Comments:
OECD Joint Workshop on the Next Industrial Revolution

5 March 2014

Myung-Jin Lee
Next Industrial Revolution?
Key messages: New Industrial Revolution
Peter Marsh

- Rapid emergence of China and India as prime locations of low cost manufacturing led to believe that old economies are being edged out of a profitable future.

- Old economies, if can adapt adroitly, opportunities are not over.
- Importance of real-gear manufacturing: In 2010, manufacturing output was roughly one and a half times higher than in 1990.

- Making products is just one part of the value chain. Others include design and development, the way products are maintained or ‘serviced after installation.

- Education right kind of engineers: combine skill in hard aspects of physics, chemistry, metallurgy, with capabilities in communication and working in teams

- Networked manufacturing
- Manufacturers are harnessing advances in technology
- Industrial democracy, Personalized production
- Cluster dynamics
- Environmental imperatives
Key messages: Next Industrial Revolution

David Rejeski

- 3-D printing, home-brew manufacturing, additive manufacturing
  - Ultimate fabricator is biology
- Biological world replaces the machine as the general principle of design
  - Open-source biological parts catalog is already online

-Policy implications

- Safety and security issues involving 3-D printing and do-it-yourself biology, at the same time as a source of potential innovation
- Energy and environmental implications unexplored,

- IPRs remain ambiguous
- Educational and workforce requirements poorly defined

- Need clear guidelines to reduce security threats, to address potential public concerns - ethical, moral
IoE Economy: winner takes all

- Once in Peak
  - 140,000 Employees
  - Market Cap, $28B
- Bankrupted now

- Sold to Facebook in 2012
  - 13 Employees
  - Market Cap, $1B
- Where does the value of $1B come from?
  - Employees?
  - Users
Job destruction by automation of works

Labor Intensive  Knowledge Intensive

Smart Machines/Robots  Internet of Everything  Business Analytics/AIs
Silent Servers at Walmart and Amazon

- “Know you better than yourself”
- The True Bargaining Power of Wal-mart
  - Predict the bottom line of suppliers by sampling of companies

Wal-Mart Used Technology to Become Supply Chain Leader

by Todd Traub on Monday, Jul. 2, 2012 12:00 am
Compression of Value Chain in Dell:

Tight supply chain management: suppliers’ engineers part of Dell’s design team
### Compressed value chain in Zara

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<th>BRAND</th>
<th>핵심</th>
<th>수단</th>
<th>트렌드</th>
<th>빈도</th>
<th>디자인</th>
<th>구색</th>
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Any threat to Zara?
- Complete elimination of value chain between design and consumption:
- This Outfit From The Victoria’s Secret Fashion Show Is 3D-Printed
Disruptions are everywhere in all industries

**Building / Funding**
*Kickstarter*
Online / Social Distribution / Real-Time Progress

**Logistics**
*JD.com (360buy)*
At Your Door Same-Day Delivery / Real-Time Tracking / Last Mile on Bikes

**Manufacturing**
*MakerBot*
3-D Prototyping / Printing

**Education**
*Codecademy*
Accessible by Anyone, Anywhere, Anytime

**Housing**
*Airbnb*
Turn Privately-Owned Properties into Hotel Experience

**Transportation**
*Uber*
On-Demand Transportation
Key Takeaways of Platform Business Trends

- Speed and compressed value chains
- New threats and ahead - elimination of value chains
- Software-based Everything
- Value chain disruption is wild and everywhere, & winner-takes-all is more prevailing => job market implications
- Platforms win over products
Manufacturing Renaissance*

Key Drivers
- Rising protectionist politics
- Exposure to currency volatility
- Fading labor rate arbitrage

⇒ The infrastructure necessary to enable manufacturing to flourish and contribute to job growth will grow in importance and sophistication and be challenging for countries
⇒ Competing between nations to attract FDI will increase dramatically
⇒ Growing materials resources competition and scarcity will fundamentally alter country and company resources strategies and competition,
⇒ Supply chain reconfiguration toward countries and regions with the right combination of favorable competitiveness attributes
⇒ Affordable clean energy strategies and effectiveness energy policies will be top priorities for manufacturers and policy-makers
⇒ The ability to innovate, at an accelerated pace, will be the most important capability differentiating the success of countries and companies
⇒ The most important driver of a nation’s competitiveness: #1 Talent driven innovation

* Deloitte(2013)
Demographic changes

World population growth

- (World) 8-10.5 billion (2050)
- (Korea) 52.16 million (2030), 48.12 million (2050)

Global middle class growth will precipitate a dramatic shift in consumption over the coming decades.

New “demand centers” are emerging as populations of middle class consumers grow around the world.

- 2009: 2 billion
- 2020: 3.2 billion
- 2030: 5 B, 85% of increase from Asia, China/India: 1B
**EROEI**

에너지투자생산성 (EROEI) = energy returned on (Energy) Invested
Technological Innovation

Technological development
- ICT: Computing speed growth ⇒ 2020 artificial intelligence with human brain power, 3 billion people on-line, 100% natural language processing
- Nano technology: quantum computing, nano device, efficiency
- Resource technology: almost unlimited supply of oil/gas water (desalination technology), food supply through artificial meat/GMO
- Engineering: solving city problems
- Health technology: health cost down, solving incurable diseases, human enhancement
- Social technology: social/economic/political participation through SNS, media/game

Sustainability of innovation
- Technically feasible ⇒ economically profitable ⇒ socially acceptable

⇒ STI policy implications
Thank You!

Many PPTs of this presentation are from the followings:

Lee, B.T. (2014), Management Challenges and Opportunities in the “Internet of Every Thing” (IoE) Economy, 37th KEF workshop