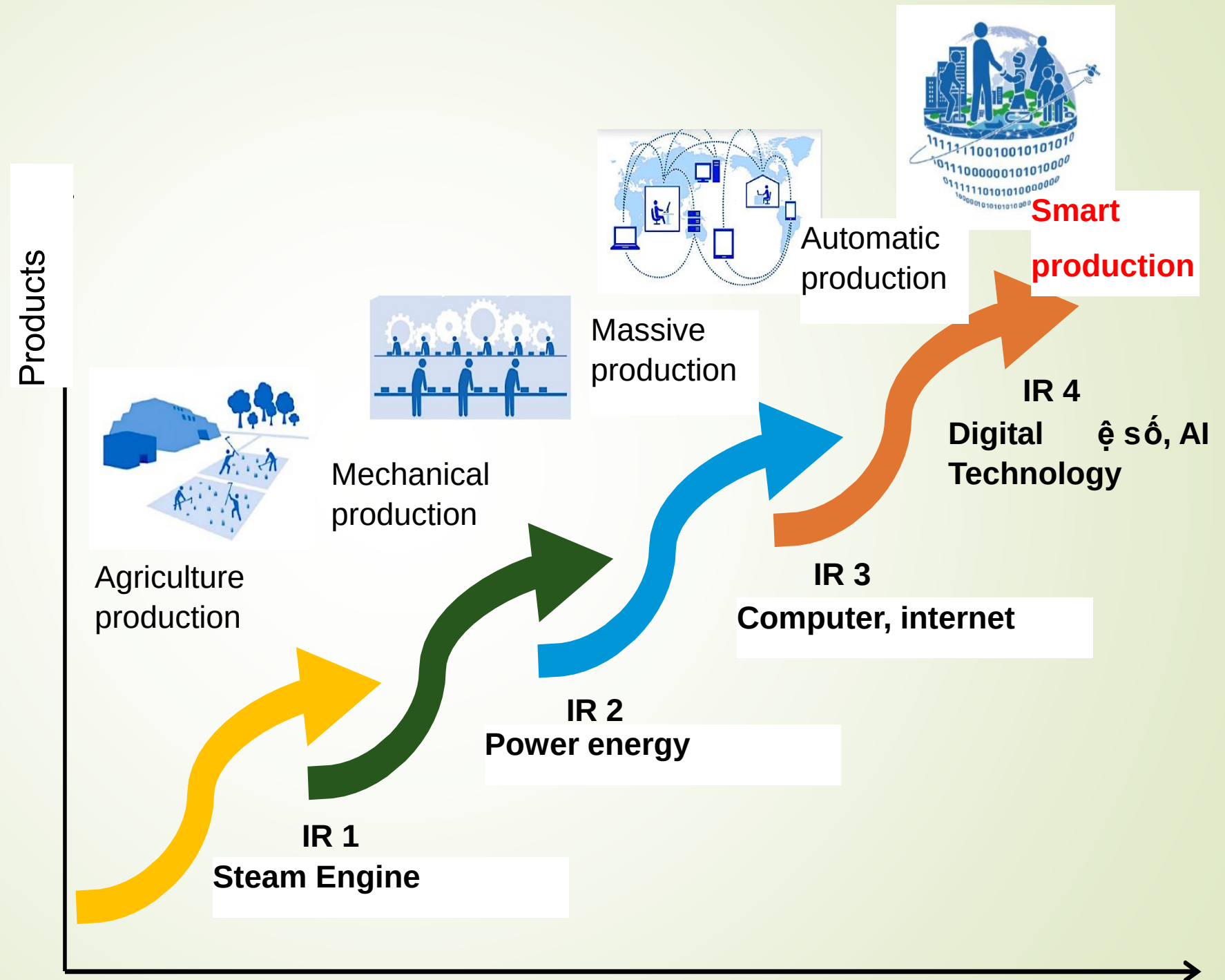


# **INDUSTRIAL REVOLUTION 4.0 THE ISSUES POSED TO VIET NAM**

**Assoc. Prof. Dr. Trần Đình Thiên  
Vietnam Institute of Economics**

# Processes to the Industrial Revolution (IR) 4.0



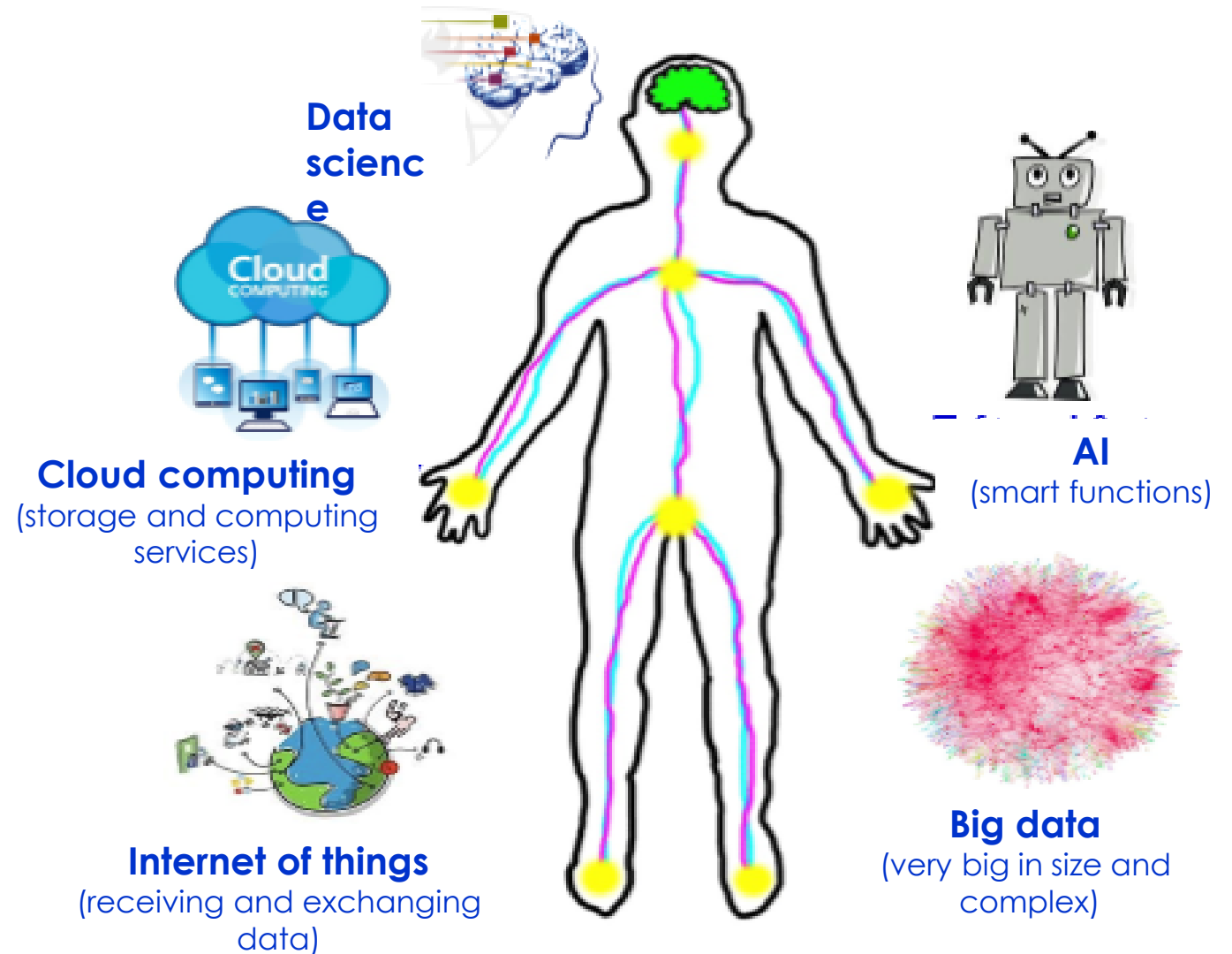
Although all technologies are advanced, it is **the technological disruptions** that have led to IR 4, and IR 4 will be dependent on the harmonious development between other technologies and digital technology

## Công nghệ số - Digital technology

- Technologies for electrical equipment and the applications using information in the form of **codes** (e.g. from analog signals to digital signals: sound in a CD that is digitalized with 65,536 levels)
- **Digitalization** (e.g.: cameras, watches, printing, Televisions, etc.) **Processing** of the digitalized data

# Disruptions of digital technologies

- **Cloud computing:**  
Environment
- **Big data:**  
Energy
- **Internet of things:**  
Artery
- **Artificial intelligence:**  
Smart functions
- **Data science:**  
“Brain” analyzes data to support decision making



## IR 4.0 – LIMITLESSNESS OF OPPORTUNITIES AND CHALLENGES?



- ➔ New capacities, new demands, new methods, coupled with endless innovative capacity of the brain ➔ opening up a limitless space for development
- ➔ Result in radical changes in humans' ways of life, working and interpersonal relations. An evolving system with new – different logics
- ➔ Opportunities are boundless, individual capacity is limited ➔ most enormous challenge ever

# IR 4.0: Unprecedented scale and speed

6

- **Scale:** technological disruptions *concomitantly take place in various fields that interact and stimulate one another*
  - Nano technology
  - Artificial intelligence, robots
  - Internet of things
  - 3D printing technology, bio-technology, material science
  - Self-driving cars, energy storage
- **Speed:** Speed of the **IR-4.0 is exponential**  
To reach **50 million users:** phones: 75 years, radio: 38 yrs, TV: 13 yrs, Internet: 4 yrs, Facebook: 3.5 yrs
- **Impacting factors:** *Internet infrastructure* that stimulates idea sharing +, resources for realizing the ideas ➡ **Trade liberalization** at the global level = difference of the era

# Impacts: robust and comprehensive

IR-4.0 has enormous impacts on:

- ***Economy, society and environment***
- All levels – ***global, regional and each nation.***
- ***Long-term positive*** impacts but also generating ***numerous short- and medium-term challenges that need adjustments.***

# DEVELOPMENT STRUCTURE AND LOGIC CHANGE RADICALLY

8

- Previously, only the "real/actual" economy, the "physical" system existed. At present, the "virtual" economy, the "digital" system are engaged in at a very high speed, upsetting the role of the structural factors: "digital – virtual" dominates "physical – actual".
- Operational mechanism of the economy and life have changed: global connections, high speed, smart - self-management.
- Scale, structure of opportunities and risks have changed, typically: employment and income
  - ❖ Many old sectors disappeared, which resulted in job loss, lost labour incomes.
  - ❖ Various new sectors appear, which creates new job opportunities and incomes, meanwhile new capacities are required.

➔ Social and economic disparity, increased risks

# Economic impacts

*From the production perspective, in the long run, the IR-4.0 will have tremendously positive impacts.*

**IR-4.0 vigorously impacts consumption, production and prices**

- From the **consumption and price** perspectives, everyone benefits thanks to accessibility to various new and high quality products and services and with lower costs
- **IR-4.0 positively impacts global inflation** attributable to technological disruptions **that help significantly save inputs** and thereby **drastically reducing the push cost pressures.**

# IR-4.0 is re-mapping the world economy

10

## ➤ ***"Technology-intensive" economies will benefit:***

- The U.S – recovers its leading status
  - Northeast Asian countries (Japan, Korea, Taiwan, China) will be also drastically engaged in, especially in the field of manufacturing industry.
  - Germany and some European countries will also strongly participate
- ## ➤ ***The countries that mainly rely on exploitation of petroleum and natural resources will be heavily affected:*** OPEC, Australia, Canada, Russia, Brazil, etc. are undergoing the challenging process of restructuring
- ## ➤ ***The countries that compete based on the advantage of cheap labor will be negatively impacted*** as manufacturing and service industries are returning to the developed countries so as to be close to the consumption markets as well as R & D centers.

# Environmental impacts

11

**IR-4.0 will have positive impacts in the short term and extremely positive impacts in medium and long terms thanks to:**

- ➡ The development of energy- and raw material-saving, environmentally-friendly technologies with significant cost reduction
- ➡ Environmental monitoring technologies are also growing fast, supported by Internet of things, enabling continuous and real-time collection and processing of information 24/7.

# THREATS AND CHALLENGES FOR EMPLOYMENT

- **5 jobs having most risks of being lost:**
  - Blue-collar workers in factories – 44%
  - Cashiers – 40%
  - Taxi drivers – 20%
  - Customer care staff – 18%
  - Pilots – 16%
- **5 jobs that are hardly lost to robots**
  - Doctors/nurses – 3%
  - Lawyers – 4%
  - Journalists – 5%
  - Researchers – 6%
  - Farmers – 11%

# ROBOTS CHASE HUMANS AWAY

Fundamental contradictions: **IR 4.0 will *sharply increase supply sources while demands may fail to catch up with*** due to the fact that a great number of workers will be replaced by robots, resulting in income loss or declined income

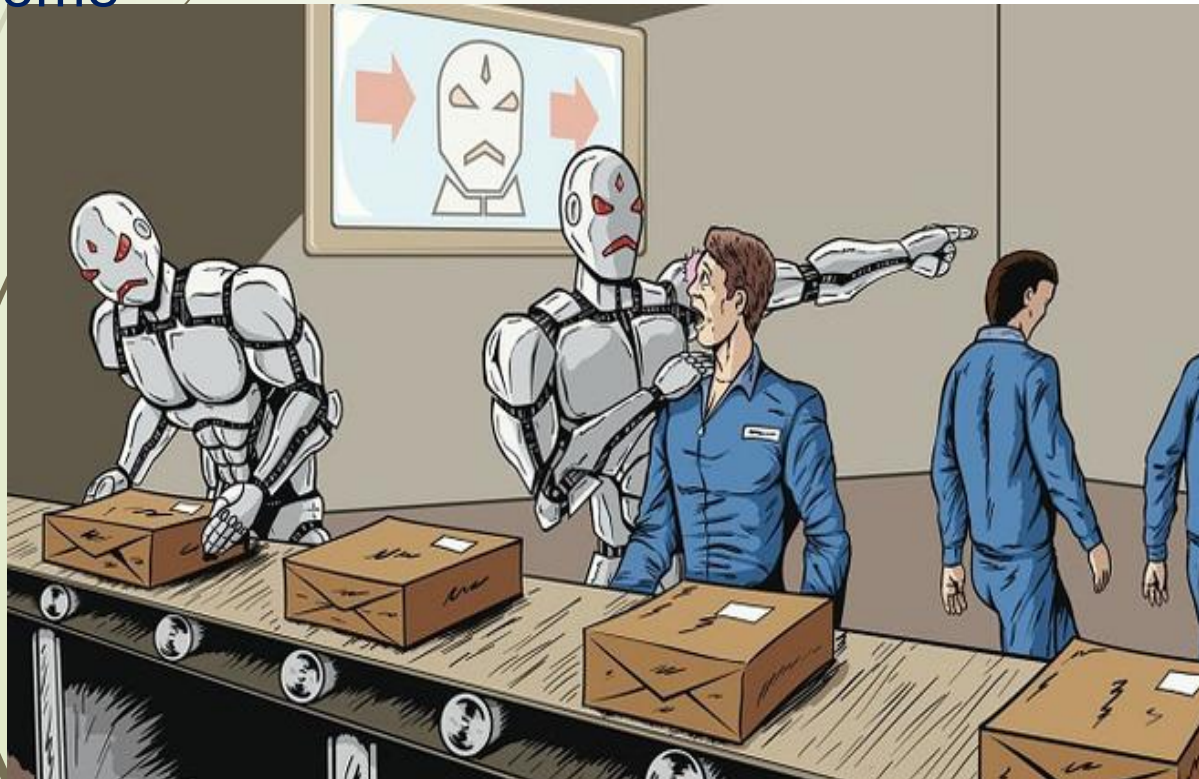
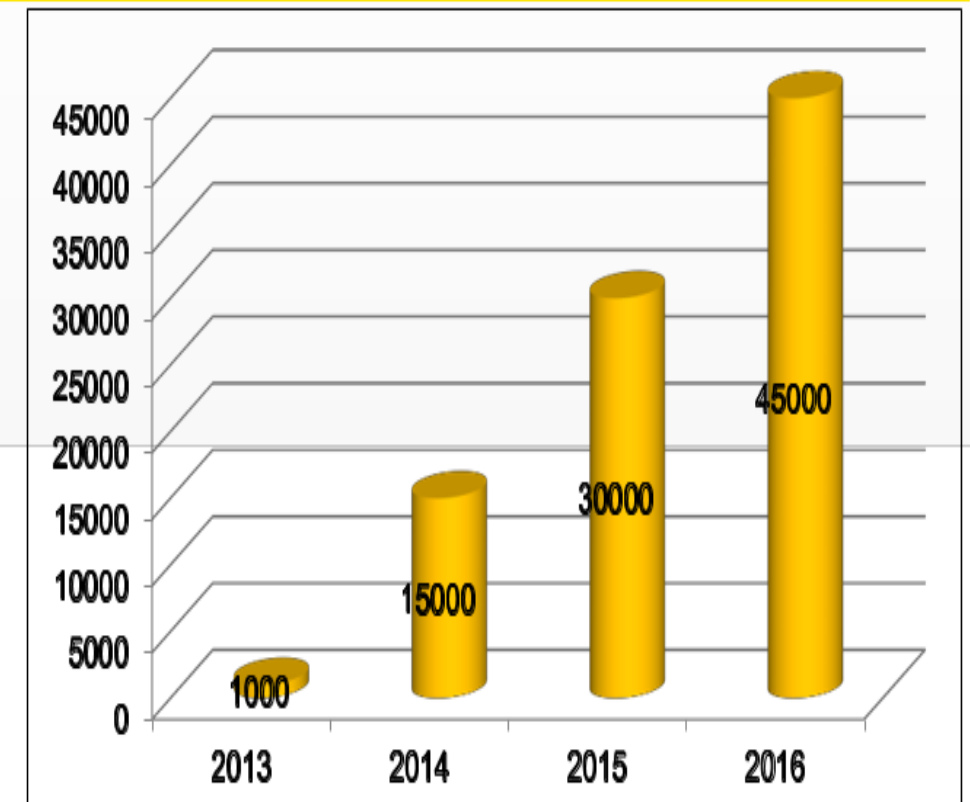


Figure 5. Number of robots working at Amazon



Nguồn: E & Y 2017.

# CHALLENGES TO CYBER SECURITY AND SOCIAL GOVERNANCE

## ➤ Challenges of cyber security:

- Cyber risks – mal software, blackmailing, Phishing and Social Engineering, cyber attacks – are growing
- Threats to national security
- Global crimes

## ➤ State governance:

- National or global?
- Large scale of subjects?
- Complexity and novelty of relationships
- Publicity and transparency?

## ➤ Self management – smart system?

## ➤ AI social administration/ governance?

# PRESSURES FOR ENGAGEMENT OF VIET NAM

**Pressure of being “lagged behind”** but integrating into a hi-tech world.

**Competitive pressure:** with the TCH and hi-tech world  
+ **FOXXCON** uses 45,000 robots to replace all "conventional" workers. **Amazon:** The summer of 2016: only 10,000 robots, after one year, deployed more than 15,000 robots.

+ **China:** The manufacturing industry of robots is over-developing and redundant of manufacturing capacity (more than 800 companies manufacturing robots, manufacturing 72,400 robots in 2016, up by 34.3% versus 2015).

## IR-4.0: Opportunities and challenges for Viet Nam

**IR-4.0** will significantly impact Viet Nam, generating *numerous opportunities and challenges*, especially in the medium and long term.

### ➤ **Advantages:**

- ➡ Aspiration and determination to avoid being lagged behind;
- ➡ Young and dynamic population
- ➡ Advantages of a follower
- ➡ High openness

### ➤ **Disadvantages:**

- ➡ Weak physical strengths and capacity (finance, human resource businesses, innovation)
- ➡ Binding/restraining institutions

# IR-4.0: Opportunities and challenges for Viet Nam

- ILO: In the next two decades, 56% of workers in five ASEAN countries (including Viet Nam), 86% of textile and footwear workers in Viet Nam will be in danger of losing their jobs because of robots.
- Vietnam's textile and footwear industries are stuck between:
- Workers from Cambodia, Bangladesh, Myanmar are cheaper. Robots, automated processes will rapidly reduce in costs in developed countries.

Robots are replacing workers is a fact going on in Viet Nam. At Minh Long Ceramics and Porcelainwares Co. Ltd: 90% of workers lost their jobs as the production line only needs 5 robots in substitution for more than 100 workers.



Robot phục vụ bàn ăn

© AFP 2017/ JOHANNES EISELE

# What does Viet Nam need to do?

18

- 1. Formulating a digital transformation strategy**
- 2. Intelligent management (modern institutions, effective government, publicity, transparency)**
- 3. Developing digitally-linked infrastructure and cyber security**
- 4. Creating digital human resources**
- 5. Building Digital Technology Industry; Smart Agriculture; Smart travel, ...**
- 6. Generating a creative, innovative ecosystem and start up**
- 7. Smart urban construction**

# Policy approach

If going on track and tuning in the right tempo, **IR-4.0 will create opportunities for Viet Nam to shorten the development gaps, or else Viet Nam will be further left behind.**

Therefore, Vietnam needs to implement ***a dual agenda:***

- (i) Continue solving outstanding socio-economic and environmental issues that have been unsolved since the previous periods of heated growth,
  - (ii) Quickly take advantages of opportunities and surmount new emerging challenges related to **R-4.0**.
- ➡ The content of the development strategy must include the contents of both groups. Focus should be particularly placed on construction of digital infrastructure and “digital” capacities

# AN OPPORTUNITY FOR THE SOCIAL INSURANCE SECTOR

- Digitalized world and global digital connections, through webs and smart tools. The wider the webs are and the more connection points there are, the more efficient it is.
- Social insurance beneficiaries will also change in scope, structure, nature (open - global links, increased general income, changeable opportunity-risk, high abnormality).
- Scale, structure, conditions, competencies and competitiveness [supply - demand and competition] in social insurance activities will change dramatically.
- Conditions and needs for renovation to social insurance activities will become vigorous and urgent