Artificial Intelligence and Society: the Challenges Ahead

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- 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 6 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”

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**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?
  - Hunting & gathering society
    - In symbiosis with Nature
    - 1.0
  - Agrarian society
    - Beginning of human organization
    - 2.0
  - Industrial society
    - Mastering of power & Mass production
    - 3.0
  - Information society
    - Increased value of intangibles & networks
    - 4.0
  - Society 5.0
    - 5.0
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?

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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

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### 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 their 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