Outline of the Moonshot R&D Program and Purpose of the Symposium

Dec. 17, 2019

KOBYASHI Yoshimitsu

Executive Member of the Council for Science, Technology and Innovation (CSTI), and Chair of the Visionary Council of the Moonshot R&D Program
What is CSTI?

The Council for Science, Technology and Innovation (CSTI) is:
- One of the policy councils on key policies of Cabinet Office.
- Headquarters for the promotion of Science and Technology and Innovation.

Chairperson

ABE Shinzo
Prime Minister

TAKEMOTO Naokazu
Minister of State for Science and Technology Policy

Cabinet Members

SUGA Yoshihide
Chief Cabinet Secretary

ASO Taro
Minister of Finance

TAKAICHI Sanae
Minister for Internal Affairs and Communications

HAGIUDA Koichi
Minister of Education, Culture, Sports, Science and Technology

KAJIYAMA Hiroshi
Minister of Economy, Trade and Industry

Executive Members

UEYAMA Takahiro
Former Vice President, National Graduate Institute for Policy Studies

KAJIWARA Yumiko
Corporate Executive Officer, Fujitsu Ltd.

KOTANI Motoko
Director, Professor, Graduate School of Science Tohoku Univ.

KOBEYASHI Yoshimitsu
Chairman, Member of the Board, Mitsubishi Chemical Holdings Corp.

SHINOHARA Hiromichi
Chairman of the Board of NTT Corporation Vice Chairs of Keidanren

HASHIMOTO Kazuhito
President, National Institute for Materials Science

MATSUO Seiichi
President, Nagoya University

YAMAGIWA Junichi
President, Science Council of Japan Head of an Affiliated Organization
Empowerment of R&D

- Create knowledge and develop sustainable innovation by promoting multiple R&D with different purpose.

Basic Research

- Creates diverse and outstanding knowledge that is the source of innovation.

Strategic Research

- Solves important issues and promotes private investments for R&D

Moonshot Type Research

- Leads the creation of disruptive innovation

Promote internal motives such as personal curiosity and sense of mission.

SIP: Cross-ministerial Strategic Innovation Promotion Program

PRISM: Public/Private R&D Investment Strategic Expansion Program
Why we need “Moonshot”?

- STI in Japan and overseas
  - Numerous basic researches in Japan
  - Rapidly-Evolving Trends Overseas
- **R&D for disruptive innovation based on basic researches is required** to solve difficult societal issues

### Basic Researches

<table>
<thead>
<tr>
<th>iPS Cells</th>
<th>Quantum Neural Network</th>
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<tr>
<td>Dr. YAMANAKA Shinya</td>
<td>Dr. YAMAMOTO Yoshihisa</td>
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### Disruptive Innovations

<table>
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<tr>
<th>US</th>
<th>EU</th>
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<td>Understanding the Rules of Life</td>
<td>Neuromorphic Computing</td>
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<th>China</th>
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<td>Quantum Experiments at Space Scale</td>
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### Virtuous Cycle of Basic Research and Innovation

**Societal Issues**
Global warming, natural disasters, declining birthrate, aging population, etc.

**Moonshot(MS) R&D Program**
Challenging R&D aiming to solve Difficult Issues

- Ambitious goals set by CSTI
- Gathering wisdom from the world
- Achieve goals with allowing for failures

**Basic Research**
The Moonshot Research and Development Program

- Aims to create disruptive innovations.
- Develops radical solutions for difficult societal challenges

<table>
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<tr>
<th>&lt;Key Points of the Program&gt;</th>
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<tr>
<td>1. Creation of innovations in a global environment!</td>
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<tr>
<td>✓ CSTI will decide ambitious goals for international societal issues and we will collaborate with other countries to achieve goals.</td>
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<td>2. Achievement of a virtuous cycle to attract further investment in basic research!</td>
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<td>✓ We will promote innovative R&amp;D that maximizes basic research capabilities without being afraid of making mistakes.</td>
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<td>3. Establishment of speedy and progressive research management!</td>
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<td>✓ We will develop the most advanced research support system, implements reliable open and close strategies, and so on.</td>
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Towards Achieving MS Goals

- Portfolio Management - Multiple projects will be running for one MS Goal
- Moonshot R&D program and other related R&D and measures will collaborate to achieve MS goals.

<table>
<thead>
<tr>
<th>R&amp;D Project</th>
<th>Probability of success</th>
<th>Market scale</th>
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<tbody>
<tr>
<td>Project A</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Project B</td>
<td>Small</td>
<td>Large</td>
</tr>
<tr>
<td>Project C</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Project D</td>
<td>Small</td>
<td>Large</td>
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Roadmap

**March - July, 2019**

- **Discussion in Collecting idea from various fields**
- **Proposal of future visions and mission goals**

**17-18 Dec, 2019 (Today)**

**International symposium**

**Early in 2020**

- **CSTI general meeting**
  - **Decision on MS Goals**

**Funding Agencies**

- **Call for proposals**
The Visionary Council was established to discuss ambitious MS goals.

- Consisted of 7 experts from various fields
- Received proposals from the general public (about 1,800)

**Visionary Council Members**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position/Institution</th>
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<tr>
<td>EDA Makiko</td>
<td>Chief Representative Officer, The World Economic Forum Japan</td>
</tr>
<tr>
<td>OCHIAI Yoichi</td>
<td>Media Artist, Assoc. Professor, University of Tsukuba</td>
</tr>
<tr>
<td>OZAKI Marissa</td>
<td>Artist (“Sputniko!”), Project Associate Professor, The University of Tokyo</td>
</tr>
<tr>
<td>KITANO Hiroaki</td>
<td>President and CEO, Sony Computer Science Laboratory</td>
</tr>
<tr>
<td>KOBAYASHI Yoshimitsu (Chair of the council)</td>
<td>Mitsubishi Chemical Holdings Corporation</td>
</tr>
<tr>
<td>NISHIGUCHI Naohiro</td>
<td>Chief Executive Officer, Japan Innovation Network</td>
</tr>
<tr>
<td>FUJII Taiyo</td>
<td>SF Writer</td>
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**Discussion Points**

1st Meeting (Mar. 29)
- Important points for deciding MS goals

2nd Meeting (Apr. 22)
- Requests from the academia and industry
- The elements of MS goals

3rd Meeting (May 23)
- Proposals from general public (about 1,800) and relevant ministries

4th Meeting (Jul. 31)
- The future vision and MS goals
Discussion of the Visionary Council

- Identifies future visions based on societal issues facing the world.
- Translates future visions into missions as MS goals.

**Elements of MS Goals**

**Inspiring**
- Clarity of MS objectives and its necessity
- Strong impact on our future society and the industries
- Intellects brought together from all over the world

**Credible**
- Not only ambitious but also scientifically feasible
- Validity of progress towards MS goals
- Consistency with relevant strategies and policies

**Imaginative**
- Innovative and radical change of our future societal system
- Clear image of our future direction

Note: Human centric is the basic concept of MS goals
The Visionary Council recommended 3 Target Areas of - aging society, - global environment, and - exploring frontiers, and 13 Visions.

The council also proposed 25 examples of Moonshot Goals.
About this symposium: Purpose and Day1

Purpose

◆ Convene the knowledge and ideas of top-class researchers, entrepreneurs and government officials from all over the world.
  ✓ for setting out ambitious and scientifically feasible goals.
  ✓ for leading the creation of disruptive innovations.

Day 1: Keynotes and Plenary Sessions

Discussions and collaborations about future visions and technologies.

◆ A.M. : Keynotes and Special Sessions
  ✓ Expectation from overseas government and research institutes: US, EU
  ✓ Keynotes: Mr. SON Masayoshi
  ✓ Special Session: Dr. Eric Astro Teller, Dr. SHIRAISHI Takashi, Dr. KYUMA Kazuo

◆ P.M. : Plenary Sessions
  ✓ Innovative Management of Moonshot Research
  ✓ Areas and Visions for Setting Moonshot Goals
Day 2: Working Group Discussions

Proposal and discussion about specific MS goal candidates and scenarios for achieving them.

- **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
- **WG3:** Expanding frontiers through co-evolution of AI and robots
- **WG4:** Sustainable resources circulation for global environment
- **WG5:** Innovation for future agriculture – satisfying both food production and environmental conservation
- **WG6:** Creating innovative non-traditional sciences and technologies based on quantum and related phenomena
- **WG7:** Cross sectional issue
We choose to go to the Moon.

John F. Kennedy

Moonshot for Human Well-being