Note
This document is almost machine translated. If there are any discrepancies, inconsistencies, or contradictions between the translation provided and the Japanese version, the Japanese version shall take precedence.

Software Modernization Committee Report

Toward the Next Stage of Software

~Toward a prosperous Japanese society that shines brightly in the world~

(Summary)

March 31, 2025

Software Modernization Committee

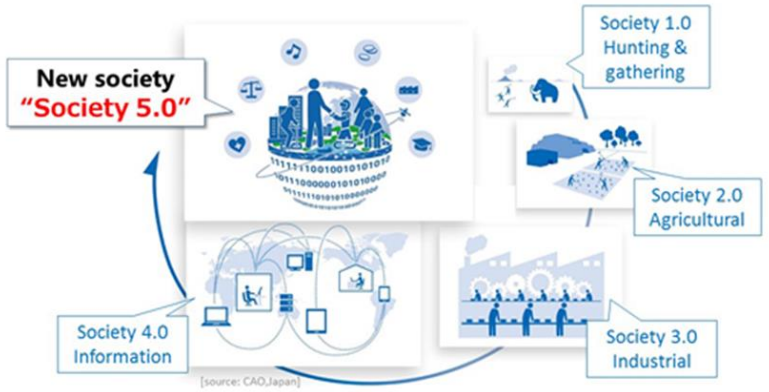
IPA Better Life with IT

https://www.ipa.go.jp/disc/committee/software-modernization-comittee.html

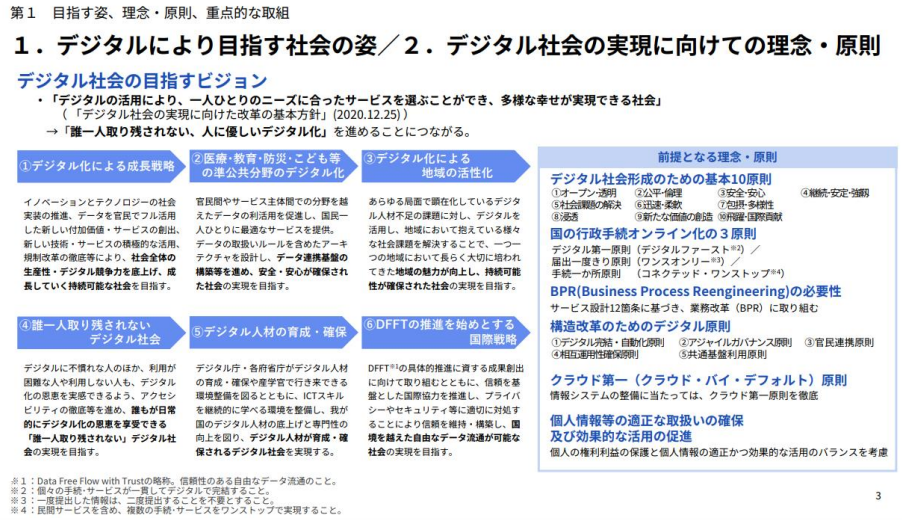
The Society Japan is Aiming to Create

- The government aims to realize **a sustainable economic society that solves social issues and enables each citizen to experience affluence and happiness.**

Basic Policy 2024



Society 5.0



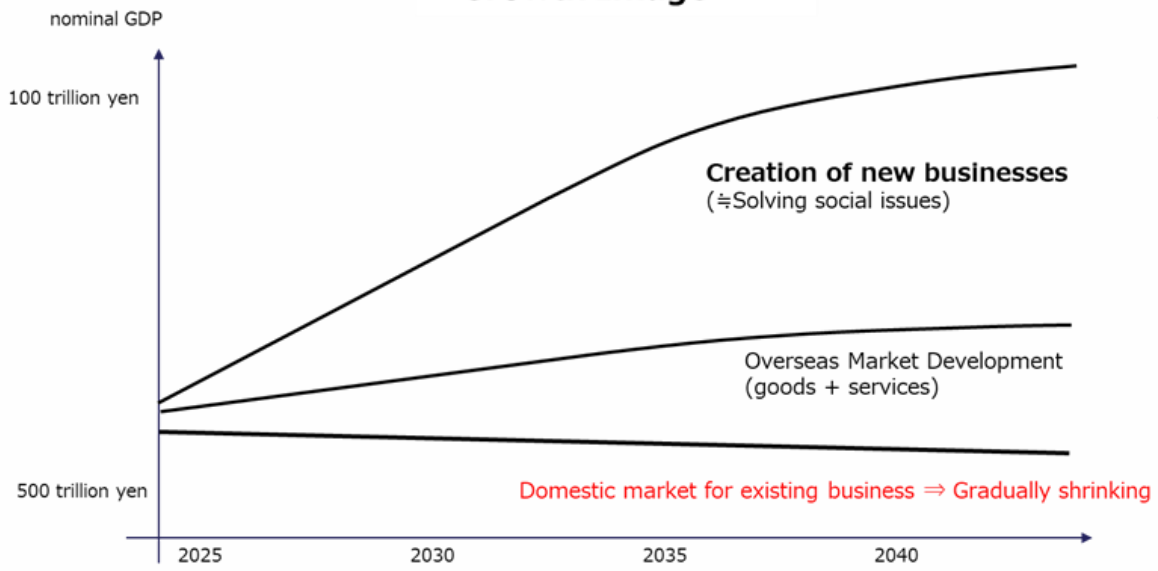
Priority Plan for the Advancement of a Digital Society

(Source: Left: “Basic Policies for Economic and Fiscal Management and Reform 2024“, Cabinet Office; Center: "Society 5.0“, Cabinet Office; Right: "Priority Plan for the Advancement of a Digital Society" Digital Agency

Using Software as a Growth Strategy

- To realize the society we aspire to, we need to create new businesses that start by **solving social issues as a growth strategy**.
- The means to solve social issues is **the use of digital technology with a focus on software**.
  - Shift to a "**Software-Defined Society**" that expands the software-defined structure to society as a whole.

■ **Growth Image**



■ **What is Software-Defined?**

"Software-Defined" is a concept that seeks to achieve more excellent value by continually updating the software that controls hardware to respond to uncertainty and changing needs.
To tackle difficult social issues and create innovative technology, Software-Defined mechanisms must be used to repeatedly test hypotheses and derive solutions while interacting with the real world.

Example) Software-Defined Vehicle

Even after selling the car, the software can be updated remotely to add functions and improve performance. This makes it possible to improve performance, driving assistance, and accident prevention functions and increases the possibility of realizing new functions that were previously impossible.

Example) Software-Defined Satellite

The Voyager spacecraft, launched in 1977, has been exploring beyond the solar system while undergoing software updates. Most recently, in October 2023, the fuel injection system was changed to extend the satellite's life.

Software's growing influence on society/industry has reached a new level

A major shift in software development due to raging technological innovation

The evolution of AI is leading to a major shift in software development.

- AI assists and takes over routine tasks such as code creation and test execution, dramatically improving productivity.
- Software development becomes an **"Building Blocks"** with open source and API standardization.
- **Labor-intensive work will be drastically reduced** ⇒ Shift from man-months to transactions based on results (= value).
- Increasing productivity through **the use of AI is essential** to expand the use of digital technology under a declining population.

Human Role Shift in Software Development Occurs.

- AI is replacing development processes, and the role of humans is shifting to upstream processes such as strategic planning, planning, and requirements definition.
- Humans **evaluate the validity of AI products (fitness-for-purpose judgments).**
- Overall perspective, conceptualization, and comprehensive judgment based **on advanced engineering** skills are required.

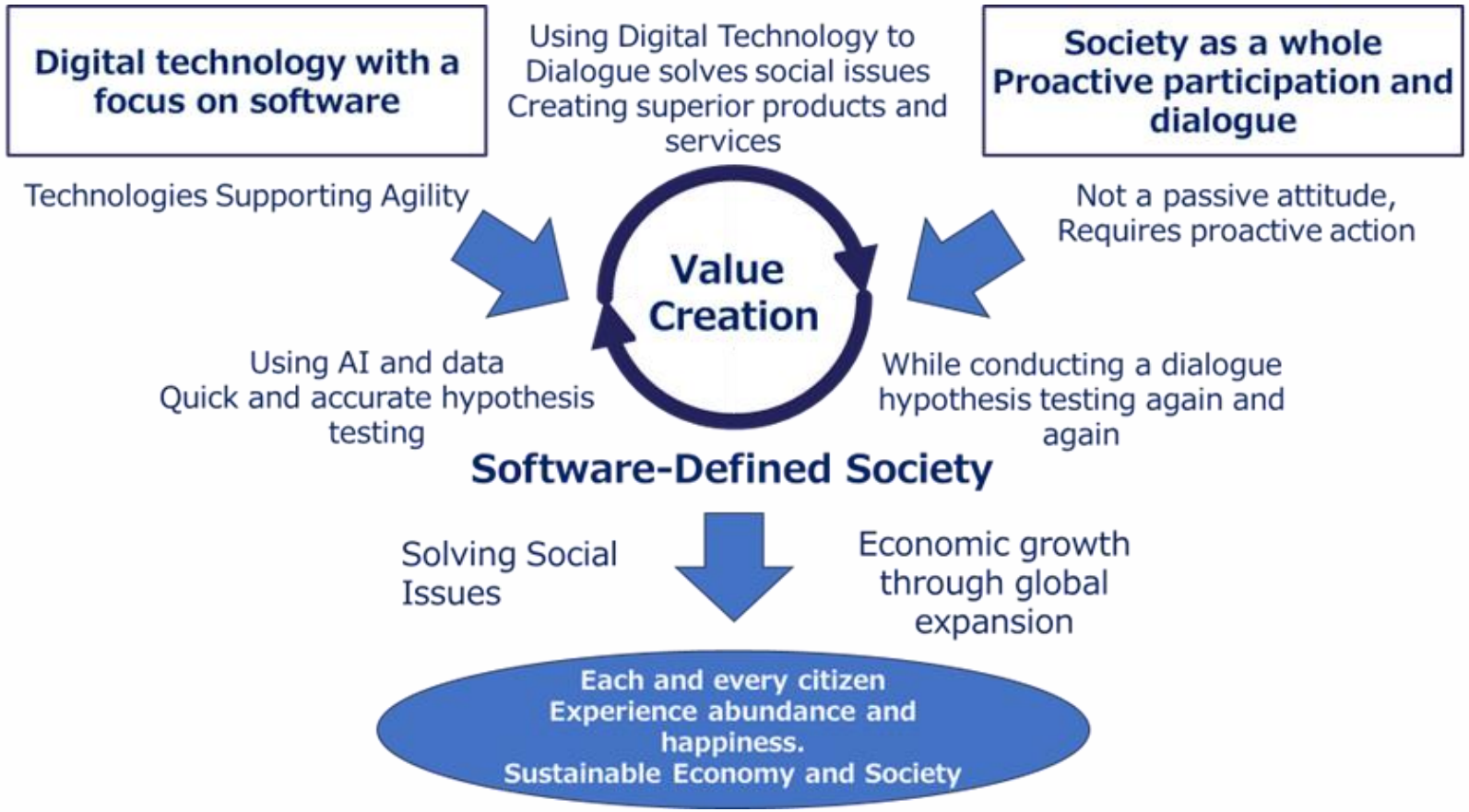
Reskilling for Increasingly Sophisticated Human Resource Requirements Reskilling to meet.

- Improvement in the ability to identify and master advanced technologies other than AI as they emerge one after another.
- Significantly reduced programming effort, but enhanced abstract thinking ability to conceive and control mechanisms that push the limits of human knowledge and augment it to cope with rapid increases in input devices, data volume, and processing volume.
- A managerial perspective is also needed to use AI to advance strategy, planning, and requirements definition, and to implement it in business and society.
- Enhancement of the system to systematically train **software engineers who will lead the transformation** of society and business, both in terms of quality and quantity.

Our vision for the next stage of software

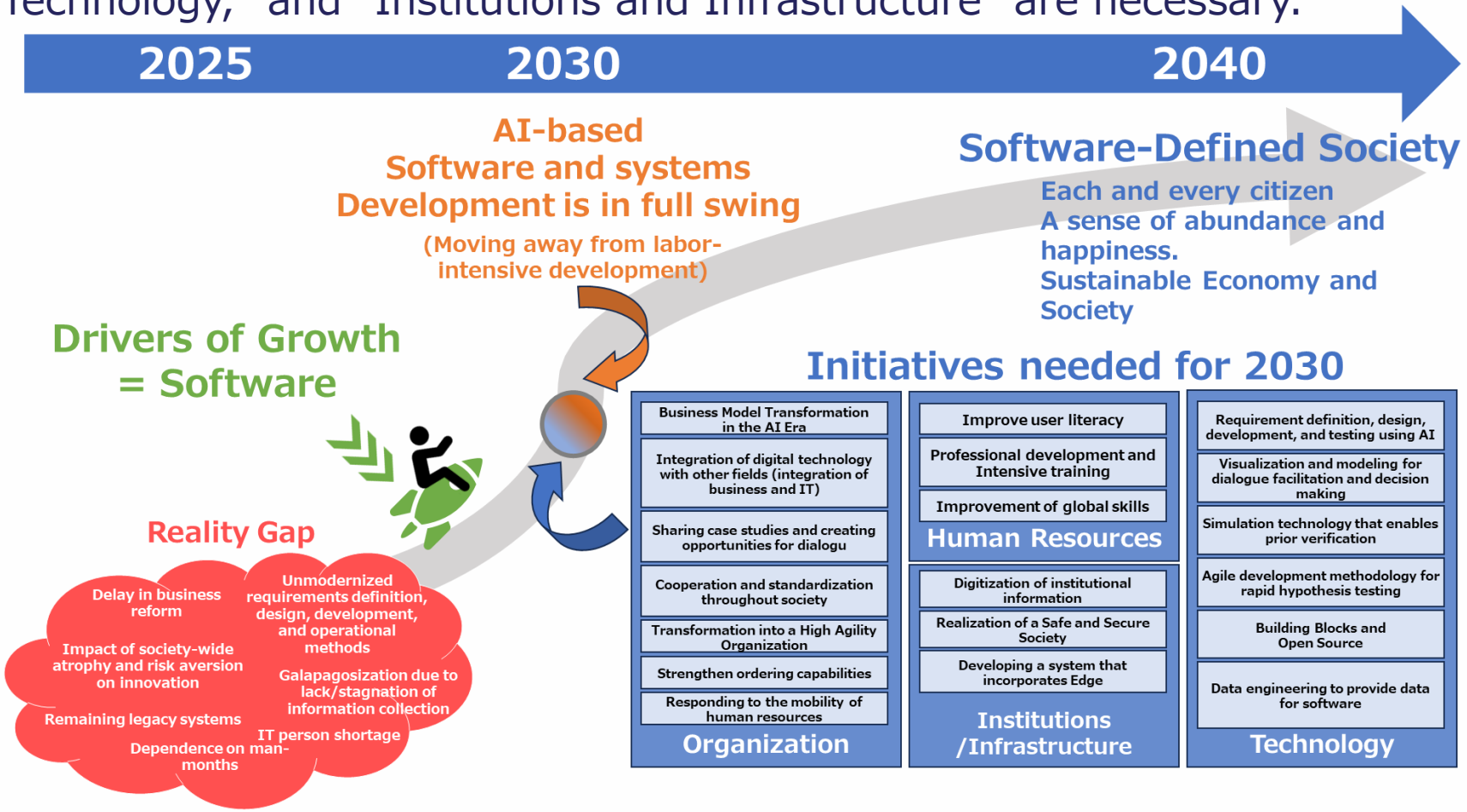
To **form a social feedback loop by stimulating extensive dialogue on** the foundation of a sense of social unity rooted in traditional culture. On this basis, we will **accelerate the transition to a software-defined society** by repeating **rapid and accurate hypothesis testing of** AI and other software-enabled **digital technology applications**, while promoting data utilization and responding to real needs.

This will help solve social issues and promote economic growth, enabling the realization of a sustainable economy and society.



Roadmap ~Toward the Next Stage of Software~

By 2030, **AI-based software and system development is expected to be in full swing**, and we **will see a shift away from labor-intensive development**. In order to respond to such an era and realize the aforementioned vision, efforts from the perspectives of “Organization," “Human resources," “Technology," and "Institutions and Infrastructure" are necessary.



Proposed activities centered on this committee for FY2025 and beyond

Of the necessary axes of initiatives for 2030 listed in the roadmap, this committee, The Committee plans to sequentially implement the initiatives mainly related to software enhancement, after determining their priority.

Point of view	Axis of an initiative	Proposed Activity Themes
General	• General	**Public Awareness Activities (Software-Defined Society, Value-oriented, etc.)**
	• Information Gathering and Analysis	**Gathering and publicizing the latest domestic and international trends**
Organization	• Cooperation and standardization throughout society	**Facilitating dialogue across organizational boundaries**
Technology	• Requirement definition, design, development, and testing using AI	**Advancement of AI utilization**
	• Visualization and modeling for dialogue facilitation and decision making • Simulation technology that enables prior verification • Agile development methodology for rapid hypothesis testing	**Promotion of advanced requirements definition, modeling & simulation**
	• Building Blocks and Open Source	**Promote open source and Building Blocks**
	• Data engineering to provide data for software	**Promoting Data Engineering**
Institutions and infrastructure	• Digitization of institutional information	**Promotion of Legal Tech**
		Promote standardization of contracts, terms and conditions, etc
	• Developing a system that incorporates Edge	**Promotion of Cloud-Edge-IoT**