INDUSTRIAL REVOLUTION 4.0
THE ISSUES POSED TO VIET NAM

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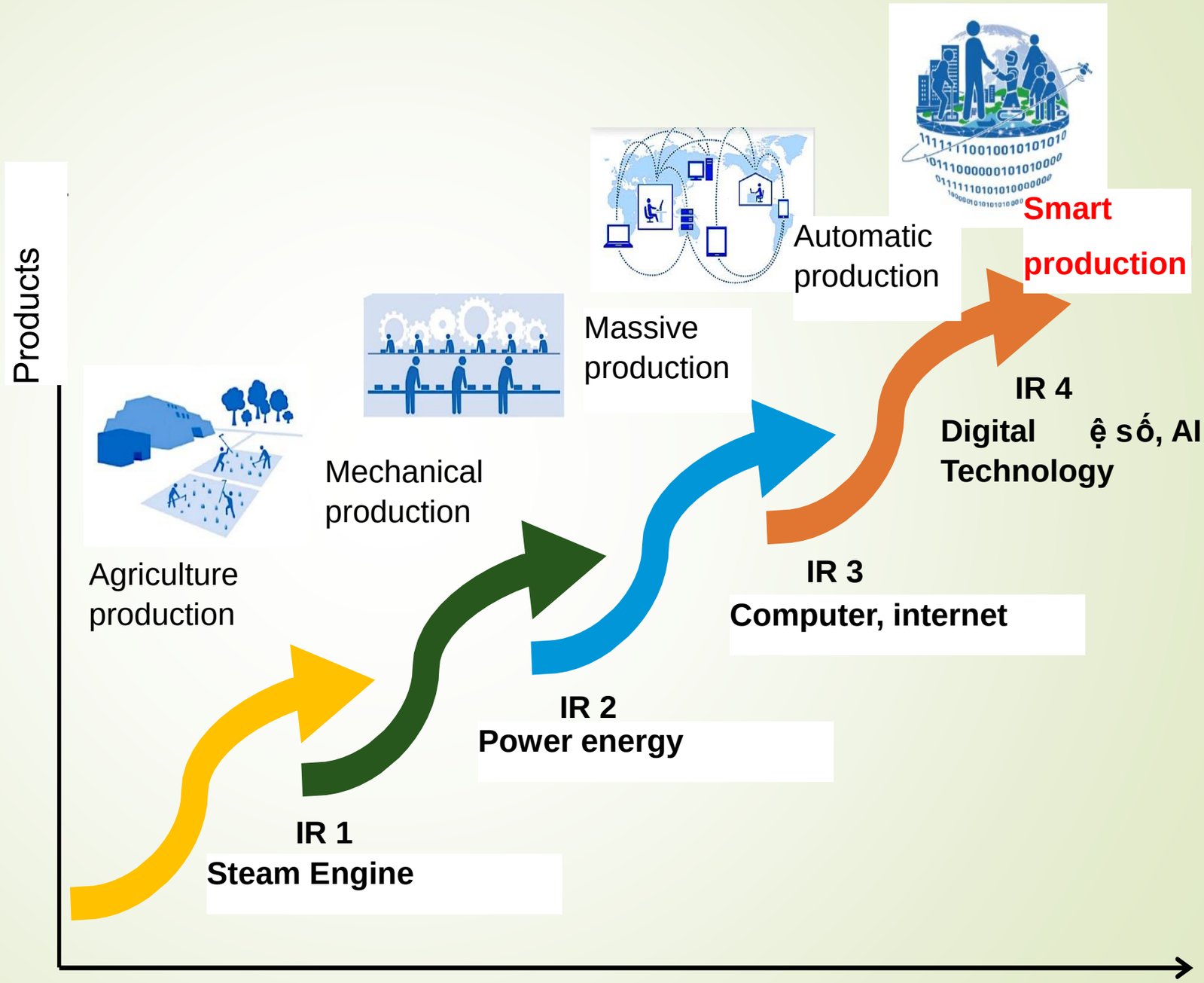
Process to the Industrial Revolution (IR) 4.0



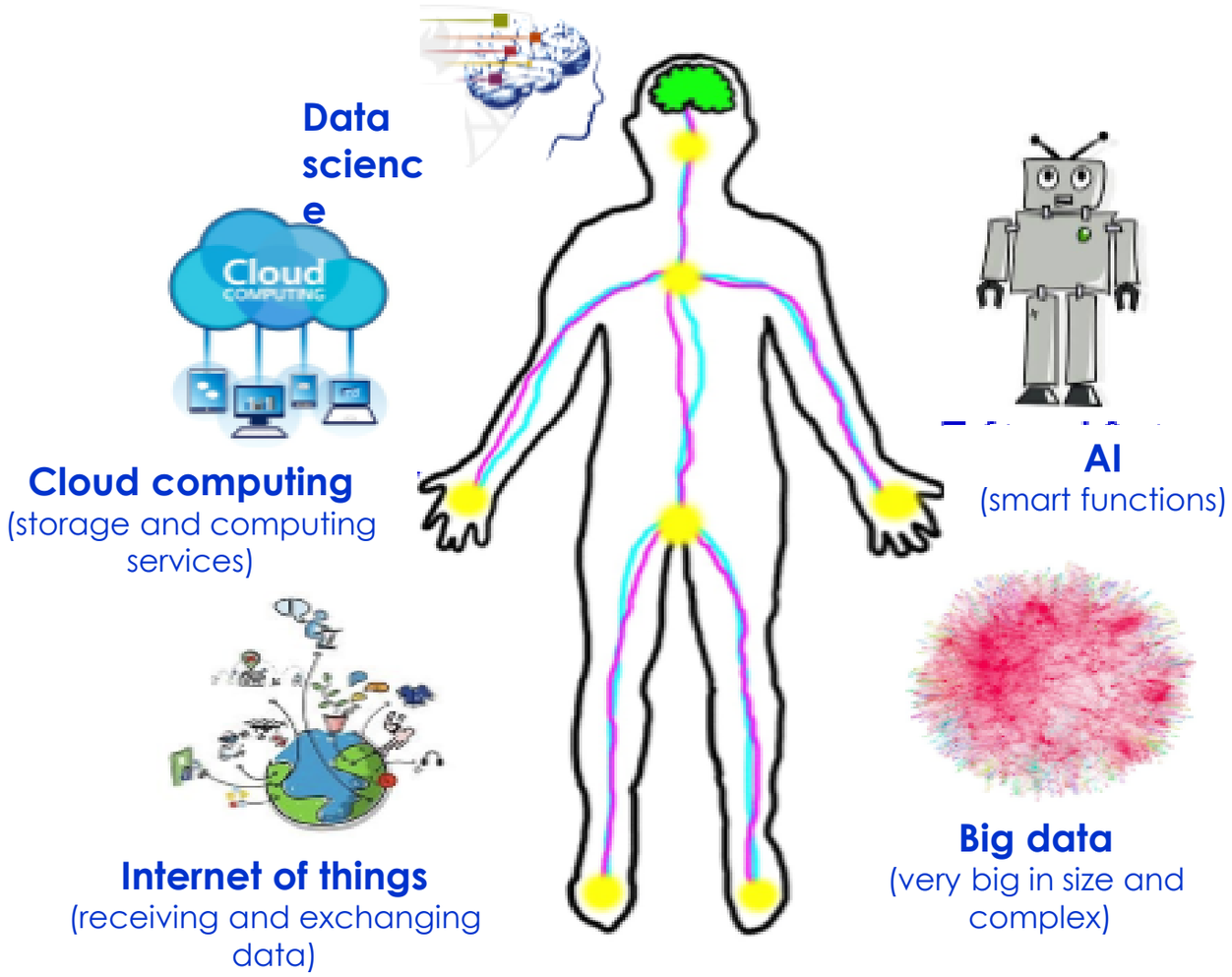
Although all technologies are advanced, it is **the technological disruptions** that have led to IR 4, and IR 4 will be dependent on the harmonious development between other technologies and digital technology

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 limitlessness 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

- **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 LOGIG CHANGE RADICALLY

- 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.

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

- ***"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 petrolium 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

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

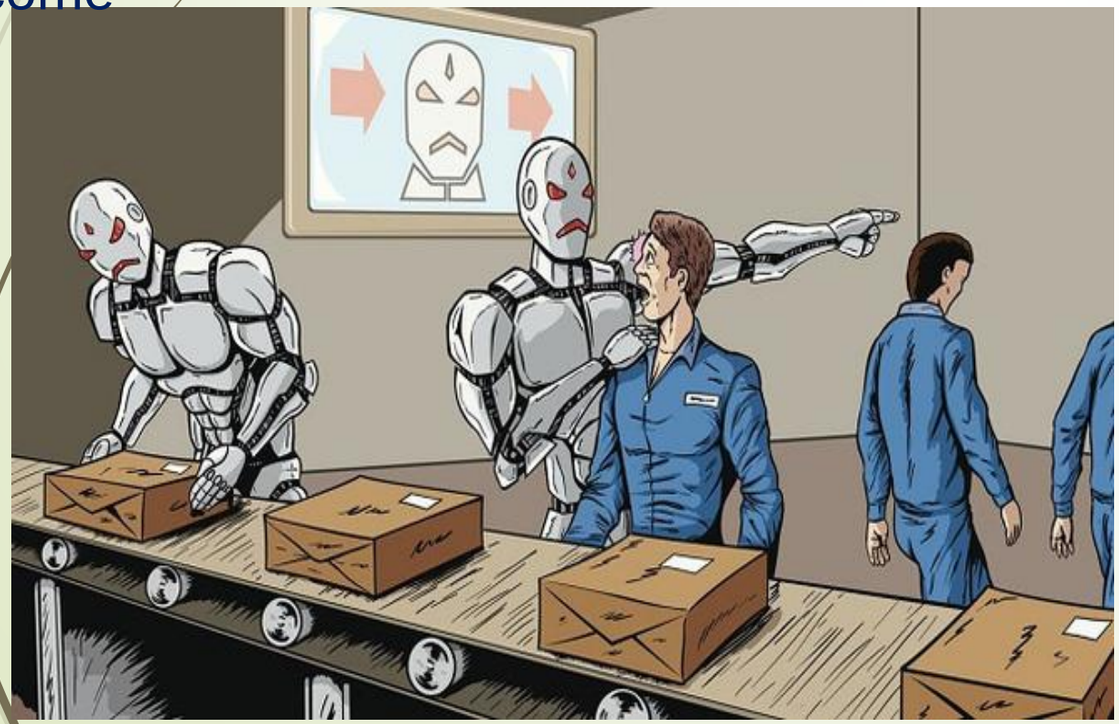
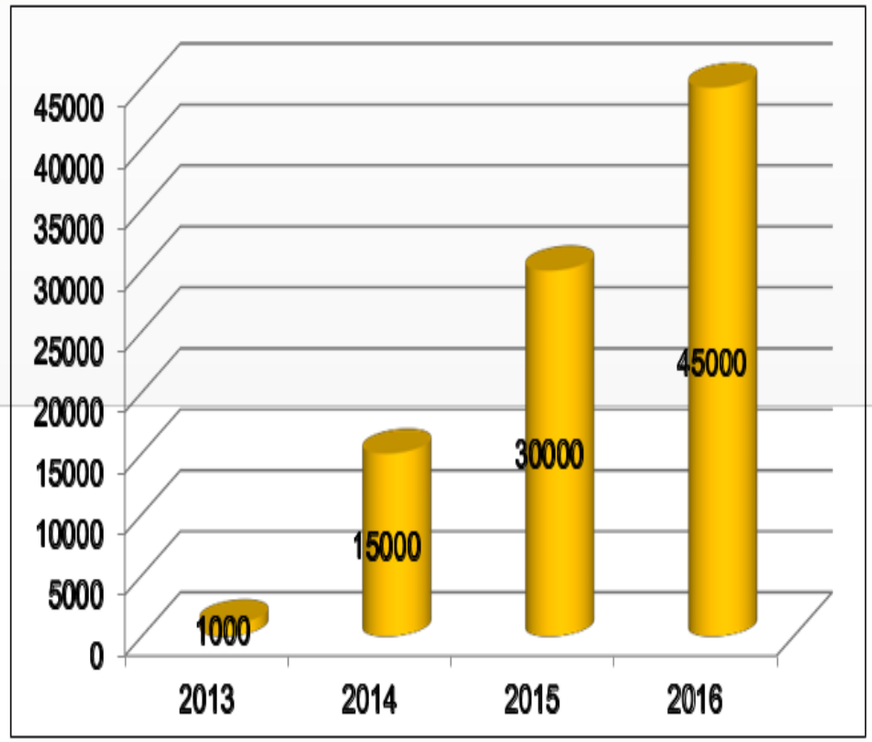


Figure 5. Number of robots working at Amazon



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 openess
- **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.

Robot phục vụ bàn ăn

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.

What does Viet Nam need to do?

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