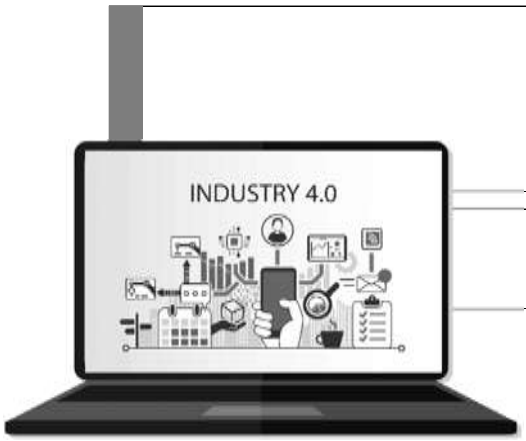
4th Industrial Revolution



Lecturer
Dilmurod Azimov (Tashkent State University of Economics)

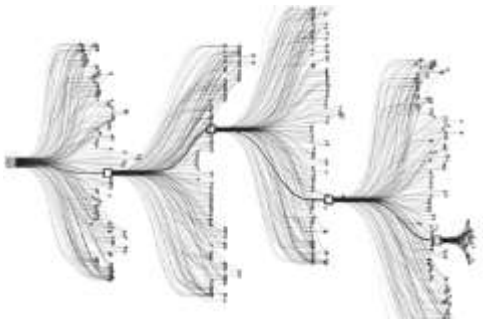
Contents

- History of Industrial Revolution
- Changes and Challenges in the 4th Industrial Revolution Era
- Class Activity: Case Study (Team Building & Case Development Planning)

4th Industrial Revolution & AI

AlphaGo

2016. 3. 9. ~ 15. Seoul



Artificial Intelligence

Neural Networks

Deep Learning

Machine Learning

Algorithm

[Terminator 2, 1991]

Defeat of the Human Race?

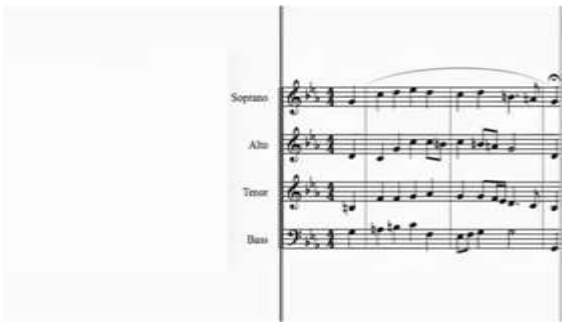
Intelligence:

the ability to perceive or infer information, and to retain it as knowledge to be applied towards adaptive behaviors within an environment or context

[wikipedia, 2018]

AI and Art

Source: The Next Rembrandt



Source: https://www.youtube.com/watch?v=QiBM7-5hA6o

- Composition (DeepBach)
- Writing a screenplay
- Writing a novel
- Artworks (DeepDream)

AI everywhere

Beginning of the 4th IR?

2016 World Economic Forum (1.20~1.23, Dabos, Swiss)
Theme: 'Understanding the Fourth Industrial Revolution'
Technological change that will bring about a social, industrial and cultural renaissance in the world

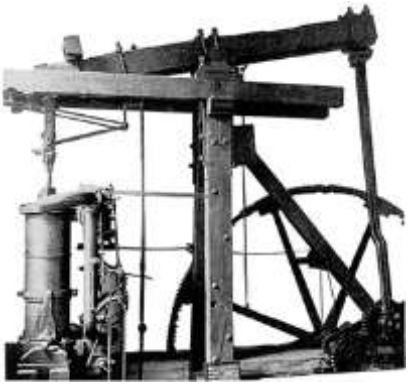
Klaus Schwab

1st Industrial Revolution

Invention of Steam Engines and Mechanization of Production

- 1769 James Watt
- Strong connectivity within the country
- Started in the United Kingdom & spread to countries in Europe

[James Watt, 1736-1819]



2nd Industrial Revolution

Electric Power and Mass Production

- Utilization of energy sources such as electricity and standardizat ion of work (1870 ~)
- Mass production on assembly line (Ford)

Thomas Edison

Nikola Tesla

3rd Industrial Revolution

Radical Information Processing with Computers and Internet

- 1970 ~ ICT(Information and Communication Technology)
- Internet, information highway, renewables, molecular biology

4th Industrial Revolution

Automation and Connectivity by Artificial Intelligence

- Technological convergence in various fields and innovation through hyper-connectivity
- Radical changes in the system including production, management, governance, etc.
- Mobile internet, cloud technology, artificial intelligence (AI), Internet of Things (IoT), big data, unmanned transportation such as self-driving cars and drones, 3D printing, robot engineering, new materials, block chain systems

4th IR & Future Changes

- Labor Market Changes: 7 million jobs extinction & 2 million new jobs creation by 2020
- Changes in industrial structure: sharing & on demand economic
- Changes in Job competency required by the workforce
- Focus on complex problem solving capabilities & social skills
- Changes in government/public sector: Moving to an algorithm-based platform pervices
- Cost savings from increased productivity

Diminishing Jobs in Future

- Secretary : Siri, Smart Speakers (Apple's HomePod, Amazon's Echo)
- Doctor : diagnosis, operation (IBM's Watson)
- Pharmacist : 350,000 medicine preparation by robots in 5 U.S. university hospitals
- Lawyer : better in case, legal provision, patent search, etc
- Pilot: Drones, expanding into passenger & cargo aircrafts
- Driver : more self-driving cars
- Stock analyst, Fund manager : AI replacing analysts
- Sports referee : fencing, tennis, etc.

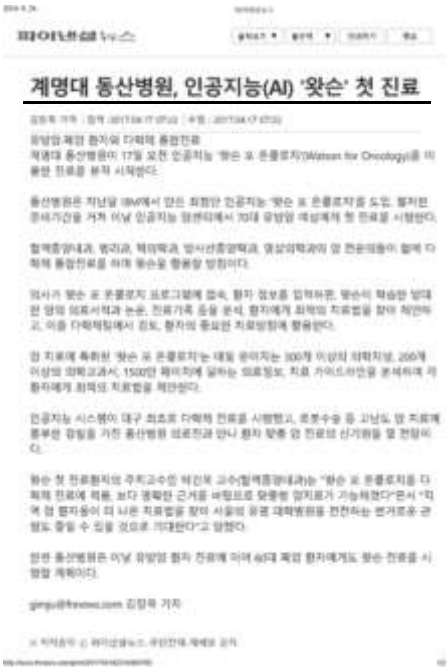
AI Secretary

Siri (iPhone) by Apple

Smart Speakers

AI Doctor

First medical treatment by artificial intelligence Watson in Keimyung University Dongsan Hospital



계명대 동산병원, 인공지능(AI) '왓슨' 첫 진료

Korea's first artificial intelligence Watson hospital in Gachon University

AI Dentist

AI Referee

VAR (Video Assistant Referee)
adopted in 2018 Russia Worldcup

Robot Referee in Tennis, Firing 9 out of 10 Human Referees

AI Counselor: ChatBot

Financial industry, Boom of AI Counselor 'ChatBot'

Bank of Montreal launches AI-powered chatbots on Facebook, Twitter

Promising Jobs in Future

- AI developer: design and development of Artificial Intelligence based on needs
- Educational content developer (Youtube creators)
- Career development consultant: Personalized career counseling by life cycle
- 3D printing material expert
- Drone pilot: increasing demands of military and commercial drones
- Wearable sensor developer: Sensor development based on application and material
- Traffic management expert: Traffic system management for self-driving vehicles
- Knowledge curator

Class Activity:

Case Study

(Team Building & Case Development Planning)

- Make a group of 3-4 classmates
- Find a company in Uzbekistan
- Search for the company's general information, products or services, market status, competitors, target customers, current industry issues, etc.
- Prepare for a 10 min. briefing

Class Activity:

Case Presentation

(7/19 Thu. afternoon session)

- Prepare for a 30 min. case presentation including Q&A

- Contents:
  - Intro. to team & team members
  - Company Profile
  - Future product or service idea for the company (4th IR related, AI-applied)
  - Name of a proposed product or service
  - Expected benefits or values
  - Target market or customer group
  - Profit model