

DX Human Resources Development of Nippon Steel Corporation

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Abstract

Nippon Steel Corporation defines “those who can extract and solve business problems based on data” as DX human resources, and aims to make all office staff and engineers DX human resources. To enhance our business competitiveness, improvement of knowledge of management using digital technology is important, in addition to having skills in business and data science. Therefore, we intend to promote education both in data science and digital management. This paper describes the efforts made for DX human resources development.

1. Introduction

Another paper of this special issue introduces NS-Lib as a base of our strength in connecting and NS-DIG™ and AIRON-EDGE™ as bases of our strength in maneuvering. Nippon Steel Corporation, through the establishment of these platforms, has been working to promote various digital transformation (DX) measures. For faster implementation of the measures, DX human resources, who will utilize those platforms, are essentially required. Nippon Steel has been implementing educational measures with regard to digital technologies, such as data science and ICT tools. However, each organization is responsible for providing training based on its needs and thereby we have no systematic education program for the whole company. To resolve this issue, after the Digital Innovation Div. was set up in 2020, we organized DX human resources development measures again and started a full-scale education program in 2021.

This paper introduces our efforts for human resources development.

2. Concept on DX Human Resources Development

Nippon Steel, considering “data-driven” and “empowerment” that are our keywords to promote DX, defines DX human resources as human resources who can extract and solve business problems based on data. To develop such human resources and encourage them to actively work at actual worksites, education from the viewpoints of business and data science is naturally required; an approach from the viewpoint of management is also necessary to make full use of such human resources with knowledge and skills on business and data science.

Accordingly, Nippon Steel provides two types of training programs: Data science training to allow office staff and engineers (hereinafter, “staff”) to acquire more knowledge and skills on business and data science, and digital management training to teach

mindset and literacy to managers who will take the lead in carrying out DX measures at each office/manufacturing site.

The two types of training programs are described below.

3. Data Science Training

Nippon Steel classifies its employees into three categories based on the levels of their knowledge and skills on data science: (1) Expert who is capable of development using digital technologies (expert data scientist), (2) staff member who is capable of high-level data analysis (citizen data scientist), and (3) staff member who can understand and evaluate data correctly (data science user). **Figure 1** illustrates the outline of Nippon Steel’s DX human resources.

Firstly, we believe that all staff should at least reach the level of data science users (3) and thus teach basic IT literacy and the mindset necessary for DX promotion to all staff. The training contents were determined also in line with the DX Literacy Standards¹⁾. After participating in online lectures, staff should pass a literacy test in a level equal to that of the IT Passport Test to complete the course. We started providing this training course in FY2021 and all staff (approximately 11 000) are expected to complete the training within FY2023.

Secondly, regarding citizen data scientists (2), Nippon Steel considers that human resources in this category take the key role in promoting DX measures at each business operation section or manufacturing site. We encourage the employees to be citizen data scientists such that citizen data scientists account for approximately twenty percent of the employees working at each organization. We accelerate the DX measures by allocating such scientists to all organizations evenly. Under our standards, citizen data scientists are demanded to have knowledge and skills so that they can utilize data in a level equal to data business strategists defined in the Digital Skill Standard - Promotion¹⁾. As a precondition, they should acquire such

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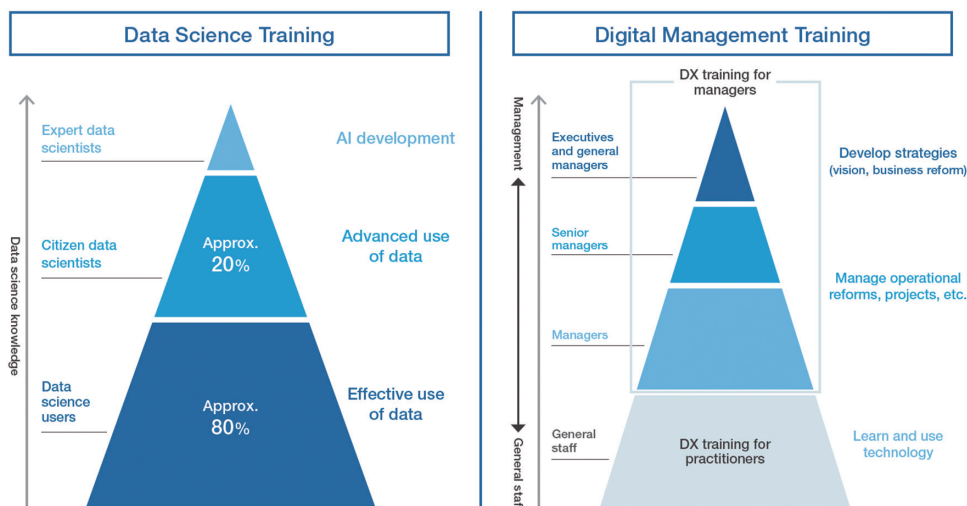


Fig. 1 The conceptual diagram of DX human resources development

Table 1 The contents of the education program for citizen data scientists

| Categories | Contents | Style |
|--------------------------------------|---|--------------|
| Strategic application of data and AI | Overview of data driven operation | Online |
| | Case study of using ICT tools | Online |
| | Workshop | Face to face |
| Data science | Study of statistics | Online |
| | Lecture and exercises of BI tool | Online |
| | Basic knowledge of machine learning | Online |
| | Hands-on of AI tool | Online |
| Data engineering | Lecture and exercises of Python (arbitrarily) | Online |
| | Basic knowledge of database | Online |

(business) knowledge through their daily operations. Employees are expected to acquire knowledge and skills on statistics, data processing, BI tools (software for analyzing and visualizing data to use it for business), and machine learning through the training. The training program also teaches staff how to utilize the knowledge and skills that they have acquired for actual business operations (Table 1). Staff learn the aforementioned items for six months mainly via online learning. With regard to the application of what they have learned on data science to actual business operations, in particular, training in a workshop form is also provided and in which each participant determines a DX strategy for issues at his/her workplace. This reinforces the training, and this is a characteristic of Nippon Steel’s education program. The training program for this category began also in FY2021 and as of the end of FY2022, approximately 400 staff members (approximately four percent of all staff) have become citizen data scientists (Fig. 2). We will continue to provide training to increase the ratio to 10% by the end of FY2025 and to 20% by the end of FY2030. In addition, to motivate employees to upgrade their knowledge and skills and notify the entire company of who has acquired the necessary skills, we issue open badges²⁾ to employees who are qualified as citizen data scientists.

Lastly, we regard expert data scientists (1) in the top category as analysis experts mainly in research sections. They are human resources who use their technical and advanced data science knowledge and skills to resolve problems. We are working to develop and reproduce such staff within research sections.

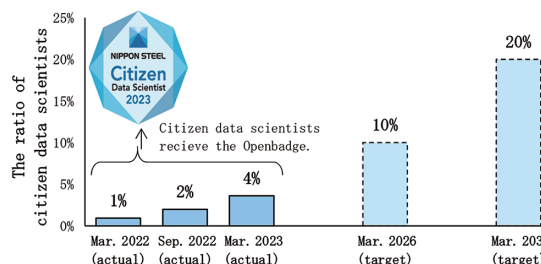


Fig. 2 The ratio of citizen data scientists

4. Digital Management Training

Nippon Steel believes that, to accelerate the DX promotion, managers should understand their roles and determine future visions and strategies and they should also have capacities for strongly leading and promoting DX. In order to develop managers who will take the lead in renovating business and production processes with digital technologies at each business operation section or manufacturing site, we provide digital management training targeting all managers (approximately 7000). The training program contains online lectures on Nippon Steel’s DX strategies, data governance, security, and intellectual property on which knowledge is required as managers, the roles of managers, and mindset as managers. The training program began in FY2021 and all managers had completed the program by the first half of FY2023 (Fig. 3). We will continue to pro-

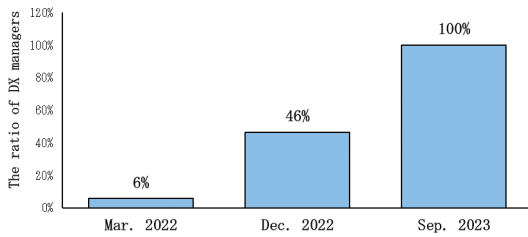


Fig. 3 The ratio of DX managers

vide training to new managers also in the future.

5. Conclusion

This paper described Nippon Steel’s efforts to develop DX human resources. The development of citizen data scientists, who play the key role in DX promotion, has proceeded as planned. Regarding

digital management training, all managers have taken all necessary training courses. Some citizen data scientists admitted that they could enhance the level of operation data analysis and its efficiency by fully utilizing the data processing and analysis techniques that they had learned in the training program. Thus, we understand the training is producing effects although the progress is slow. We will update the training contents as required and develop human resources as planned, thus accelerating the promotion of Nippon Steel’s DX measures.

References

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