

IGE/BRIE/McKinsey & Co. International Conference

Impacts of the Fourth Industrial Revolution and Policy Agenda to Korea

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Science and Technology Policy Institute

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Contents

01 The Fourth Industrial Revolution?

02 Impacts: Industries, Economy and the Society

03 Policy agenda to Korea

The Fourth Industrial Revolution? : Mixed Views





[4th!] Unprecedented Transformation

vs.

[4th?] Steep, but Continuous Path

Navigating the next industrial revolution

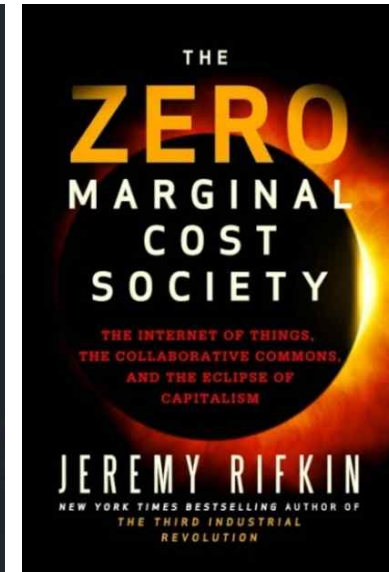
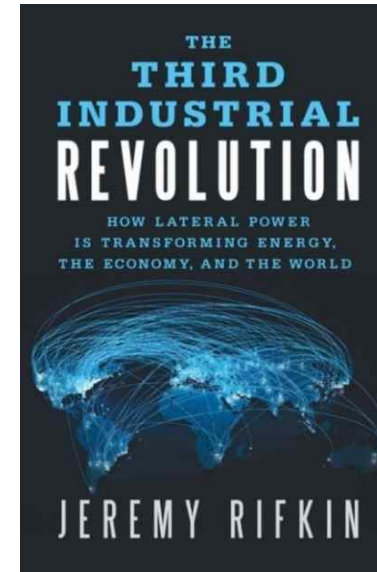


Revolution	Year	Information
	1 1784	Steam, water, mechanical production equipment
	2 1870	Division of labour, electricity, mass production
	3 1969	Electronics, IT, automated production
	4 ?	Cyber-physical systems

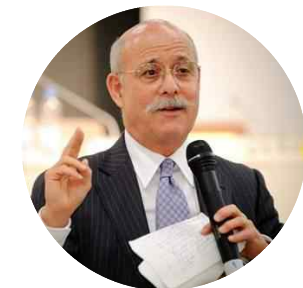


Klaus Schwab

“There are three reasons why today’s transformations represent not merely a prolongation of the Third Industrial Revolution but rather the arrival of a Fourth and distinct one: velocity, scope, and systems impact.”



“The Third Industrial Revolution - the digital revolution - has yet to reach its vast potential, making it far too early to declare it over and done.”

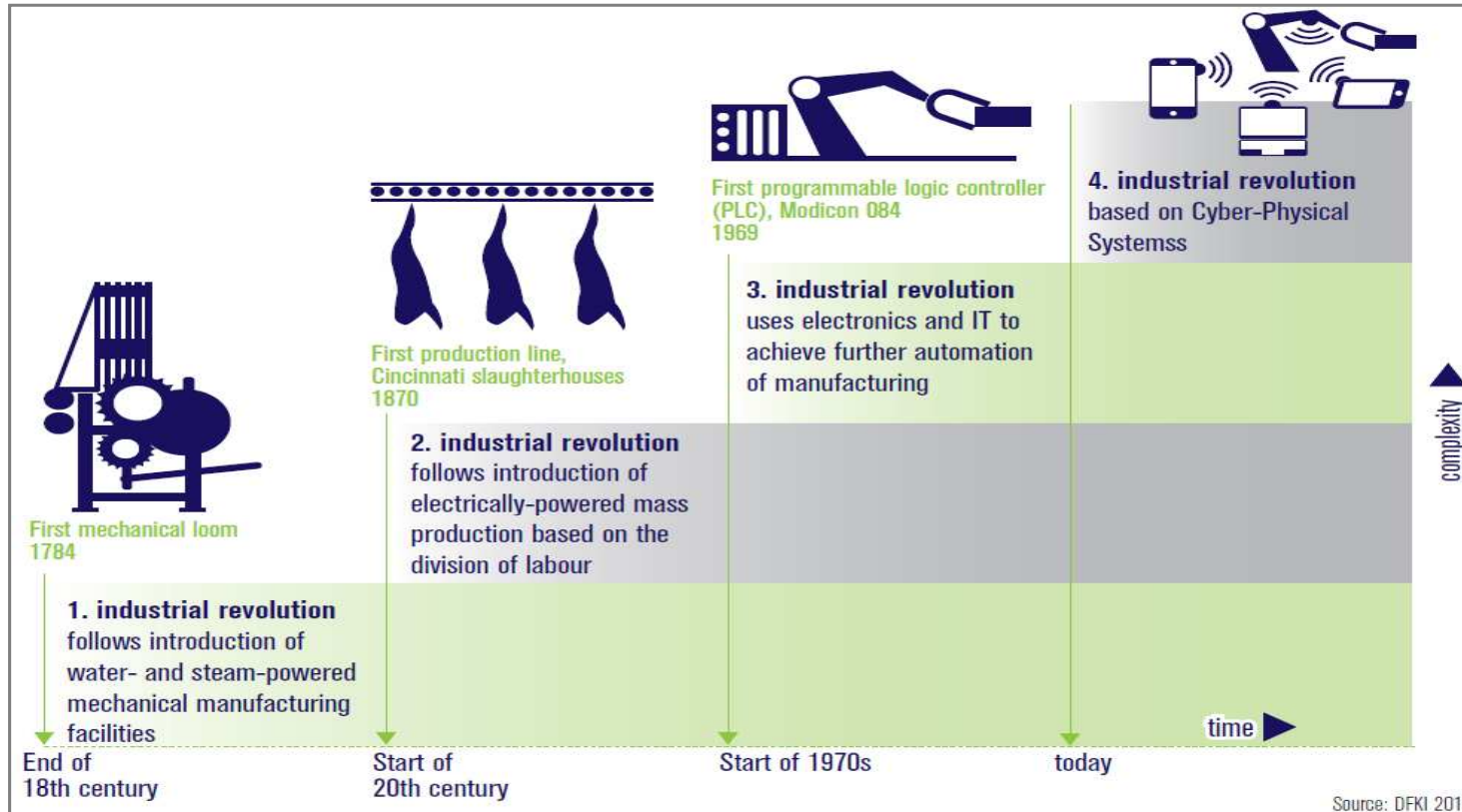


Jeremy Rifkin

Define the Changes? Cope with Them!

The Fourth Industrial Revolution? : What makes it possible?

* GPT: General Purpose Technology



GPT	Water/Steam Power	Electric Power	Electronics / IT
Role	Mechanize Production	Create Mass Production	Automate Production

No GPT?

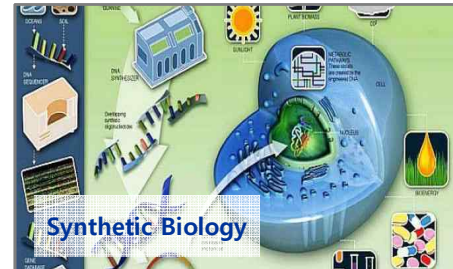
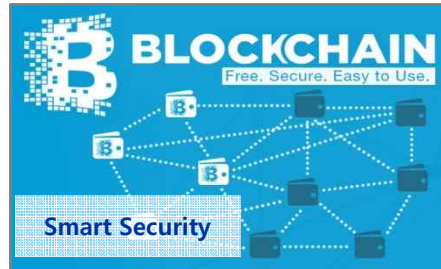
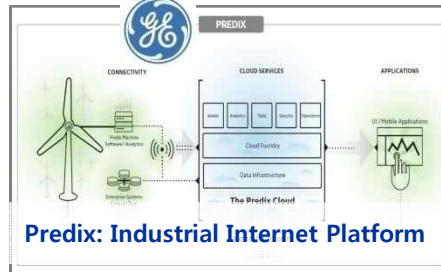
- Cloud computing (70s~)
- Big Data analysis (90s~)
- Artificial Intelligence (50s~)
 - Deep Learning (90s~)
- under the remarkable development of materials, ICT and technology convergence

The Fourth Industrial Revolution? : What makes it possible?

- **U dream failed to meet Peter Drucker's Inequality Condition**
- **Reality: Value << Cost**
- **Because of Huge Cost**
 - **Sensors in Goods (RFID)**
 - **Sensor Networks**
 - **Processing Servers embedded in Environment**
 - **Vast Storage Devices**
 - **Business Analytics**
- **Invent Smartphone makes it possible**

Byungtae Lee(2016.2.16)

The Fourth Industrial Revolution !



Connectivity 2.0 (Matchmaker, Go-Between)

- Design business models, Collaborate
- Create ecosystems and Platforms



Big Data (Cloud, Analytics, Deep Learning)

- Gather, Store, Analyze Data
- Create Intelligence and Values

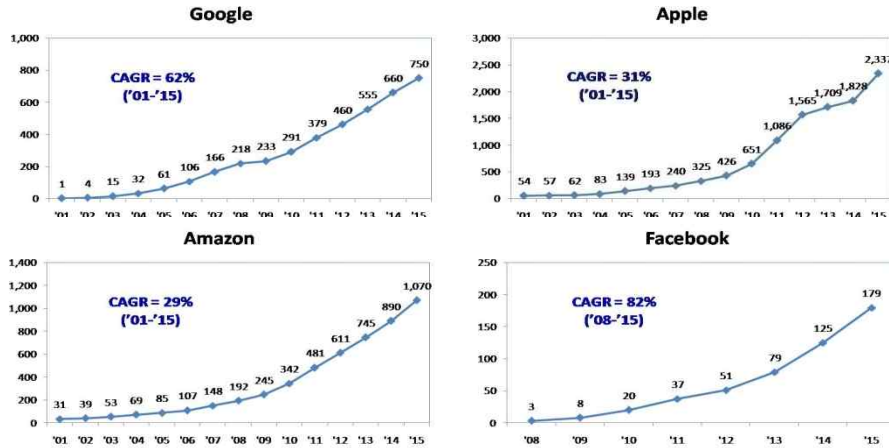
The Fourth Industrial Revolution? : Impacts?

- **The velocity, scope and system impact of technological convergence makes unpredictable business environment**
 - Business model will be led by cloud computing and big data analysis in the fourth industrial revolution
 - The speed of the fourth industrial revolution depends on the degree of trust in each society and deregulation
- **The products and services in fourth industrial revolution characterized by increasing return to scale**
- **Polarization of Job quality**
- **Deepening income inequality**
- **Individual Privacy, human ethics, security**

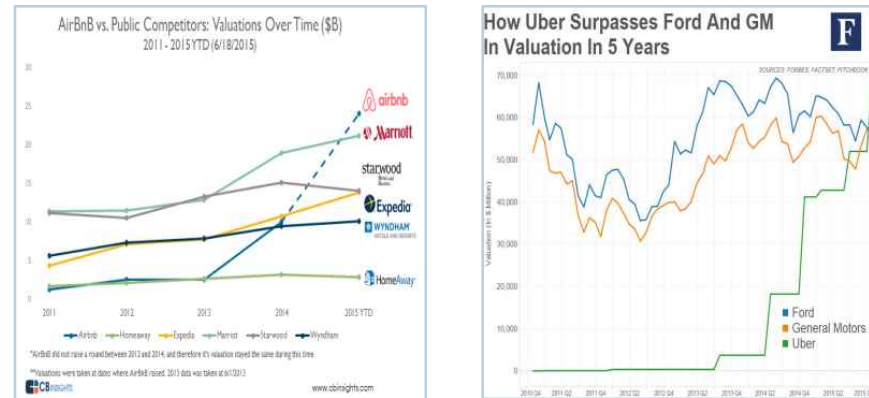
Byungtae Lee(2016.2.16)

Impacts : Industries

Dominance of Digital Platform Companies



New Convergence Business Models



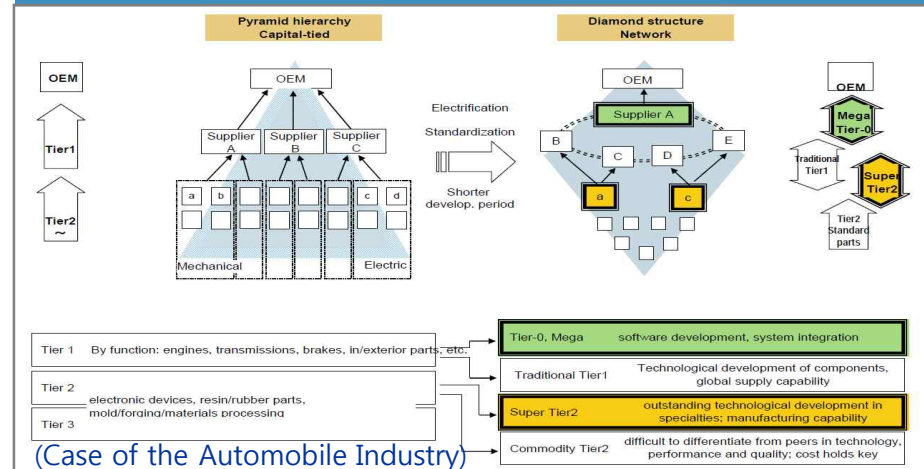
Online + Offline

Shift from Product to Software & Service



"Every industrial company will need to become a software company to thrive"

Industry Landscape Change



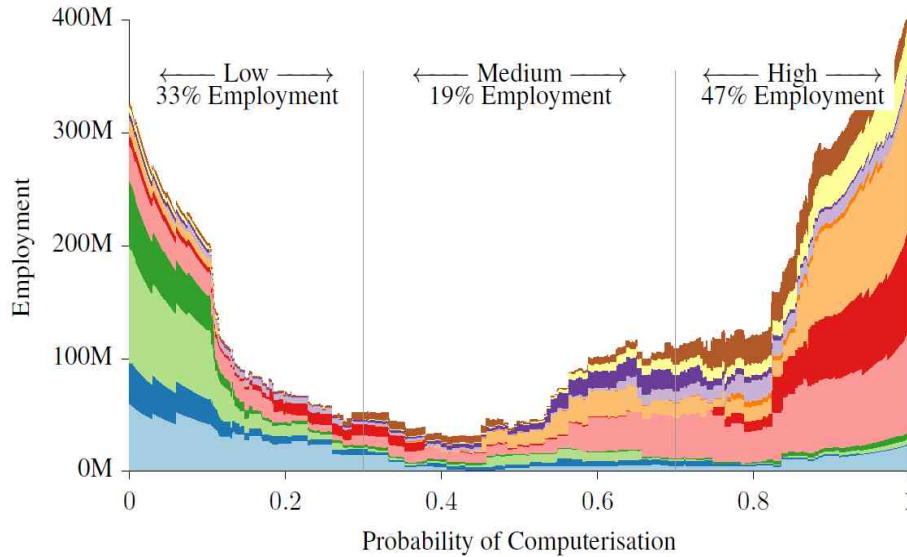
Pyramid → Diamond (Integrator, Specialist*)

* ex) ultra low power chips

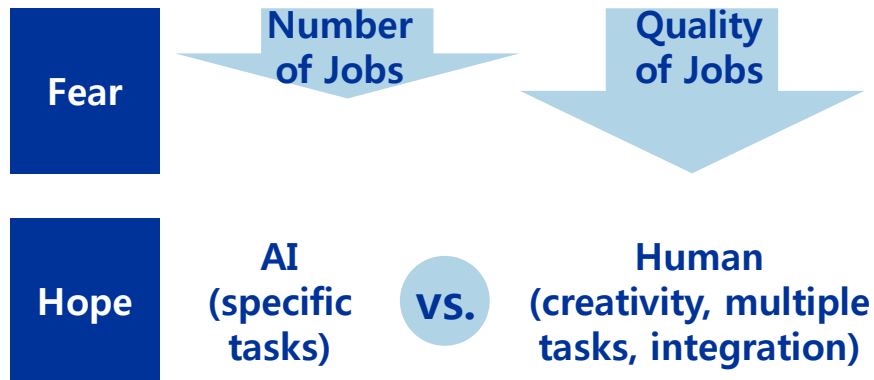
STEPPI 과학기술정책연구원

Impacts : Economy and the Society

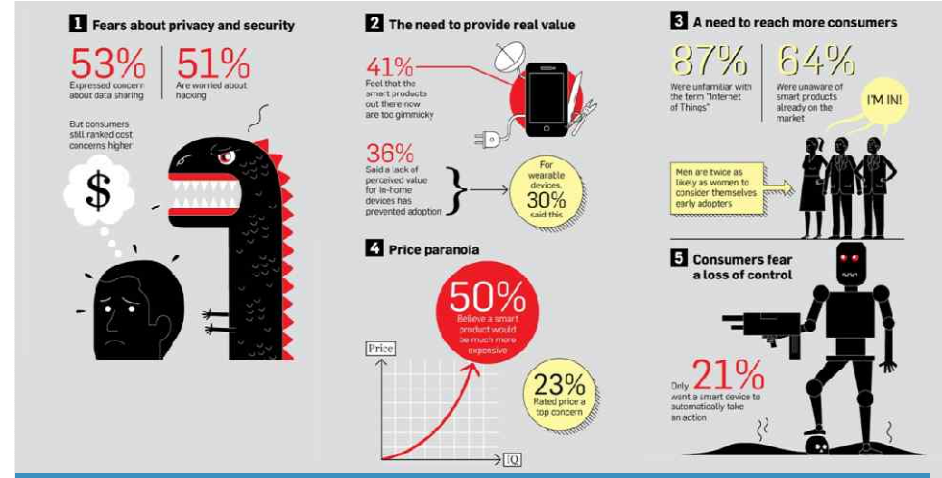
Unemployment



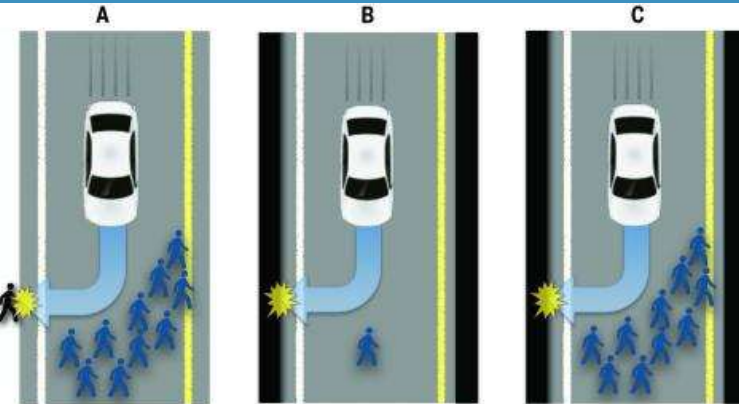
자료: C. Frey & M. Osborne, The Future of Employment: How Susceptible are Jobs to Computerisation?, 2013.



Complexity and Risk



Social and Ethical Issues



- self-driving car, automated trading systems, robotic surgery, etc
- responsibility, justice, conflict, regulation

Policy Agenda to Korea

Industry

- Digital platform
- Convergence, Integration
- Software & Service

Economy

- Unemployment
- Lower quality of jobs

Society

- Privacy, security
- Conflict
- Transaction costs

Facilitate Innovation

- Component innovation → system innovation
- Soft Innovation: product / process → business model
- Reform silo regulation

Nurture Skills

- Productivity → Creativity
- Holistic talent: Sci-tech + business + humanities

Build Trust

- Ensure privacy, protect data, prevent fraud
- Resolve conflict: new players vs. incumbent players

Thank You !

