



Overview of Moonshot R&D at JST

2020.10.22
Department of Moonshot R&D Program





MOONSHOT RESEARCH & DEVELOPMENT PROGRAM

A bold new program for creating [disruptive innovation](#) in Japan.

We will tackle the challenges facing future society through ambitious goal-oriented research projects, leaping beyond the limits of conventional technology without fear of failure.

International collaborations and diverse research teams will generate results of real value to stakeholders across the globe.



Society

Turn our aging society into an innovative and sustainable one through diversity and techno-social transformation.



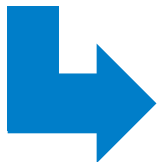
Environment

Protect the global environment while stimulating growth.



Economy

Explore frontiers with science and technology.



‘Moonshot for human well-being’



Inspiring

- Bold goals with self-evident value.
- Significant impact on future society and industry.
- Research talent gathered from all over the world.

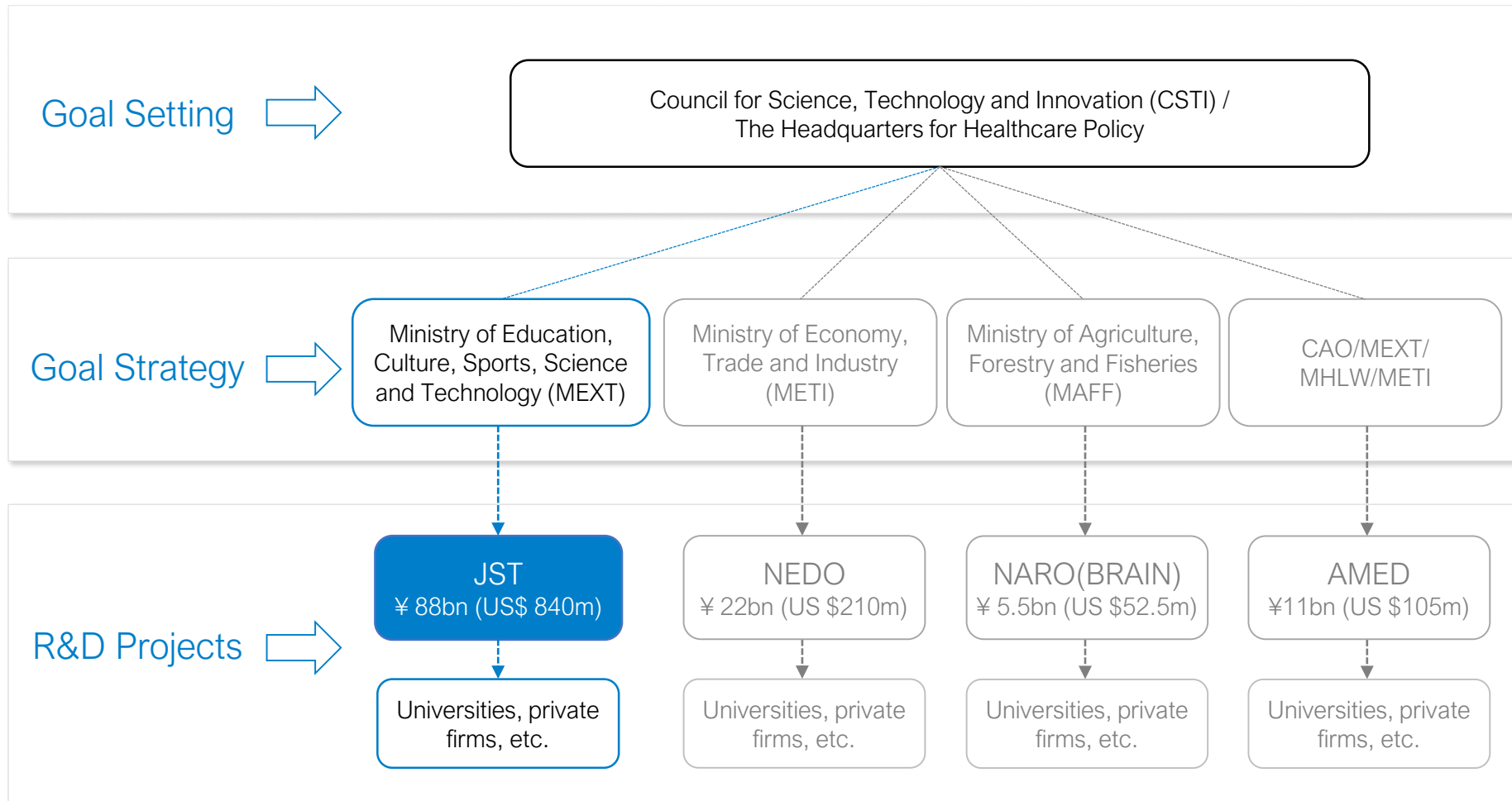
Imaginative

- Radical reimagining of future social structures.
- Direction not limited to conventional approaches.

Credible

- Ambitious but also scientifically feasible.
- Specific, measurable objectives.
- Consistent with relevant strategies and policies.

Program Structure



The Moonshot Goals



Goal 1: Realization of a society in which human beings can be free from limitations of body, brain, space, and time.

Goal 2: Realization of ultra-early disease prediction and intervention.

Goal 3: Realization of AI robots that autonomously learn, adapt to their environment, evolve in intelligence and act alongside human beings.

Goal 4: Realization of sustainable resource circulation to recover the global environment.*

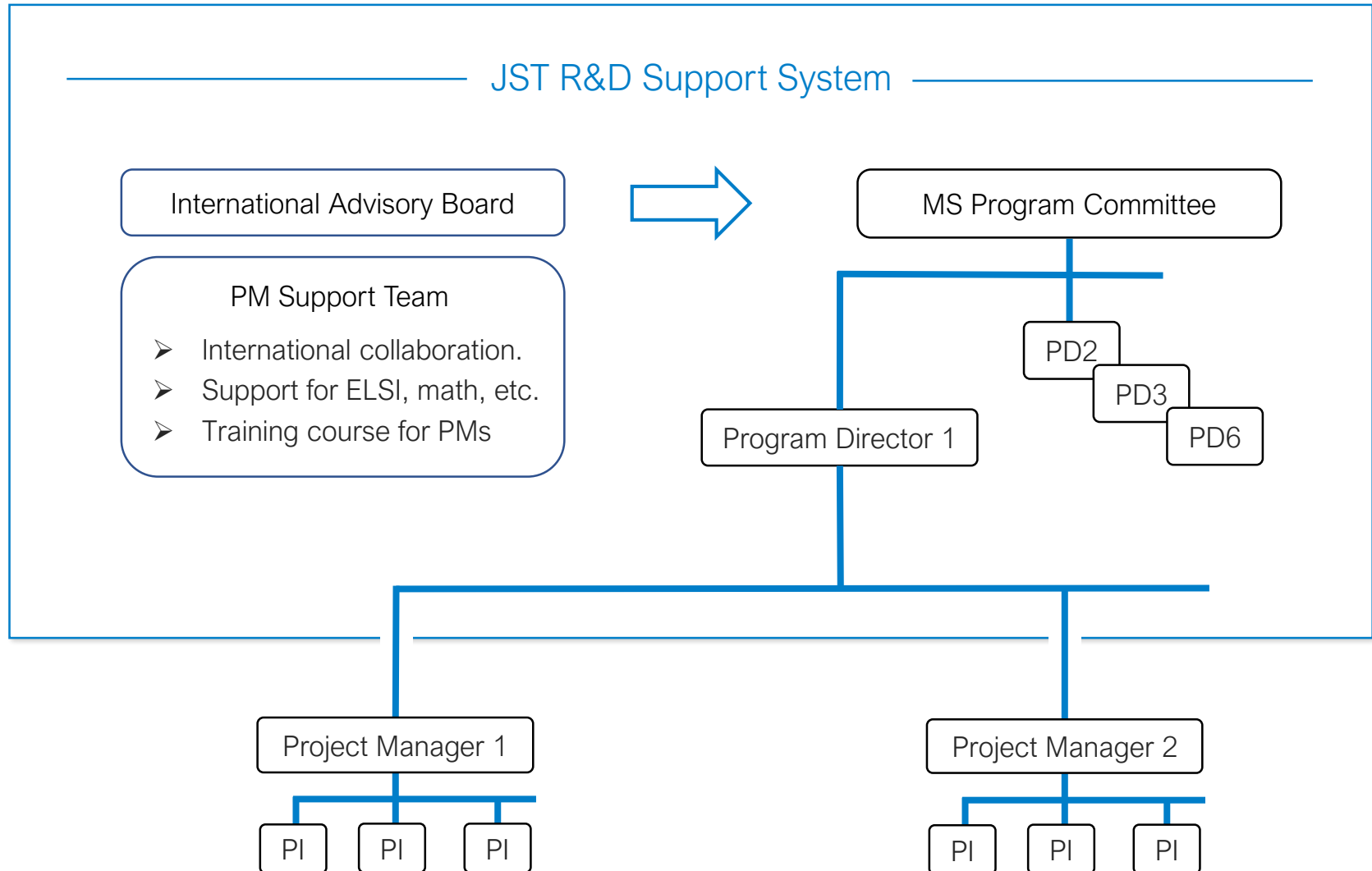
Goal 5: Creation of the industry that enables sustainable global food supply by exploiting unused biological resources.*

Goal 6: Realization of a fault-tolerant universal quantum computer that will revolutionize economy, industry, and security.

Goal 7: Realization of sustainable care systems to overcome major diseases by 2040, for enjoying one's life with relief and release from health concerns until 100 years old.*

* Managed outside JST

Research Project Management Structure



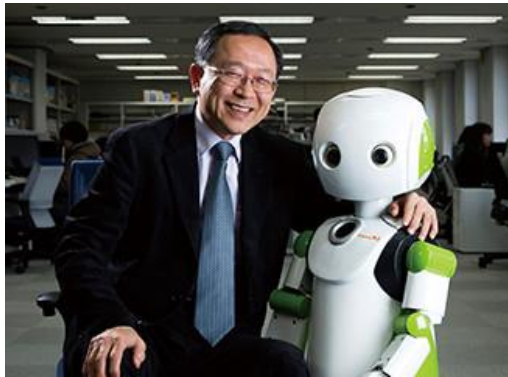


Current Goals:



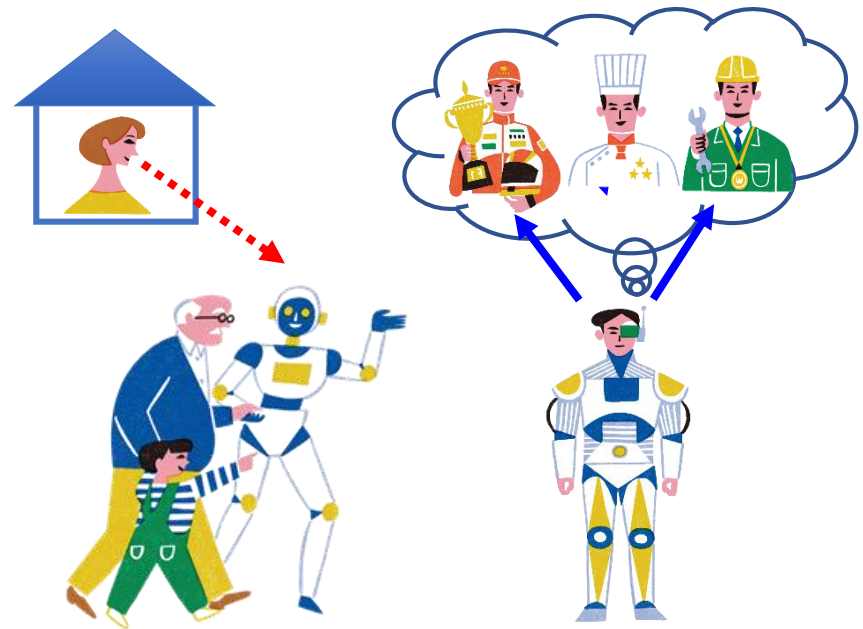
Realization of a society in which human beings can be free from limitations of body, brain, space, and time by 2050.

Development of technologies, including remotely operable avatars, that overcome limitations of geography and physical ability to allow everyone to participate in social activities.



PD : Dr. HAGITA Norihiro

Chair and Professor, Art Science
Department, Osaka University of Arts



Society of diversity and inclusion



ISHIGURO Hiroshi
Professor, Graduate School of Engineering
Science, Osaka University

Realization of a Human-Avatar
Symbiotic Society where Everyone can
Experience a Diverse Range of Human
Activities

KANAI Ryota
President and CEO, Araya, Inc.

Freedom from Bodily Limitations by
Expanding Physical and Perceptual
Capabilities

MINAMIZAWA Kouta
Professor, Graduate School of Media Design
Keio University

Development of Cybernetic Avatars to
Create Shared-Experience with
Harmonious Physical and Social
Characteristics

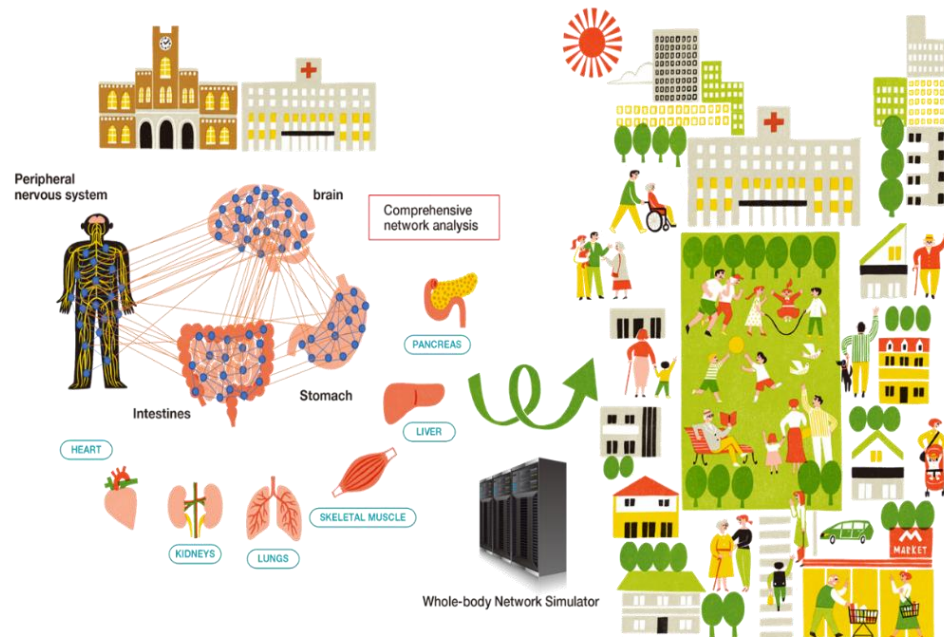


Realization of ultra-early disease prediction and intervention by 2050.

Development of technologies to prevent serious diseases such as dementia and cancer by regulating the networks between the brain, intestine and other organs for which the relationships have not been fully analyzed.



PD : Dr. SOBUE Gen
Chairperson
Aichi Medical University





AIHARA Kazuyuki
University Professor
The University of Tokyo

Comprehensive Mathematical
Understanding of the Complex Control
System between Organs and Challenge
for Ultra-Early Precision Medicine

OHNO Shigeo
Emeritus Professor and Project Professor
Graduate School of Medicine,
Yokohama City University

Challenge toward the Control of
Intractable Cancer through
Understanding of Molecular, Cellular,
and Interorgan Networks

KATAGIRI Hideki
Professor, Graduate School of Medicine
Tohoku University

Challenge for Eradication of Diabetes
and Comorbidities through
Understanding and Manipulating
Homeostatic Systems



TAKAHASHI Ryosuke
Professor, Graduate School of Medicine
Kyoto University

Towards Overcoming Disorders Linked
to Dementia based on a
Comprehensive Understanding of
Organ Connectivity

MATSUURA Yoshiharu
Professor, Research Institute for Microbial
Diseases, Osaka University

Understanding and Control of Virus-
Human Interaction Networks



Realization of AI robots that autonomously learn, adapt to their environment, evolve in intelligence and act alongside human beings by 2050.

Development of AI robots that have the same sensitivity as humans, physical abilities equal to or higher than humans, and grow together with humans.



PD : Dr. FUKUDA Toshio

Professor, Graduate School of Science and Technology, Meijo University





SUGANO Shigeki
Professor
Faculty of Science and Engineering
Waseda University

Smart Robot that is Close to One
Person for a Lifetime

NAGATANI Keiji
Project Professor
School of Engineering
The University of Tokyo

Innovation in Construction of
Infrastructure with Cooperative AI and
Multi-Robots Adapting to Various
Environments

HARADA Kanako
Associate Professor
Graduate School of Medicine
Graduate School of Engineering
The University of Tokyo

Co-evolution of Human and AI-Robots
to Expand Science Frontiers

HIRATA Yasuhisa
Professor
Graduate School of Engineering
Tohoku University

A New Lifestyle Alongside AI-enabled
Robots to Create Together a Diverse
and Inclusive Society that Leaves No
One Behind



Realization of a fault-tolerant universal quantum computer that will revolutionize economy, industry, and security by 2050.

Development of large-scale, versatile quantum computers that can make significant contributions to multiple areas of society.



PD : Dr. KITAGAWA Masahiro

Professor, Graduate School of
Engineering Science, Osaka University





KOASHI Masato
Professor, Graduate School of Engineering
The University of Tokyo

Research and Development of Theory
and Software for Fault-tolerant
Quantum Computers

KOSAKA Hideo
Professor, Faculty of Engineering /
Institute of Advanced Sciences
Yokohama National University

Development of Quantum Interfaces for
Building Quantum Computer Networks

TAKAHASHI Hiroki
Assistant Professor
Experimental Quantum Information Physics
Unit, Okinawa Institute of Science and
Technology Graduate University

Fault-tolerant Quantum Computing with
Photonically Interconnected Ion Traps

FURUSAWA Akira
Professor, School of Engineering
The University of Tokyo

Development of Large-scale Fault-
tolerant Universal Optical Quantum
Computers



MIZUNO Hiroyuki
Senior Chief Researcher
Center for Exploratory Research
R&D Group, Hitachi, Ltd.

Silicon Massively Parallel NISQ
Computer

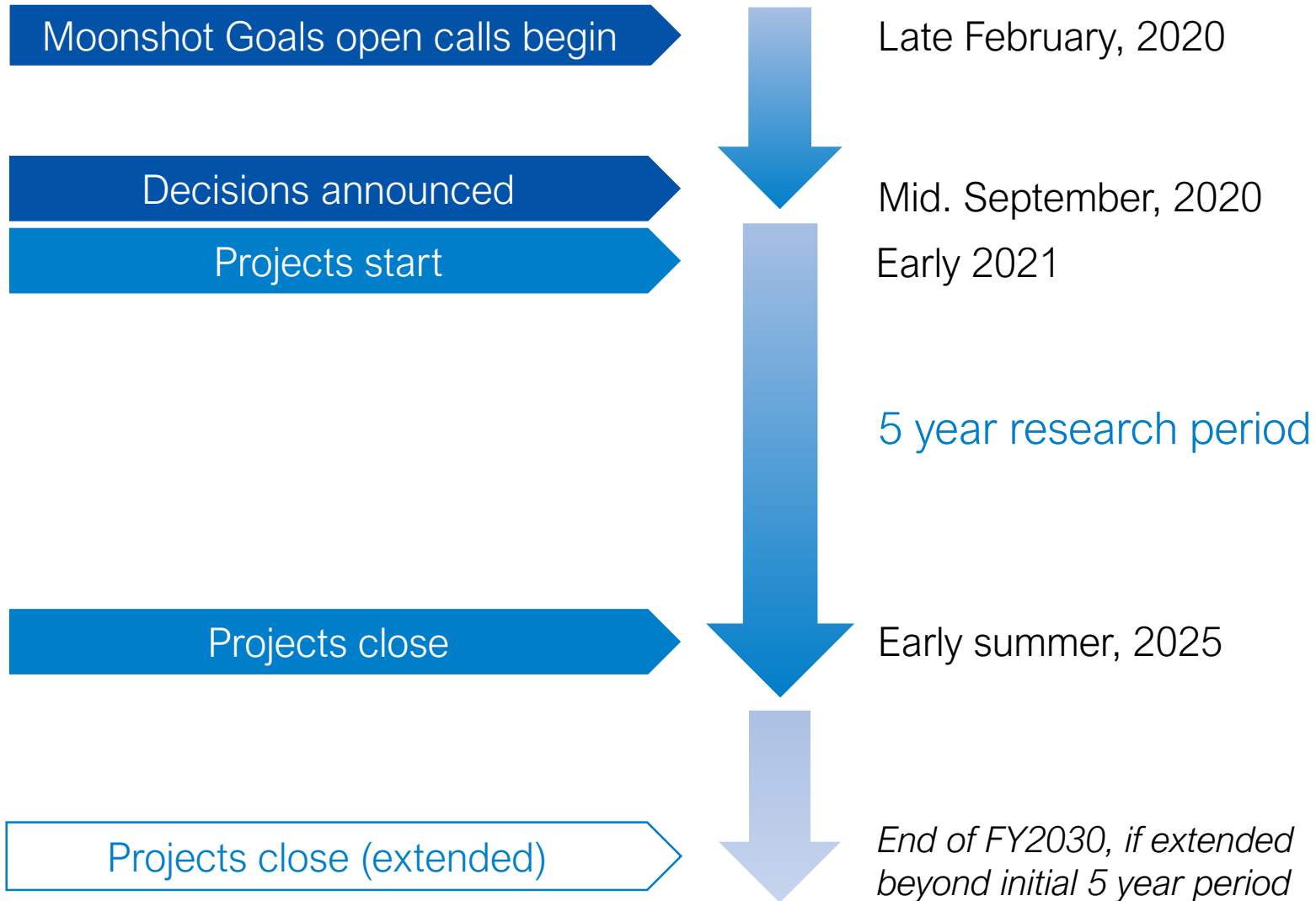
YAMAMOTO Takashi
Professor, Graduate School of Engineering
Science/Institute for Open and
Transdisciplinary Research Initiatives
Osaka University

Quantum Cyberspace with Networked
Quantum Computer

YAMAMOTO Tsuyoshi
Research Fellow, System Platform
Research Laboratories
NEC Corporation

Development of Integration
Technologies for Superconducting
Quantum Circuits

Timeline





International Collaborations:



Case1
Co-funding type collaboration

Participating in Moonshot R&D
Program as co-researchers without
receiving JST's fund



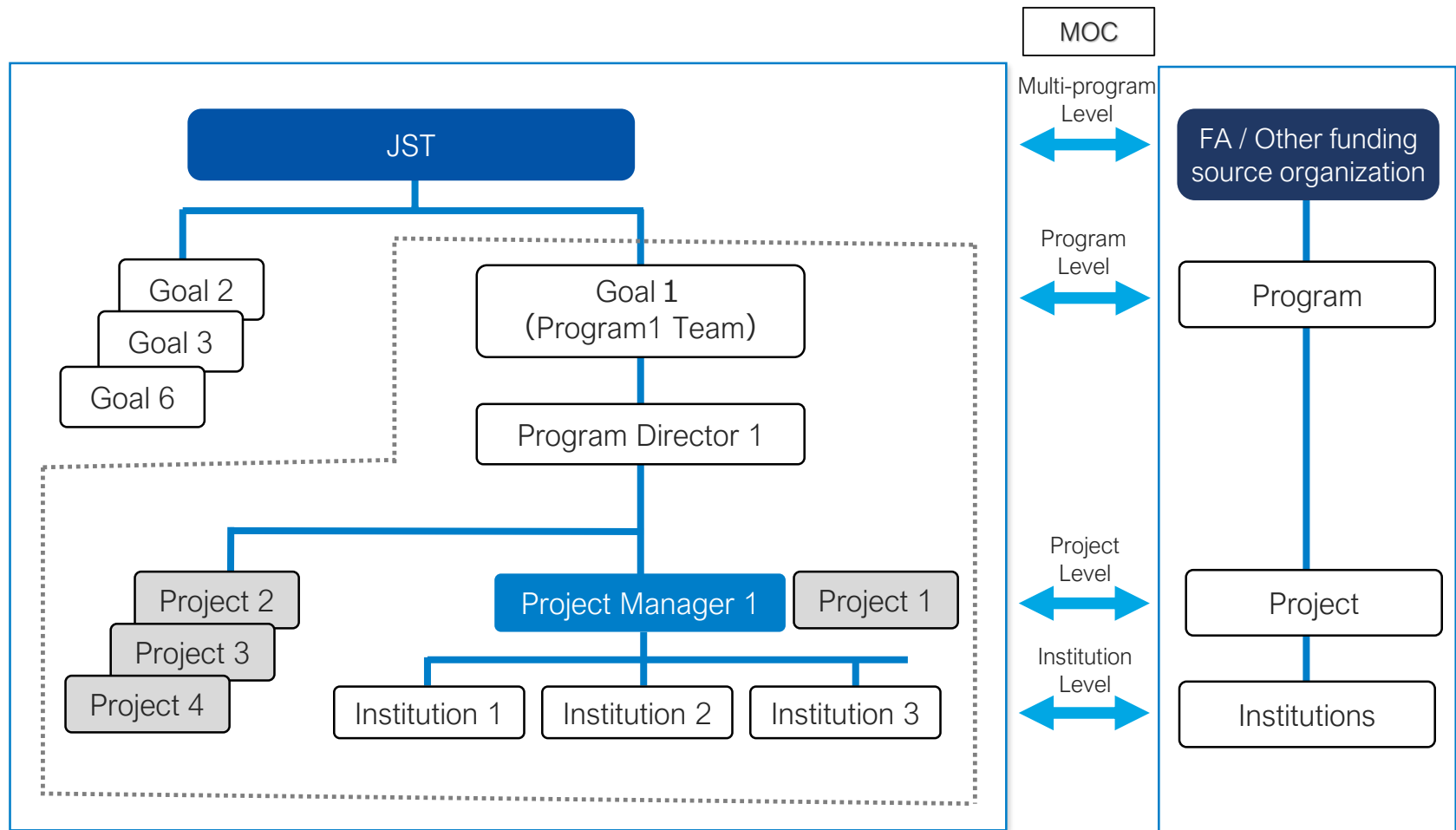
MOC

Case2
JST-funding type collaboration

Participating in Moonshot R&D
Program as performers by receiving
JST's fund



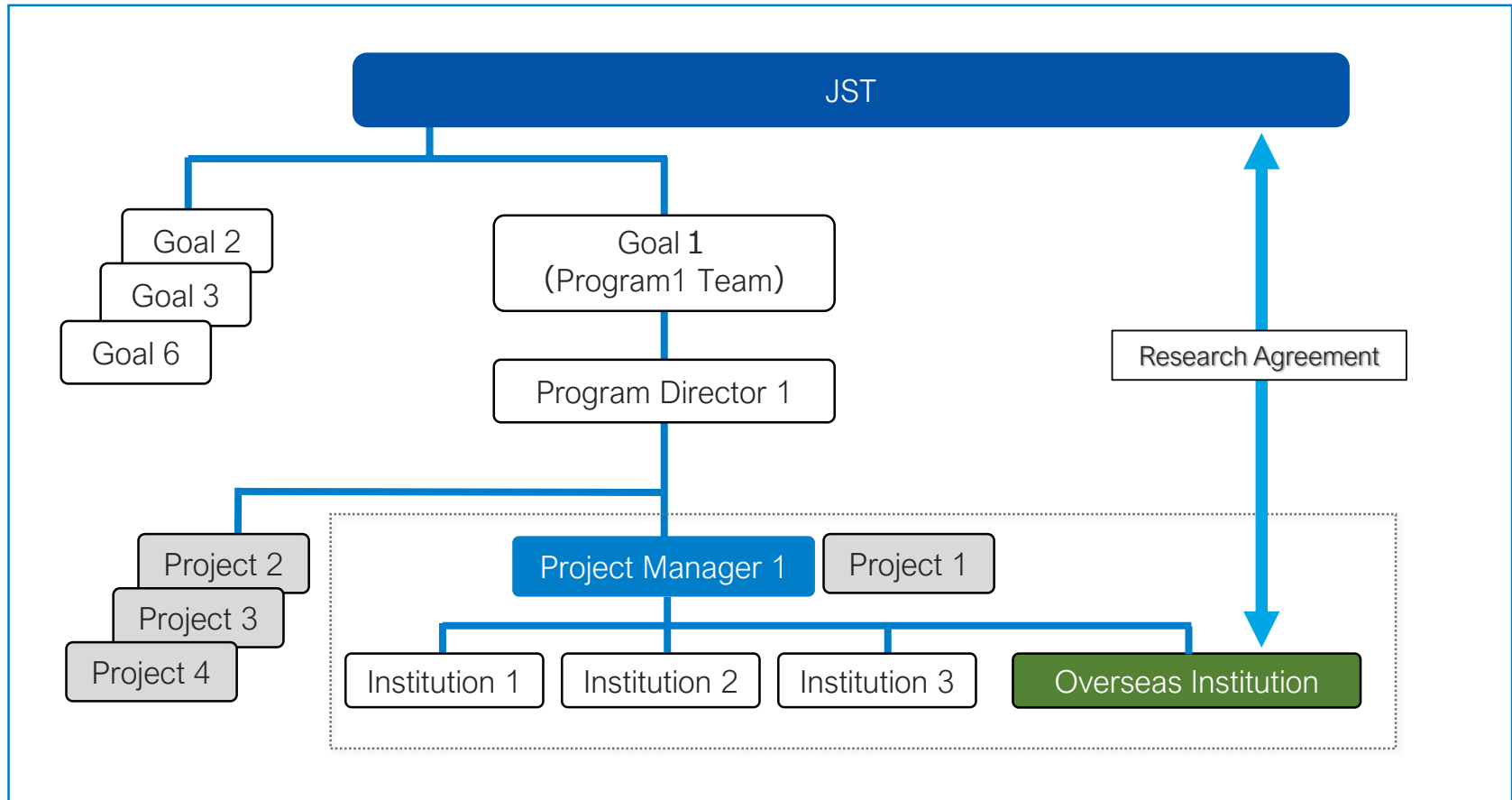
Research Agreement



For overseas institution without receiving JST's fund;

- Conditions in MOC or equivalent document will be decided through discussion among relevant institutions.

*Confirmation is required by JST (and overseas FA or other funding source organization if requested) prior to signing.



For overseas institution participating in Moonshot R&D Program by receiving the fund from JST;

- Unless otherwise agreed by the parties in writing, participating overseas institution shall agree that JST owns all rights, titles, and interests in IPRs, and, in no case, JST's ownership shall be less than 50%



MILLENNIA Program:



Change is up to you!

Moonshot R&D - MILLENNIA Program

Deadline: Nov. 10 at noon



Japan Science and
Technology Agency

Welcoming youth-focused teams to
brainstorm new Moonshot Goal
candidates for the 'new normal' society
in 2050.

Call period: Sep. 9 to Nov. 10 noon

Period for Investigation Research: About 6 months
(Jan. - Jun., 2021)

Funding Amount: About ¥5,000,000 / team

Number of teams to be Adopted: About 20 teams

Encouraging diverse international teams

*at least one member must be affiliated with Japanese institution



**Japan Science and
Technology Agency**

Department of Moonshot Research and Development Program
email: moonshot-info@jst.go.jp