

OECD Technology Foresight Forum 2016
Artificial Intelligence: The Economic and Policy Implications

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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

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Chair: Prime Minister

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

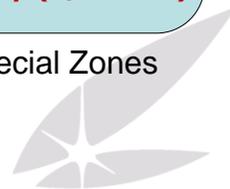
Secretariat: STI Bureau, CAO

- 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”



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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>

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“Society” at the heart

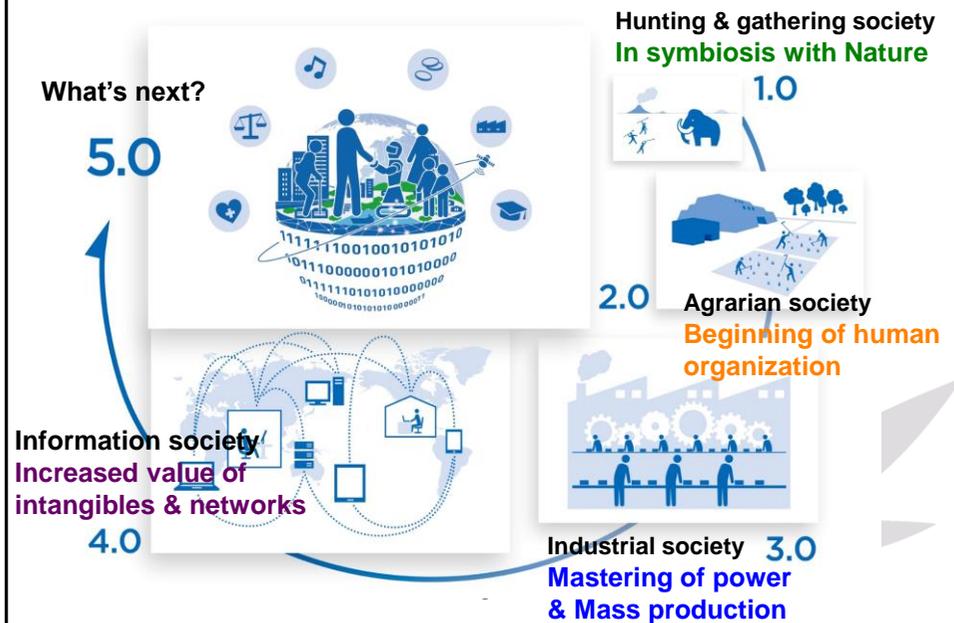
- Technology-driven ➔ Human-centered
- Society backed by STI
 - Enabling technologies, but not only (“beyond technique”)
- Value of sustainability and inclusiveness
- Everybody on board



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Society 5.0



Lessons from the History

1. Hunting and gathering society
 - In symbiosis with Nature
2. Agrarian society
 - Very beginnings of human organization
3. Industrial society
 - Mastering of power and mass production
4. Information (or digital) society
 - Increased value of intangibles and networks
5. **Society 5.0**

→ Sustainability

→ Inclusiveness

→ Efficiency

→ Power of intellect



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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



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Guiding principles

6. STI and Society

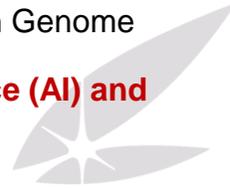
– Co-creation of STI

- 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 ~)**



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What's new in AI?



AI competing human!

AI working for human!



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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?



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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)



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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?

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Matrix form analysis

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

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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?

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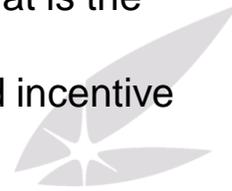
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B. Law

- 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?

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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?

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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?



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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?



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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?



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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



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