



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Public Lecture Report SCSP1513 (Section 04)

4th Industrial Revolution by Prof. Dr. Rose Alinda Alias

Venue : Seminar Hall, N28A

Time : 0800AM – 1000AM

Date : 25th of September 2017

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Contents

Executive Summary..... 2

Introduction..... 3

Impact of 4th Industrial Revolution..... 4

Future Job Requirements..... 6

Executive Summary

Speaker: Prof. Dr. Rose Alinda Alias

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During Technology & Information System on 25th of September 2017, there was a public lecture by Prof. Dr. Rose Alinda Alias. The lecture was discussing on Forth Industrial Revolution(4IR). It gives the students some exposure on what is 4IR, Industry 4.0, Education 4.0 and UTM 4.0 Journey also how to react to these changes.

In the past few years, people around the World has shown their interests in these issues. World Economic Forum Annual Meeting 2016 brought the theme of “Mastering the Forth Industrial Revolution” also discussed on future graduates requirement which is crucial for the UTM students especially to the Computer Science students where there will be a huge change in the World by our courses.

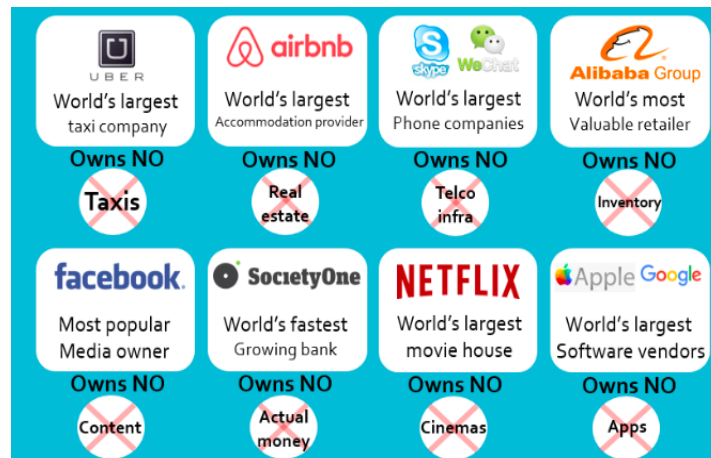
Industrial revolution is defined as the changes in manufacturing and transportation that eases the human works which uses an agrarian and handicraft economy into using machines in large-scale factories. This revolution occurs in manufacturing and transportation which began in Britain in the 18th century.

The First Industrial Revolution focused mainly on water and steam power to mechanize production. The Second Industrial Revolution is on electric power in creating mass production. The Third Industrial Revolution used electronics and information technology in production. Now a Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is combining of technologies between the physical, digital, and biological aspects.

There are three reasons why there is no prolongation of the Third Industrial Revolution but rather the arrival of a Fourth and distinct one: velocity, scope, and systems impact. The speed of current breakthroughs has no historical precedent. When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance.

Introduction

“We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before. We do not yet know just how it will unfold, but one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academia and civil society.” (Professor Klaus Schwab, Founder and Executive Chairman of the World Economic Forum).



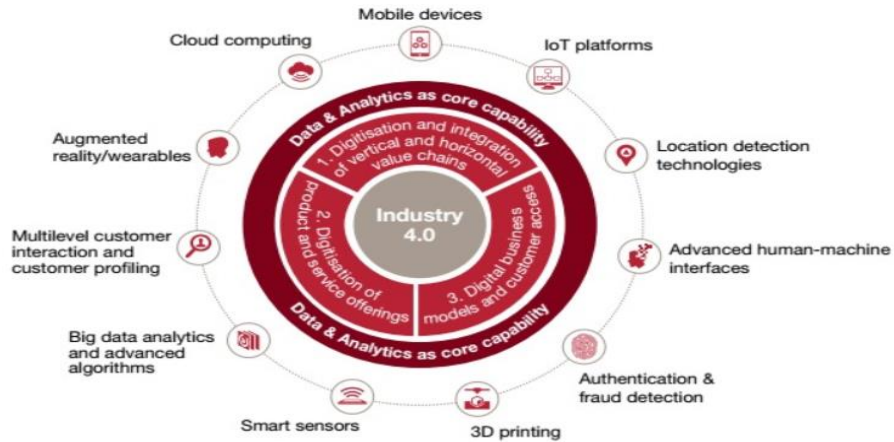
From what Professor Klaus Schwab said above, we could see that fourth revolution will change our future and already disrupting many technologies such as Uber which disrupts the taxi companies although they own no cars/taxis, Alibaba Group which known worldwide as a huge retailer which own inventories. From here it is clear that Fourth Industrial Revolution already grows rapidly and must be implemented in our education. This revolution is not focusing only on industries, but in any aspects that can combine technologies between the physical, digital, and biological.

Here in Malaysia, programming is already being implemented and studied by any course also in the primary school. Main purpose of this is to train the future leaders the importance of critical thinking in creating a massive innovation in our country.

Lastly, if we ignore the changes around us, the World will ignores us. So this public lecture is a genius decision made by whom responsible in implementing the Forth Industrial Revolution ideas into the students of computer science in UTM to help the youth in changing how we work parallel to the World progress.

Impact of 4th Industrial Revolution

Industry 4.0 framework and contributing digital technologies



Source: PwC 2016

Disruptive technologies are transforming all end-to-end steps in most sectors. We could see many of the workers lost their jobs as people no longer needs their company's services and supplies such as Kodak which was once known as a huge photography company who fell victim to disruptive technology, taxi companies who fell victim to Uber and Grab which offers a more efficient services. Fourth Industrial Revolution somehow gives a huge impact to whom ignores its existence in industries.

- Healthcare

Precision medicine helped doctors in analyzing patient's genome sequence, medical history, and lifestyle. This help doctors in creating a unique therapies to an individual.

- Agriculture

Artificial Intelligence powered machines can easily detects weeds or pests and automatically applying herbicides to the plants. Machines also been used to measures the plants population and much more.

- Insurance

Data from wearable devices that monitor health and sensors that track driving habits were used in detecting human behaviors to determine pricing. By doing this, policyholders will be forced to implement safer habits. Sensors in cars can prevent many threat potentials.

- Manufacturing

Optimize supply chain operations and predict the failure of machine parts.

When Will the Future Arrive?

According to the World Economic Forum Technology Tipping Points and Societal Impact report, the following technology tipping points could occur by 2025:

- 10% of people wearing clothes connected to the Internet
- The first robotic pharmacist in the US
- The first 3D-printed car in production
- 5% of consumer products printed in 3D
- 90% of the population with regular access to the Internet
- Driverless cars equaling 10% of all cars on US roads
- The first transplant of a 3D-printed liver
- Over 50% of Internet traffic to homes for appliances and devices
- The first city with more than 50,000 people and no traffic lights
- The first AI machine on a corporate board of directors

As the Fourth Industrial Revolution unfolds, what innovations are in store?

Advances in computing power, artificial intelligence, robotics, and material science can fasten the shift toward more environmentally friendly products of all kinds. Digital fabrication techniques, including 3D printing, can bring manufacturing closer to customers and make spare-part maintenance easier and cheaper.

Breakthroughs in biotechnology can allow replacement bones and transplantable organs to be grown from 3D printed patient's stem cells. As discoveries unfold about human brain functions, we can look toward neural implants and brain-machine interfaces that address cognitive diseases and potentially enhance human intelligence.

New energy technologies can create low-cost, plentiful, and sustainable sources of power—and power storage—to wean the planet off first-industrial-revolution fossil fuels. Robots can handle household chores, assist nurses, and even build themselves.

The scale and breadth of technological innovations is revolutionizing the way we do business. Next, we explore how the Fourth Industrial Revolution can impact individuals and society.

Future Job Requirements

As the World changes, we as an individual must have certain skills in adapting into the changes as future jobs requirements needs a skillful individuals which can compete with the growth of industry parallel to the future needs.

Figure given shows 10 skills that needed in the future. Some of the skills already being implemented in the 2015 such as complex problem solving, people management, negotiation, creativity, service orientation, coordination with others and many more.

There are some skills that seems new to us but important to the future needs. We as the future leaders must prepare ourselves in every aspects as we cannot predict what the future will be as it moves too rapid and unpredictable. With the skills provide in our education system might not be that enough as many company needs a unique individual with special skills to compete with other huge company. Individuals are not bonded to stick to how the education system provides them but they need to make own research in improving themselves as this are what being seen by the employers.

Top 10 skills

in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity



Source: Future of Jobs Report, World Economic Forum