

Invited lecture at Korea University

Digital Transformation and Innovation – *Concepts, Cases, and Contemplation*

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Self-introduction



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Academic background

- 2013 – 2018 PhD in **Technology and Innovation Management**, SPRU, University of Sussex
- 2012 – 2013 MSc in **Technology and Innovation Management**, SPRU, University of Sussex
- 1995 – 2001 BEng & MEng in Mechanical Engineering, Seoul National University (South Korea)

Industrial background

- 2010 – 2012 **Innovation** Strategy Manager, Samsung SDS
- 2008 – 2010 **Technology** Strategy Manager, Samsung SDS
- 2001 – 2008 Software Engineer, Samsung SDS

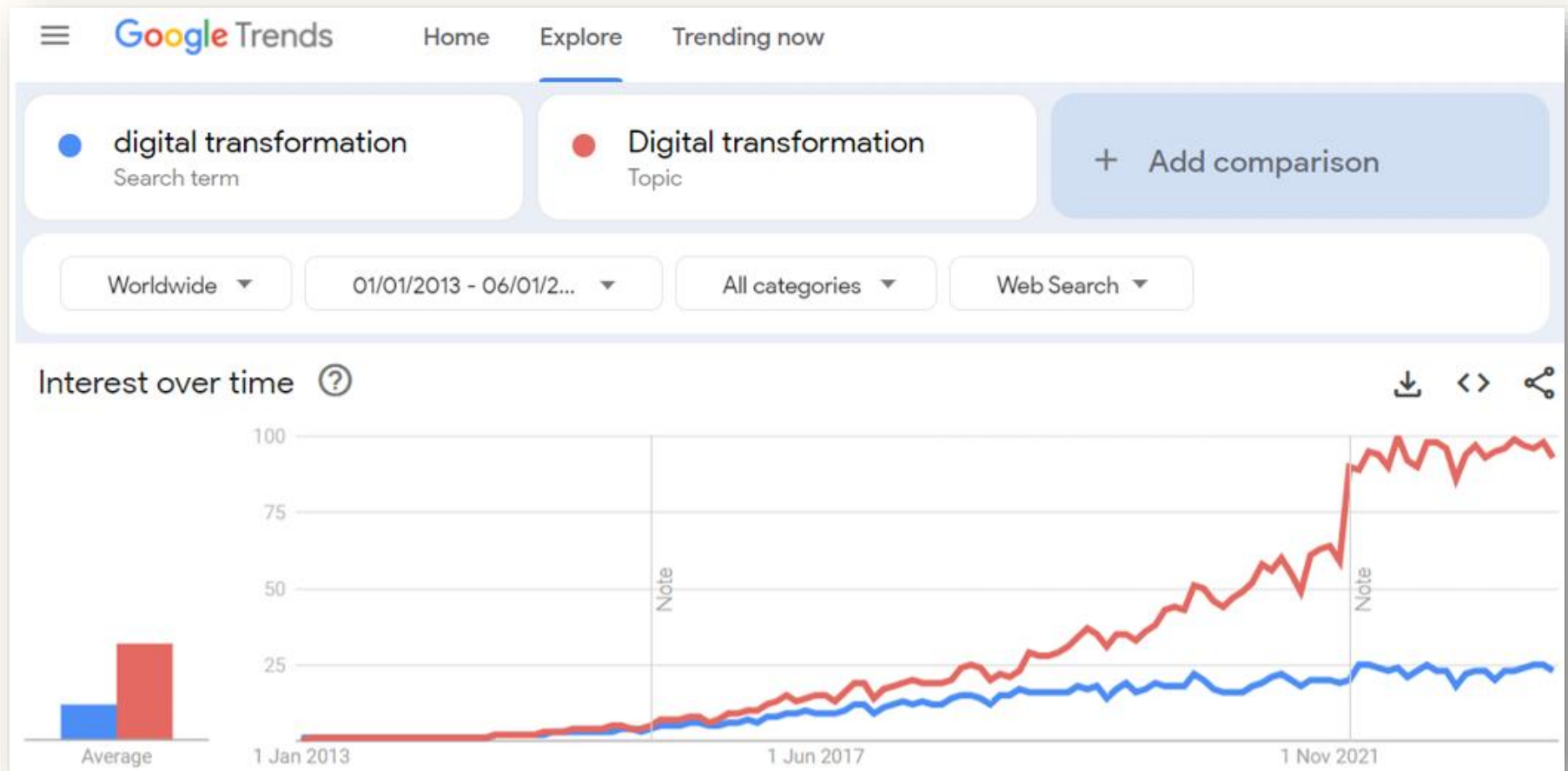
Today's Agenda

- **Background**
- **Digital Transformation – Is it a new phenomenon?**
- **What is ‘Digital Transformation’?**
- **Cases and contemplation**
- **Discussion/Q&A**



Background

- ‘Digital Transformation’ is everywhere



Background

- ‘Digital Transformation’ is creating new JOBS!

I will search some people and will show to you

in digital transformation

Home My Network Jobs

People 1st 2nd 3rd+ Locations Current company All filters Reset

143 results

143 results from my 1st connection, and the number has been increasing...

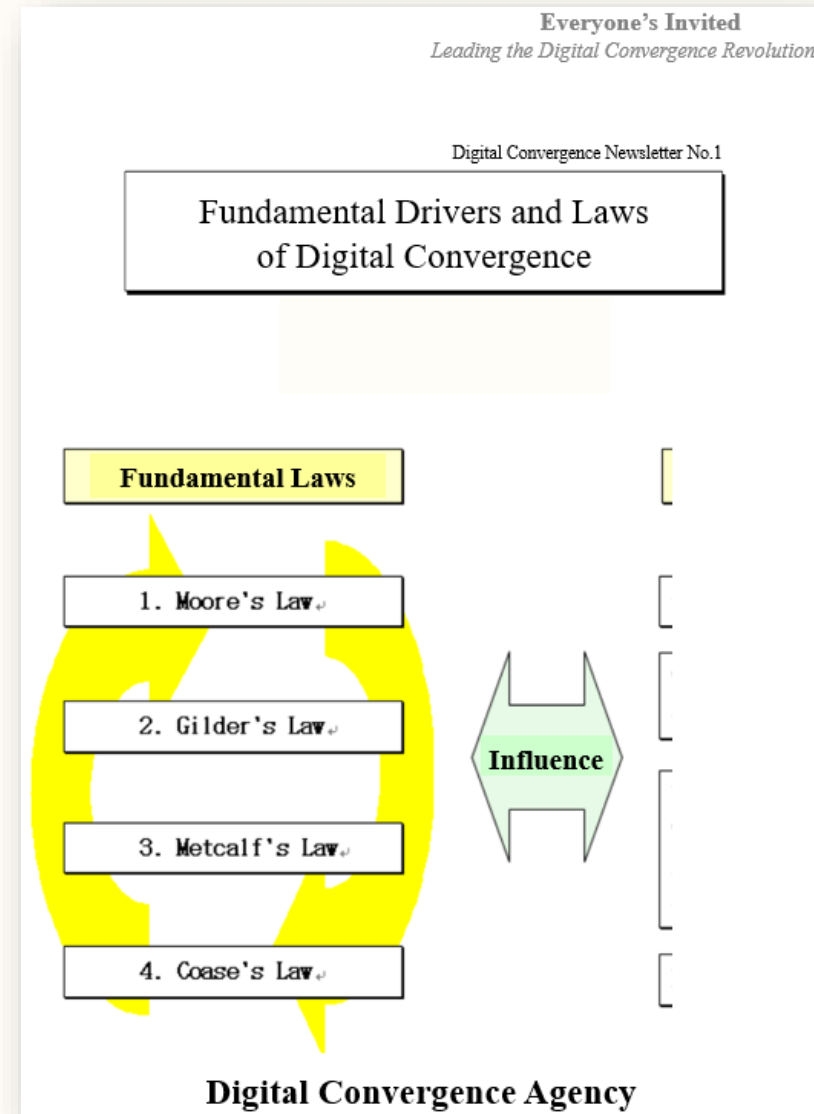
Do you think 'Digital Transformation'
is a new phenomenon?

PolEv.com/stp



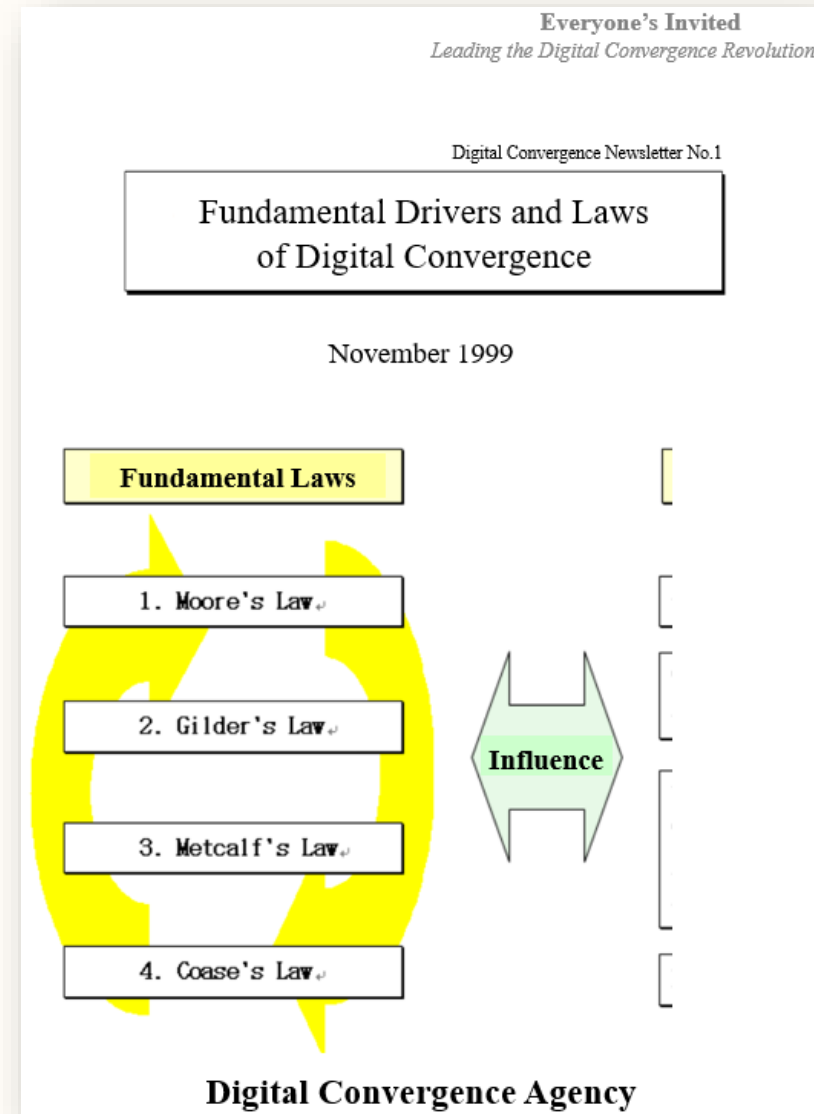
Some Examples

- This is a snapshot of Samsung's newsletter on '**digital convergence revolution**'.
- Can you guess when this 1st newsletter was published/distributed to their members?



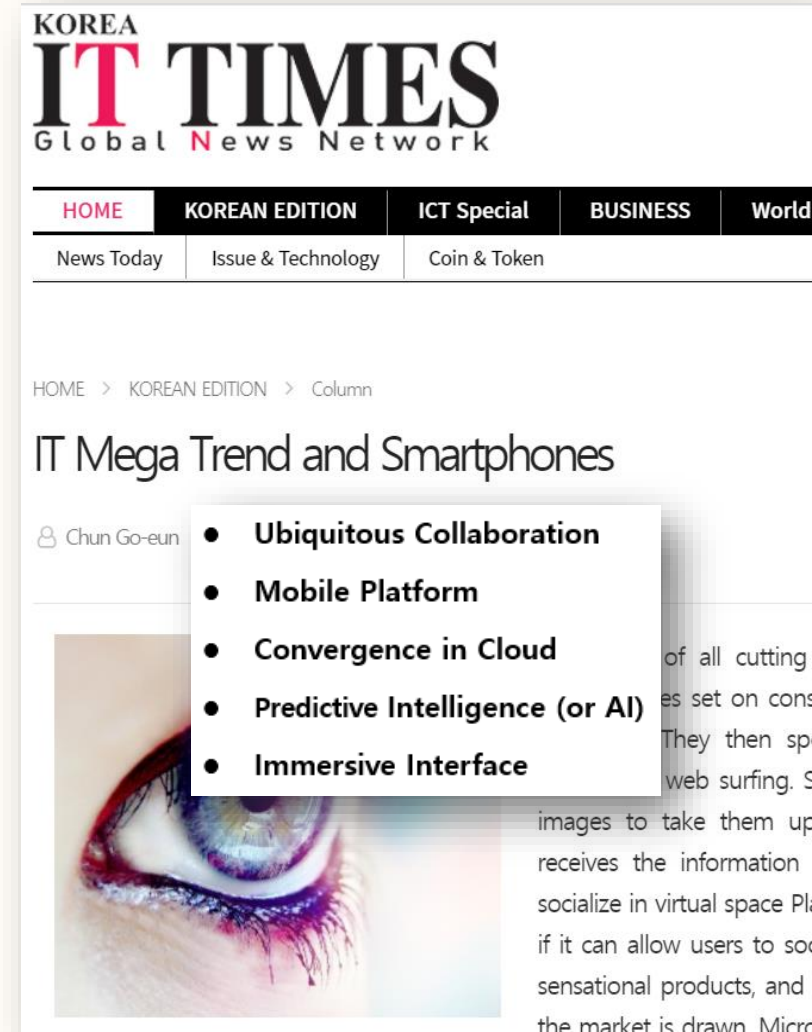
Some Examples

- This is a snapshot of Samsung's newsletter on 'digital convergence revolution'.
- Can you guess when this 1st newsletter was published/distributed to their members?
...
- The series of newsletters were sent to all members of the company since **November 1999 (25+ years ago!!)**



Some Examples

- This is a news article explaining the list of 'IT megatrend' announced by Samsung.
- Can you guess when this list of technology-related trends was publicly announced?
- ...
- Based on their foresight research, the company announced these trends in **November 2009 (15+ years ago!)**.





Digital Transformation does
not seem to be a completely
new phenomenon...

Key Questions

- **What** is Digital Transformation?
- **Why** is it important?
- **So what?**





Part 2. What is Digital Transformation?



Many definitions of 'DT'

- **Some definitions (academic)**

- “... the use of new digital technologies (social media, mobile, analytics or embedded devices) to enable *major business improvements* such as enhancing customer experience, streamlining operations, or creating new business models.” (Fitzgerald *et al.*, 2014: 2)
- “Digital transformation is concerned with the changes digital technologies can bring about in a company’s business model, which result in changed products or organizational structures or in the automation of processes.” (Hess *et al.*, 2016: 124)

Many definitions of 'DT'

- **Some definitions (practical)**

- “anything from IT modernization (for example, cloud computing), to digital optimization, to the invention of new digital business models.” (*Gartner*)
- “The term is widely used in public-sector organizations to refer to modest initiatives such as putting services online or legacy modernization. Thus, the term is more like “digitization” than “digital business transformation.” (*Ibid.*)

Hype, buzzword, or riding a bandwagon?

Gartner Hype Cycle for Digital Marketing and Advertising, 2019



A photograph of a modern, multi-story building at night, illuminated with a deep blue light. The building features a complex facade with large glass windows and balconies. The text "What is Digital Transformation?" is overlaid on the image.

What is
Digital Transformation?

What is ‘Digital’?

- ‘Analogue’ vs ‘Digital’

- “We live in an **analogue** world. There are an **infinite** amount of **colours** to paint an object ... an infinite number of **tones** we can hear, and there are an infinite number of **smells** we can smell. The common theme among all of these analogue signals is their **infinite possibilities**.”¹
- “**Digital** signals and objects deal in the realm of the **discrete** or **finite**, meaning there is a **limited** set of values they can be. That could mean just two total possible values, 255, 4,294,967,296, or anything as long as it’s not ∞ (infinity).”¹

¹ Source: <https://learn.sparkfun.com/tutorials/analog-vs-digital/all>

‘*Digitisation*’ and ‘Digitalisation’

- **Digitisation:** “the conversion of analogue data and processes into a machine readable format” (OECD, 2019: 7)
 - The conversion of analogue data to digital format
 - e.g. Analogue-to-digital converter
- It “makes physical products ... programmable, addressable, sensible, communicable, memorable, traceable and associable.” (Yoo *et al.*, 2010: 725)

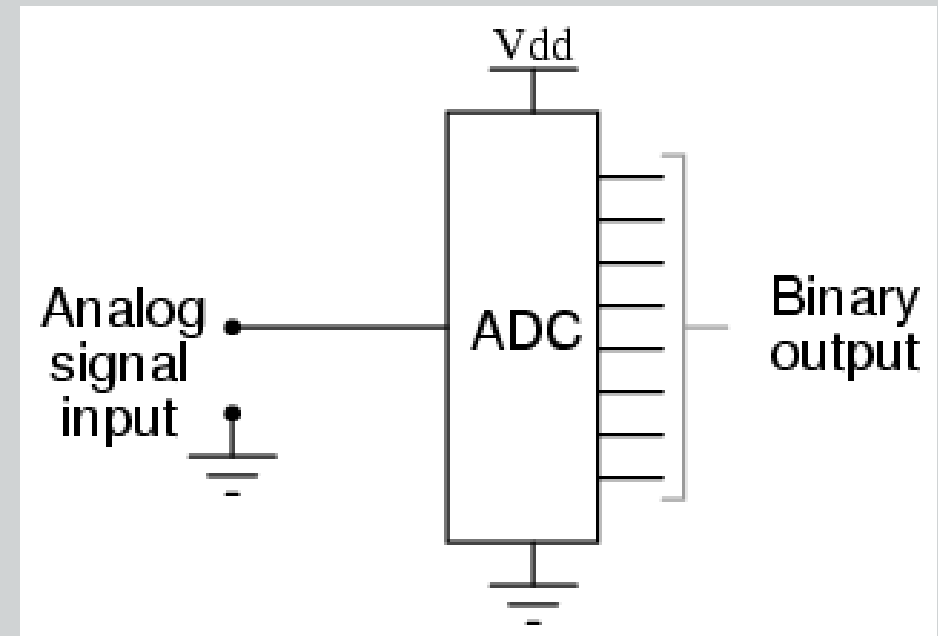


Fig: An analogue-to-digital converter

‘Digitisation’ and ‘*Digitalisation*’

- **Digitalisation:** “the use of data and digital technologies as well as interconnection that results in new, or changes to existing, activities” (OECD, 2019: 7)
 - Changes in product/service and process through the application of digital technologies and **digitisation**
 - e.g. UK’s NHS GP service (2012 vs 2024)
 - NHS: National Health Service
 - GP: General Practice

‘Digitalisation’ – Change in process

- **Digitalisation** is closely related to *change* in the way that firms and people do (e.g. process innovation).
- Let’s think about a question:
 - Is ‘digital transformation’ just a technological change?
 - It is a transformative change. Then, how do, or can we, differentiate a change from a change which is transformative?

Change and **Transformation**

- **Transformation** in the **change** literature
 - According to Demers (2007), a dramatic view of ‘change’ emerged in the change literature since the 1980s.
 - ““Real” change is now seen as a period of discontinuity, of disruption.” (Demers, 2007: 43)
 - “There is recognition that change does not always follow a path of cumulative, gradual adaptation; episodes of **transformation** or **radical change** now take center stage.” (*Ibid.*)
 - “... more attention is given to defining what a **transformation** or **radical change** is, as apposed to an incremental ... change.” (*Ibid.*)

‘Digital Transformation’

- Different levels of change
 - Changes in technology, individual/group, society (socioeconomic change)
- Definitions of ‘**digital transformation**’
 - The economic and societal effects of digitisation and digitalisation (OECD, 2019)
 - “[A] socioeconomic change across individuals, organizations, ecosystems, and societies that are shaped by the adoption and utilization of digital technologies.” (Dąbrowska *et al.*, 2022: 931)

‘Digital Transformation’

- **Digital Transformation:** “the economic and societal effects of digitisation and digitalisation” (OECD, 2019: 7)
- A perspective on ‘**digital transformation**’ adopted by us:

“**Changes** in how the organisation **creates and captures value**, which are **enabled** by **digital technologies**.” (Chang, 2020)



Part 3. Cases and Contemplation

So what?

- **Digital Transformation is *imperative!***
 - Data became a strategic resource (Adner *et al.*, 2019)

- **Static vs dynamic organisations**
 - e.g. Toys“R”Us

- **Importantly, it's *not* all about firms in the 'high-tech' industries**

Some Examples: Food Industry

- **McDonald's McD Tech Labs**

https://youtu.be/mX_I25rrhNM

McDonald's acquires artificial intelligence startup Apprente

By **Mario McKellop** - September 16, 2019

805 0



Source: <https://www.theburnin.com/startups/mcdonalds-acquires-ai-startup-apprente-launches-mcd-tech-labs/>

Earlier this week, McDonald's [announced](#) that it had acquired artificial intelligence (AI) startup [Apprente](#). The corporation purchased the two-year-old firm to integrate its voice

Some Examples: Cosmetic Industry

- Perfect Corp and Estée Lauder

<https://youtu.be/qFn39e9AnUI>

The company behind YouCam Makeup app launches a new set of AR tools for beauty brands like Ulta

Catherine Shu @catherineshu / 10:35 am GMT • January 10, 2019

Comment



Source: <https://techcrunch.com/2019/01/10/the-company-behind-youcam-makeup-app-launches-a-new-set-of-ar-tools-for-beauty-brands-like-ulta/>

Some Examples: Agricultural Industry

- **John Deere's AI Sprayer**

https://youtu.be/FOqko1nB_wc

Volocopter and John Deere team up for a crop-spraying autonomous agricultural drone

Darrell Etherington @etherington / 2:27 pm GMT • November 7, 2019

Comment



Autonomous drone-based transportation startup **Volocopter** has revealed its first partner for its new VoloDrone industrial and commercial electric vertical take-off and landing craft: **John Deere**. The agricultural and industrial heavy equipment company is working with Volocopter on a VoloDrone-based aerial crop-dusting industrial heavy equipment company is working with Volocopter on a VoloDrone-based aerial crop-dusting industrial and commercial electric vertical take-off and landing craft: **John Deere**. The agricultural and autonomous drone-based transportation startup **Volocopter** has revealed its first partner for its new VoloDrone

So what?

- “**Radical**”
 - It can trigger new *radical* changes.
- “**Disruptive**”
 - Changes could be *disruptive*.
- “**Technology**”
 - Changes are enabled by (relatively new) *technologies* (which aren’t understood by many).

Q&As and Discussion