Dec. 18, 2019

Summary of Plenary Sessions

KASAI, Yasuko

Deputy Director, Cabinet Office, Government of Japan

Plenary Session 1 :
Innovative Management of Moonshot Research

Plenary Session 2 :
Areas and Visions for Setting Moonshot Goals

Plenary Session 1 :
Innovative Management of Moonshot Research

Plenary Session 2 :
Areas and Visions for Setting Moonshot Goals

Plenary Session 1 13:00-15:20(2:20) Tuesday 17Dec., 2019

The Management of the Moonshot and new Policy-making in STI

MOONSHOT
RESEARCH & DEVELOPMENT PROGRAM

UEYAMA Takahiro [Moderator]

- *Executive Member of the Council for Science, Technology and Innovation (CSTI)*
- *Former Vice President, National Graduate Institute for Policy Studies*

Presentation : The Management of the Moonshot and new Policy-making in STI

Maurice Conti

- *CEO, Applied Intelligence*

Presentation: Real Moonshots in the Real World

Chris Fall

- *Director, Office of Science, United States Department of Energy (DOE)*

Adam D'Angelo

- *Founder and CEO of Quora*
- *Former CTO, Facebook*
- *Program Advisor, INNO-vation Program*

Presentation: Quara Knowledge sharing and AI

Wolfgang Burtscher

- *Deputy Director-General of the European Commission's Directorate-General for Research and Innovation*

Anousheh Ansari

- *CEO of the XPRIZE Foundation (XPRIZE)*

Keynote Speech:

HAMAGUCHI Michinari

- *President, Japan Science and Technology Agency (JST)*

AKAISHI Koichi

- *Vice Minister for Innovation, Cabinet Secretariat, GOJ*

THE MOONSHOT R&D:
A NEW MISSION-ORIENTED R&D PROGRAM

The Japanese government's new emblematic R&D enterprise that the CSTI designates to organize Japan's state-of-the-art scientific and engineering technologies into more disruptive techno-social innovations.

Serious Problems:
The world is faced with big transformations such as global warming and environmental disruption that are commonly understood but difficult to reach an agreement about the solution

Such as …*Expanding population and future scarcity of food that are seemingly not urgent but will seriously damage the wealth of the world; shrinking the boundary between human and non-human that has been accelerated by the advancement of AI technology; declining birthrate and aging society that are prevalent in most of the leading countries but no other country than Japan has experienced at the similar level of gravity; and so forth.*

Key Points of the discussion

- **INOVATIVE MANAGEMENT OF MOONSHOT R&D PROGRAM**

Policy dilemmas in planning the Moonshot R&D Program

How best might the public money promote such mission-oriented programs including disruptive and risk-taking innovations?

- **MANAGEMENT SYSTEM: ITS DESIGN AND EVALUATION METHODS**

How we solve it? Target, Approach, Evaluation system, Responsibility, Science integrity, ELSI

- **ADVANCED RESEARCH DATA MANAGEMENT**

Open/Closed Science for enhancement of open collaboration and new method of lunching research results

Summary points of the discussion

Different understandings of the Moonshot Project in Japan

- Japan's advantages of promoting the Moonshot Project
- **A lot of social problems Japan face. The world is looking at Japan to know whether she will be able to overcome the problems or not**
- The acknowledgement of Japan's current strength of scientific and engineering potential.
- Showing their view that Japan is at the crossroad, but also estimate the high potential of Japanese academic work.

Summary points of the discussion

INOVATIVE MANAGEMENT OF MOONSHOT R&D PROGRAM

- There is “The Dilemma” between Government funded R&D and Mission-oriented R&D such as Moonshot program

- Governmental-Funded Disruptive Innovation is very Challengeble

- **There are “Basic Principles” of Innovative Management System. Design and Evaluation Methods through which this sort of “risk-hedging disruptive innovation”.**

Continue to the next page…

Summary points of the discussion

Continue…

- **Cultivating the “Moonshot culture”. Often difficult for the government and FA to understand the significance of Moonshot.**
- **Stressing the importance of “Moonshot ethics”.**

Summary of the discussion

Continue…

- Mission-oriented research such as Moonshot vs. curiosity-driven research.
- Top down orientation to direct research into problem-solving and contribution to global challenges.
- Should protect the autonomy of academia and importance of bottom-up approach to ST
- **Global missions represented by SDGs will be getting more and more important and the EU's approach to this problem should be shared with Moonshot Project**
- **A variety of stakeholders involved are very important. Not only female researchers but also need to consider undergraduates' involvement with MS.**

Summary points of the discussion

“Basic Principles” of Innovative Management System

DESIGN AND EVALUATION METHODS are;

- Moonshot R&D Program as a Whole Package for Portfolio Approach, and Evaluation system. Program Directors should response for budget, management, and accountability in it.

- **Micro definition of each project is important, avoiding micro-management.**
- **Number of small starts are recommended and gradually narrowing down.**

For example, 300 -> 150 -> -> -> -> and 1 and/or a few !

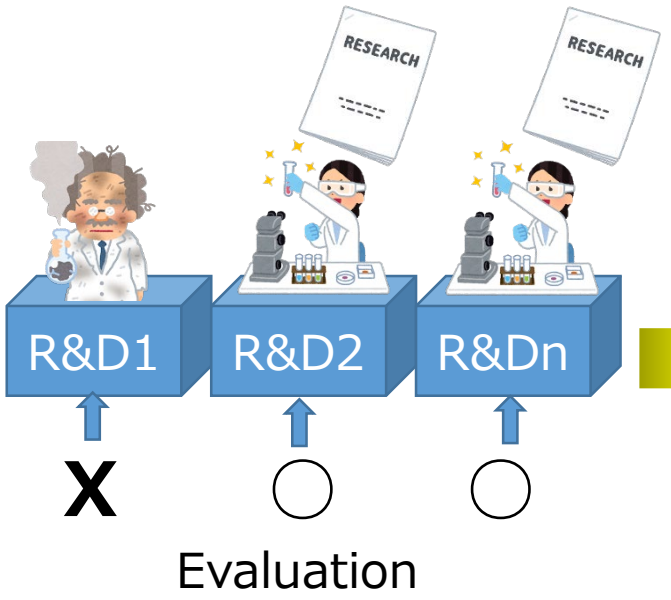
- Measurement for evaluation was also important
- The significance of enhancing the accountability to promote MS.

III. CONTENTS OF MANAGEMENT SYSTEM: ITS DESIGN AND EVALUATION METHODS

Innovative Evaluation System:

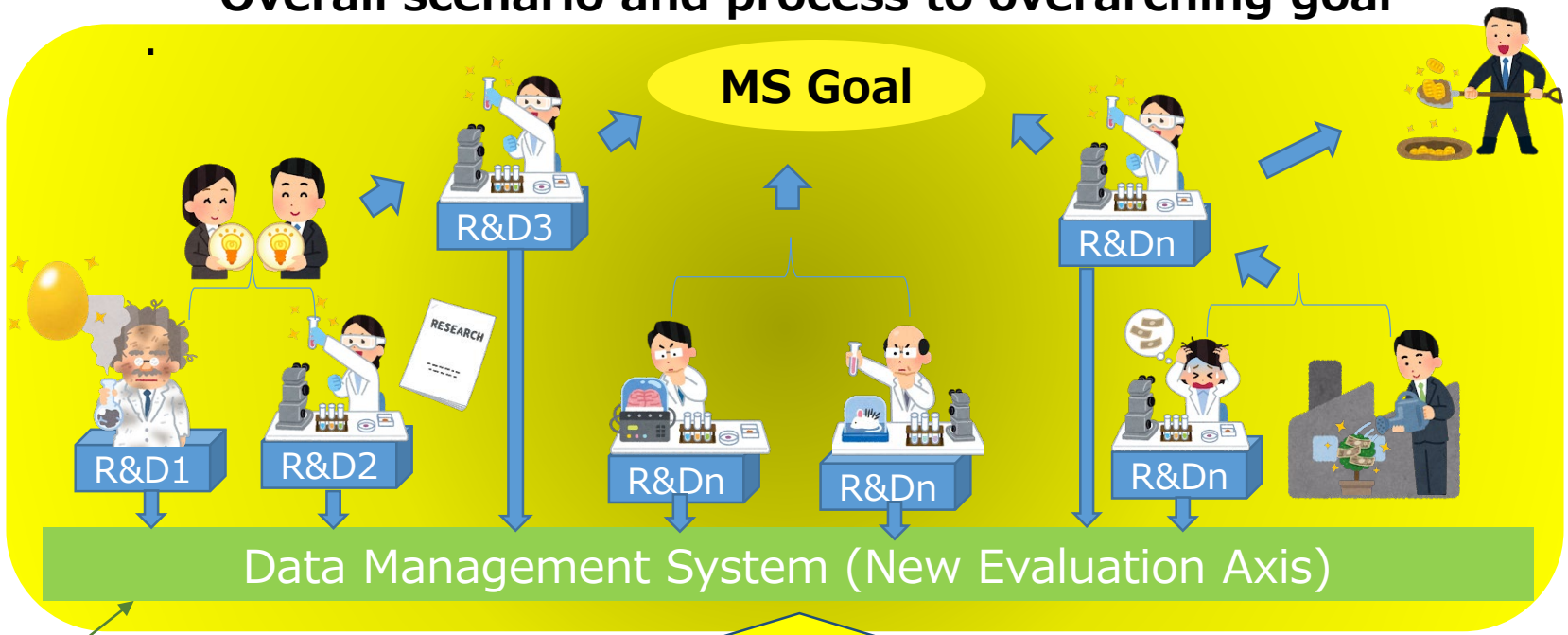
・Evaluate each approach only in the context of the overall process for the Moonshot Goal. This makes it possible to overcome failure as an experience and instead use it as a seed for new challenges. Therefore, we must first of all develop an overall scenario and an overarching goal. Create new evaluation standards to provide different values for each package. This would include an Advanced Data Sharing and Data Management system

"Single" Evaluation System



Evaluation

MS Evaluation
"Overall scenario and process to overarching goal"



"I have not failed. I've just found 10,000 ways that won't work."
— Thomas A. Edison

That are the values

◎ Evaluation

Summary points of the discussion

ADVANCED RESEARCH DATA MANAGEMENT

- Important to create incentives for researchers to share their own data
- Understanding the importance of data in the age of data-oriented research. But difficult to change the mindset of researchers whose sense of ownership was, is and will be very strong. How can we change it?
- The centralized data platform in the government might enhance the collaboration between publicly funded research and one led by companies.
- **Importance of government-owned data. Should be opened to enhance more and more collaboration and disruptive innovation.**

Plenary Session 1 :
Innovative Management of Moonshot Research

Plenary Session 2 :
Areas and Visions for Setting Moonshot Goals

Plenary Session 2

Areas and Visions for Setting Moonshot Goals

KITANO Hiroaki 【Moderator】

- Member of the Visionary Council
- President and CEO, Sony Computer Science Laboratories, Inc.
- Senior Vice President of Sony Corporation
- President of The Systems Biology Institute
- Professor at Okinawa Institute of Science and Technology Graduate University

Presentation : Areas and Visions for Setting Moonshot Goals

Pascal Lamy

- Chair of the Paris Peace Forum
- Director-General of the World Trade Organization (2005-2013)
- Chair of Ocean Mission Board for Horizon Europe, and Former Commissioner

Keynote : The Mission of Horizon Europe

Danny Soon

- Executive Director, Biomedical Research Council (BMRC) Agency for Science, Technology & Research (A*STAR), Singapore

Jacob Taylor

- Assistant Director for Quantum Information Science, White House Office of Science and Technology Policy

Presentation : Quantum Information Science and the Technology Frontier

Rebecca L. Keiser

- Head, Office of International Science and Engineering, National Science Foundation (NSF), USA

David Locke

- Prize Lead, ANA Avatar XPRIZE

Wolfgang Burtscher

- Deputy Director-General of the European Commission's Directorate-General for Research and Innovation

Kenji Yamaji

- Senior Vice President, Director-General of the Research Institute of Innovative Technology for the Earth (RITE)
- Emeritus Professor, University of Tokyo
- Chair of WG4, The Moonshot International Symposium

ANDO Kiyoshi

- Senior Staff Writer & Editorial Writer, NIKKEI, Inc.

MOONSHOT
RESEARCH & DEVELOPMENT PROGRAM

Realize our society based on human centric society

Moonshot Mission Areas

1. Leveraging the Aging Society

Solving issues Japan is facing, and leverage them to transform Japan

2. Save the Earth and our Civilization

Solving global agenda issues affecting the future of civilization

3. Exploring frontiers with science and technology

Making wildest imaginations in to Reality

Plenary Session 2: Areas and Visions for Setting Moonshot Goals

Summary of Comments on Panel Discussions

- Multi stake holders are required. Not only the researchers in the University and government, but also people from society, company, etc.
  - "Social transformation" needs people from "social".
  - Diversity is important because it is social problem.
- Town hole meeting can be good idea to involving the society
- Young people should involve from the first framing status.
  - Millennium challenge should be promoted.
- 5 years funding is not enough period for Moonshot program. Government can think to promote the MS R&D program over long term for example 10-20 years.
- Number 25 goals with large budget can be too much. Small starts with small budget will be recommended for the first year. Big challenge with large budgets, both form company and government, should come after that.

Summary of Plenary Sessions and Logistics

3 Target Areas, 13 Visions were confirmed.

6 (+1) Working Groups: Open for the discussion of MS goals

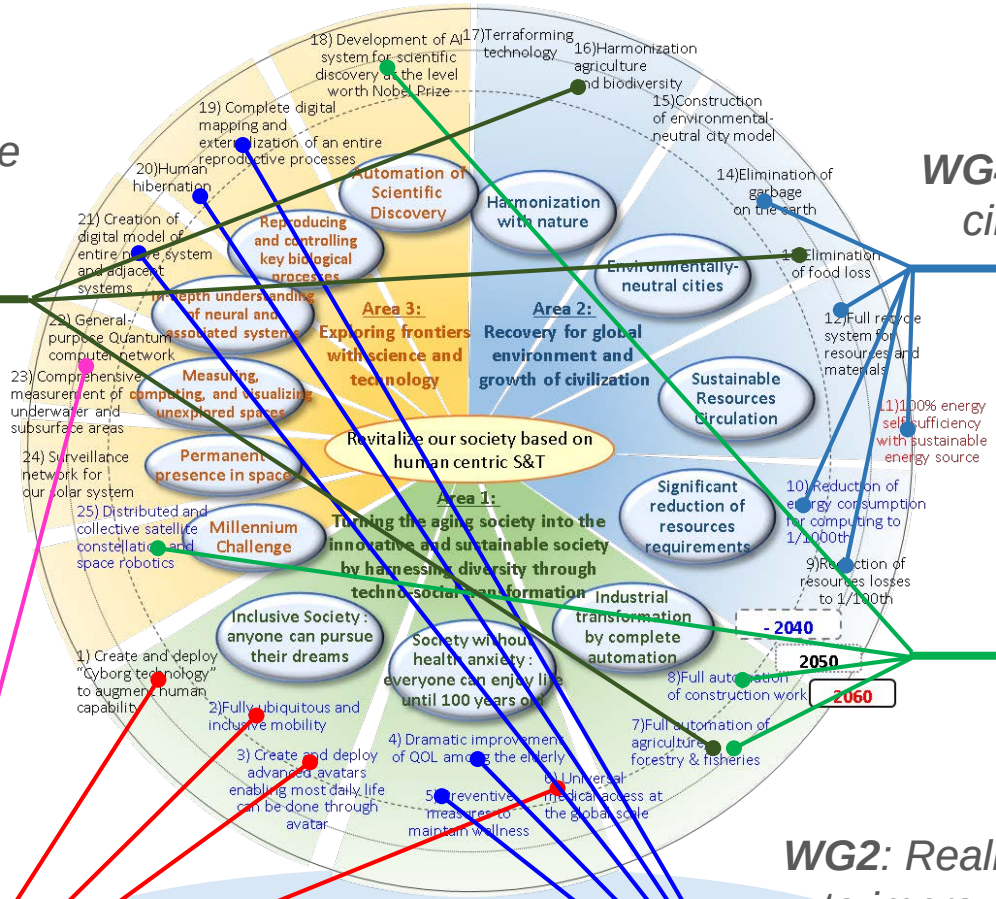
MOONSHOT
RESEARCH & DEVELOPMENT PROGRAM

***WG5**: Innovation for future agriculture –satisfying both food production and environmental conservation*

***WG4**: Sustainable resources circulation for global environment*

***WG6**: Creating innovative non-traditional sciences and technologies based on quantum and related phenomena*

***WG3**: Expanding frontiers through co-evolution of AI and robots*



***WG1**: Expanding human potential for a society where everyone can pursue their dreams*

***WG2**: Realizing a human life that "continues to improve both physically and psychologically" through complete understanding of biological functions*

***WG7**:*
Cross sectional issue