TA Experiences in South Korea

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Structure of the Presentation

- Technology Assessment (TA) in Korea
  - KISTEP's TA Activities
  - The Results of Several TAs
- Exploring an Improvement of Korea's TA
  - Preparation for the Next Step of KISTEP's TA

* This presentation material is based on Moonjung Choi's(Future Technologies and Technology Assessment, The 14th Trilateral Science and Technology Policy Seminar) and Jyhyun Ahn's(What to Prepare for the Safe and Successful Acceptance of Blockchain, 7th European Conference on Corporate R&D and Innovation).

Ⅰ. Technology Assessment (TA) in Korea

History

- 2001: Formation of the legal basis of TA
  (Enactment of ‘Framework Act on Science and Technology’)
  ☞ TA shall be entrusted to the KISTEP by the MSIT
- 2002: A planning study on the TA system by KISTEP
- 2003: First TA on NBIT (Nano-Bio-Information Technology)
- Until 2018: Completed 19 TAs ☞ In progress: Social Robot

Purpose

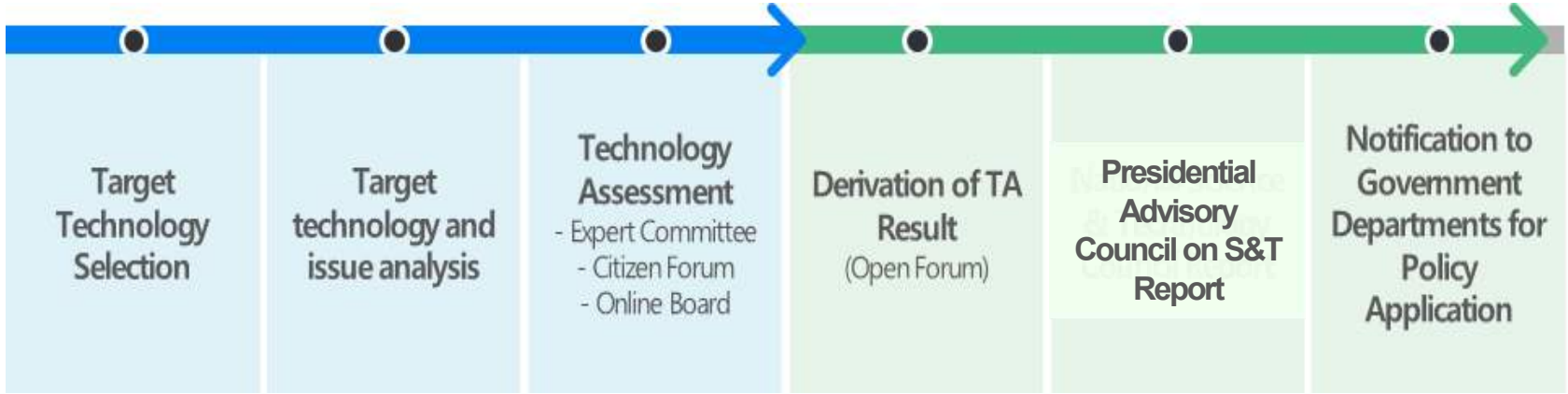
- To evaluate in advance the impact of the development of new science and technology on the economy, society, culture, ethics and the environment

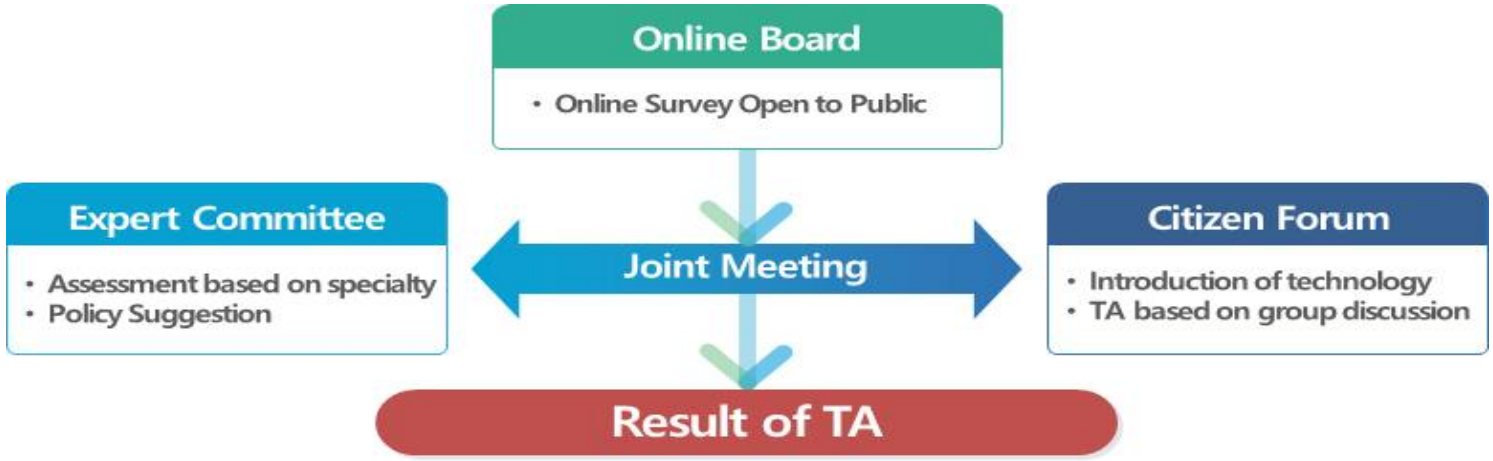
- To reflect the results in the policy
  - ☞ The heads of the relevant central government agencies shall reflect the results of the technology assessment in their research and development projects in the areas under their jurisdiction, or take measures to minimize the negative impacts

List of Target Technology

Year	Technology
2003	Nano-Bio-Information Technology
2005	Radio-Frequency Identification / Nano
2006	Stem Cell Treatment Technology / Nano Materials / Ubiquitous Computing Technology
2007	Climate Change Response Technology
2008	Disease Response Technology
2011	Brain-Machine Interface
2012	Big Data
2013	3D Printing / Smart Network
2014	Unmanned Vehicle / Super-high Building
2015	Artificial Intelligence / Genome Editing
2016	Virtual Reality and Augmented Reality
2017	Bioartificial Organs
2018	Blockchain

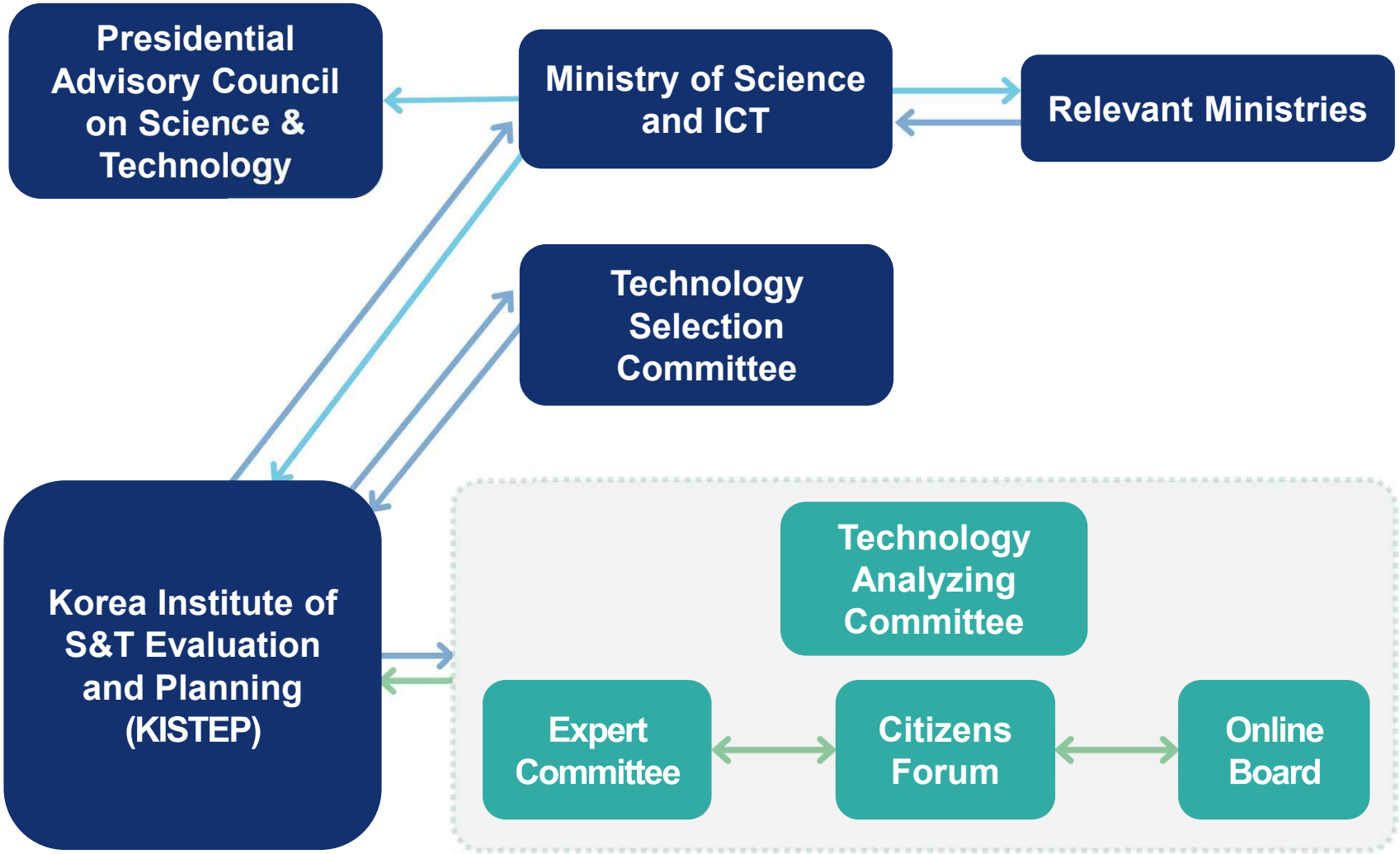
Promotion Process





* Ref. Y.C. Kim, Technology Assessment of Artificial Intelligence, IAMOT 2017 Conference Proceedings

Promotion System



Ⅱ. The Results of Several TAs

- Big data, Genome editing, Blockchain -

Big Data (1)

- Positive effects
  - create new jobs and various business opportunities
  - improve business competitiveness and productivity through scientific decision-making based on data analysis
  - public service levels in various areas such as security, welfare and civil affairs can be improved
  - personal welfare is improved through a customized service that is personally optimized

- Negative Impacts
  - the disparity in the capacity for utilizing bid data could trigger the disparity in the opportunity of creating added value
  - big data analysis dependent on foreign affiliated companies can cause national intelligence leak
  - privacy may be violated by hacking

Big Data (2)

- Policy recommendations
  - Government tried to foster fundamental core technologies on big data, and build relevant industries in a systematic manner
  - Developing professional human resources is also important
  - Public data should be opened. It was recommended to disseminate the data and analysis methods used for the public sector decision-making
  - The legal and systematic framework should be prepared to protect privacy
  - Services should be developed for the general public that can be easily used in everyday life

Genome Editing (1)

- Possibility and safety in curing disease were assessed
  - Genome editing can fundamentally treat genetic disorders
  - Serious side effects may occur genetic scissors sever unintended DNA and readjustment would be difficult when side effects occur
- There was a lot of discussion about the application of genome editing technology to embryos and reproductive cells
- Genome editing technology will improve the quality and safety of agricultural and livestock products
  - It must verify whether these modified products are safe to humans and should also examine modified products' effects on the ecosystem when released into nature.

Genome Editing (2)

- Policy recommendations
  - More in-depth researches are needed such as the effectiveness of genetic scissors and verification on the impacts on human body
  - New regulatory framework needs to formulate for verification of safety of products created by genome editing technology
  - A consensus from every level of society needs to be drawn as the iss ue concerning the application of genetic scissors to embryos and rep roductive cells

Blockchain (1)

- Industry
  - Increase of the mutual trust between collaborating parties
    → would reduce the time and cost
  - Emergence of new industries based on blockchain and cryptocurrency system
- Transaction and Consumption
  - Increase of the possibility on transparent history management of products → activation of peer to peer (P2P) transactions for personal products and used goods
- Technology Misuse
  - Possibility of the use on tax evasion or illegal goods transactions

Blockchain (2)

- Social Trust
  - Emergence of an incentive compensation system that provides a cryptocurrency for participation in social activities and transparent disclosure of donation → may contribute to the expansion of sharing activities
- Social Acceptance
  - Ambiguous expectations or unreasonable devaluation of blockchain technology → may lead to unnecessary debate and extra social costs
- Legal Issue
  - Possibility of the violation on the "right to modify" and "right to forget" included in the Personal Information Protection Act and the Electronic Financial Transaction Act

Blockchain (3)

- Culture
  - Activation of the cultural content activities by both consumers and producers ← due to the reduction of content distribution fees
  - Possibility of the free dissemination of uncensored information ← as the central management unit is absent
- Environment
  - Increase of voluntary motivation for renewable energy production and energy conservation ← through direct energy trading between suppliers and consumers
  - Expansion of trust-based environmental management activities ← with transparent disclosure of environment data such as sewage treatment and waste disposal

Blockchain (4)

- Policy recommendations
  - A systematic review on the technology and policy issues and the efficiency of technology utilization in different sectors has to be carried out
  - For the wide utilization of blockchain technology in industries, regulations/legislations has to be reviewed, and many efforts for public education and social consensus are required
  - In order to secure the global technological competitiveness and to introduce the technology to various industries stably, the R&D of core technology has to be supported

Dissemination of TA Results

- Report

- Book for the public

Ⅲ. Exploring an Improvement of Korea's TA

Preparation for the Next Step of KISTEP's TA

- The characteristics of Korean TA
  - TA is performed with the **legal basis**
  - The **government** is responsible for the TA performance
  - Pursue the merits of both the **discursive and instrumental** model of TA system

- Consideration for future improvements

Target Technology

- Scope of technology to be assessed
- Number of technology to be assessed

TA Process

- Expert committee and citizen forum
- Impact on the economy, society, culture, ethics and the environment

Use and dissemination of TA results

- Effective way to reflect TA results in policy setting
- The role of TA in NIS

Thank you !

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