

Tentative
Translation

Case Studies On AI Governance Initiatives

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The Conference toward AI Network Society

Case Studies On AI Governance Initiatives: Overview

○ We conducted interviews with business operators who are actively and willingly working on AI governance.

- NTT DATA Corporation [NTT DATA]
- Oki Electric Industry Co., Ltd. [OKI]
- Sony Group Corporation [SGC]
- IBM Japan, Ltd. [IBM Japan]
- NEC Corporation [NEC]
- Hitachi, Ltd. [Hitachi]
- FUJITSU LIMITED [FUJITSU]
- Sumitomo Mitsui Financial Group, Inc. [SMFG]

Note: The text in square brackets [] are the acronyms/abbreviations.

○ We categorized their initiatives as follows:

- Organization and responsibilities
- Human resource development
- Review of services and products
- Guidelines and principles
- ◆ Security
- ◆ Privacy
- ◆ Fairness
- ◆ Transparency and accountability
- ◇ Others

■ AI Governance

Interviews were conducted around the statement: “When planning, developing, introducing, and managing systems and services that utilize AI, we will comply with legal systems and social norms, and build and implement a system to appropriately manage risks related to AI” (specific details varied depending on the business operator).

➤ The responses include:

- Having management systems and operations that control activities to ensure compliance with social norms and systems, when developing, using, and providing IT systems and services that use AI. [NTT DATA]
- Addressing risk management and definitions under AI utilization and AI product provision (1- providing products and services that utilize AI, identifying the risks associated with utilization, and taking countermeasures, 2- quality assurance and risk management / countermeasures in contracts, development, product provision, and operation, and 3- encouraging customers to understand AI utilization). [OKI]
- Putting into practice the principles set forth in IBM’s “Principles of Trust and Transparency.” [IBM Japan]
- Defining AI Ethics Principles. “Ethics” implies that it is a code of conduct for each employee, and is viewed as a social norm. [Hitachi]

Note: Each business operator is also engaged in various initiatives other than those described in this paper.

Case Studies On AI Governance Initiatives: Overview

● Organization and responsibilities

A team is set up to put AI ethics into practice, protect privacy, and ensure security, and a person in charge at a company-wide level is appointed to work on effective AI governance across departments. For example:

- The chairman (a senior officer) of the AI ethics committee is appointed by the CEO.
- Governance related to AI ethics is regarded as part of the internal controls and viewed as a management issue.

● Human resource development

In order to deepen employees' understanding of AI ethics, common training for all employees and specialist training for employees based on their job category are provided (technical and sales positions). For example:

- E-learning of AI ethics, AI literacy, etc., is facilitated, and the level of understanding is confirmed through tests.
- Workshops and study sessions to identify business risks are held, as well as seminars with experts.

● Guidelines and principles

The company establishes guidelines, principles, etc. for AI based on its corporate philosophy and vision. For example:

- In formulating the plan, the company collects information on domestic and international trends and examples from other companies, in addition to receiving advice from external experts.
- The formulation of AI guidelines ensures reliability and enhanced corporate value, leading to the promotion of AI development and utilization.

◆ Security

Efforts are being made to build a system that will ensure security based on industrial standards and developing rules and will implement security measures related to AI.

- Systems have been established in the past to ensure security (e.g., by assigning a manager). Security measures related to AI are being undertaken within the existing system.
- Rules for security have been established in the past (e.g., formulating internal regulations). Security measures related to AI are being undertaken based on existing rules.

◆ Privacy

Efforts are being made to establish a system and develop rules to protect personal information based on relevant laws and regulations, and to address privacy protection related to AI.

- Systems to protect personal information have been established in the past (e.g., by appointing a manager). Privacy protection related to AI is being addressed within the existing system.
- Rules for the protection of personal information have established in the past (e.g., formulation of internal regulations). Privacy protection related to AI is being addressed based on the existing rules.

◆ Fairness

To ensure fairness, bias in learning data and AI judgment results are being checked.

- The existence of bias is confirmed using a quality checklist and, if there is a bias, it is removed.
- Workshops are held to extract and quantify the values that should be emphasized from the perspective of fairness, and these are reflected in the development of AI.

◆ Transparency and accountability

Technologies and tools related to "Explainable AI" (XAI) are being developed in order to provide customers with understanding and gain their consent.

- In the design and Proof of Concept (PoC) stages, the logic of AI decisions is explained to the customer, and the system is operated and delivered only after obtaining the customer's consent.
- Fact sheets on learning data and the process of model building are being created, and efforts are being made to standardize them.

● Review of services and products

In order to develop and utilize trusted AI, we review services and products at each stage of planning, development, implementation, and operation.

- At the planning and development stages, ethical issues, fairness and other risks of AI utilization are reviewed by corporate, business, legal and other departments.

- Monitoring of AI accuracy and other aspects is conducted during the implementation and operation phases.

Organization And Responsibilities

< Main initiatives >

- Have the top management oversee the implementation of AI governance.
- Expand the existing governance structure to support AI governance.
- Promote initiatives related to AI governance by establishing cross-company working groups and ethics committees.

< Specific initiatives by each business operator >

<ul style="list-style-type: none"> ✓ The Technology Development Division is taking the lead in creating a system for AI governance, while the design system and the main administration are being discussed within the relevant departments. ✓ The future governance structure is currently under consideration. Rather than building a new organization dedicated to AI governance, incorporating a check system based on a risk-based approach in the governance (management) structure of existing information system development projects is deemed more important. 	NTT DATA
<ul style="list-style-type: none"> ✓ The director of the Innovation Promotion Center, also the general manager of the AI Risk Management Division, is responsible for designing the system. In addition, regarding system operation, the manager (Compliance Officer) is responsible for the Compliance Committee, which was established with the commitment of the top management. ✓ A company-wide working group has been formed with internal and external experts on AI. 	OKI
<ul style="list-style-type: none"> ✓ The chairman of the AI Ethics Committee (a senior officer), appointed by the CEO, is responsible for the committee. In addition, the AI Ethics Committee, consisting of the Steering Committee and the Working Committee (which operates multiple working groups with members from the head office and business divisions [the secretariat is the AI Ethics Office]), is responsible for system operations. ✓ AI ethics assessments are being performed by an AI ethics assessment officer in each business unit of electronics. In addition, the above-mentioned AI Ethics Committee will confirm the assessment and provide feedback (risk response recommendations and, in some cases, discontinuation recommendations). 	SGC
<ul style="list-style-type: none"> ✓ The Privacy Advisory Committee, established at IBM Corporation, is responsible for defining the vision and governance of AI ethics. The AI Ethics Board, established by the Privacy Advisory Committee, is responsible for identifying, reviewing, and approving risks related to AI ethics. ✓ The AI Ethics Board is led by IBM's Chief Privacy Officer and an IBM Fellow who is a researcher in AI ethics. 	IBM Japan
<ul style="list-style-type: none"> ✓ In compliance with laws and regulations and the "AI and Human Rights Policy," the corporate division conducts company-wide checks, and the on-site division conducts checks on each project. 	NEC
<ul style="list-style-type: none"> ✓ The future governance structure is currently under consideration. AI ethics self-checks are conducted only for AI cases and are handled by Lumada Data Science Lab (LDSL). LDSL, an organization specializing in AI, accumulates the knowledge obtained. 	Hitachi
<ul style="list-style-type: none"> ✓ The governance of AI ethics is regarded as a part of internal controls and is viewed as a management issue. ✓ AI ethics are reviewed by the "Human Centric AI" Working Group, which consists of members from a wide range of specialized departments, including technology development, legal affairs, SDGs, Human Rights and operations. 	FUJITSU
<ul style="list-style-type: none"> ✓ The System Security Management Department has established a system risk management structure, which includes requirements for AI in the Security Standards Guide and has established guidelines for AI introduction. In addition, the IT Planning Department oversees the planning, development, and operation of systems using AI. For each system, a department responsible for system risk is designated; each department is responsible for the system under its authority. 	SMFG

Human Resource Development

< Main initiatives >

- Provide education on AI ethics and AI literacy to employees using e-learning (for all employees, and for employees grouped by job type [technical and sales positions]).
- Hold workshops, study sessions, seminars with experts, etc.
- Provide AI ethics and skill-based technology education for those in technical positions.

< Specific initiatives by each business operator >

Common to all employees Improving understanding of the importance of AI ethics	✓ Facilitating e-learning to deepen understanding of AI ethics, AI literacy, etc., and confirming the level of understanding through tests.	OKI SGC NEC	FUJITSU SMFG
	✓ The following methods and measures are being used to promote the understanding of AI ethics and AI literacy: <ul style="list-style-type: none"> ➢ Workshops and study sessions are held to identify business risks. ➢ Seminars are held with experts in the field. ➢ Educational content, such as videos, are shared using the company's information bulletin board. 	NTT DATA OKI SGC IBM Japan	NEC FUJITSU SMFG
	✓ Collaborating with universities to provide education that will lead to the emergence of project leaders in AI.	OKI SGC	NEC SMFG
	✓ It is also possible to learn about AI using the learning apps on digital transformation that are provided on company smartphones.	SMFG	
Technical positions Improving understanding of issues related to AI development and implementation, and product quality assurance	✓ Education on AI ethics and technology is provided for different skills.	OKI SGC	SMFG
	✓ Educational content supervised by experts has been created, and practical experience in risk checks can be obtained in workshops in which multiple departments (corporate, technology, sales, etc.) participate.	OKI	
Sales positions Improving understanding of issues to be considered when dealing with customers	✓ Not only is education on selling AI products being provided, but also education on contracts.	OKI NEC	SMFG
	✓ Study sessions on AI governance are held at the request of customers.		NTT DATA

Service And Product Reviews

< Main initiatives >

- Ethical issues, fairness, and other risks associated with the use of AI are reviewed by corporate, business, legal, and other departments during the planning and development stages.
- AI accuracy is monitored during the introduction and operation stages.
- The risks to the business are assessed and issues such as frequency and means of monitoring are considered, based on the risk assessment.

< Specific initiatives by each business operator >

<p>Planning and development stage</p>	<ul style="list-style-type: none"> ✓ Reviewing the appropriateness of projects, AI models and data, etc. <ul style="list-style-type: none"> ➤ Reviews are being conducted to determine whether AI can solve management issues. In addition, reviews are being conducted using checklists in the corporate, business, and legal departments to determine whether there are any ethical issues in the utilization of AI. ➤ The corporate, business, and legal departments will use checklists to review not only the accuracy and interpretability of AI models, but also the risks that may arise from the utilization of AI, such as the fairness of the data and models. 	<p>NTT DATA FUJITSU SGC SMFG IBM Japan NEC</p>
<p>Implementation and operation stage</p>	<ul style="list-style-type: none"> ✓ Reviewing the risks associated with degradation of accuracy during operation. <ul style="list-style-type: none"> ➤ Along with the development and operation support infrastructure for monitoring AI operations, a mechanism has been introduced that can monitor the degradation of AI accuracy and automatically detect and repair it (or develop it for implementation). 	<p>NTT DATA Hitachi IBM Japan FUJITSU NEC SMFG</p>
<ul style="list-style-type: none"> ✓ The aim is to ensure that the AI operates above a certain level by monitoring three indicators: the nature of the input data, the predictions for that data, and the results of comparing those predictions to the actual results. In addition, by appropriately managing this information, it can be used to analyze the reasons behind the indicators falling below a certain level and then to restore quality. 		<p>NTT DATA</p>
<ul style="list-style-type: none"> ✓ In the operation and maintenance of AI systems, it is difficult to guarantee that the accuracy of AI will always be maintained, so agreements on procedures such as AI management, monitoring, and updating have been reached with the users, and implemented. 		<p>NEC</p>
<ul style="list-style-type: none"> ✓ The impact of the AI system on the customer's business is clarified in terms of risk, and measures to be taken are decided according to the risk. The magnitude of risk is established with the customer in each case (e.g., risks that need immediate action, risks that need to be reviewed over time, etc.), and the frequency and means of monitoring are considered. 		<p>NEC Hitachi</p>
<ul style="list-style-type: none"> ✓ The company has a well-established product development process and checklists for each stage: planning, development, implementation, and operation. In this process, matters related to AI quality assurance are incorporated. 		<p>SGC FUJITSU</p>

Guidelines And Principles

< Main initiatives >

- Formulate guidelines, principles, etc. for AI based on corporate philosophy and vision.
- Collect the latest information from Japan and overseas and formulate guidelines on the basis of the advice of external experts (technology, law, human rights, etc.).
- Formulate guidelines for AI to ensure reliability and increase corporate value.

< Specific initiatives by each business operator >

- ✓ AI guidelines, principles, etc. were formulated.
 - In May 2019, NTT DATA formulated the NTT DATA Group AI Guidelines with the aim to achieve a society where humans and AI coexist in harmony. [NTT DATA]
 - In September 2019, the OKI Group AI Principles were formulated in order to provide AI that can coexist appropriately with humans, and contribute to the comfortable and prosperous lives of people. [OKI]
 - In September 2018, based on the founding prospectus, mission/vision, code of conduct, etc., the Sony Group AI Ethics Guidelines were formulated and announced internally and externally. [SGC]
 - In May 2018, "IBM's Principles for Trust and Transparency were announced. In September 2018, Everyday Ethics for Artificial Intelligence were announced. [IBM Japan]
 - In April 2019, the NEC Group AI and Human Rights Policy was established to prevent and resolve human rights issues that may arise from the utilization of AI. [NEC]
 - In February 2021, the AI Ethics Principles were formulated, and a white paper was released to the public. [Hitachi]
 - In March 2019, the Fujitsu Group AI Commitment was formulated to clarify the corporate governance policy of Human Centric AI. [FUJITSU]
 - In November 2017, AI introduction guidelines (undisclosed) that summarize AI-specific risks were formulated. [SMFG]

- ✓ The following were considered in formulating AI guidelines:
 - Domestic and international trends related to AI ethics and case studies of other companies.
 - Advice from external experts well-versed in technology, law, human rights, etc. on how to formulate guidelines and how to make the company unique.

NTT DATA	NEC
OKI	Hitachi
SGC	FUJITSU
IBM Japan	SMFG

- ✓ By formulating AI guidelines, it is possible to ensure ethical credibility, improve corporate value, and promote AI development and utilization as well as AI business.
- ✓ By formulating AI guidelines, business processes that have been individually optimized in each department will be standardized and reviewed so that they are in line with AI guidelines across departments.

NTT DATA	NEC
OKI	Hitachi
SGC	FUJITSU
IBM Japan	SMFG

Security

< Main initiatives >

- Implement AI-related security measures based on or in collaboration with existing systems and rules.
- Research and develop technologies to detect attacks against AI and to defend against attacks.
- Conduct joint research with universities and research institutes in Japan and overseas (on security analysis, cryptography, secret calculation, guaranteeing the correctness of learning data using blockchain, etc.)

< Specific initiatives by each business operator >

Building a system	<p>✓ In the past, based on JISQ27001 (ISO/IEC 27001), which is a certified standard for the Information Security Management System (ISMS), a system was built to ensure security, which involved measures such as assigning a security manager to each department. Security measures related to AI are being addressed within the existing framework.</p>	NTT DATA OKI IBM Japan NEC	Hitachi FUJITSU SMFG
	<p>✓ In the past, based on ISO9001, which is a certified standard for the Quality Management System, a product security team was formed in each department, and a system for ensuring the security and quality of the product was built. AI security measures have been taken within the existing security and quality management framework of the AI ethics governance system.</p>	SGC	
Developing rules	<p>✓ In the past, rules for ensuring security were established; internal rules were formulated to ensure the confidentiality, integrity, and availability of information as well as to deal with the possibility of information leakage. Security measures related to AI are taken based on the existing rules or the AI ethics assessment rules, and with the collaboration of the existing security team.</p>	NTT DATA OKI SGC IBM Japan	NEC Hitachi FUJITSU SMFG
Research and development	<p>✓ Research and development is being conducted on technologies that can detect and prevent attacks on AI.</p>	NTT DATA SGC IBM Japan	NEC Hitachi FUJITSU
	<p>✓ Joint research on AI-related security is being initiated with universities and research institutes in Japan and overseas.</p> <p>➢ Research themes include security analysis, cryptography, secret calculations, and guaranteeing the correctness of learning data using blockchain, etc.</p>	NTT DATA OKI IBM Japan NEC	Hitachi FUJITSU SMFG
<p>✓ Technology is being utilized to protect against hostile attacks during operations (by measuring and enhancing the robustness of AI models, runtime detection, etc.).</p>	IBM Japan		
<p>✓ Monitoring is conducted to detect anomalies in the learning data compared to past data and model trends, and if an alert is issued, human checks are performed.</p>	NEC		

Privacy

Rules for the protection of personal information have been established in the past, based on the Personal Information Protection Act and JIS Q15001, and this involved

< Main initiatives >

- Handle privacy protection related to AI based on existing systems and rules.
- Assign a person to be responsible for compliance with the General Data Protection Regulation (GDPR) in each region in a global structure (a person may also be placed in each department).
- If there is a possibility that the contractor will use the acquired personal information, or if there is a possibility that the company will use the personal information acquired by the customer, the management of personal information will be specified in a non-disclosure agreement.

< Specific initiatives by each business operator >

Building a system	<p>✓ A system for personal information was established in the past, based on the Personal Information Protection Act and JIS Q15001, and this involved assigning a person to be responsible for managing personal information in each department. Privacy protection related to AI is being addressed within the existing system.</p>	NTT DATA OKI SGC IBM Japan	NEC Hitachi FUJITSU SMFG
	<p>✓ To address privacy protection related to AI, a system for the protection of personal information was established based on both domestic and overseas laws and regulations.</p>	SGC	
	<p>✓ An assigned person is responsible for compliance with the General Data Protection Regulation (GDPR) in each region in a global structure (in addition to each region, a person may be placed in each department).</p>	SGC	FUJITSU
Developing rules	<p>✓ Rules for the protection of personal information were established in the past, and include internal regulations regarding the acquisition, use, and storage of personal information as well as actions to be taken in the event of information leakage. The company is addressing privacy protection for AI based on the existing rules.</p>	NTT DATA OKI SGC IBM Japan	NEC Hitachi FUJITSU SMFG
	<p>✓ Matters pertaining to the management of personal information are clearly stated in the confidentiality agreement in cases where there is a possibility that the acquired personal information will be used by a subcontractor.</p>	SGC	SMFG
	<p>✓ The company clearly states matters pertaining to the management of personal information in the confidentiality agreement in cases where there is a possibility that the company may use personal information obtained from customers (business partners) who use the products and services provided by the company.</p>	IBM Japan	SMFG

Fairness

< Main initiatives >

- Check for bias in learning data and AI judgments results when building AI models (and remove bias, if necessary).
- Hold workshops to extract and quantify the values that should be emphasized from the perspective of fairness and reflect them in the development of AI.
- Ultimately, use human judgment to ensure that AI judgments that are directly passed on to customers do not lead to unfair results.

< Specific initiatives by each business operator >

<ul style="list-style-type: none"> ✓ Quality checklists and other tools are used to check for bias in the learning data and AI output, and, if there is bias, it is removed as necessary. 	NTT DATA SGC IBM Japan NEC Hitachi FUJITSU SMFG
<ul style="list-style-type: none"> ✓ Since AI facial recognition may result in racial discrimination, it will not be used in public places, and an announcement was made to that effect. ✓ Some tools for measuring bias in AI data and models are available as open source. 	IBM Japan
<ul style="list-style-type: none"> ✓ The learning data used to generate the AI is inspected for bias in terms of age, race, and other factors, and the content of the inspection is disclosed to customers to inform them of the scope of support during operation. ✓ The behavior of the model is explained by using highly transparent algorithms so that the trend of AI output can be understood. 	NEC
<ul style="list-style-type: none"> ✓ Workshops are organized with stakeholders involved in AI, such as designers, operators, and users, to extract and quantify the values that should be emphasized from the perspective of fairness, and to reflect these values in the development of AI. ✓ Multidimensional fairness based on regions such as Japan, US, and Europe, and intersectional bias, which is non-linearly caused by the overlap of various attributes, such as gender, age and race, is extracted and improved while balancing accuracy of AI. 	FUJITSU
<ul style="list-style-type: none"> ✓ When using AI, the final judgment is made by humans to ensure that the AI judgments that are directly passed on to customers do not lead to unfair results. 	SMFG

Transparency And Accountability

< Main initiatives >

- Develop technologies and tools related to “Explainable AI” (XAI) to provide customers with understanding and gain their consent.
- Explain the logic of AI judgment to customers at the design and Proof of Concept (PoC) stages and obtain their consent before operation and delivery.
- Create fact sheets on learning data and model building processes and implement initiatives for standardization.

< Specific initiatives by each business operator >

Development stage	✓ Developing technologies and tools related to Explainable AI (XAI) in order to gain customer understanding and consent.	NTT DATA SGC IBM Japan	NEC Hitachi FUJITSU
	✓ Explaining to customers the logic behind the AI's output at the design and Proof of Concept (PoC) stages and obtaining their consent before operation and delivery.	OKI NEC	Hitachi
	✓ Explaining to customers not only the benefits but also the risks of AI, such as the possibility of misrecognition if it is used incorrectly.	NTT DATA OKI	SGC
	✓ Conducting quality evaluations of the developed AI, factoring in the interpretability of models and the interpretability of predictions to ensure accountability in the AI development methodology and AI quality assessments.	NTT DATA	
Operational stage	✓ Providing a system that can utilize XAI (Grad-CAM and LIME), visualize the basis for judgments made by deep neural networks, and investigate the causes of incidents in image recognition.	SGC	NEC
	✓ Fact sheets on learning data and the process of model building are being created, and efforts are being made to standardize them. ✓ The XAI tool, which can explain what goes wrong when a bias occurs, is available as open source.	SGC	IBM Japan
	✓ In areas where explanations of the logic and rationale behind judgments are important, it is stipulated that the decision on whether to use AI should be taken carefully, based on the characteristics of the business.	SMFG	

Others

< Specific initiatives by each business operator >

[Signing contracts to ensure the effectiveness of AI governance]

<ul style="list-style-type: none"> ✓ Signing joint research agreements and confidentiality agreements on AI and data utilization and agreeing on the handling of rights and ownership of deliverables that are not necessarily protected by relevant intellectual property laws and regulations or specifying the agreement items in the guidelines. 	NTT DATA SGC	SMFG
<ul style="list-style-type: none"> ✓ Contracts that do not allow for the application of internal rules regarding AI ethics, data acquisition, etc. will not be signed. ✓ The criteria for joining groups are: 1) it must be possible to secure freedom of action after joining, and 2) the contract must allow withdrawal from the group in case governance problems arise after signing the contract. 	IBM Japan	
<ul style="list-style-type: none"> ✓ The contract clearly states that the company will not be liable for any damages caused by the exercise of the customer's discretion in the use of AI. ✓ If the accuracy of the system deteriorates, it will be repaired, and the contract will mention that support will be provided for the operation and maintenance of the system. 	NEC	

[Confirming the effectiveness of AI governance in joint research]

<ul style="list-style-type: none"> ✓ In the research and development group, screening to verify the risk and validity of the research themes is conducted using a checklist at the initiation stage of research. 	Hitachi	
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[Verification of the effectiveness of AI governance]

<ul style="list-style-type: none"> ✓ The quality assurance department has established a system in which products and services cannot be provided unless the check status is confirmed. All checklists must be cleared at each stage of planning, development, and introduction. 	SGC	FUJITSU
<ul style="list-style-type: none"> ✓ Once a year, the company monitors compliance with AI implementation guidelines and assessment of system risks. 	SMFG	

[Raising awareness of and promoting thoroughness in adhering to AI ethics and AI governance frameworks]

<ul style="list-style-type: none"> ✓ The CEO personally sends all employees messages stating that acting in accordance with AI ethics is integral to IBM's values. 	IBM Japan	
<ul style="list-style-type: none"> ✓ The company views AI ethics as part of corporate governance and shares details of the discussions among members of the External Advisory Committee on AI Ethics, which consists of external experts of AI, Legal Affairs, SDGs, Ecology and Medicine, with the CEO and the Board of Directors. Individual AI businesses are examined by relevant departments, such as AI Ethics and Technology Development, and, if necessary, risk mitigation measures shall be taken to control them. 	FUJITSU	

[Spreading and raising awareness of AI ethics and AI governance]

<ul style="list-style-type: none"> ✓ The company is working to spread and raise awareness of AI ethics by participating in international industry organizations and sponsoring research groups on AI ethics. 	SGC IBM Japan	FUJITSU
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