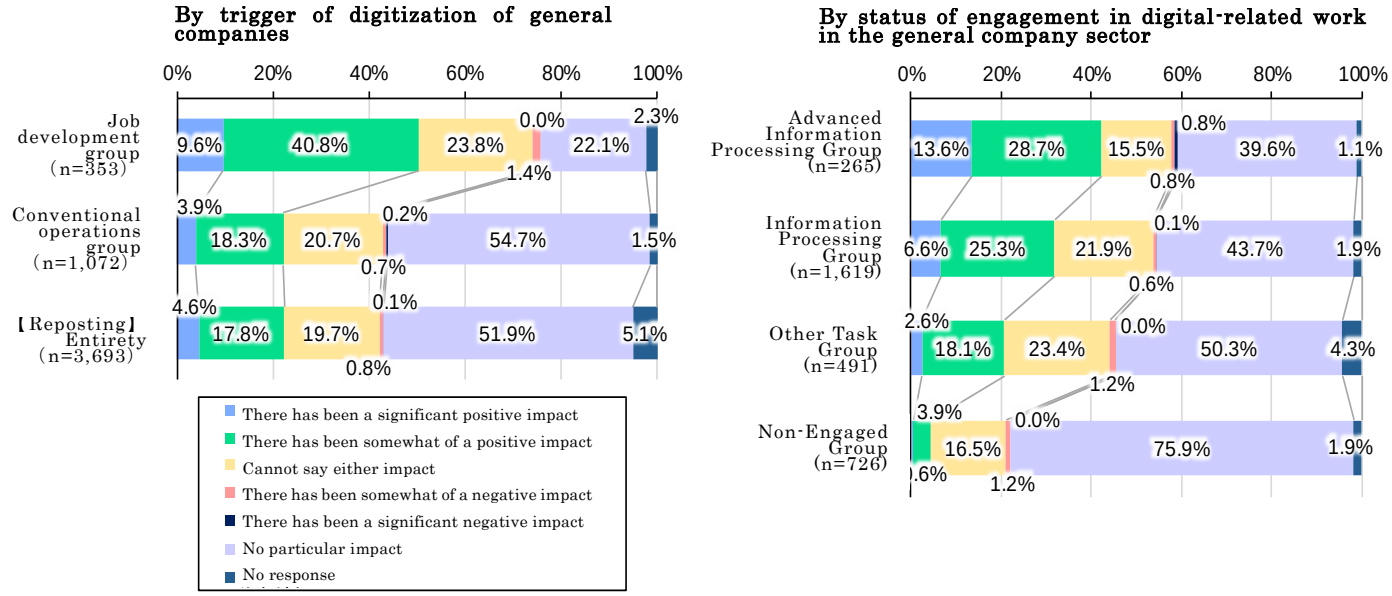

Figure 2: Impact of digitization on employment of persons with disabilities to date by company group in the general company

In the group of companies promoting the digitalization of the work of persons with disabilities as job development or new areas of work (job development group) and the group of companies with persons with disabilities engaged in work involving planning, coordination, and judgment, such as data processing and systems development (advanced information processing group), the percentage of companies that viewed the impact of digitalization as positive was higher than in the other groups (Figure 2).

(2) Results of company interview survey

(a) Status of changes in occupations for persons with disabilities due to digitization

Through the interview survey of 16 companies, we were able to obtain information on the content of digital-related work in which persons with disabilities are engaged, the reasons why they became involved in such work and the impact of digitization, methods for recruiting and acquiring skills of persons with disabilities engaged in digital-related work, and efforts for work assignment and human support to enable persons with disabilities to engage in work smoothly, as well as their challenges and human resource support to enable persons with disabilities to engage in digital-related work smoothly, as well as issues and future prospects.

The collected digital-related work was classified into the following four patterns to organize the content of the interviews.

	Pattern	Definition
New tasks associated with digitization	(1)	Non-routine tasks (requiring problem solving and complex communication activities) using digital technology
	(2)	Routine tasks (clear workflows) using digital technology
Conventional operations (operations that existed prior to the development of digitalization)	(3)	Operations that have changed due to the introduction of digital technology
	(4)	Operations in which some tasks have changed due to the introduction of digital technology, although the nature of the work remains the same.

In the companies performing the work in pattern (1) (non-routine tasks using digital technology) included systems development, RPA development, website management and updating, flyer design and video editing, among others. When recruiting new persons with disabilities for this type of work, some companies included IT skills and past work experience as recruiting conditions. In addition to programming and operating video editing software, in actual work, there were instances in the actual work where people with disabilities were also responsible for communicating with people in other departments or at other companies by attending meetings, although the extent of this varied from company to company.

In the companies performing the work in pattern (2) (routine tasks using digital technology), included work such as annotation, data entry, scanning, among others. This work involved persons with a variety type of disabilities, including people with severe physical disabilities and people with intellectual

disabilities. At the time of recruiting, advanced IT skills were not a requirement for employment, and many employees acquired these skills after joining the company, either under the guidance of senior staff or through self-study as they gained work experience.

The companies performing the work in pattern (3) (operations that have changed due to the introduction of digital technology) were mainly those that had been engaged in on-site operations on factory production lines or in warehouses. The introduction of digital technology into the manufacturing, picking, production management, equipment management, and other tasks traditionally performed in-companies has changed the nature of the work, resulting in improved efficiency and accuracy of the work and reduced workload for persons with disabilities. In addition, in some companies, the introduction of digital technology has automated the work of entering data into systems and checking the types and quantities of goods, and other changes have enabled persons with disabilities to take on new tasks that were previously performed mainly by persons without disabilities.

The companies performing the work in pattern (4) (operations in which some tasks have changed due to the introduction of digital technology, although the nature of the work remains the same) were mainly cases in which persons with disabilities involved in operations, kitchen, cleaning, facilities management, and other field work, began to use digital equipment, etc., in some tasks such as work reporting, etc.

Persons with disabilities engaged in work in patterns (3) and (4) were recruited with an emphasis on their aptitude for the work itself in the field-related work rather than on their IT skills, and the method of acquiring skills was mainly instruction from field staff employees and the use of work manuals.

As an effort to enable persons with disabilities to engage in work smoothly, many companies, regardless of the work pattern, have worked to subdivide work and devise the management and guidance of the work by managers, supervisors, etc.

(b) Future Prospects

Many of the companies performing the work in pattern (1) indicated that they would like to maintain their current operations or further expand the scope of their operations. On the other hand, several companies cited the cost of human resource development (time, training burden, etc.) and the development of human resources that can work in other departments or respond to ambiguous instructions as future problems. Many of the companies performing the work in pattern (2) indicated that they expect to continue to have sufficient workloads for the foreseeable future.

Many of the companies performing the work in pattern (3) expressed their intention to continue to promote the digitization of the entire company or to continue to aim at enabling more persons with disabilities to work with digital equipment, etc. in their current on-site operations. Many of the companies performing the work in pattern (4) cited difficulties in recruiting new employees with disabilities as a problem. The main reasons for this were that the ability to perform the work in question and the possession of qualifications necessary for the work are requirements for recruiting persons with disabilities, and that the amount of clerical work tends to decrease with the shift to digitalization. On

the other hand, some companies are expanding their employment of persons with disabilities due to factors other than the progress of digitalization, such as the increase in the number of stores with kitchen facilities.

In terms of workforce development efforts, the survey identified several examples of such efforts, including providing specialized training such as RPA training, providing opportunities for persons with disabilities to learn on their own and ensuring that they have enough time to learn, mentoring by managers and senior staff, creating a system where people with disabilities teach each other, and using job coaches.

While some of the companies performing on-site operations have faced challenges in recruiting and retaining persons with disabilities, others have been able to expand the scope of their work and improve productivity by digitizing their operations. While it is important to keep in mind that the ease of introducing digital devices and other equipment may vary depending on the size, type of industry and nature of business of the company, it is important to develop and share good examples of cases where digitization has expanded the scope of work and improved productivity of persons with disabilities, as this will help companies promoting the employment of persons with disabilities and companies interested in digitization and related work to promote the employment of persons with disabilities.

(3) Summation

a. Issues in promoting digitalization

In the company questionnaire survey, the most frequent responses to the question about what they have done in digitizing their workplaces and the challenges in digitizing the work of persons with disabilities were "creation of a comfortable working environment for persons with disabilities" and "maintenance and improvement of motivation of persons with disabilities" for general companies, and "carving and reconstructing work" and "implementation of training and manuals" for special subsidiaries.

All of these are required regardless of the nature of the work, and it was found that they are also emphasized as issues in the promotion of digitization of the work of persons with disabilities. Many of the innovations and considerations of companies that have promoted digitization are ideas and methods that have been used in the past to enable persons with disabilities to participate smoothly in work, regardless of the nature of the work. It is thought that it is possible to apply the know-how on the employment of persons with disabilities that has been cultivated over the years to digitization-related work as well.

b. Status and issues of engagement in digital-related work by disability type

The results of the company questionnaire survey showed that the status of engagement in digital-related work differed by disability type. Looking at the status of general companies employing each disability type, the percentage of companies employing persons with intellectual disabilities who are engaged in digital-related work was lower than those employing persons with physical or mental disabilities, at around 30%.

On the other hand, a higher percentage of special subsidiaries employed persons with intellectual disabilities, and a higher percentage of companies had persons with intellectual disabilities engaged in digital-related work. In particular, a high percentage were engaged in data scanning, data input/output, data review and cross-checking, and annotation work. In general companies, there were also examples of persons with intellectually disabilities engaged in digital-related tasks such as data scanning, data entry, and data review and cross-checking. It is thought that the introduction of digital-related work can go smoothly if a framework is established that includes easy-to-understand operating methods, work instructions, and a system to prevent errors. Other persons with disabilities who were thought to have difficulty in performing complex tasks may be able to do so through the use of digital devices.

c. Recruitment and human resources development

In general, companies emphasized employment readiness at the time of recruiting. In other words, they thought that the knowledge and skills necessary for the job could be acquired after employment and placed more emphasis on the basic ability and willingness to absorb such knowledge and skills, and the ability to cooperate with others. In companies where persons with disabilities are engaged in non-routine work using digital technology, there were cases where skills and experience were required, but even if they did not have sufficient skills and experience at the time of recruitment, their active skills, such as the ability to work independently, to learn on their own, and to ask questions, were highly valued and led to their recruitment.

In terms of skills acquired after recruiting, there were many cases where employees learned skills on their own through work, etc., or from their supervisors or seniors, and there were also cases where employees with disabilities taught each other. There were also cases where employees dedicated to RPA development work were required to take training at the requesting department's expense.

In the company interview survey, there were examples of companies using public employment security office (Hello Work), work transition support providers, special support schools, and vocational ability development schools for people with disabilities at the time of recruitment. Efforts to acquire IT skills are promoted by agencies that support to persons with disabilities. In securing digital human resources for persons with disabilities, it is possible to collaborate with such regional employment support agencies, special support schools, vocational ability development schools, and career centers of university. In addition, if it is difficult to handle the post-employment stage with the in-company system alone, one option would be to utilize the employment support of employment and life support centers for persons with disabilities, employment retention support providers, job coach support, etc.

(d) Cost of digitization of operations

Regarding the cost of hardware such as equipment and systems for digitization of operations for persons with disabilities, the company interview survey revealed that many companies have digitized their operations as a whole companies, and there were few examples of digitization related operations specifically for persons with disabilities. However, many companies are aware of the benefits of

digitization in terms of efficiency, accuracy, etc., and it is expected that digitization of business operations will continue to be promoted, taking into account the balance between the cost of implementation and the benefits.

With regard to soft costs, the company questionnaire survey showed a certain number of responses, mainly from special subsidiaries, indicating that their operations involve an increased burden in terms of job curving, training and preparing manuals, and the increased frequency of support provided. It will be needed to clarify what kind of work involves support burdens, at what stage human costs are incurred, whether they are temporary or not, and what measures and conditions should be taken to reduce human costs when digitizing the work of persons with disabilities.

(e) Summary conclusion

The importance of this research is that it has allowed us to understand the overall situation in companies regarding the current status of the engagement of persons with disabilities in digital-related work, the reasons for such engagement and efforts, and the impact on the employment of persons with disabilities amidst the rapid progress of digitization in society as a whole.

In addition to the advancement of digital technologies such as AI, and the impact of behavioral restrictions due to the spread of COVID-19, there have been significant changes in the way society as a whole works, such as the spread of teleworking and online meetings, and in the work of persons with disabilities, there have been changes in their involvement in digitally related work and in the content of their work. We hope that this research will contribute to think about the work of persons with disabilities and the expansion of their work areas, as the digitization of the work of persons with disabilities in companies is expected to progress in companies along with the further digitization of society as a whole.

7 Relevant research products

Situation and specific examples of work of persons with disabilities using digital technology, 2024
(Leaflet for employers and employment support agencies)

(https://www.nivr.jeed.go.jp/research/kyouzai/kyouzai82.html)