AI With Trust and Integrity

NTT's approach to creating business and societal value responsibly

Contents

Introduction 3

NTT's AI Charter 4

- Enabling Sustainable Development 4
- Human Autonomy 4
- Ensuring Fairness and Openness 5
- Security 5
- Privacy 5
- Communication and Co-creation With Society 6

Bringing it Together With *tsuzumi* 7

Reflections of the Charter 8

- Internal Governance 8
- Global Collaboration 10

Join the Effort 11

Glossary of Terms 12

Endnotes 13

About NTT 14

Introduction

Shortly after ChatGPT launched worldwide in late 2022, valid concerns arose about using **generative AI** (GenAI) safely and responsibly.

Questions included its biases, ensuring social good remains central, and who controls the training data. NTT shared the excitement but recognized the **need for guidelines** to prevent negative outcomes.

Historical lessons, such as the internet's early promise gradually evolving into a platform where harmful ideas can spread, have influenced **NTT's cautious approach** to GenAI.

Drawing on its AI experience, NTT has developed internal expertise and guidelines focused on maximizing **benefits and business value**.

NTT's AI Charter

Artificial Intelligence (AI) has been rapidly pervading society through technological innovations such as deep learning, and it will soon be solving everyday problems of various kinds and scales without human awareness or understanding.
However, there have been fears that the use of AI could lead to unintended discrimination and unjustified restrictions or inducements to action. In addition, the long-term consequences and impact of AI behaviors are still uncertain, thus raising both expectations and anxiety. In order to answer these concerns and to embed AI more deeply and successfully into society, NTT, as well as its employees and engineers (hereafter 'we'), need basic principles in our approach to AI, which we should constantly be aware of and keep in mind as we get more involved in the use and R&D of AI.

01 Enabling Sustainable Development

AI is a beneficial technology that enables **holistic development** of lives and society. We ensure that our active R&D and our fair social implementation of AI will continue to **benefit people, society and the planet** into the future, with full respect for the norms of various countries, regions and communities. Establishing AI technologies that enable people to **pursue sustainable development** fulfills our mission, from both a public and a corporate viewpoint.

02 Human Autonomy

AI is not just a tool for people to solve social issues but is evolving into an entity that brings about changes in people's behavior, living environment, and even the consciousness of individuals and society. **Human autonomy should always be respected** when such AI is designed and adopted. We will continue to extend our knowledge of AI and our understanding of its characteristics so that we can design and apply AI appropriately in accordance with social norms such as human rights and diversity.

03 Ensuring Fairness and Openness

The operational results of AI systems may contain bias. We will ensure that **fairness is always maintained** by understanding the characteristics of data and algorithms in AI so that users will not feel compelled to make unfair decisions. The mechanisms of AI will become more and more complicated. We will ensure **openness** by presenting AI's operational scope and limitations as well as by improving its transparency and explainability while always listening to public voices.

04 Security

We will build AI systems **to be secure** throughout their operational lifetime and respond quickly in cases of error or abuse. Automated AI systems will bring more benefits but even more risks. We will ensure their safety by understanding the details of their operations and by preparing for anticipated risks.

05 Privacy

We will ensure privacy in AI to improve its **trustworthiness** by observing the secrecy of communications and by establishing an appropriate flow of personal data for AI.

06

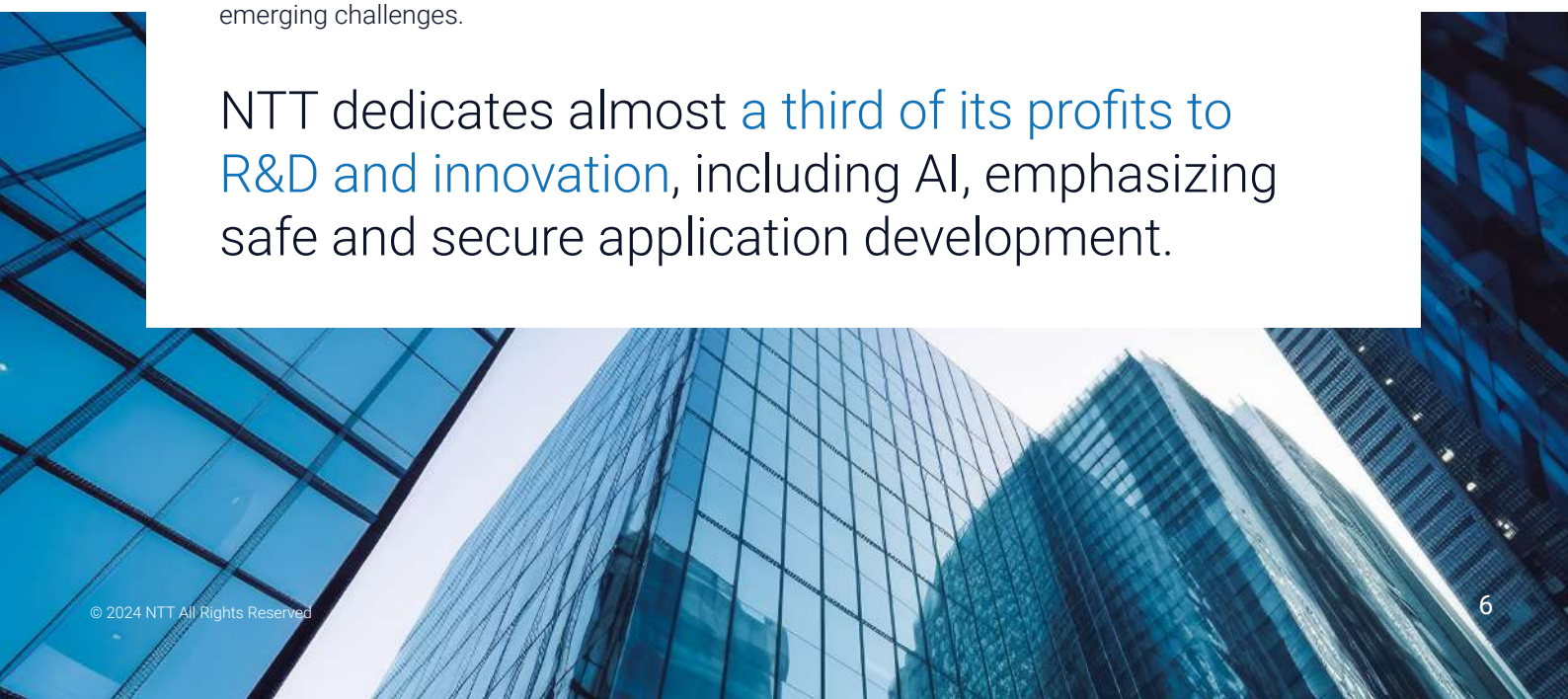
Communication and Co-creation With Society

AI and its surrounding environments are changing dynamically. We will constantly share information and communicate with society. We need to collaborate with stakeholders in conducting R&D and creating new AI businesses. Through **communication and co-creation with society**, we are contributing to the development and spread of an AI that can be trusted by everyone.

Committed to the Challenges of AI

Generative AI is a game-changing technology, significantly impacting business and society. Leveraging its long history with AI, NTT uses the AI Charter as its guiding framework to tackle emerging challenges.

NTT dedicates almost a third of its profits to R&D and innovation, including AI, emphasizing safe and secure application development.



Bringing it Together With tsuzumi

NTT's AI Charter influences all aspects of its AI tool development, including the ***tsuzumi*** initiative. GenAI systems like ChatGPT use Large Language Models (LLMs) trained on vast data sets. The GPT-4 model has about a trillion parameters. NTT developed *tsuzumi*, a smaller LLM named after a Japanese hand drum, to explore the benefits and challenges of smaller LLMs, which can offer specific advantages and reduce some risks.

tsuzumi exhibits four core features:

Lightweight

tsuzumi has versions with seven billion and 600 million parameters, compared to an estimated one trillion parameters for GPT-4.

Flexible Customization

tsuzumi can be fine-tuned to the specialized vocabulary and knowledge base of individual industries with a small amount of additional training.

Multilingual Support

tsuzumi can accept prompts and produce output in Japanese and English, which combined with its compact size enhances its potential.

Multimodality

Beyond language inputs, such as a natural language prompt, *tsuzumi* can accept graphic inputs, such as a chart or hand-written form.

Two of these features in particular echo the philosophy enshrined in the AI Charter: **lightweight and flexible**. Massive LLMs like GPT-4 require vast amounts of energy and resources for their training. Because *tsuzumi* is lightweight and developed using a small fraction of the parameters used in larger LLMs, it consumes much **less energy, reduces greenhouse gas emissions, and is more sustainable**.

In addition, a small, flexible LLM like *tsuzumi* can be trained on a carefully selected set of inputs. This creates greater transparency and **improves the quality** of its output. With a more focused LLM, it is also easier to provide security, protect privacy, and ensure that humans remain informed and in control.

Research into smaller LLMs like *tsuzumi* is fundamental to the development of **safe, secure, and trustworthy AI**. In a 2024 report, the technology research company Gartner said it expects that by 2027 more than half the GenAI models used by businesses will be founded on smaller LLMs compared to just one percent in 2023.[i]

Reflections of the Charter

Skeptics might view NTT's AI Charter as mere words, but it influences the *tsuzumi* model, guides the company's internal governance, and promotes collaboration with various stakeholders.

Internal Governance

NTT leads in AI corporate governance with **stringent structures** and **processes promoting integrity**. The AI Charter underpins this system, emphasizing proactive risk management. While risk cannot be entirely eliminated, NTT aims to control it effectively to achieve corporate goals, including profitability and sustainability.

NTT evaluates AI-related risks through three lenses:

(1) staying **competitive with AI technology**,
(2) adhering to **legal regulations**, and
(3) maintaining a **reputable deployment of AI**.

NTT's strategy is guided by the AI Charter, supported by an **AI Governance Policy** and detailed **AI Usage Guidelines**, **accessible to all employees** online. Each NTT unit has an AI risk management officer trained in these policies, overseen by a group-level AI risk management leader to address compliance and unexpected issues.

Under this framework, **every AI project is reviewed by both the project manager and the company's AI risk management officer**. Each project is categorized into one of **three risk levels**:

Prohibit

Revise the usage of AI for the project.

High risk

Needing an additional assessment and defined steps to mitigate any risks.

Limited risk

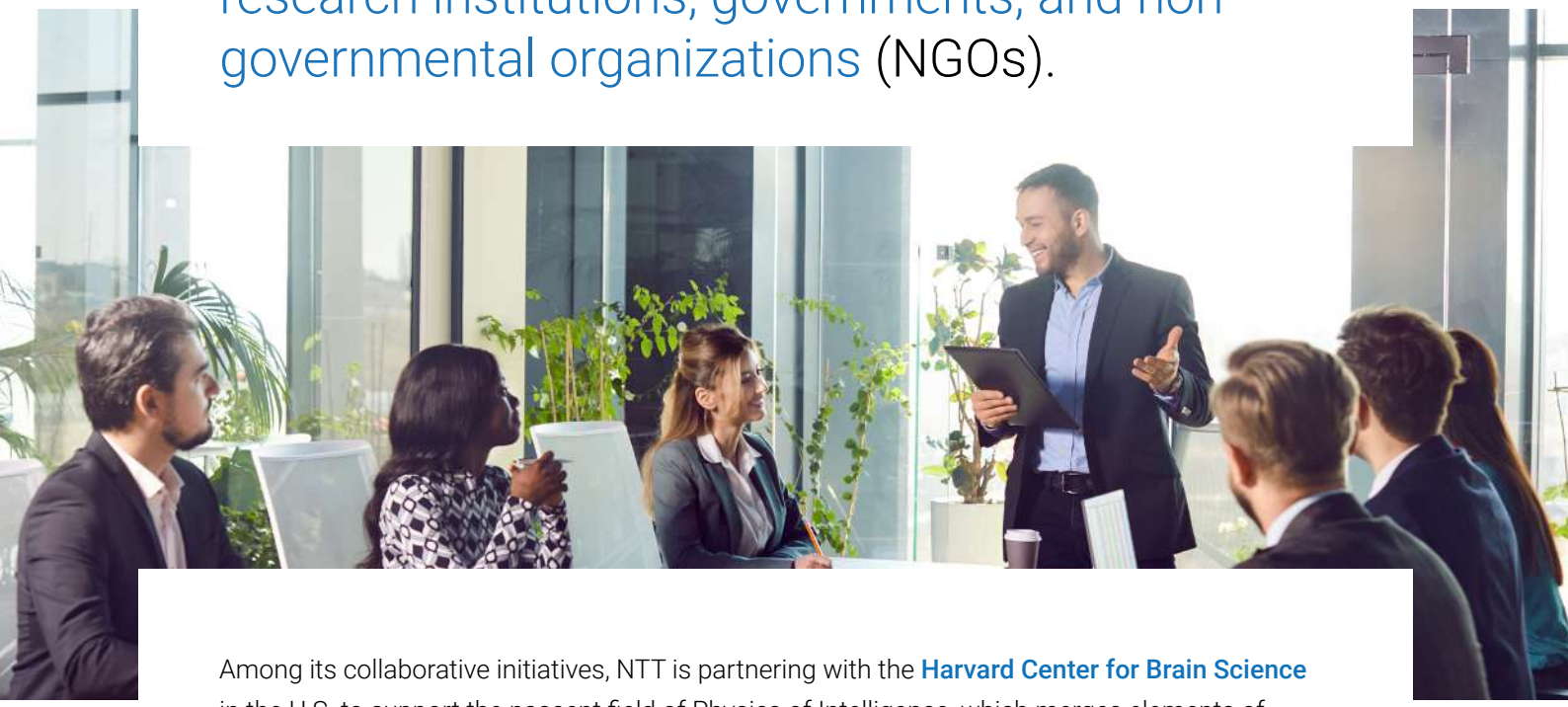
Managed by the project manager under proper oversight.

AI technologies are transforming not just businesses, but society as a whole; therefore, appropriate governance frameworks are essential to ensure these **changes are beneficial.**

Global Collaboration

Realizing the full potential of AI requires collaboration. Partnerships can generate valuable ideas for advancement and usage, help society foresee and manage undesirable consequences, and foster safe, secure, and trustworthy development.

NTT collaborates with a wide ecosystem, including technology partners, academic and research institutions, governments, and non-governmental organizations (NGOs).



Among its collaborative initiatives, NTT is partnering with the **Harvard Center for Brain Science** in the U.S. to support the nascent field of Physics of Intelligence, which merges elements of computer science, neuroscience, and psychology. NTT researchers closely cooperate with Harvard colleagues, and the company has funded a two-year fellowship at the center.

NTT also contributes to the **Hiroshima AI Process Code of Conduct**, a set of voluntary guidelines endorsed by the Group of Seven (G7) countries in 2023, promoting the safe and trustworthy use of GenAI. Additionally, NTT participates in the informal task force for the **G7 AI Code of Conduct Monitoring Mechanism** and agreed to be among the first test sites for this mechanism.

Furthermore, NTT is actively involved in the **World Economic Forum's AI Governance Alliance**, which advocates for the ethical development of AI. Executives from NTT take part in various working groups within the alliance.

Be Part of Building a Safe, Secure, Trustworthy AI

GenAI is one of the most **enigmatic** emerging technologies. The data used to train LLMs and the algorithms generating outputs such as text, audio, video, code, or images are often obscure to most users. Despite this, AI holds **immense potential**.

To ensure AI development provides widespread benefits while avoiding misuse and negative outcomes, early implementation of transparent governance structures and policies is crucial. **NTT's AI Charter** and related policies are initial efforts to guide this development. They aim to create a pathway for producing AI tools that **deliver value while preventing errors** that could be challenging to correct later.

NTT is committed to increasing transparency around these issues and reducing the uncertainties surrounding this new technology. It invites those interested in developing safe, secure, and trustworthy foundations for AI to **join this effort**. NTT aims to collaborate with others to establish a responsible approach that generates value for individuals, businesses, and society. Learning from past experiences and **sharing visionary goals** for the future will help avoid pitfalls and accelerate AI's progress toward its full potential.

Glossary of Terms

Artificial intelligence (AI)

A field of computer science that uses algorithms to try to mimic the human brain and deliver insights from vast amounts of data.

ChatGPT

A Generative AI (GenAI) tool from Open AI that debuted in 2022 and generates original output based on natural-language queries called prompts.

Generative AI (GenAI)

A type of AI that can generate new content, such as text, images, video, and audio, based on training from a massive pool of inputs.

GPT-4

The Large Language Model (LLM) behind ChatGPT developed by Open AI.
It was preceded by GPT-3.

Large Language Model (LLM)

A model trained using a large amount of text data that can understand natural-language inputs and generate original outputs.

Parameters

A node within an AI neural network. A neural network is a fundamental structure of AI systems designed to function like the human brain.

Endnotes

i **Perri, Lori. "3 Bold and Actionable Predictions for the Future of GenAI."** Gartner, April 4, 2024.

NTT contributes to a sustainable society through the power of innovation. We are a leading global technology company providing services to consumers and business as a mobile operator, infrastructure, networks, applications, and consulting provider. Our offerings include digital business consulting, managed application services, workplace and cloud solutions, data center and edge computing, all supported by our deep global industry expertise. We are over $97B in revenue and 330,000 employees, with $3.6B in annual R&D investments. Our operations span across 80+ countries and regions, allowing us to serve clients in over 190 of them. We serve over 75 percent of Fortune Global 100 companies, thousands of other enterprise and government clients, and millions of consumers.

www.global.ntt