

Overview: Emerging Technologies and Issues

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Introduction to the Course on Digital Commerce
and Emerging Technologies

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What is the digital economy?

The digital economy is the share of total economic output derived from a number of broad “digital” inputs. These digital inputs include digital skills, digital equipment (hardware, software and communications equipment) and the intermediate digital goods and services used in production. Such broad measures reflect the foundations of the digital economy.

Source: Accenture

Digital transformations affect...

- ▶ How we communicate with each other e.g. using mobile phones, social media
- ▶ How we conduct business e.g. e-commerce, multi-channel marketing
- ▶ How we produce goods and services e.g. by using sensors, 3D printing, robots
- ▶ How we live e.g. e-learning, online shopping
- ▶ How we work e.g. teleworking, freelancing
- ▶ How we spend recreational time e.g. video streaming, music streaming, social media

In the next 60 seconds

- ▶ 100,000 tweets are sent
- ▶ 204 million emails are sent
- ▶ Google receives 2+ million queries
- ▶ Apple processes 47,000 app downloads
- ▶ 48 hours of new video are uploaded to YouTube
- ▶ Facebook users share 684,478 pieces of content

Emerging technologies in the digital economy

- ▶ UNCTAD Information Economy Report 2017 highlighted that the digital economy is growing rapidly underpinned by the introduction of key technologies, including cloud computing, big data analytics, the Internet of Things (IoT), artificial intelligence (AI), robotics, 3D printing.
- ▶ Interplay of IoT, big data and artificial intelligence (IA) will be one of the main engines of future technological and economic growth.
- ▶ Impact of 3D printing on digital commerce
- ▶ For each of the above areas, the course covers: (a) definition of the technology; (b) areas of application; © main policy questions arising from the new technology; (d) interplay with development

Interplay between AI, Big Data and IoT

- ▶ Key interplay between:
 1. AI: Data-based learning
 2. Big data: Capture, storage, analysis of data
 3. IoT: Data collection through IoT
- ▶ Data collected by IoT sensor contributes to building large pools of data (big data) which, in turn, can be processed and used for the development of machine learning and artificial intelligence.

Internet of Things (IoT)

- ▶ Definition: where Internet connectivity becomes expanded to everyday devices such as cars, home appliances, clothes, city infrastructure, and medical and health care devices.
- ▶ Term first coined in 1999 by Kevin Ashton of Massachusetts Institute of Technology. Envisioned a world where the Internet would be linked to the physical world through ubiquitous sensors collecting feedback real time.
- ▶ One example of a rapidly growing industry IoT: autonomous or driverless cars
- ▶ IoT devices cut across industries. Their interconnection forms systems typically described as “smart houses”, “smart cities”, and eventually “smart countries”.

Internet of Things (IoT): Growing rapidly

- ▶ With 20-50 billion devices connecting online in the next five years, the IoT transformation will be the next disruptive ICT development.
- ▶ Technology and services revenue connected to the IoT marketplace grew at an 8.8% compound annual growth rate (CAGR) from 2012-2017 - increasing from \$4.8 trillion to \$7.3 trillion (source: IDC)



Big data

- ▶ In year 2000, estimated that a quarter of the information available in the world was digital. By 2010, only 2% of the available information was non-digital.
- ▶ Cross-border flows are estimated to have augmented 45 times from 2005 to 2015 (McKinsey, 2016)
- ▶ While no clear definition for “big data”, there is clear trend toward datafication.
- ▶ Datafication refers to: (1) process of digitization; (2) production of information in digital format.
- ▶ Businesses and organisations increasingly depend on digitization and analysis of their data to operate properly.

Big data applications for digital commerce

- ▶ Enhanced personalization: Digital commerce companies use targeted advertising such as personalized promotional emails
- ▶ Pricing agility: Companies can analyze competitor prices and price trends in real time and adapt their pricing accordingly
- ▶ Improving conversions: Companies can track a visitor's experience and behavior on their website, and use that information to determine what influences a consumer to buy
- ▶ Inventory management: Companies can predict and optimize how much to keep in supply.

Artificial intelligence (AI)

- ▶ Artificial intelligence (AI) is the ability of a computer to perform tasks commonly associated with intelligent beings. For example, the ability to reason, discover meaning, generalize or learn from past experience.
- ▶ AI is not a new topic, but the increase in computing capacity and availability of ever larger pools of data has enabled extraordinary progress in the field of AI in recent years.
- ▶ New wave of automation brought by AI is likely to generate considerable productivity growth. On the other hand, concerns have been raised regarding the impact that this automation could have on security, jobs and employment.

Application of AI in digital commerce

- ▶ Enabling an automated shopping experience
- ▶ Creating a more personalized customer experience
- ▶ Retargeting potential customers
- ▶ Creating an efficient sales process

Example of AI integrated in CRM

- ▶ If the AI system enables natural language learning and voice input, like Siri or Alexa, a customer relations management (CRM) system will be able to answer customer queries, solve problems and even identify new opportunities for sale.
- ▶ The North Face uses AI to help customers find the best jacket for them. Customers answer a few questions using voice input and the AI technology finds the jackets that best fit the situation based on customer input and the system's own research.
- ▶ More examples described in the Digital Commerce Course.

3D Printing

- ▶ 3D Printing consists of creating physical products from a digital design file by superposting substrate materials using a layer-upon-layer printing approach. Also known as “additive manufacturing”.
- ▶ Makes it possible for individuals to design and produce tangible products on demand. This opens up new possibilities for just-in-time production and customization which, in a previous time, would have been prohibitively expensive for an individual and small businesses.
- ▶ The high potential for customization is one of the reasons why 3D printing has been successfully used in the healthcare sector to make prosthetic limbs, custom hearing aids and dental fixtures.
- ▶ Supply chain implications: The printing of the product can be done closer to the point of sale with much less storage, inventory and logistics involved. Potential scenario of localized production.
- ▶ The industrial sector is expected to undergo a deep transformation, called by some “the third industrial revolution” when the convergence between robotics, AI, and 3D printing intensifies.

Thank you!

**Feel free to contact me should you
like any further information.**