



# UNTANGLED

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## CONTENTS

From the editors 1

New UNTANGLED paper on the impact of digital technologies on wage inequalities 2

UNTANGLED researchers present findings at automation and well-being workshop 3

Insight from PROJECT BEYOND 4.0: from project findings to policy recommendations 4

## FROM THE EDITORS

The UNTANGLED team has been busy with a variety of tasks over the past three months, as we head into the final year of our project. We're working on a range of topics, and gearing up to deliver several key outputs in the coming quarters, including our first policy briefs.

In this quarter, UNTANGLED researchers published a paper on the impact of digital technologies on intraregional wage inequality and presented preliminary results of their findings on the impact of automation on wage and household inequality.

This edition of the newsletter also features an article sharing insights from BEYOND 4.0. This project just came to an end, so we asked four researchers to share some of their key findings on regional entrepreneurial ecosystems – sets of interdependent actors and factors that enable productive entrepreneurship within a particular territory. They deliver several helpful insights and recommendations for policymakers.

We also have several events planned for next months. Our seventh Virtual Expert Café will take place on May 25th, 2023, from 2-3:30 pm CET. And we'll hold a workshop on skill changes and the value of skills on June 15.



### Upcoming events

**25 May** – UNTANGLED Virtual Expert Café

**15 June** – Workshop on skill changes and the value of skills

Follow us on social media or check [projectuntangled.eu](https://projectuntangled.eu) to make sure you don't miss out!



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101004776

## NEW UNTANGLED PAPER ON THE IMPACT OF DIGITAL TECHNOLOGIES ON WAGE INEQUALITIES

In the research paper “*The digital service economy as a source of intraregional wage inequalities*” Roberta Capello, Camilla Lenzi and Elisa Panzera analyse how three models of the digital service economy – the product-service economy, sharing economy and online service model – affect wage disparities within European regions.



**Roberta Capello**



**Camilla Lenzi**



**Elisa Panzera**

Roberta Capello, Camilla Lenzi & Elisa Panzera (2023).

“*The digital service economy as a source of intraregional wage inequalities*”  
(Deliverable 4.7).

Leuven: UNTANGLED project  
1001004776 – H2020.

In the research paper “The digital service economy as a source of intraregional wage inequalities” Roberta Capello, Camilla Lenzi and Elisa Panzera analyse how three models of the digital service economy – the product-service economy, sharing economy and online service model – affect wage disparities within European regions.

They find that diffusion of the digital service economy contributes to the widening of intraregional wage inequalities in Europe, especially when three economic models coexist, reinforcing their impact.

Each of these models has specific characteristics. The product-service economy entails a strategy whereby manufacturers offer their customers not only products but also various services, such as training or consultancy. Meanwhile, the sharing economy is based on the creation of new online markets for underutilised assets (e.g. a spare seat in a car, a spare bedroom, spare time) which are made temporarily accessible to other users upon payment based on a peer-to-peer exchange (BlaBlaCar, TaskRabbit, Airbnb). Finally, the online service economy involves digital platforms providing services, products or content (e.g. mobility solutions, food delivery services, payment) without owning the necessary assets. This value creation model rests on the dematerialisation of assets or products, enabled by the unbundling of products from the service a product can provide (Deliveroo, Uber).

“Popular fears that the diffusion of the new technologies will increase inequalities are not fully misplaced. However, regions are not similarly exposed to these risks, and only some of them are experiencing a widening of wage inequality conditions,” says Roberta Capello, professor at the Politecnico di Milano.

She and her co-authors analysed data on innovations and wages from 164 regions between 2009 and 2016 and found that a noticeable widening of wage inequalities took place in regions where digital service economy models were fully developed and co-occurred. When only one model prevailed, its impact on wage disparities was limited.

“Our findings suggest that in regions with a fully developed digital service economy pattern, or in those where sharing economy is dominant, policymakers should focus on interventions,” says Camilla Lenzi.

The paper is available [here](#).

## UNTANGLED RESEARCHERS PRESENT FINDINGS AT AUTOMATION AND WELL-BEING WORKSHOP

UNTANGLED researchers Piotr Lewandowski and Zuzanna Kowalik of IBS participated in the workshop *Automation and Well-being* at the University of Groningen on April 14.



**Piotr Lewandowski**



**Zuzanna Kowalik**

UNTANGLED researchers Piotr Lewandowski and Zuzanna Kowalik of IBS participated in the workshop *Automation and Well-being* at the University of Groningen on April 14. The interdisciplinary event brought together researchers in economics, economic geography, sociology, organizational psychology, management science and technology, and innovation science. The speakers presented complementary perspectives on the consequences of automation technologies. Piotr Lewandowski presented the paper “Automation and Income Inequality in Europe”, co-authored with Karina Doorley (ESRI), Jan Gromadzki (IBS), Philippe Van Kerm (LISER), and Dora Tuda (ESRI).

Their preliminary findings suggest that between 2006 and 2018, the adoption of robots significantly reduced wages and employment in Europe. Although automation widened wage inequality, it had a minimal impact on household income inequality. Finally, they found that risk sharing in households and redistribution cushion the effect of automation.

The slide features a red background with a white circular graphic on the right side. The IBS logo is in the top left corner. The title 'Automation and Income Inequality in Europe' is centered in white. Below the title, it says 'Preliminary - please do not cite'. The authors' names and affiliations are listed at the bottom.

ibs institute for structural research

### Automation and Income Inequality in Europe

Preliminary - please do not cite

Karina Doorley (ESRI, Trinity College Dublin, IZA)  
Jan Gromadzki (IBS, SGH, IZA)  
**Piotr Lewandowski (IBS, IZA, RWI)**  
Dora Tuda (ESRI, Trinity College Dublin)  
Philippe Van Kerm (LISER, University of Luxembourg)

1 / 26

## INSIGHT FROM PROJECT BEYOND 4.0: FROM PROJECT FINDINGS TO POLICY RECOMMENDATIONS<sup>1</sup>



**Vassil Kirov, Bulgarian  
Academy of Sciences**



**Gabriela Yordanova, Bulgarian  
Academy of Sciences**



**Steven Dhondt, TNO**



**Peter Oeij, TNO**

In this blog, we summarise some core results of the BEYOND 4.0 analysis of regional entrepreneurial ecosystems – sets of interdependent actors and factors governed to enable productive entrepreneurship within a particular territory. Entrepreneurship is a crucial driver of economic change, with innovation, diffusion, and competition mechanisms. The impact of digitalisation depends on how such entrepreneurs implement and use technology themselves and collaborate with others. If a region can maintain innovative entrepreneurship, then while digitalisation may cause disruption, new start-ups and scale-ups create new jobs and economic growth.

To understand what will happen with work in the future, there is a need for a broader perspective on technology. The future of work cannot be deduced from an analysis of tasks. Growth in Europe is dependent on how regions use opportunities to conquer new markets and develop new products/services. Companies use the same technology in very different ways; the same technology can be adapted into different products and services. This means that digital transformation will lead to different scenarios. Regions can deal with technologies in a resilient way. At the same time, these technologies can be a recipe for economic disaster. Social and policy shaping is needed to ensure socially inclusive outcomes, especially in a context where social impacts have been exacerbated by the Covid-19 pandemic.

The BEYOND 4.0 research focused on understanding how ecosystems research could provide useful policy recommendations in the context of digital transformation. If technological transformation can be conceived as a race between work augmentation and work substitution, then regions have a role to play in steering this race. Regions have important leverage in the sense that they make decisions to develop and support sectors with economic potential.

BEYOND 4.0 sees (digital) technologies as socially shaped. This means that there is a space for regulation at different levels and by different actors/institutions. To understand these social forces, we need to look at history and understand how the long term matters. We also need to understand how institutions influence the selection and shaping of technologies. This perspective is needed to guide consistent, long-term policy.

BEYOND 4.0's understanding is that digital transformation should not be seen as a threat, but rather as an opportunity that should be guided toward socially inclusive results. Our core recommendations should be understood based on that principle.

<sup>1</sup> This text is part of Chapter 4, "Supporting the inclusive growth of ecosystems in the context of the digital transformation" from the forthcoming book *The Practical Side of Digital Transformation: A Tool Book for Practitioners*, Peter R.A. Oeij, Vassil Kirov, Egoitz Pomares (Editors). Sofia 2023, Prof. Marin Drinov Publishing House of Bulgarian Academy of Sciences.

## > INSIGHT FROM PROJECT BEYOND 4.0: FROM PROJECT FINDINGS TO POLICY RECOMMENDATIONS<sup>1</sup>

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### **Preparing, attracting and preserving talent**

In our analysis of entrepreneurial ecosystems, we learnt that all companies struggle to attract sufficient talent. Ecosystems' economic performance can be explained by their access to sufficient talent (Dhondt et al. 2022). Ecosystems have focused on two major pathways: to develop talent locally or attract talent internationally. In the case of the Dutch Brainport ecosystem, there has been a great deal of policy support to attract international talent. Each month, hundreds of internationals are allowed to work for local firms. Over the past decade, a lot of effort has been invested in redirecting local talent to technical education. By contrast, for a region such as Sofia most of the action has remained local. The city has been able to further support the existing pool of workers with excellent IT skills. These people understand the newest digital technologies. This growth of local IT specialists has worked as an attractor for many international companies. However, in the future Sofia will need to attract international talent to maintain the local growth of the ICT sector. Future success in any entrepreneurial ecosystem depends on finding a balance between developing local talent and attracting it from other regions and countries.

### **Boosting networks: a long-term mission**

Entrepreneurial ecosystems show the importance of networks and networking between actors to support economic growth. This networking could take different forms, but should be based on a long-term, consistent supporting policy effort. As illustrated by the case of Sofia, European and national funding programmes have included the involvement of crucial ecosystems' stakeholders. Regional and local authorities and governments created arenas (e.g. discussions, forums) where stakeholders discussed issues and built trust to develop coherent long-term plans.

### **Crafting conditions and building on knowledge**

Another lesson is that the focus should not be on managing digital transformation itself, but rather on stimulating companies to experiment with the most diverse technologies and new business models. Within entrepreneurial ecosystems, there should be room for experimentation and learning. Universities, research centres and companies need to collaborate to create this learning experience. One example is Sofia's municipal Sandbox for IT Technologies. This experimenting should be supported by targeted investment in key technologies, part of individual regions' smart specialisation. European policies should be directed to support such efforts, mainly in those EU regions that lag behind in the development of the knowledge-sharing economy.

### **Developing infrastructure is also needed in the context of digital transformation**

Entrepreneurial ecosystems are only as strong as their physical and digital infrastructure. It is certain that in the context of digital transformation, digital infrastructure has become a crucial element for success. The availability of fast, reliable internet service has been pointed out as a precondition for the development of the Bulgarian ICT ecosystem. But other infrastructure elements may play a role in connecting companies and clients. Regarding the element of physical (and ICT) infrastructure, respondents from all regions/ecosystems state that multimodal physical infrastructure (road, rail, waterways, air) is sufficiently well-developed, even if most regions indicate congestion problems. Concretely, within the ecosystem perspective, regional authorities should analyse companies' concrete needs in order to target efforts and investments. Sometimes such efforts do not require substantial finance: e.g. optimisation of the public transport network to allow employees to get to particular office areas more easily, or development of concrete transport connections to ease the ecosystem's exchanges with international business partners.

### **Formal institutions: competence and rule of law**

The final factor that drives growth of entrepreneurial ecosystems is the working of their formal institutions. Such institutions should be focused on creating a sharing environment. Major companies and self-interested politicians can easily destroy the fruits of collaboration; they can also weigh heavily on recruiting of local talent. The success of a region depends on the degree to which these companies can develop self-restraint. Politicians need to understand how formal institutions can deter future investments in the region. Institutional innovation should be focused on supporting the collaboration needed for inclusive growth. In this respect, European regions should stay curious and sensitive about institutional innovations that can inspire others.

## UNTANGLED PARTNERS

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UNTANGLED is a three-year interdisciplinary Horizon 2020 research project that seeks to examine the interconnected trends of globalisation, demographic change and technological transformation, and their effects on labour markets in the European Union and beyond. By engaging a broad range of stakeholders, including companies and civil society organisations, we will develop practical policy proposals to help governments cushion the negative impacts of these trends and ensure their benefits are enjoyed fairly across regions and sectors.

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