Industry Academia Collaboration in Japan

Shinichi Yamanaka

Ambassador
Embassy of Japan in Bulgaria

	Internal	External
Helpful	Strengths	Opportunities
Harmful	Weaknesses	Threats

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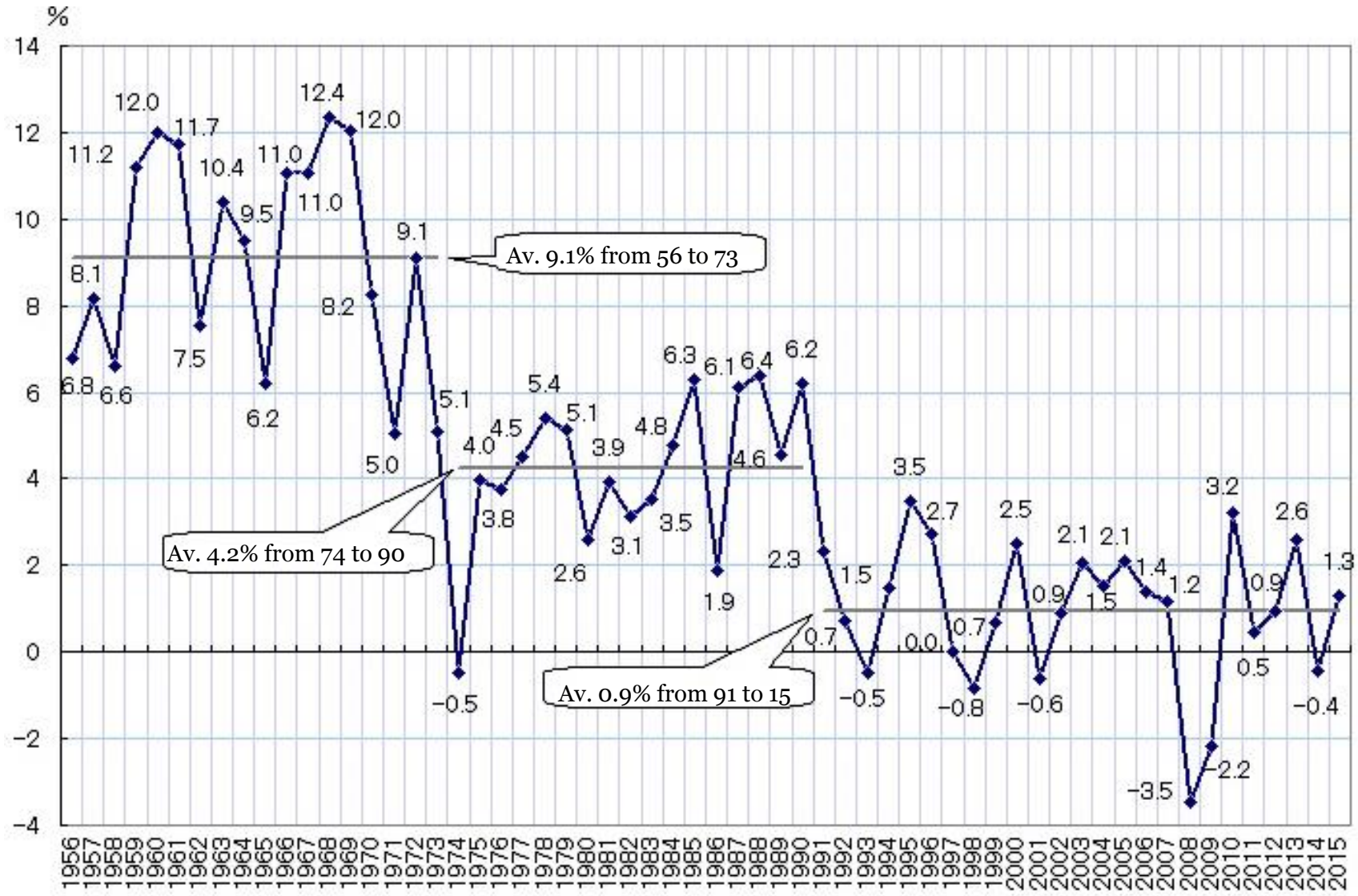
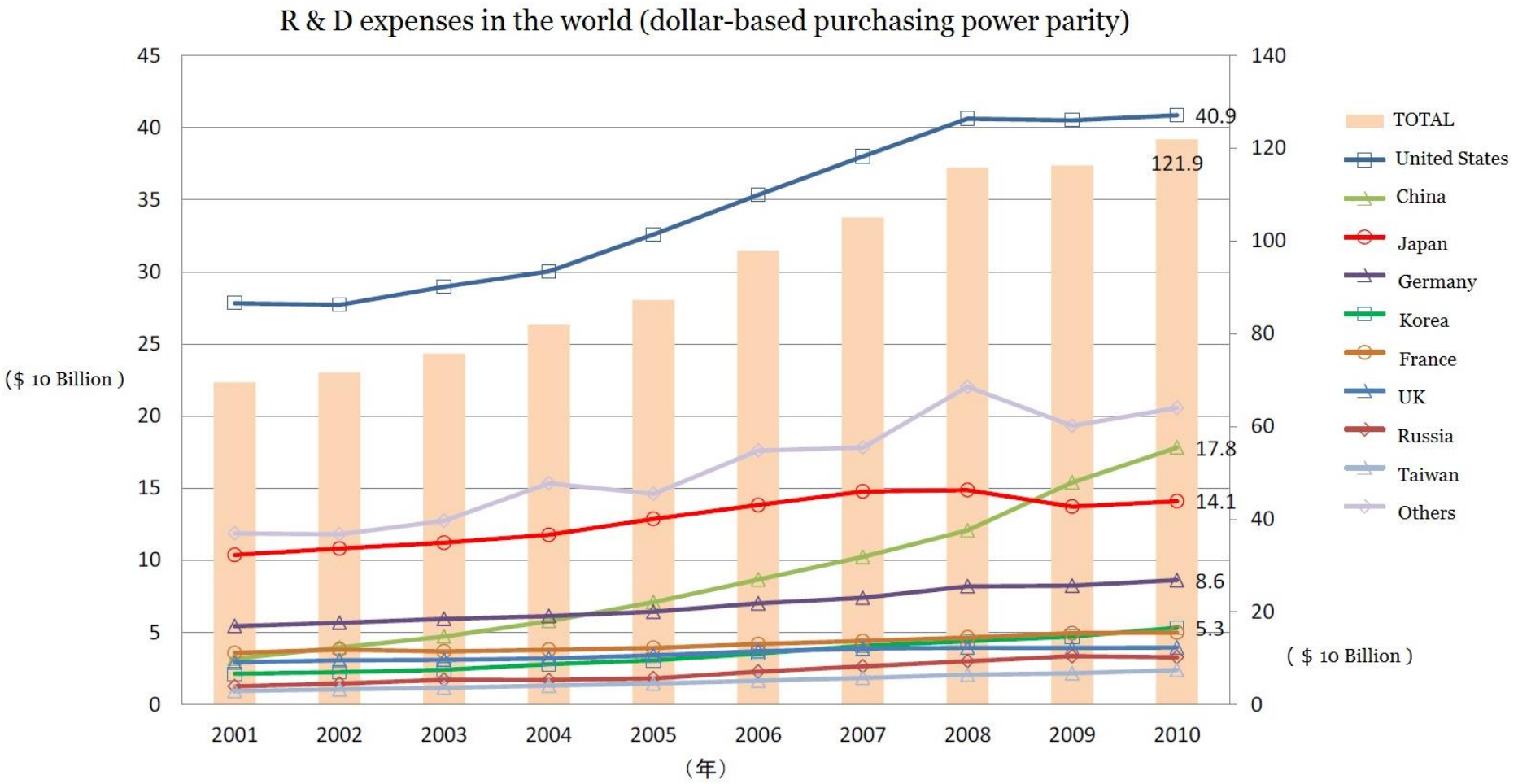
Problems Particularly Revealed in Survey

Change of the GDP growth rate of Japan



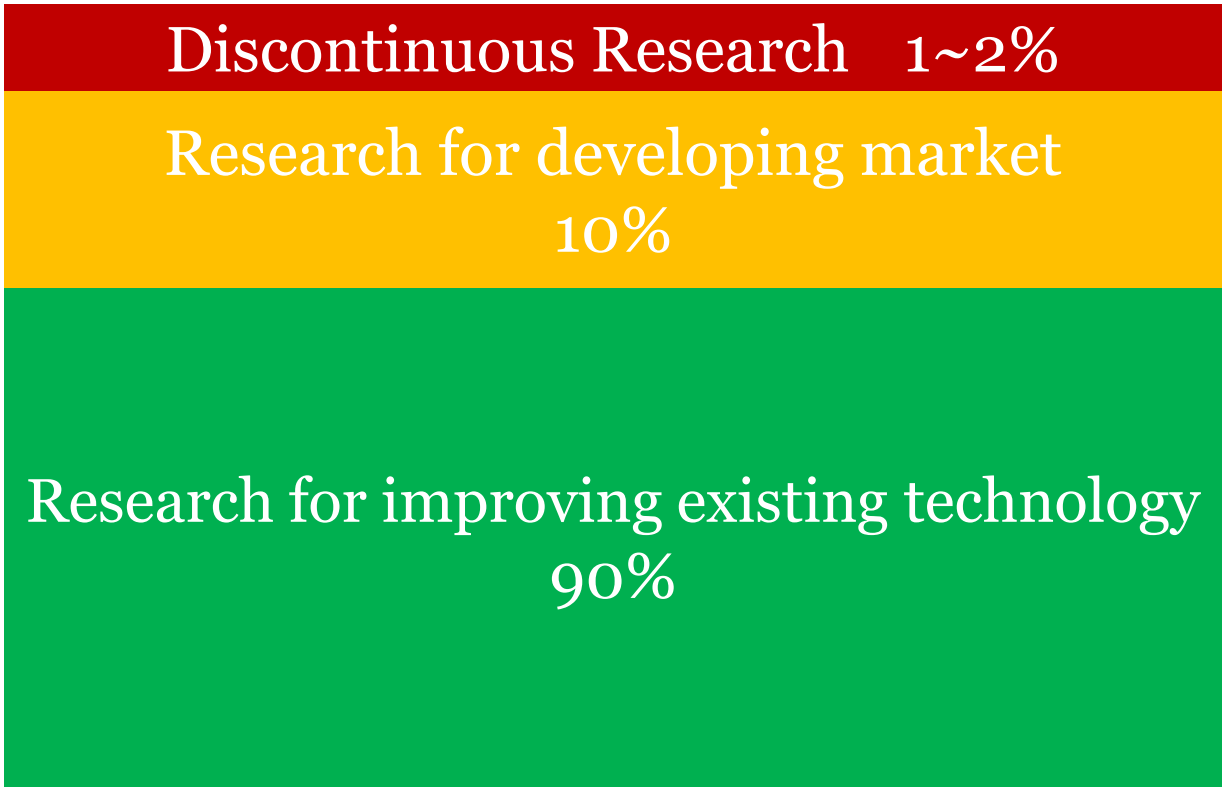
Trend of R&D expenses in private sector



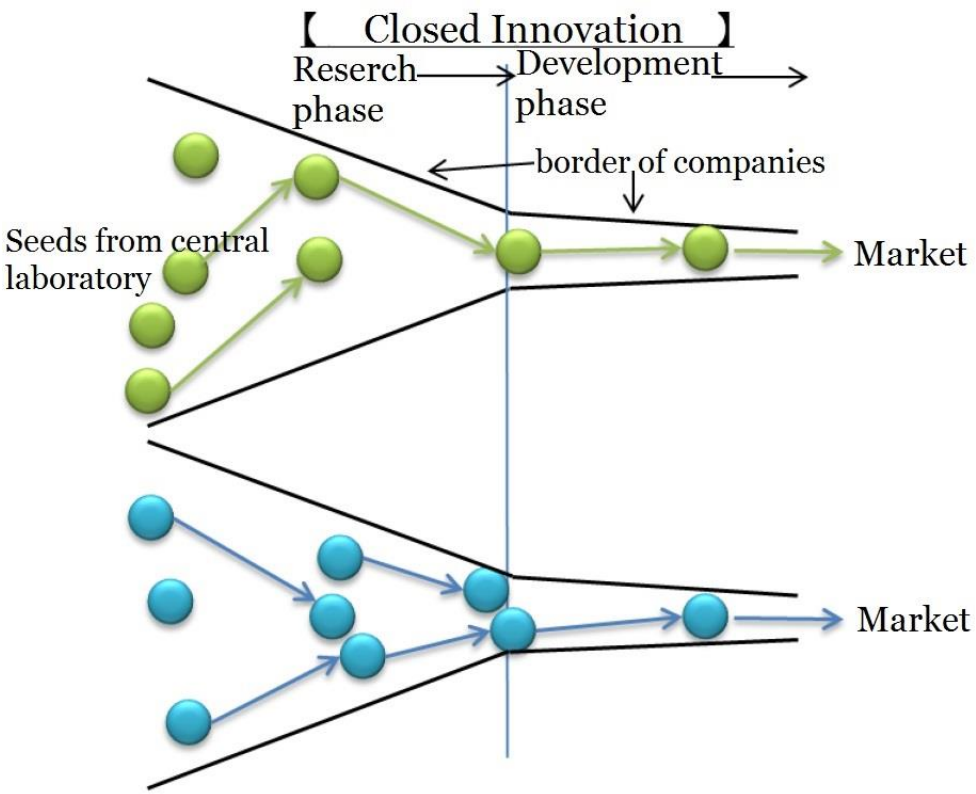
(REF.) OECD「Science, Technology and R&D Statistics /Main Science and Technology Indicators /Gross Domestic Expenditure on R&D -- GERD

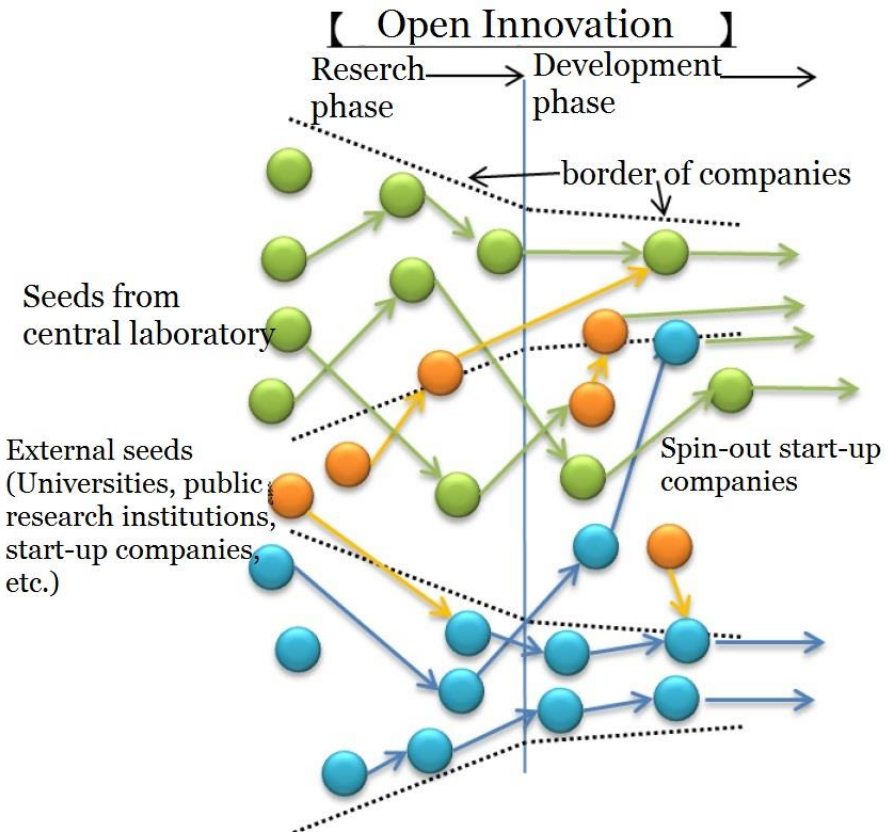
Decline of the medium-long term R&D expenditure in Private Sector

- Due to intensified international competition, companies tend to introduce most R&D expenses into short-term research in the world.
- This trend is growing year after year, and a country needs to support mid-to-long term research.

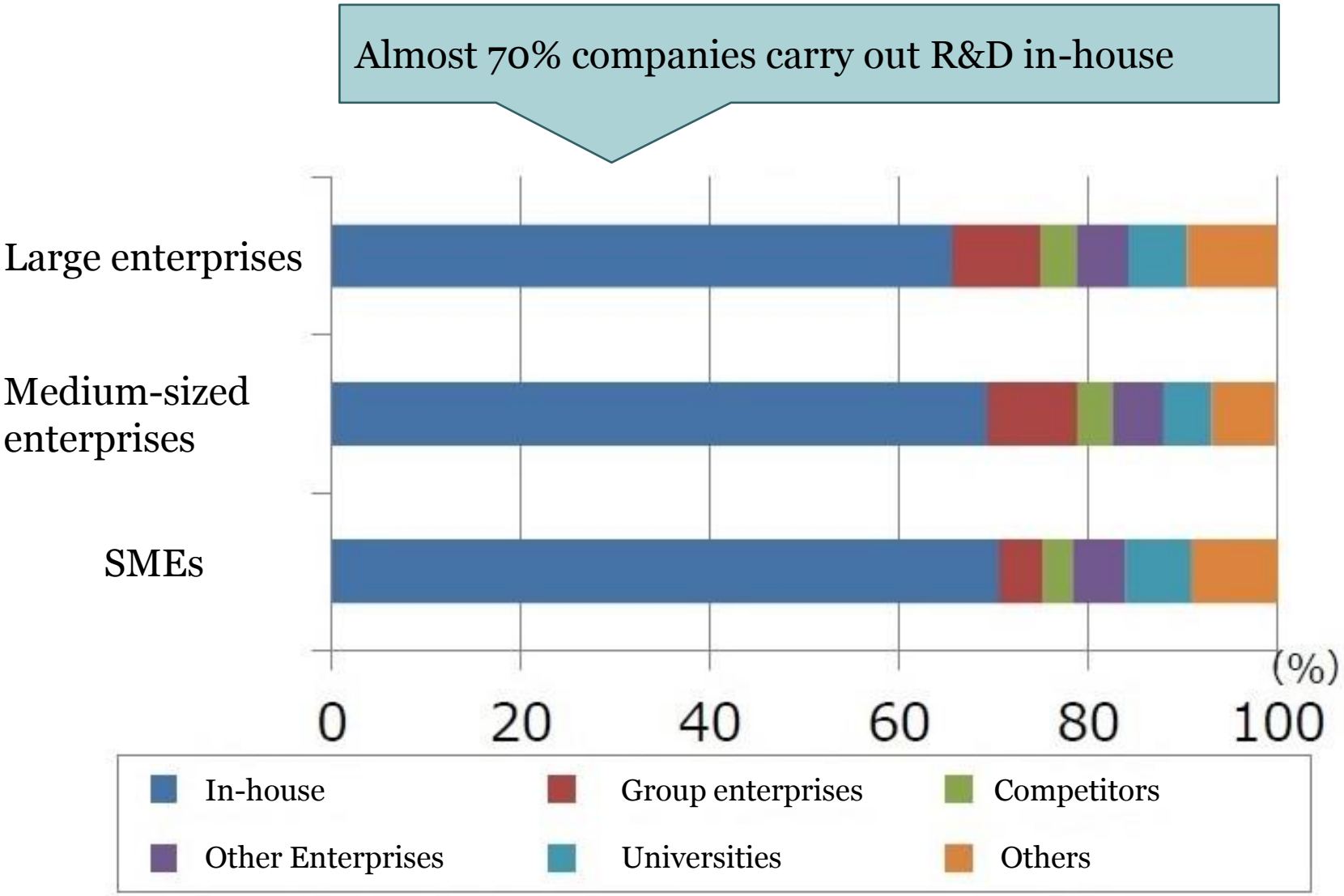


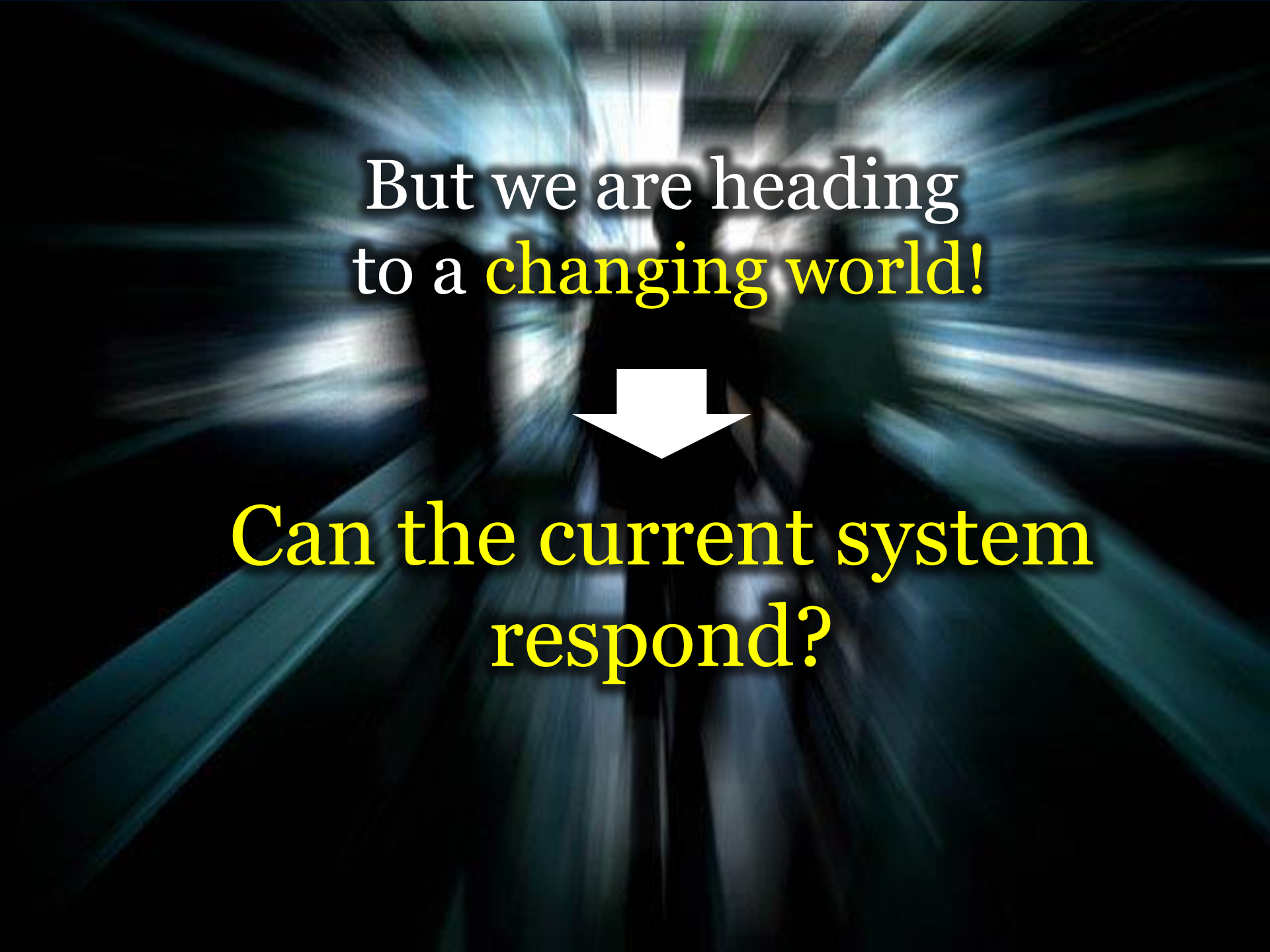
What is the Open Innovation?





70% of Japanese company' R&D is in-house

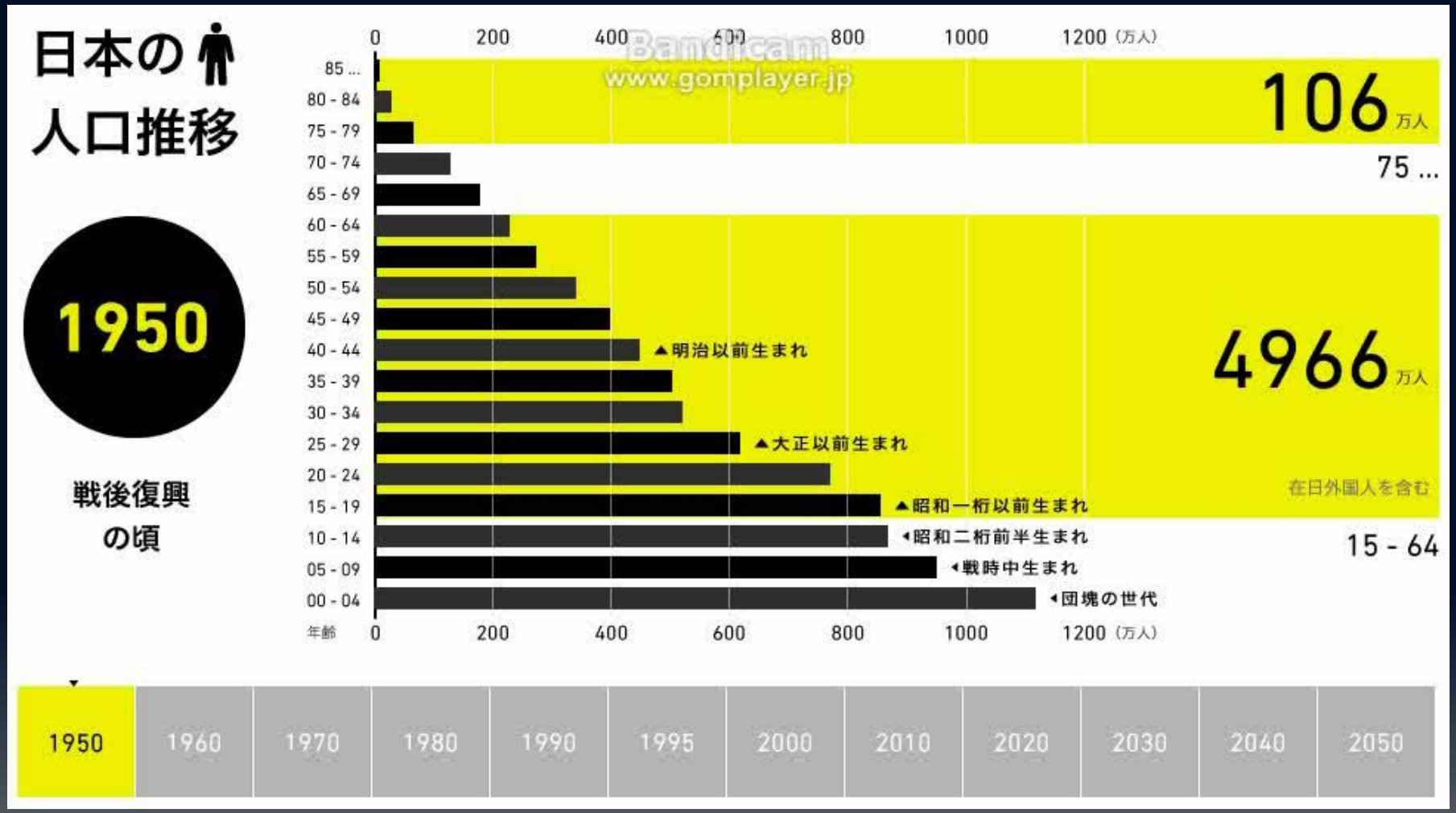



But we are heading
to a changing world!
Can the current system
respond?

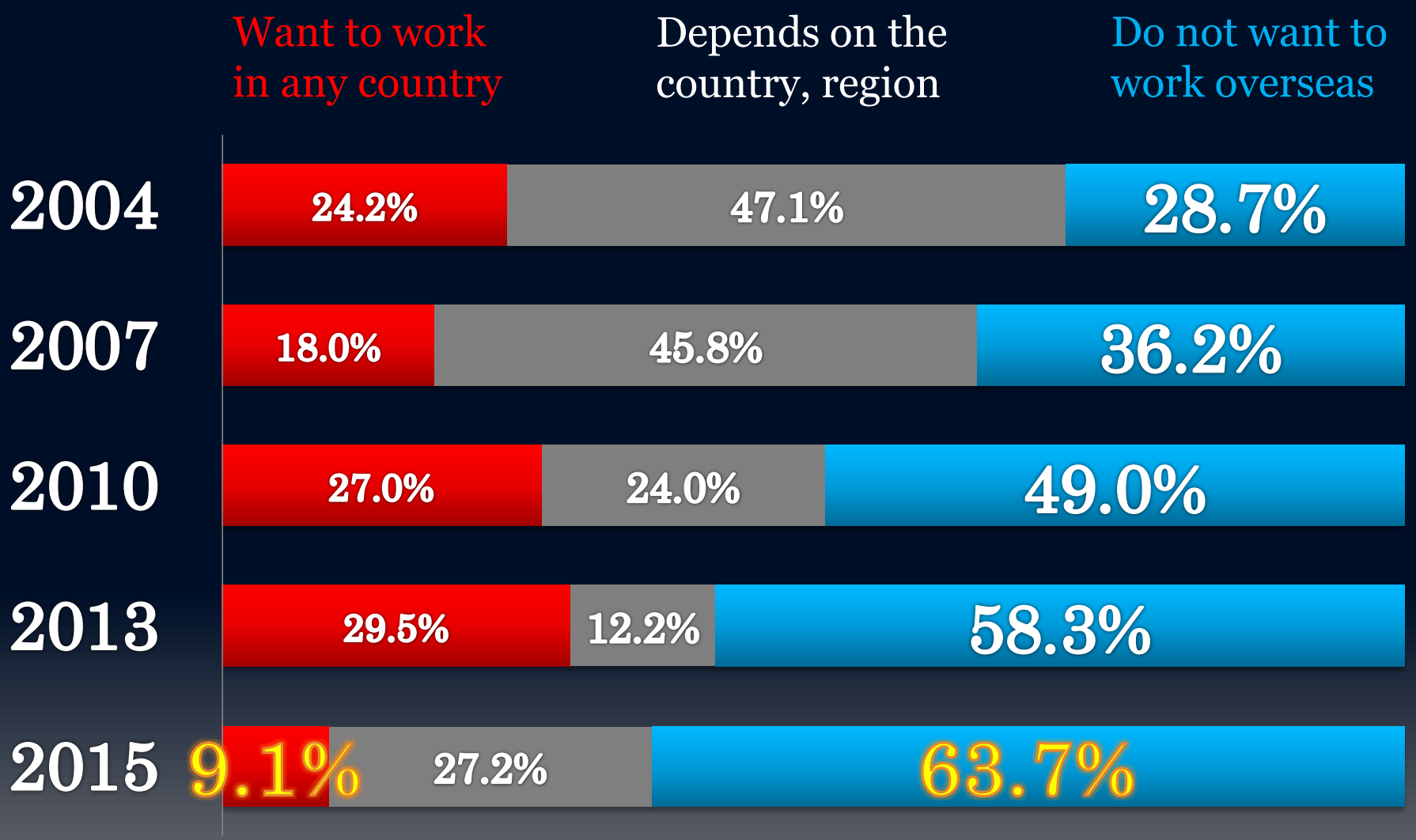
	Internal	External
Helpful	Strengths	Opportunities
Harmful	Weaknesses	Threats

Paradigm shift

Demographic Change in Japan According to Age



Survey of New Employees : "Would You Like To Work Overseas?"



Source: SANNO Institute of Management, 4th Survey on New Employees' Global Awareness, 2010


Unless we are clearly aware of Japan's strengths
and our accomplishments up to now,
we will not be able to devise effective strategies

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Activities to promoting industry-academia collaboration

① **Science and Technology Basic Law (1995)**

※Science and Technology Basic Plan

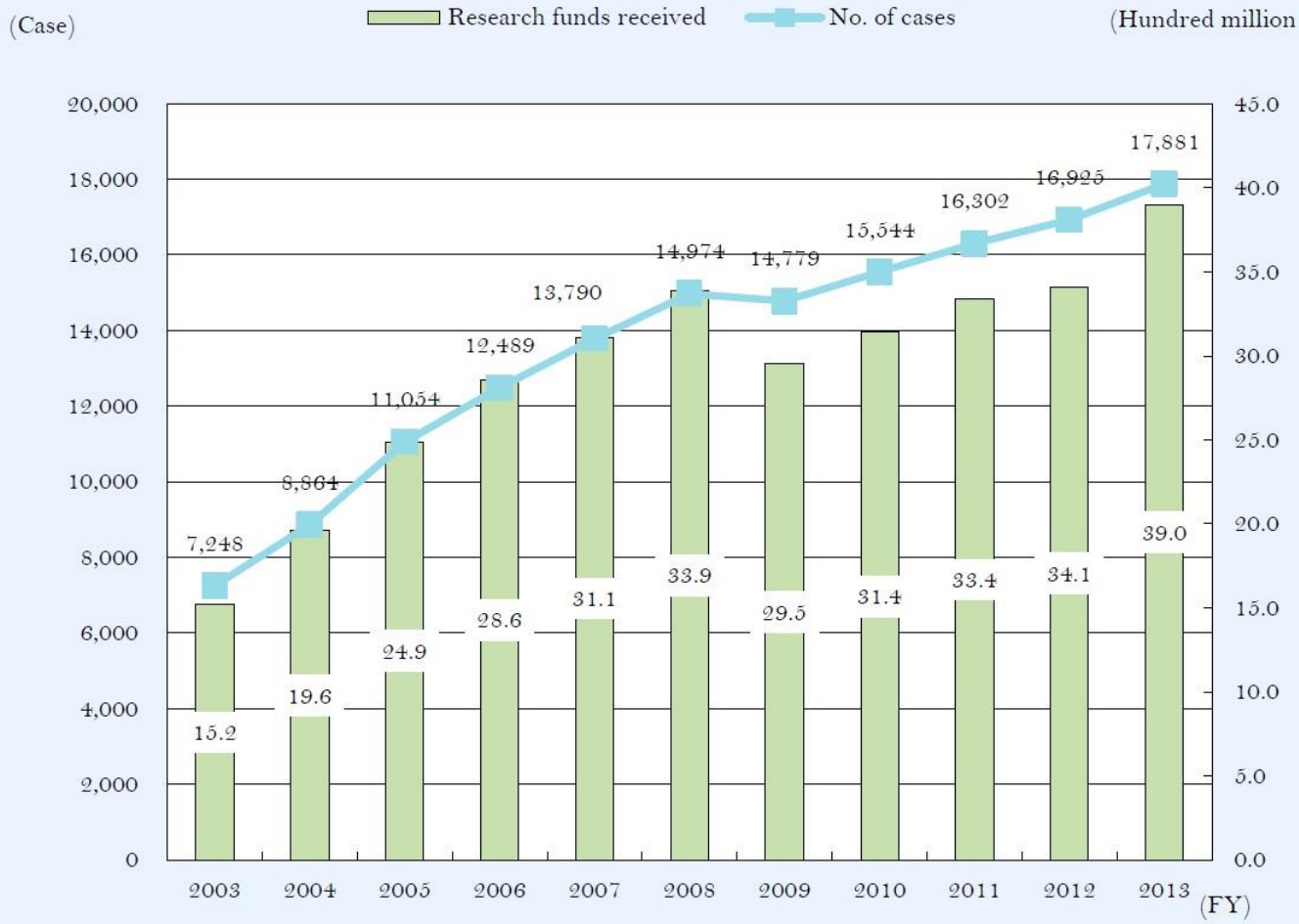
② **Promotion of Technology Transfer from University to Private Business Act(1998)**

③ **Special Measures Concerning Revitalization of Industry and Innovation Act (1999)**

④ **Industrial Technology Enhancement Act (2000)**

⑤ **National University Corporations Act(2003)**

Number of joint researches with industry at universities



Source: "The present state of Industry-Academia Collaboration in National University" MEXT

Nobel Prize winner number since the 21th century (natural science)

◇ **the 21th century: 2001-2016** **(the number of people)**

		Physics	Chemistry	Physiology or Medicine	**Total**
1	USA	20	21	17	**58**
2	JAPAN	7	5	4	**16**
3	UK	6	0	8	**14**
4	FRANCE	2	2	3	**7**
5	GERMANY	3	2	1	**6**
6	ISRAEL	0	5	0	**5**
7	AUSTRALIA	0	0	3	**3**
7	RUSSIA	3	0	0	**3**
9	NORWAY	0	0	2	**2**

The Nobel Prize in Physics 2014

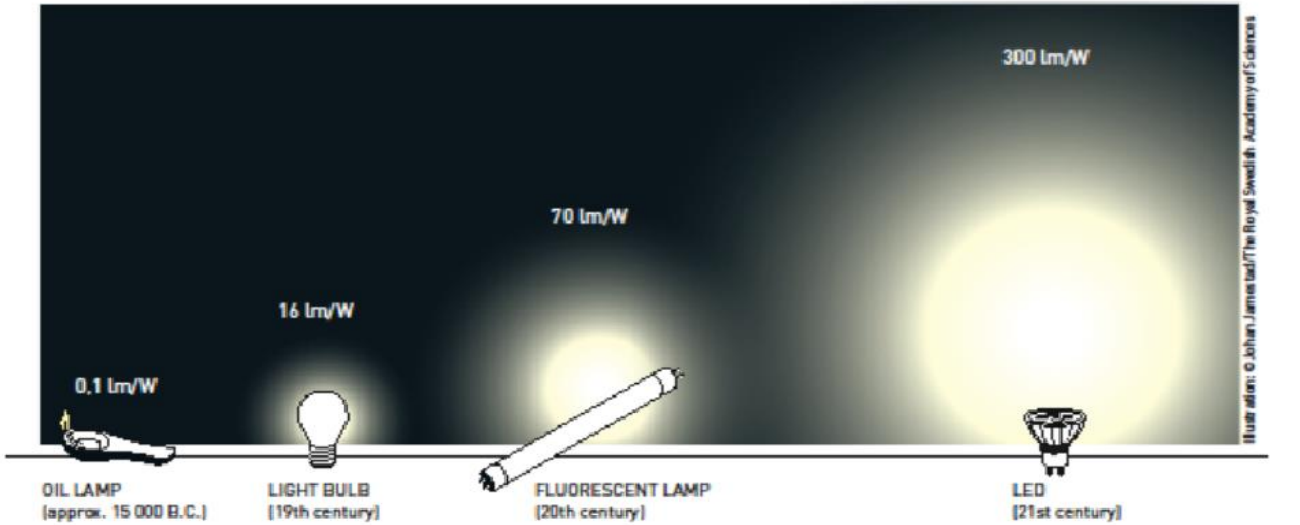


Photo: A. Mahmoud
Isamu Akasaki

Photo: A. Mahmoud
Hiroshi Amano

Photo: A. Mahmoud
Shuji Nakamura

Strong points of Japanese Industry

- Shipment value and world share of industrial robot

  No.1 in the world

- World share of sensing device is 50%

  especially light intensity and temperature

  sensor sensors are 70%

OECD /PISA 2012
Programme for International Standard Assessment
Reading, Science & Mathematics Average

	Reading	Average Score	Science	Average Score	Mathematics	Average Score
1	Japan 1st	538	Japan 1st	547	South Korea	554
2	South Korea	536	Finland	545	Japan 2nd	536
3	Finland	524	Estonia	541	Switzer land	531
4	Ireland	523	South Korea	538	Nether lands	523
5	Canada	523	Poland	526	Estonia	521
6	Poland	518	Canada	525	Finland	519
7	Estonia	516	Germany	524	Canada	518
8	New Zealand	512	Nether lands	522	Poland	518
9	Australia	512	Ireland	522	Belgium	515
10	Nether lands	511	Australia	521	Germany	514
	OECD Average	496	OECD Average	501	OECD Average	494

※ survey subjects: Age15


Internal
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Next society	Strengths of Japanese education, Japanese people
“TIies” and “empathy” important in next open innovation	Collaborative behavior in groups strong point of Japanese !
Work requiring expart thinking and complex communication skills increasing	Homogenous, high-quality education contributes to building of strong, warm human relations !

Japan’s national character and education good match for next society

Carlos Ghosn ; CEO of NISSAN Motor

"Japan can be extremely competitive internationally because of its culture and social values"

Quality of service

Japanese value of simplicity

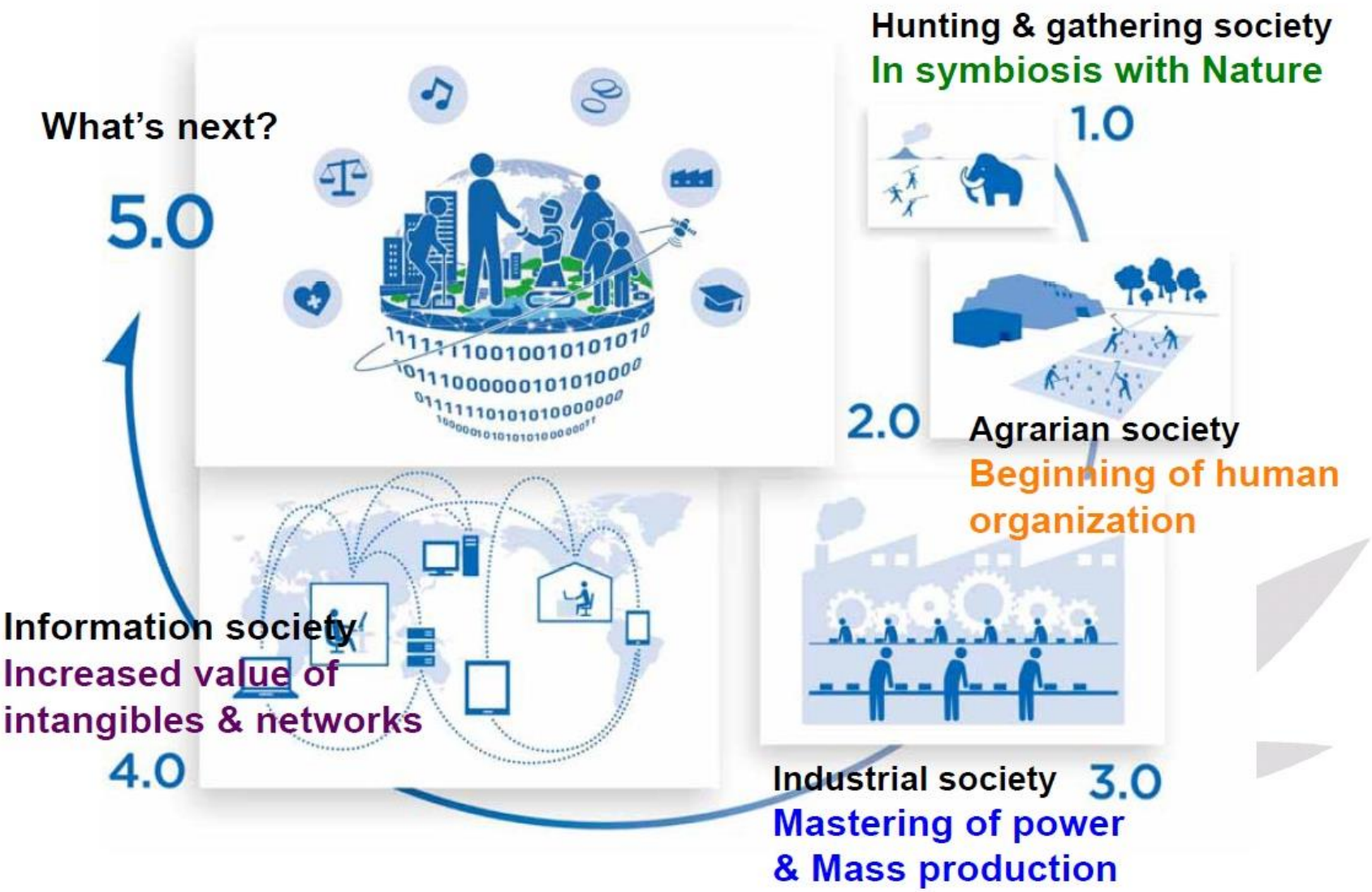
Master of continuous improvement


We will confidently grow
the areas we should grow!

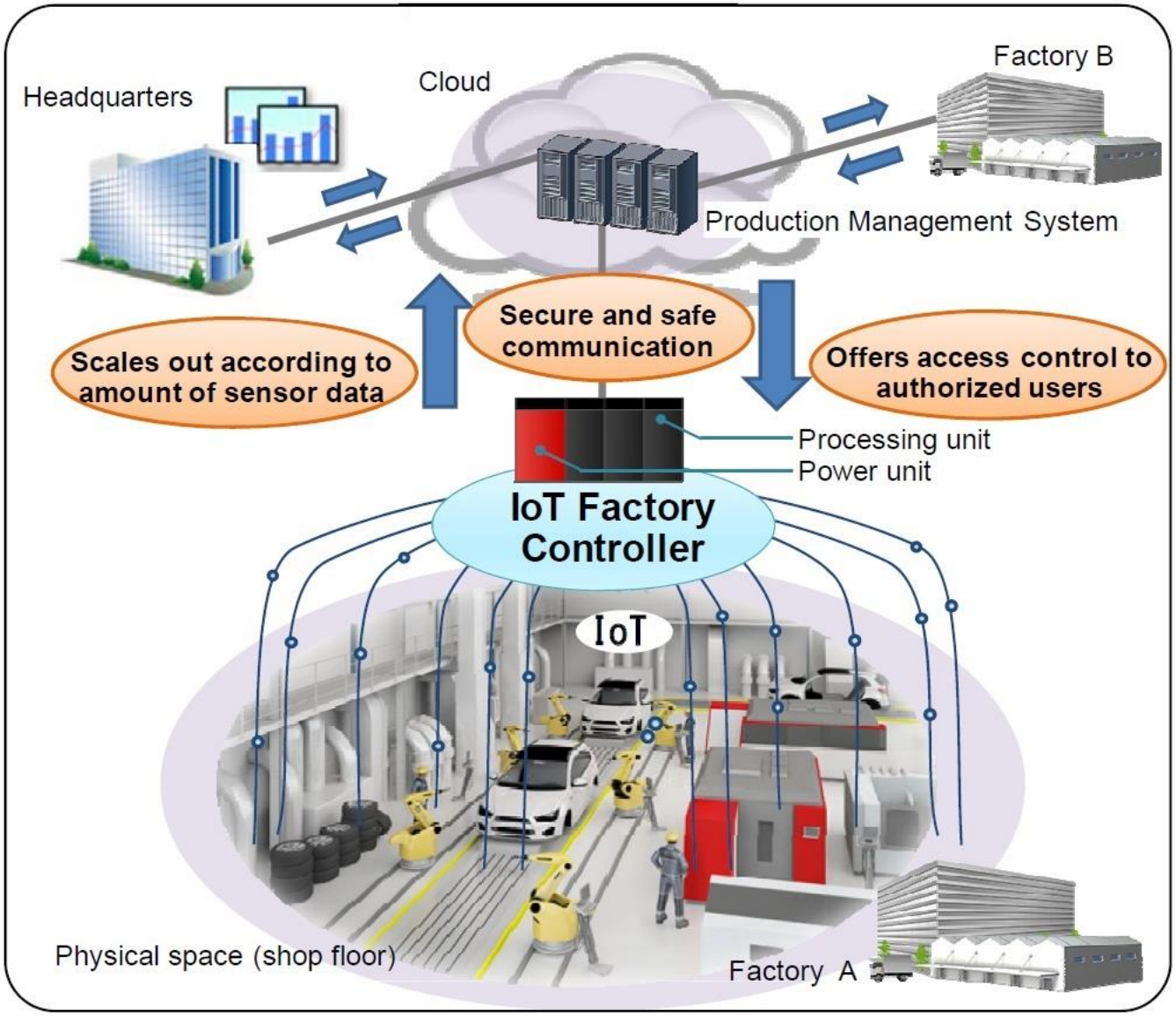
The 5th S&T Basic Plan (2016-2020)

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

Society5.0


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

e-F@ctory


Headquarters
Cloud
Factory B
Production Management System
Secure and safe communication
Scales out according to amount of sensor data
Offers access control to authorized users
Processing unit
Power unit
IoT Factory Controller
IoT
Physical space (shop floor)
Factory A

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?

Fin.

Prof. AMANO : NOBEL Laureate Physics 2014 will come to Bulgaria

at Sofia University

Lecture
At Sofia University
On 13th April