V10.128 -
A Holistic Approach to Innovation

Lecture 03:
Digital Transformation

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1. Information Technologies in Firms: Current Situation

- Our era is characterized by technological innovation, which causes **rapid changes in technologies and processes** in organisations (El Sawy, Malhotra, Park, Pavlou, 2010), **causing misalignments between strategies and operations in organizations** (McAdam, Bititci, Galbraith, 2017).
- E.g.: **Digital technology makes paper filing obsolete**.



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1. Information Technologies in Firms: Definition of Digital Transformation

- The adaptation to these rapid changes is called digital transformation.
- "**Digital transformation is characterized by changes ... which are driven and built on a foundation of [information] technologies. Within an enterprise, digital transformation is defined as an organizational shift to big data, analytics, cloud, mobile and social media platforms**" (Nwankpa, Roumani, 2016).
- Adopting digital transformation into the processes of firms is considered of high importance for contemporary firms to survive.
- Digital transformation changes the **business models** in many industries (Osterwalder, Pigneur, 2010; Dhar, Sundararajan, 2007).



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1. Information Technologies in Firms: Business Models based on IT Platforms

- A **platform is a center for connections between providers and customers**
- Through IT-platform-based businesses, **customers and providers join, to conduct economic transactions** freely and without any barrier
- Various services emerged through information technology (IT) platform-based businesses
  - For example:









  - TaskRabbit: connects providers, who are willing to provide labor, to customers, who need help for everyday tasks such as cleaning, moving, and assembling furniture
  - Uber: provides transportation by connecting drivers to customers

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1. Information Technologies in Firms: Classes of IT-Platform-Based Business Models

- **Computing Platforms** (e.g., Amazon Web Services, Microsoft Azure)
- **Communication Platforms** (e.g., Apple iOS, Google Android, Microsoft Windows, Twillio)
- **Utility Platforms** (e.g., Google Search, Kayak and Zenefits)
- **Interaction Network Platforms** (e.g., Facebook, WeChat)
- **Marketplace Platforms** (e.g., eBay, Amazon Marketplace, AirBnB, Kickstarter or UpWork)
- **On-demand Service Platforms** (e.g., Uber, Munchery and Heal)
- **Content Crowdsourcing Platforms** (e.g., YouTube, Yelp and TripAdvisor)
- **Data Harvesting Platforms** (e.g., Waze, OpenSignal and InsideSales.com
- … (more platforms at data.platform-hunt.com)

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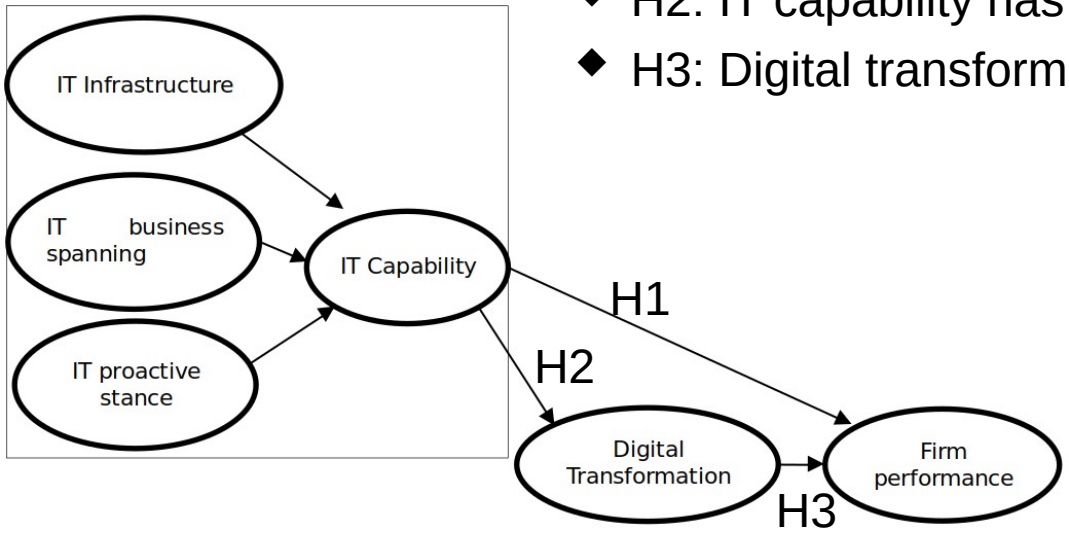
2. Benefits of Digital Transformation: Opportunities through IT in Firms

- Consequently, there has been an increase in interest in **understanding how firms and organizations can benefit** from this phenomenon and conduct transformation within their respective structures (Nwankpa, Roumani, 2016).
- Especially, a lot of **research** is conducted to find how digital capabilities can help gaining competitive advantage (Yoo, Henfridsson, Lyytinen, 2010).
- It has been shown that **digital transformation**
  - makes firms **more competitive**
  - makes employees **more productive**
  - allows to provide **better customer experiences**

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2. Benefits of Digital Transformation: Benefit Model: Example 1

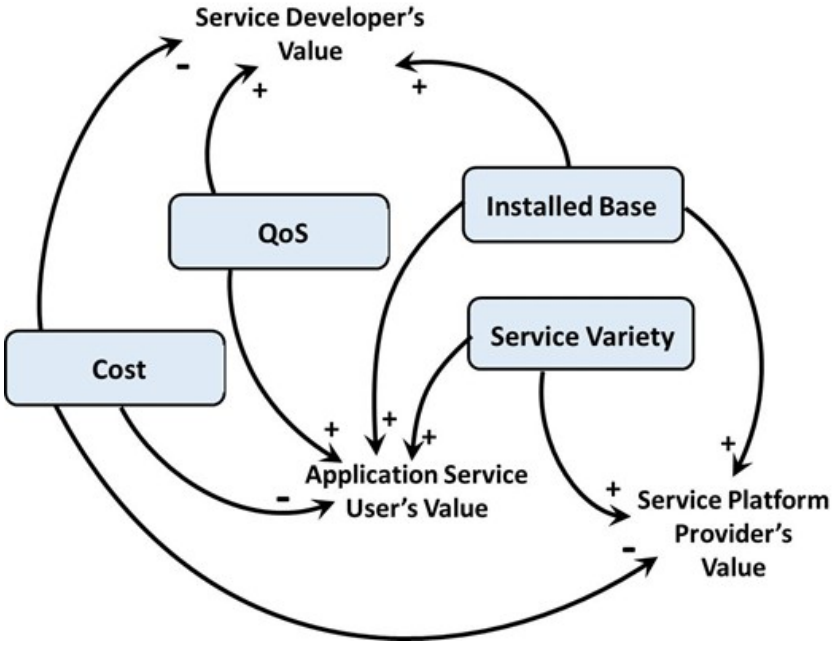
- A **research model** adopted from Nwankpa & Roumani (2016) for measuring the performance of a firm is:
  - H1: IT capability has a positive relationship with firm performance
  - H2: IT capability has a positive impact on digital transformation
  - H3: Digital transformation has a impact on firm performance



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2. Benefits of Digital Transformation: Benefit Model: Example 2

- **A value creation model can show the effects of service parameters on the values** (utilities) obtained by stakeholders (i.e., service developer, service platform provider, users). In detail, it can show:
  - **Impact of stakeholder values on dynamics of customer attraction**
  - **Impact of stakeholder decisions on value, and**
  - **Feedback loops indicating direct and indirect network effects**



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3. Challenges at Firm Level: Resources and Skills are Needed

- Companies **face challenges to exploit** successfully new opportunities of **digital technologies** (UNCTAD, 2017; Müller & Hopf, 2017), as they do **not have the agility and flexibility** required (Horlach et al. 2016)
- The **firm environment has to be ready** before digital transformation can be started.

  For example: Although Ecuadorian firms have access to broadband networks, the **lack of more advanced digital tools and applications prevents firms** to access new markets, spur innovation, and to enhance productivity (MINTEL, 2018; OECD, 2017).



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3. Challenges at Firm Level: Continuous Change

- As **technological innovation is continuous, digital transformation must be an ongoing process**.
- The digital market evolves fast (Forbes, 2019), as the IT industry shows strong growth.
- When new technological innovations go to market and digital markets evolve fast (Forbes, 2019), firms need to be ready for digital transformation.



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3. Challenges at Firm Level: Effective Implementation of Technology Takes Time

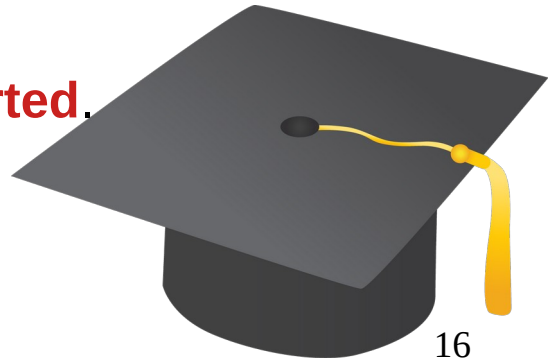
- The **challenging task is to find the right technology to be implemented**.
  - Implementations of many technological innovations can result in chaos.
  - Adopting new **enterprise management solutions** takes a lot of time and effort.
- It **takes time to train employees** how to use the technological innovation effectively.



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3. Challenges at Firm Level: Upheaval & Uncertainty for Employees

- **Continuous technological innovations and their implementations is a burden** for employees.
  - Adaptation to technological changes causes stress.
  - Adaptation to technological changes requires the **willingness of employees to learn** and change.
- Employees usually **do not feel prepared and supported** for those digital transformations.
- **Learning of employees need to be continuous and supported**.



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4. Challenges in a Wider Context: Disruption of Industries

- **Platforms have the potential to disrupt existing industries**, as the platforms of Uber, Zipcar, Lyft, Airbnb did, or shake up previously less organized services, as TaskRabbit, Handy, Upwork did (Kenney and Zysman 2015; Zysman and Kenney 2017a).
- **With respect to the disruptions and shake ups, different standpoints of institutions and platform-based businesses can be observed**
  - For example:

Uber claims that it is a technology company in the IT field. Uber claims to provide technology only and that Uber drivers are independent contractors

Whether the company is **providing transportation or technology became legal cases** around the world.(* Case No. C-13-3826 EMC Document251, Filed 03/11/15, United States District Court, ORDER DENYING DEFENDANT UBER TECHNOLOGIES, INC.'S MOTION FOR SUMMARY JUDGMENT (Docket No. 211))

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4. Challenges in a Wider Context: Not Everybody Benefits

- Digital technologies adoption and use vary among economies, industries, and firm size, raising **concerns about the benefits of digital transformation** (OECD, 2017).
  - Digital inclusion
  - Digital gap
  - Employment reduction
  - Concentration of power



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5. Discussion Session:
5.1. Setting

- **It is essential to understand how digital transformation and, especially, IT platform-based businesses work**, to imagine **how our economies will work in the future**.
- **Without this understanding, platform-based businesses will use their market power to:**

  Extract surplus of platform stakeholders (Restaurants earn less using the platform, as the platform fees increase (e.g., yogiyo))

  Imbalanced value distribution between the platform stakeholders (i.e., achieves in-sustainability),

  Disable competition, and with that, **the emergence of innovation**,

  Collect private data to manipulate the end-users behavior

- Without this understanding, the **current tendencies of wealth accumulation in the hands of a few (1% of word population) will continue**, putting the majority of the society (90%) into a weak position.

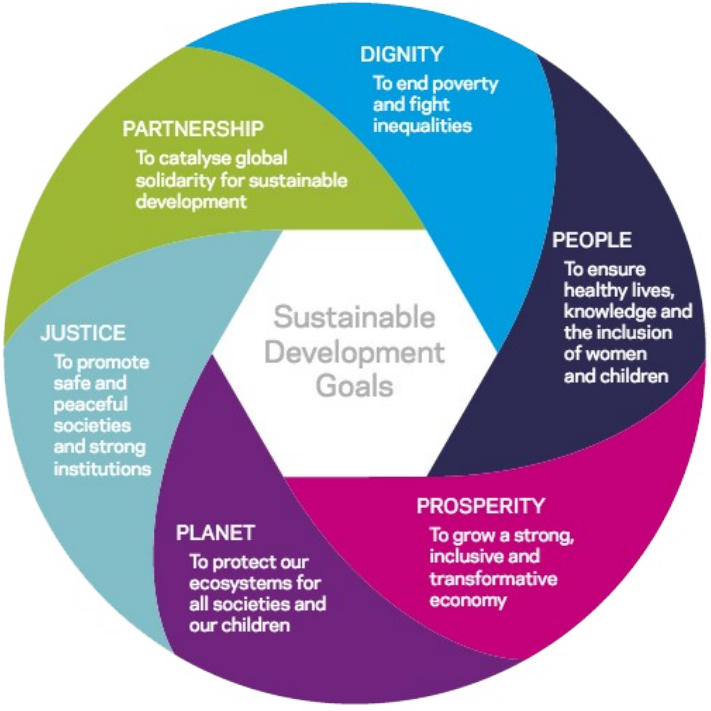


Figure by Elsevier and SciDev.Net (2015) on sustainable development goals reproduces the figure of the United Nations (2015)

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5. Discussion Session:
5.2. Group Discussion: Perspective 1

(Pro Position: “Unconditional Digital Transformation Results in the Best Possible Outcome for Firms and Society”)

- General Perspective 1
  - Task: Imagine and describe how successful firms look like in 2066
  - Task: Imagine and describe people who can still work in 2066.
  - Task: Imagine and describe a society that exists 2066.
  - Task: Describe the winners and losers in 2066, and demonstrate that the lack of inclusion of all members of a society is no problem.

- Individual Perspective 1
  - Task: Considering the general developments in 2066, imagine and describe your own position/job/purpose in 2066.

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5. Discussion Session:
5.2. Group Discussion: Perspective 2

(Contra Position: “Digital Transformation Needs to Be Balanced with other Developments that Societies Need”)

- General Perspective 2:
  - Task: Describe what needs to be done to achieve a balance.
  - Task: Imagine and describe a society in 2066 that found a balance between automation and tasks (purpose in life) for people.
  - Task: Imagine and describe the workforce in 2066.
  - Task: Describe the winners and losers in 2066. Describe whether there is an inclusion problem and/or digital gap.
- Individual Perspective 2:
  - Task: Considering the general developments in 2026, imagine and describe your own position/job/purpose in this future scenario.

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5. Discussion Session:
5.2. Group Discussion: Assignment

- Groups A and B and C prepare 3 slides (5 min) about “general perspective 1” and prepare 1 slide (3 min) about “individual perspective 1”
- Groups D and E and F prepare 3 slides (5 min) about “general perspective 2” and prepare 1 slide (3 min) about “individual perspective 2”

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5. Discussion Session:
5.3. Plenary Discussion

- Group A presents 3 slides (5 min) about “general perspective 1”
- Group B presents 1 slide (3 min) about “individual perspective 1”
- Group F presents challenges perspective 1 (12 min)
- Group D presents 3 slides (5 min) about “general perspective 2”
- Group E presents 1 slide (3 min) about “individual perspective 2”
- Group C presents challenges perspective 2 (12 min)

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