

# Data Governance and AI Principles for Development and Operation in Nippon Steel Corporation

Masayoshi SUGIYAMA\* Tomoyuki SASAKI  
Masakazu KOMIYAMA

## Abstract

*The most suitable management, quality, and security are prerequisites for leveraging data. Nippon Steel Corporation has been in the process of reinforcing our existing information management regulations for continuously strengthening our data governance. Furthermore, in February 2022, we released AI principles for development and operation, summarizing cautionary points based on both how AI is to be utilized and how AI is to be developed.*

## 1. Introduction

To utilize data, managing the data appropriately and securing its quality and security are important. Nippon Steel Corporation developed the integrated data management platform NS-Lib™ as a base for its strength in connecting and has been working to utilize data more broadly. Under such circumstances, we are considering improving our basic information management rules to define management methods related to data creation, storage, utilization, disclosure, and disposal in order to continuously enhance our data governance (Fig. 1).

In February 2022, we determined the AI principles for development and operation<sup>1)</sup> by summarizing cautionary points on how AI is to be both utilized and developed.

This paper introduces our data governance and the AI principles for development and operation.

## 2. Nippon Steel's Data Governance Platform and Rules

In conventional data management at Nippon Steel, users were limited and controlled for each system in many cases and thereby data and systems were managed without discrimination. We are now promoting data utilization throughout the company by establishing and using the integrated data management platform NS-Lib while the conventional method is still being applied to existing systems. Data to be utilized throughout the entire company should be managed and applied to ensure that the data is utilized in a secure and appropriate manner. NS-Lib is equipped with management functions for such purpose (Fig. 2).

In addition, to appropriately promote data utilization using the aforementioned NS-Lib throughout the entire company, we are developing rules. In our efforts to extend data utilization so as to enhance our enterprise value, our data governance rules demand that information be managed according to the basic information management rules and they define management methods related to data storage, disclosure, and utilization. Such management methods are necessary to understand that Nippon Steel's data is an asset that produces values and to continue to produce values from data (specific rules are under discussion).

- (1) Data storage
  - a) Store valuable data for a necessary period of time.
  - b) Determine and clarify storage periods assuming that data will be used throughout the company.
  - c) Delete data for which the storage periods have ended.
- (2) Data disclosure
  - a) Disclose data to allow the entire company to utilize it.
  - b) Give appropriate privileges to data users and control their ac-

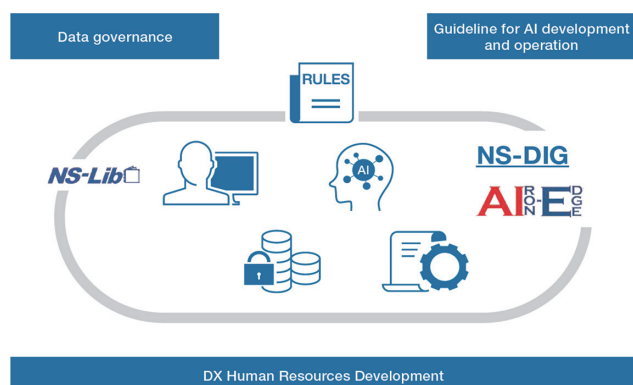


Fig. 1 The systems and rules of data utilization

\* General Manager, Digital Innovation Div.  
2-6-1 Marunouchi, Chiyoda-ku, Tokyo 100-8071

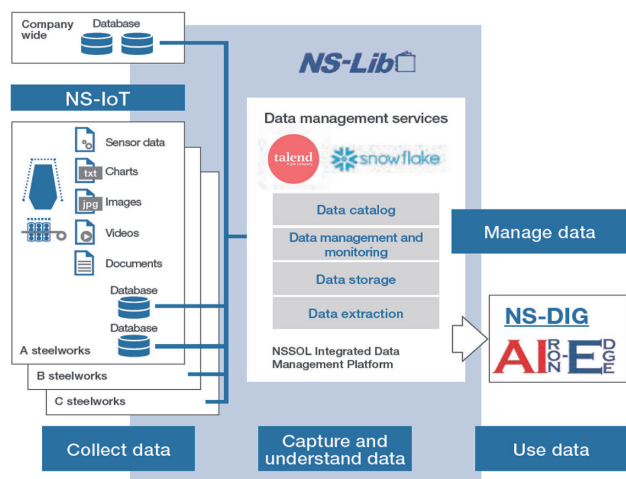


Fig. 2 The concept of NS-Lib

cess.

(3) Data utilization

- a) Register and maintain metadata to promote data utilization and enhance the ease of search.

**3. Policy on the Organizational System for Promoting Data Utilization and Governance**

To promote data utilization throughout the entire company, we are discussing the clarification of roles to manage data in the future. We will add some roles, such as data owners who manage data in systems of their departments/sections, data stewards, and data governance officers.

Data stewards manage data under commission from data owners. Specifically, they register and maintain metadata, protect and check data, determine whether data can be disclosed and who can see the disclosed data, and set access control when disclosed. H.O. departments and steelworks' departments, etc. that have knowledge on the actual data to be managed will be in charge.

Data governance officers will give guidance and support to the data owners and data stewards to promote company-wide data utilization. They determine company-wide policies for operations to be performed by data stewards, such as fixing priority orders to metadata registration, data protection and check, determination of who can see disclosed data and whether data can be disclosed, and setting of access control. They also give guidance and support according to the policies. Departments that determine company-wide policies will be in charge and work to promote data utilization throughout the company.

**4. AI Principles for Development and Operation**

Nippon Steel is expanding the utilization of AI, which advances on a daily basis, as a means to enhance its business competitiveness. Meanwhile, AI has two types of characteristics: white box AI, such as algorithms and programs designed by humans, and that of black box AI, which makes predictions and provides guidance with the inductive method via learning data. Accordingly, AI includes the risk of Nippon Steel's value being damaged as a result of inappropriate actions in its development and operation. To prevent this, these principles regulate basic attitudes so as to develop and operate AI appropriately. The principles are applied to AI, a high-level information processing technology developed and operated by Nippon Steel. "AI" at Nippon Steel refers to entire AI systems including non-AI

components.

These principles were created by referring to various guidelines: AI Utilization Guidelines<sup>2)</sup> issued by the Japanese Ministry of Internal Affairs and Communications, Ethical Guidelines<sup>3)</sup> issued by the Japanese Society for Artificial Intelligence, Ethics Guideline for Trustworthy AI<sup>4)</sup> released by the EU, IEEE Ethically Aligned Design,<sup>5)</sup> OECD AI Principles,<sup>6)</sup> and Asilomar AI Principles<sup>7)</sup> released by Future of Life. Below are the items to be commonly regulated that are specified in our principles.

- (a) Appropriate utilization
- (b) Compliance
- (c) Security
- (d) Fairness
- (e) Dignity/autonomy and privacy
- (f) Robustness
- (g) Explainability
- (h) Appropriate learning
- (i) Education/literacy
- (j) Conformance to AI development and utilization guideline

For the items, based on the understanding that AI may damage other companies unintentionally and that the thoughts of people who give data to AI are unconsciously biased, we consider the following matters.

- A) Appropriate utilization considering appropriate roles of AI and humans
- B) Conformance to regulations that vary from country to country
- C) Consideration of the possibility that AI may damage our employees and third parties fatally, physically, or financially
- D) Consideration to prevent AI from producing social injustice and differences
- E) Consideration of human dignity, autonomy, and privacy
- F) Securing of the robustness throughout the service life
- G) Securing of the transparency from the viewpoints of failure events and legality
- H) Securing of quality considering data quality elements (e.g., validity and consistency) and unconscious bias
- I) Continuation of provision of training to the employees to have them understand AI correctly and use AI appropriately
- J) Conformance to AI development and utilization guideline

**5. Conclusion**

We believe, to promote data utilization, governance is important and it is realized via the development of rules, standards, and systems, in addition to infrastructure development and deployment of new technologies. This paper introduced part of our efforts.

**References**

- 1) Nippon Steel: AI principles for development and operation. 2022
- 2) Japanese Ministry of Internal Affairs and Communications: AI Utilization Guidelines. 2018
- 3) Japanese Society for Artificial Intelligence: Ethical Guidelines. 2017
- 4) EU: Ethics Guideline for Trustworthy AI. 2019
- 5) IEEE: Ethically Aligned Design. 2019
- 6) OECD: AI Principles. 2019
- 7) Future of Life: Asilomar AI Principles. 2017

**NIPPON STEEL TECHNICAL REPORT No. 131 OCTOBER 2024**



Masayoshi SUGIYAMA  
General Manager  
Digital Innovation Div.  
2-6-1 Marunouchi, Chiyoda-ku, Tokyo 100-8071



Masakazu KOMIYAMA  
Senior Manager  
ICT Strategic Planning Dept.  
Information & Communication Technology Div.



Tomoyuki SASAKI  
Chief Manager  
Digital Innovation Div.