

Toward realization of the new economy and society

**- Reform of the economy and society
by the deepening of “Society 5.0” -**

- Outline -

April 19, 2016

**Keidanren
(Japan Business Federation)**

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"Great reform age", where IoT, AI, robots and life science will drastically change industrial and social structures, has arrived.

Although great reform movement has become a worldwide trend, Japan has embarked on such initiative only recently.

As forerunner of finding solutions to emerging problems, it is imperative for Japan to promote a nation-wide innovation across the whole economy and society.

We therefore make this policy recommendations regarding 1) the concept, 2) issues to be addressed, 3) actions to be taken by the government, and 4) initiatives of the industry.

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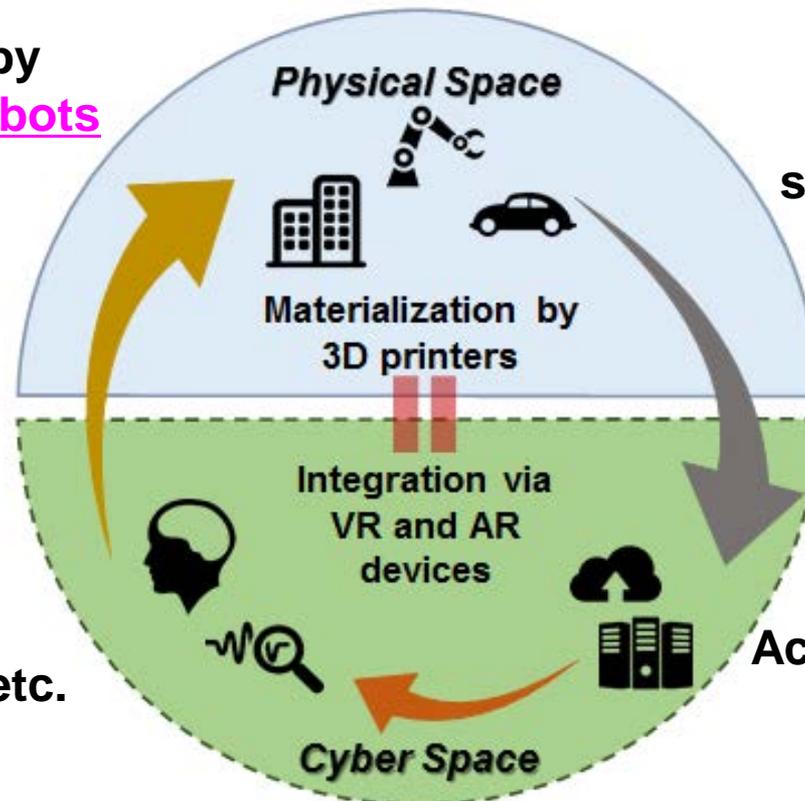
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- The foundation to underpin the reform is a creation of new values by integration of cyber space and physical space (CPS) with rapid evolution of ICT as a background.
- Value creation is also accelerated by AI and robots based on CPS.

Implementation by machines and **robots**

Data collection by sensors and devices



Analysis by **AI**, etc.

Accumulation as Big Data

※ CPS : Cyber Physical Systems

※ VR : Virtual Reality
AR : Augmented Reality

- ❑ Innovative business models have been created mainly led by European and U.S. companies.
- ❑ Conventional industrial structures are anticipated to drastically change.

Evolution of the manufacturing industry

- ❑ Transition from a conventional model (make profit by simply selling products) to a new model (make profit by service as a whole including after-sales care)
- ❑ Materialization of custom-made mass production corresponding to individual consumers' needs



Connected car and automated driving

- ❑ Realization of “Evolving Vehicles.” It will be possible to update functions of vehicles just like smartphones.
- ❑ Realization of fully automated driving will make the interior of a moving vehicle a living room.



Health management by wearable devices

- ❑ Health condition will be monitored in real time and analysis result will be utilized for preventive medicine and therapies, etc.

FinTech

- ❑ By utilizing ICT, it will be possible to support existing financial businesses and to provide new services taking substitutions into account.



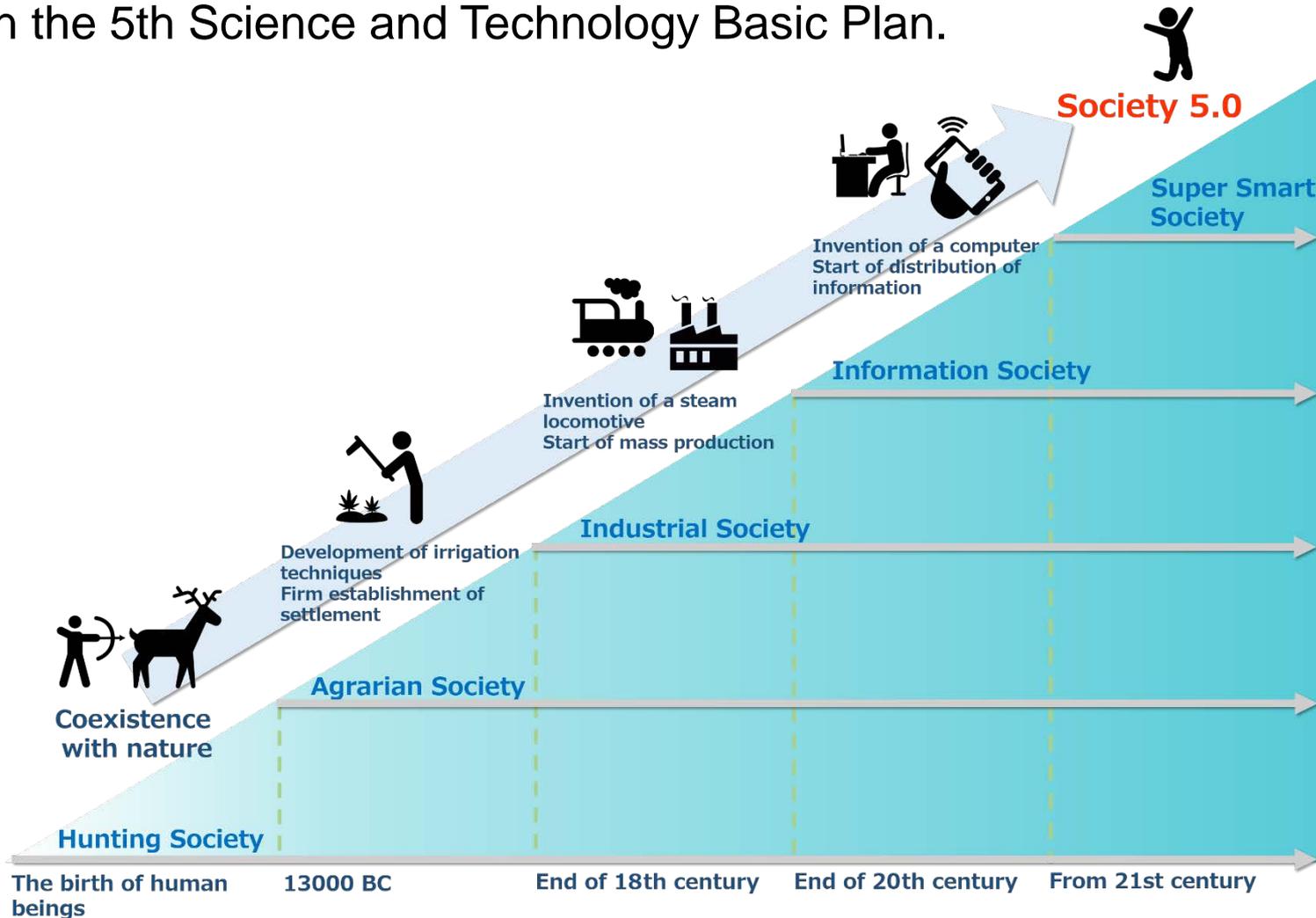
- The importance of IoT drives nations to proactively take initiatives.

Nations	Characteristics
<p>Germany Industrie 4.0</p> 	<ul style="list-style-type: none"> □ In its 2010 “High-Tech Strategy 2020,” the country published “Industrie 4.0.” □ Utilizing latest technologies including IoT in the manufacturing industry, by the reform of supply chains of the manufacturing industry that have factories as a starting point and the entire value creation process, it aims at (1) enhancement of competitiveness as a production base of high value added products, and (2) enhancement of competitiveness as an export base that distributes machine tools and modules needed for the manufacturing all over the world.
<p>U.S. Industrial Internet</p> 	<ul style="list-style-type: none"> □ In 2012, it was proposed by General Electric as a “Industrial Internet” scheme. □ By combining industrial equipment and analysis software, added values such as cost reduction are created and the Industrial Internet system covers 5 areas including manufacturing, energy, healthcare, public sector and transportation. □ Dissemination of a common software platform “Predix” is also a target.
<p>Estonia e-Estonia</p> 	<ul style="list-style-type: none"> □ Since around 2000, whole nation of Estonia has been promoting “e-Estonia” policy which aims to make the entire country an information - oriented nation. □ ID card is issued to all people over 15 years old and carrying it is mandatory to promote online public services. This ID card can be used as a driver’s license and health insurance card, also it is utilized over 3,000 private sector services such as company registration and payment of taxes.
<p>Singapore Smart Nation</p> 	<ul style="list-style-type: none"> □ Aiming at becoming the world’s first smart country, Singapore addresses its national strategy “Smart Nation.” Various sensors are installed all over the nation and real time data is shared by ministries and government offices to realize the creation of a nation which is safe and convenient to live. □ By integrating various data to “Smart Nation Platform,” uses and applications have been promoted.

* Other than the above, EU, China and other countries have started their initiatives.

Japan's initiatives - Society 5.0 -

- ❑ Initiatives of individual companies have been progressing, however, national strategy has not been complied.
- ❑ Under such circumstances, Society 5.0 concept has been introduced in the 5th Science and Technology Basic Plan.



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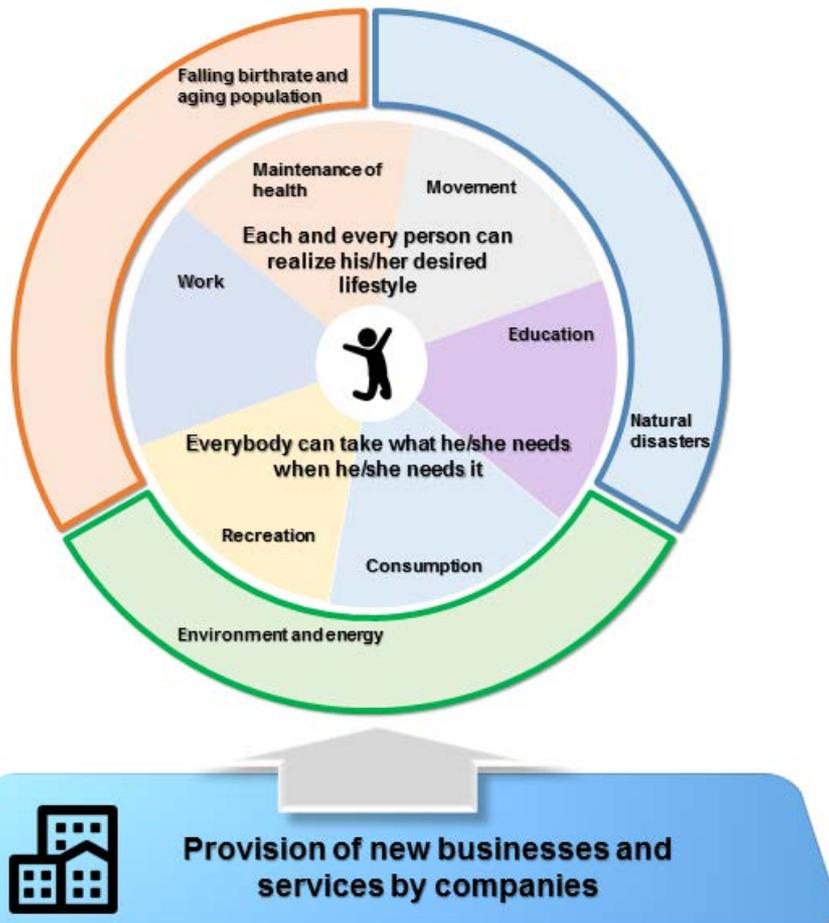
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- Aims at the new economy and society which focuses on individuals.



Reform of individuals

=> Increase the power of individuals

Every individual including elderly people and women can live safe and secured comfortable and healthy life and each and every individual can realize his/her desired lifestyle.

Reform of companies

=> Provide new values

Improvement of productivity through digitization and reform of business models are promoted, and at the same time, the new economy and society will be realized by promoting innovation and globalization.

Solving social issues

=> Create future

Efforts are made to solve a pile of issues of our country such as falling population, super aging society and natural disasters so that rich and vigorous future will be realized. Through overseas expansion of new businesses and services, we can contribute to solving global scale issues as well.

Viewpoints toward realization of the new economy and society

- To provide new values and services through reforms with needs arising from national challenges as a momentum.
- To utilize strength of physical space in the competition of CPS,
- To capitalize on 1) creative capability of “disruptive innovation” and “innovation based on social issues”, and 2) "invisible manufacturing" (software).

Starts from problems of our country

Takes advantage of the strength of
our industry

Creates a new strength

Falling
population

Super aging

Disasters and
terrorism

Environmental
problems

Manufacturing
(Hardware)



Invisible manufacturing (Software)

Incremental
innovation



Disruptive innovation

Innovation based on
technology



Innovation based on social issues

The new economy and society to be realized by creation of future

Falling population
Decline of industrial
competitiveness

**Smart society
undaunted by the decrease of population**

Super aging society
Lack of women's
active participation

**Society in which every individual
including elderly people and women
can actively participate**

Disasters & terrorism
Decrepit infrastructure

**Safe and secured society
in both cyber and physical spaces**

Environmental problems
Lack of resources
and water

**Society that contributes to the solution
of global environmental issues**

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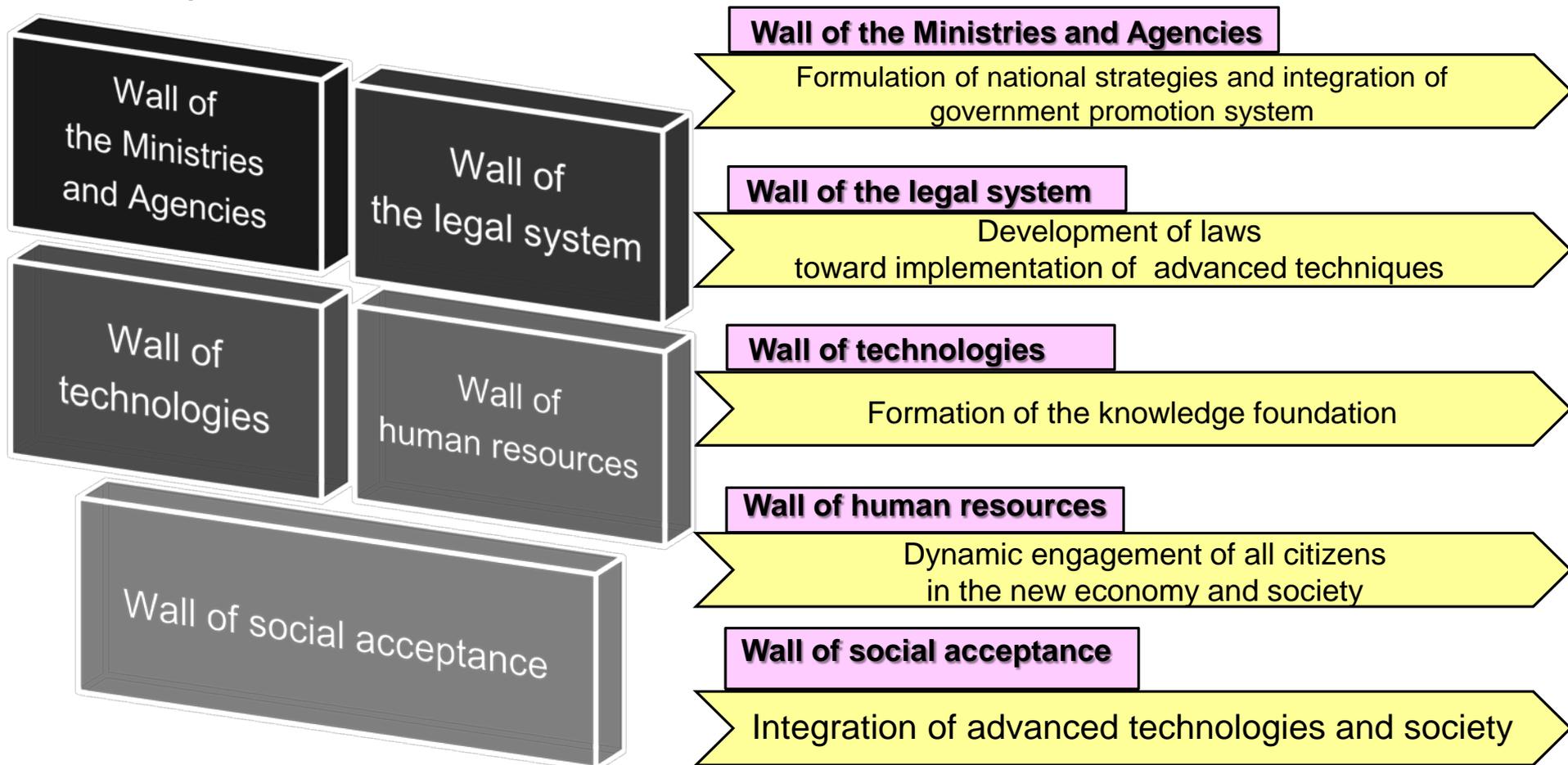
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Breakthrough of the "Five Walls"

- It is imperative to break through the "five walls" to realize the new economy and society in which discontinuous and disruptive changes are expected to occur.



□ **Formulation of national strategies**

- With involvement of industry and academia national strategies must be formulated by the ministries and agencies in an integrated manner toward realization of “Society 5.0.”
- A handy IoT platform must be also architected.

□ **Construction of promotion system by unified effort of government departments**

- Manifold councils and promotion systems of each ministry and agency must work together in an integrated manner to promote national strategies integrally and flexibly as a nation.

* One possibility is a system in which relevant government departments and industry work together under overlooking and directions of the Council for Science, Technology and Innovation whose chairperson is the prime minister. (“Society 5.0 Realization Council (tentative name)”).

□ **Construction of a thinktank function**

- It is necessary to deploy necessary actions by backcasting from the image of future economy and society. It is worthy to establish a cross-sectional full-time thinktank function of ministries and agencies in which private sector participates.

□ **Development of rules**

for promoting uses and applications of data

- Data is an extremely important key factor. Quality, quantity and distribution speed of usable and applicable data are directly connected not only to convenience of individual people’s lives but also competitive edge of companies and countries.
- Construction of an international framework is also necessary.

□ **Promotion of regulations and system reform**

- There is a possibility of current regulations to obstruct innovation.
- Including next generation automobiles, unmanned aircrafts and robots, further reform must be promoted taking into consideration citizen’s voice.

□ **Promotion of administrative digitization**

□ **Examination of intellectual property related legislative system**

□ **Technologies to be promoted**

- It is necessary to promote technologies such as cyber security, AI technologies, robotics, nano, bio and systems science and technology.

□ **Improvement of environment related to innovation of science and technology**

- It is essential to secure “1% of GDP, a total amount of 26 trillion yen” government investment into R&D which is stipulated in the 5th Science and Technology Basic Plan.
- It is necessary to continue and expand the scale and themes of innovative government R&D projects such as SIP and ImPACT, and to reform national innovation system.
- In order to encourage private investments, maintenance and expansion of the R&D tax system are essential.

* SIP: Cross-ministerial Strategic Innovation Promotion Program

* ImPACT: Impulsing Paradigm Change through disruptive Technologies

□ **Educational reform toward dynamic engagement of all citizens**

- It is necessary that all citizens become “human that think independently and create new values by combining various items while working with others.”
- It is indispensable to provide education to foster creativity and to improve IT literacy from the primary and secondary education levels and promotion of lifelong education.

□ **Securing professional human resources**

- A pressing issue is securing and fostering human resources for cyber security, data science and international standardization which are considered to be essential to realize new economy and society.
- One possibility is accepting professional human resources from overseas. The government should create an environment to accept high skilled persons.

□ **Building a social consensus**

- It is essential to share national vision among all stakeholders to build a social consensus.

□ **Examination of ethical issues, social implications, etc.**

- Taking advantage of the knowledge of humanities and social science, examination of Ethical, Legal and Social Implications (ELSI) should be promoted by industry, academia and government while developing techniques.
- The examination must cover from the relationship between humans and machines (AI and robots) to philosophical issues such as definition of individual happiness and humanity.

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□ Clarification and expansion of “Non- competitive area”

- In order to realize “Society 5.0” and solve social problems, “non-competitive area” will be clarified and cooperation among domestic and foreign companies will be promoted to strengthen international competitive edge.

□ Promotion of full scale joint studies through the cooperation of industry, academia and government

- Jointly explores and shares visions, such as an image of how a society in the future should be and issues and concentrates various resources to promote full scale joint studies.

□ Construction of an ecosystem by diverse companies

- Through successful cooperation with start-ups, mid-sized enterprises and small and medium businesses, an ecosystem that can contribute to improvement of productivity of the entire economy and society will be constructed.

□ **Activities to expand market**

- To spread the concept of "Society 5.0" and expand the system overseas jointly by the government and private sector.
- To promote strategic industrialization and standardization in an integrated manner.
- To strengthen human resources who tackle international standardization while cooperating with universities and R&D agencies.

□ **Promotion of human resource strategy**

- Business persons who play lively parts in the forefront of business world actively participate in the education of students to foster human resources through the cooperation of industry, academia and government.
- Promotes women's participation to discover potential talents, and at the same time, positively accepts excellent foreigners so that diversity will be improved.

□ Reform of organizations and awareness

- In order to be free from existing businesses, promotes organizational reform and cooperation among departments, and at the same time, improves the environment where each and every employee can exert his/her creativity as well as efficiency.
- In order to promote diversity of human resources, treatment and personnel systems within companies will be revised taking into consideration the diversification of sense of values among individuals.

□ Reform of work style

- In the new economy and society, it is expected that role of humans will change drastically due to reasons such as creation of new jobs and disappearance of existing jobs.
- Promotes an increase of job mobility to create an environment where diversified and flexible ways of working can be accepted and each and every person can play a lively part.

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A new age which has leading-edge technologies as its foundation is not necessarily on the extension of the current line. It is also an age full of “uncertainties.”

Because of its uncertainties, industry must create reform on its own initiative to lead the world.

These policy recommendations are just a starting point toward the reform of economy and society. We will further deepen our examination for individual issues to disseminate our opinions.