



**UNIMORE**  
UNIVERSITÀ DEGLI STUDI DI  
MODENA E REGGIO EMILIA

# Impact of digital transformations on SMEs. Challenges, opportunities and policy issues

Professor Margherita Russo

Department of Economics 'Marco Biagi', University of Modena and Reggio Emilia, Italy  
CAPP Centre for the Analysis of Public Policies (DEMB-UNIMORE), Italy

WORKSHOP

**THE IMPACTS OF DIGITAL TRANSFORMATION ON INNOVATION ACROSS SECTORS**

21-22 September 2017 | London, Digital Catapult Centre

# Impact of digital transformations on SMEs

→ What can we learn by analyzing the impact on SMEs?

→ Which type of SMEs?

Let's consider SMEs

- in growing manufacturing markets
- specialized in the production of components in supply chains in mechanics (e.g., machinery production, automotive)
- active in ecosystems dense of knowledge
- with an experience in collaboration networks, within and across the supply chains.

# Why do SMEs matter?

- have a relevant share of economic activities
- are essential in the integration of specialized manufacturing activities that could not be managed at higher scales
- are essential in research and innovation, being in the forefront for most innovative insights, thus being a complementary asset in any manufacturing and service economy [K. Arrow, 1982]

# Transition phase: it's a revolution!

## 1\_ incumbent companies → competences

- are formed along the company's lifetime
  - are solidly grounded
    - on the **knowledge, experience of their employees**, and
    - on the **interactions within the company and with other companies** and various **sources of knowledge** provided by research centers and university.
- Both **individual** and **organizational** changes are needed to address the opportunities emerging from the ongoing technological revolution

Transition phase: it's a revolution!

1\_incumbent companies → competences

**Individual changes:** new competences are needed

- What about the ones already employed?
- What about the new competences that must be formed and fine tuned in the new setting?
- What kind of competences and in which array?

Transition phase: it's a revolution!

**1\_incumbent companies → competences**

**Individual changes:** new competences are needed

→ **Multidisciplinary teams** mastering the challenges and opportunities of new technologies, with competences not only in STEM, but also in Psychology, Art, History, Literature, Anthropology, Economics, Language, Design

Case studies:

- the case of autonomous cars [Russo, 2017]
- the RIETI survey on big data use in Japan: the lack of competences not in data analytics, but in the interpretation of the results of data analysis [Motohashi, 2017]

# Transition phase: it's a revolution!

## 1\_incumbent companies → organizational changes

- They are essential
- BUT they not always can be managed with the current competences of SMEs
  - Are organizational changes designed as 'a tool- kit' in the Business Schools?
  - Have those organizational changes to be tailored case by case? By whom?
  - Who has the competences to design a new organizational setting for the many different SMEs in the different sectors?

# Transition phase: it's a revolution!

## 2\_ digital vs. manual

- not a dichotomy, but essential complementary components for producing very high quality products

Two examples from the Lamborghini plant

- The case of the manual analysis of leathers, by using hand touch and visual control, preliminary to the laser cutting, to optimize the use of the material
- The case of production of the carbon fiber shells, in which hand shaping gives the touch of perfection



# A matter of scale

- If multidisciplinary competences are needed, they could not be afforded at a small scale.
  - It's a matter of adequate use of those resources that would not result to be fully employed within an individual SME.

A solution: vertical disintegration (phase specialization)

i.e. the creation of a specific business dedicated to those activities, whose scale must be appropriate for exploiting the benefits of the many diverse competences for a larger scale of activity → providing the services produced by those set of competences to supply many SMEs.

# A matter of scale

## vertical disintegration & specialization

an opportunity for creating new businesses to support SMEs.

- Are SMEs aware of the benefits they could receive?
- Are they prepared to change their interaction settings by demanding those new services?
  - demand and supply in **a market that has not yet formed**
  - need for **policy interventions** and **for intermediary agents** supporting the formation of a new market
    - relevance and credibility of intermediaries is crucial
    - crowding out effect of their action must be controlled
    - business models of the intermediaries should be discussed, ie subsidies vs 'market' pricing of their services

# Policy interventions

## some urgent challenges to be addressed

- How can these new multi-competences companies can be supported?
- Which role can be played by the Higher Education Institutions?
- Are the Entrepreneurship Programs appropriate to cope with those needs?
- What competences should intermediaries have to enhance their effectiveness in supporting complex networks connecting business companies, research institutions, government and civil society?