

UK-Japan Exploratory Meeting
Creating a super-smart society: artificial intelligence, robotics and IoT
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Artificial Intelligence and Society: the Challenges Ahead

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Advisory Board on AI and Human Society

- Cabinet Office (CAO), Government of Japan
 - Council on Economy and Fiscal Policy

– Council for Science, Technology and Innovation (CSTI)

Chair: Prime Minister

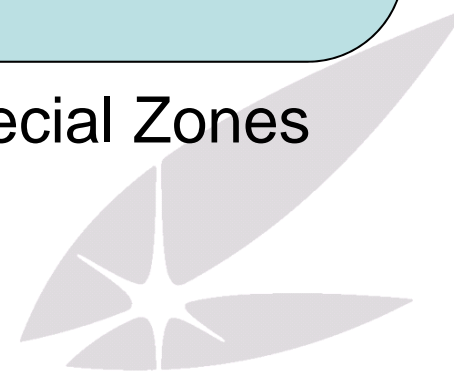
Members: 7 cabinet members (including PM & Minister of State for S&T Policy) and 8 executive members

Secretariat: STI Bureau, CAO

- Committees
- Advisory Board on AI and Human Society (5/2016 -)



- Advisory Council for National Strategic Special Zones
- Central Disaster Management Council
- Council for Gender Equality



Shaping Innovation

- Political discourse
 - Innovation for growth
 - Innovation for addressing social & global challenges
 - Innovation for empowering industry, institutions, people
 - Innovation for development
 - ...
 - Innovation for society

“Society 5.0”



The 5th S&T Basic Plan (2016-2020)

1. Introduction: changing context and our goal
 - Era of drastic change
2. Preparing the next: Future industry and society
 - **Society 5.0**
3. Addressing **socio-economic & global challenges**
4. Investing in “fundamentals”: People and Excellence
5. Better functioning STI systems
- 6. STI and society**
7. Leading effective STI Policy implementation

<http://www8.cao.go.jp/cstp/english/basic/5thbasicplan.pdf>

“Society” at the heart

- Technology-driven Human-centered
- Society backed by STI
 - Enabling technologies, but not only (“beyond technique”)
- Value of sustainability and inclusiveness
- Everybody on board



Society 5.0

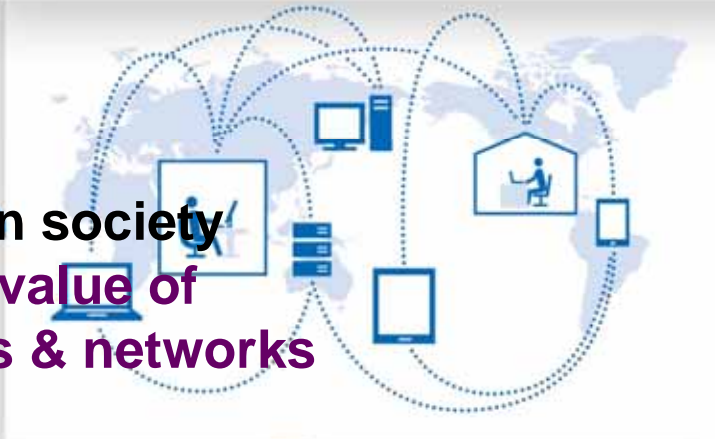
What's next?

5.0



Information society
Increased value of
intangibles & networks

4.0



Industrial society 3.0
Mastering of power
& Mass production



Agrarian society
Beginning of human
organization

2.0



Hunting & gathering society
In symbiosis with Nature

1.0



Lessons from the History

1. Hunting and gathering society

- In symbiosis with Nature

Sustainability

2. Agrarian society

- Very beginnings of human organization

Inclusiveness

3. Industrial society

- Mastering of power and mass production

Efficiency

4. Information (or digital) society

- Increased value of intangibles and networks

Power of intellect

5. **Society 5.0**



Exploratory fields

3. Addressing socio-economic & global challenges
 - Sustained economic growth and innovation-led regional development
 - Energy, Natural resources, Foods
 - Addressing aging issues
 - Empowered manufacturing
 - Achieving a safe and secure living standard
 - Resilience against natural disasters
 - Food security, living and working environment
 - Cyber security
 - National security
 - Addressing global challenges and contributing to global development
 - Climate change
 - Bio-diversity



Guiding principles

6. STI and Society

– Co-creation of STI

- Dialogue and collaboration
- Empowering stakeholders
- Science advise for policy making
 - Science for policy
- Ethical, Legal and Social Implications (ELSI)

– Research integrity

• Putting into practice

- Bioethics Committee Interim Report on Genome Editing (April 2016)
- **Advisory Board on Artificial Intelligence (AI) and Human Society (May 2016 ~)**



What's new in AI?



AI competing human!

AI working for human!

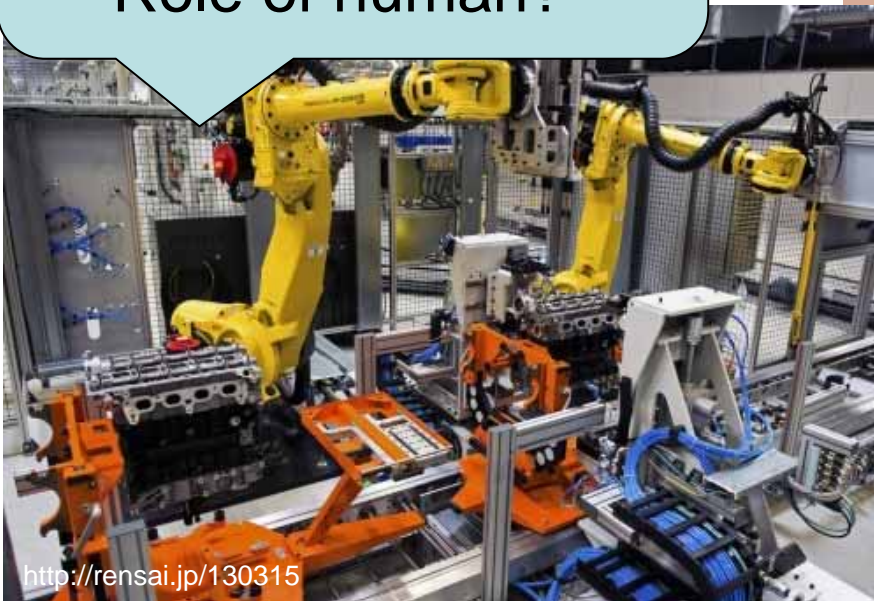


Useful but ...

Mobility for elderly and disabled, in rural area ...
Responsibility for accidents?



Precise, flexible, adaptable, efficient, ...
Role of human?



Supportive, fun, user-friendly, ...
Relationship with AI?



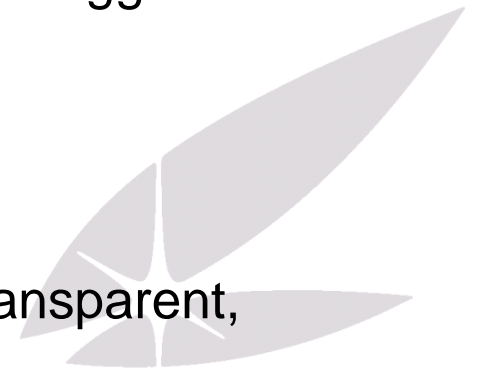
Baseline for discussion

- AI from the perspective of human society
- Gathering experts in law, economics, ethics, education, business, and technologies
- Focusing on technologies which would become accessible in near future (not science fiction!)
- And engaging debate with general public (e.g. web-based questionnaire and workshops)



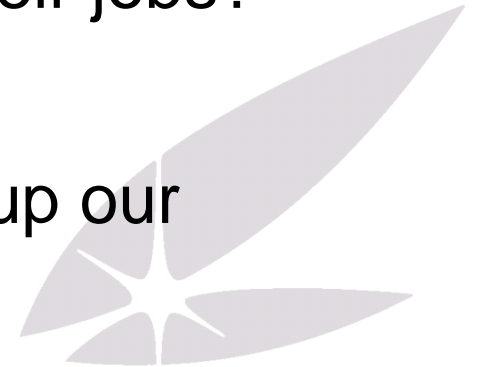
To be considered ...

- Ethics
 - Can we accept being insidiously manipulated by AI into changing our mind, preference, and conviction?
- Law
 - How can we develop laws that protect users and yet accelerate R&D and utilization of AI?
- Economy
 - How can we maximize the benefit from AI while minimizing the income gap between people who can take advantage of AI and those who can't?
- Society
 - How can we avoid excessive dependence on and exaggerated fear of AI?
- Education
 - What should we learn to cope with AI?
- R&D
 - What should researchers do to make AI secure, transparent, controllable, and ethical?



Case - based approach

- Self-driving cars
 - Who will be responsible for the accident by self-driving cars? Auto company? AI developer? Data supplier?
- Automated manufacturing
 - How can education (human resource development) help workers practice new sophisticated skills so as not to lose their jobs?
- Conversational AI
 - To what extent can we allow AI to stir up our emotions?



Matrix form analysis

	Case A	Case B	...	Common issues
Ethics				A
Law				B
Economy				C
Society				D
Education				E
R&D				F



A. Ethics

- Can we accept being manipulated to change our feeling, belief and behavior, or being ranked by AI without being informed?
- How will the advance of AI affect our sense of ethics and the relationship between humans and machines?
- Will AI be affecting our view of humanity, including our ability and emotion, since AI extends our time, space, and body senses?
- How do we assess the action or creation by AI?

B. Law

- How can we balance the benefits from AI exploiting Big Data and the protection of personal information?
- Can the existing laws and legal frameworks address appropriately possible legal issues raised by AI?
- How can we clarify the locus of responsibility for the accidents caused by AI? What is the risk of “using” or “not using” AI?
- How should we design the right and incentive for the creation enabled by AI?



C. Economy

- How will AI change our way of working?
- What is the national policy that facilitates the utilization of AI?
- How will AI change the employment system and the way corporations operate?



D. Society

- How can we reduce the AI divide and address imbalances of the social costs related to AI?
- Is there any potential pathology of society, conflicts and addiction AI may engender?
- How can we ensure the freedom “to use” or “not to use” AI and protect the right to be forgotten?



E. Education

- How can we develop the ability to do things that only humans can do?
- What is the national policy for solving the educational inequality caused by AI?
- How can we develop our ability to exploit AI?



F. R&D

- How can we research and develop AI in compliance with:
 - Ethics, Accountability, Visibility, Security, Privacy, Controllability, and Transparency?
- How can we properly disclose AI-related information so that users can make a decision on his own as to whether and how to use AI?



Policy Challenges!

- Our challenges
 - Co-evolution of society and technology
 - The problem of “double-edged sword”
 - Benefits (e.g. low cost personalized services) but risks (e.g. privacy issue, discrimination, loss of public anonymity, ...)
 - Limits of automated decision making
 - Transparency, Responsibility, Liability
 - Question of “Off switches”
- **Social dialogue involving all stakeholders and international community**
 - Social responsibility
 - Moral imperative

