

20 June 2018
Paris, OECD Conference Centre



WORKSHOP: HOW TO LEVERAGE THE POTENTIAL OF THE DIGITAL TRANSFORMATION FOR INNOVATION AND RESEARCH?

Date: 20 June 2018

Location: Paris, OECD Headquarters



Workshop website: https://www.innovationpolicyplatform.org/digitalinnovation



Introduction to the workshop

Much is in flux with the digital transformation and innovation processes are no exception. Changes are driven by the wider availability of data and better ways to process and analyse them (e.g. software tools, AI), changes in the processes for developing innovations (often allowing for "scale without mass") and the emergence of new ways of bringing products to the market (e.g. through digital platforms). These transformations apply to the research, development and commercialisation stages of innovation. The very innovation process is fundamentally different in the intangible economy compared to manufacturing, as illustrated by the case of software that entails little "production" but very frequent update and innovation cycles. These fundamental changes lead to tensions within companies and industries together with the emergence of new actors, in order to seize the opportunities of the digital transformation. These changes to the very nature of innovation affect the opportunities and risks different players (large companies, SMEs, research organisations, and start-ups) have with research and innovation.

On the one hand, a number of digital tools are accessible to all, and establish a level-playing field between the one-person start-up with a laptop and Internet access on the one hand and a large company on the other hand. Indeed, it is no longer only large established players that dominate industries: new players are involved in the digital transformation of the automotive and pharmaceuticals sectors, in commercializing advances in genomics or offering on-demand transportation services, following the model introduced by Uber. On the other hand, fully exploiting the potential of some of the new digital technologies may require large-scale investments only affordable for large firms and certain research institutions. Processes may be computerised but require large data sources not accessible to all, and platforms may offer opportunities for entry to some but not all, and may disproportionally benefit the owners of those platforms. In the competition for scarce skills, large players are favoured as they can offer higher wages.

The workshop will bring together experts and policy makers to discuss what we know about the effects of the digital transformation on the innovation performance of various types of actors, including industry-science relationships and the distributional impacts of innovation. The workshop will also discuss the implications of these transformations on innovation policies.

The outcomes of the workshop will directly contribute to the OECD Going Digital Horizontal Project and to the <u>TIP digital and open innovation project</u>, which aims to identify innovation policy priorities in the context of the digital transformation.

AGENDA

Welcoming

9h30 - 10h00

- **Göran Marklund**, Deputy Director General for External Matters, VINNOVA, Sweden, and Chair of the OECD TIP Working Party
- Dirk Pilat, Deputy Director, Directorate for Science, Technology and Innovation, OECD
- Caroline Paunov, Senior Economist, Directorate for Science, Technology and Innovation, OECD: Introduction to the workshop and introductory quiz



Göran Marklund is Deputy Director General and Head of Operational Development at VINNOVA, the Swedish Government Agency for Innovation Systems. He was previously Science and Technology Attaché at the Swedish Embassy in Washington DC, guest researcher at the Center for International Technology Policy at George Washington University and Associate Professor in Economic History at Uppsala University. Mr. Marklund often gives advice to the Government on research, innovation and growth policy issues. As a researcher, he has primarily specialized in globalization, innovation and

national competitiveness, with a particular focus on innovation, R&D and indicators on innovation and growth. In this function he has closely followed OECD's and Eurostat's indicator work and often assisted at the meetings of OECD's groups of national experts on science and technology. Mr. Marklund is chairman of the Advisory Board for R&D and Innovation Statistics at Statistics Sweden and Chair of the OECD Working Party on Innovation and Technology Policy.



Dirk Pilat, a Dutch national, is Deputy Director of the OECD Directorate for Science, Technology and Innovation. He supports the Director of STI in overseeing OECD's work on innovation, business and productivity dynamics, science and technology, digital economy policy, consumer policy as well as the statistical work associated with each of these areas. He also helps ensure this work contributes to the strategic objectives of the Organisation to support and develop better policies for better lives. Dirk joined the OECD in February 1994 and has worked on many policy issues since then, including innovation, the role of digital technologies for economic growth, climate change and environmental

innovation, labour markets, regulatory reform, global value chains, productivity and entrepreneurship, as well as health innovation. He is currently helping to coordinate the OECD's new Going Digital project, which is a multidisciplinary, cross-cutting initiative that aims to help policymakers better understand the digital transformation that is taking place and help articulate recommendations for pro-active policies that will help to drive greater growth and societal well-being. Dirk was responsible for the OECD's Committee for Scientific and Technological Policy from 2006 to January 2009, and for the Committee on Industry, Innovation and Entrepreneurship from February 2009 to December 2012. Before joining the OECD, he was a researcher at the University of Groningen, where he also earned his PhD in Economics, working primarily on productivity and economic growth.



Caroline Paunov is a Senior Economist and Head of Secretariat for the OECD Working Party on Innovation and Technology Policy (TIP) at the Directorate for Science, Technology and Innovation of the OECD. She currently oversees the Working Party's projects on digital and open innovation and on knowledge transfer between industry and science. She previously conducted work on innovation for inclusive growth and on national intellectual property rights systems in emerging economies. Specialised in applied econometrics, hery research work has been published in leading academic journals, including the Review of Economics and Statistics, the Journal of Development Economics,

the Canadian Journal of Economics, Research Policy and World Development. Previously, Caroline worked for the World Bank, the United Nations and cooperated on various projects for the public sectors in Brazil, Spain and Germany. She holds a B.A. and M.A. (Hons) from the University of Oxford, a M.Sc. from the University Pompeu Fabra and a Ph.D. in Economics from the University of London.

Session 1: Keynote - Capitalism without Capital - Prof. Jonathan Haskel

10h00-11h00

• **Jonathan Haskel**, Professor of Economics at Imperial College Business School, Imperial College London

In their new book 'Capitalism without Capital: The Rise of the Intangible Economy', Jonathan Haskel (Imperial College London) and Stian Westlake (Nesta) bring together a decade of research on how to measure intangible investment and its impact on national accounts, showing the amount different countries invest in intangibles, how this has changed over time, and the latest thinking on how to assess this. They explore the unusual economic characteristics of intangible investment, and discuss how these features make an intangible-rich economy fundamentally different from one based on tangibles. Capitalism without Capital concludes by presenting three possible scenarios for what the future of an intangible world might be like, and by outlining how managers, investors, and policymakers can exploit the characteristics of an intangible age to grow their businesses, portfolios, and economies.



Jonathan Haskel is Professor of Economics at Imperial College Business School, Imperial College London and Director of the Doctoral Programme at the School. He was previously Professor and Head of Department at the Department of Economics, Queen Mary, University of London. He has taught at the University of Bristol and London Business School and been a visiting professor at the Tuck School of Business, Dartmouth College, USA; Stern School of Business, New York University, USA; and visiting researcher at the Australian National University.

He is an elected member of the Conference on Research in Income and Wealth (CRIW) and a research associate of the Centre for Economic Policy Research,

the Centre for Economic Performance, LSE, and the IZA, Bonn. Since September 2015, he has been a member of the Financial Conduct Authority Competition Decisions Committee and the Payment System Regulator Enforcement and Competition Decisions Committee. Since 1st February 2016, he has been a non-Executive Director of the UK Statistics Authority. He has been on the editorial boards of Economica, Journal of Industrial Economics and Economic Policy. Between 2013 and 2016, he was an elected member of the Council of the Royal Economic Society and between November 2012 and December 2015, a member of the "Research, Innovation, and Science Policy Experts" (RISE) high level group advising the European Commissioner for Research, Innovation, and Science on policy.

11h00-11h30: Coffee break

Session 2: Opportunities and barriers for research collaboration in the digital age

11h30-13h00

Digital technologies provide unprecedented opportunities for research. These include the possibility to collect and exploit vast amounts of real-time data, or conduct large-scale computerised experiments, which allow for many more trials than could be realised by human researchers. Investments needed to use digital technologies effectively in research and to create and integrate different competences to fully exploit the digital potential may, however, be too high (both regarding infrastructure and skills) for all firms and research institutions to have access to them. Consequently, the relative cost of engaging in innovative research activities may lead to the exclusion of the firms and researchers that are not able to afford such costs, resulting in a concentration of R&D as is the case today.

Questions:

- To what extent has the digital transformation changed opportunities to engage in research activities related to innovation for different actors and places?
- Are changes similar across academic disciplines and industry sectors? What are the expected trends? To what extent have appropriate multidisciplinary and multi-sectoral teams emerged to exploit the potential of data in research?
- Should policy intervene to ensure more widespread opportunities to innovate at the research stage? What are the organisational changes needed to facilitate a re-orientation of research organisations (and firms) in that regard?
- How does the digital transformation facilitate opportunities for extending research networks and collaborations with others (researchers, research organisations and firms)?

Perspectives from ongoing TIP work:

• **Dominique Guellec**, Head of Division, Directorate for Science, Technology and Innovation, OECD

Speakers:

- Peter Leihn, Commercial Director, CSIRO's Data61, Australia
- Michaela Muruianu, Programme Lead for Artificial Intelligence, Digital Catapult, UK
- Jean-Michel Dalle, Managing Director, Agoranov, France
- Claire Stolwijk, Researcher, Strategy and Policy for Innovation, TNO, the Netherlands
- Steven Drew, Vice President of Business Development in Europe, InnoCentive



Dominique Guellec is Head of the Science and Technology Policy (STP) Division, within the OECD's Directorate for Science, Technology and Innovation (DSTI). This division covers notably: innovation policies, science policies, biotechnology and nanotechnology issues, national innovation studies, innovation for development, the STI Outlook, the Innovation Policy Platform, and the Space Forum. Mr. Guellec joined the OECD in 1995 and has worked in the DSTI on statistics and quantitative economic analysis of science, innovation and growth. From 2004-2005, Mr. Guellec was Chief Economist of the

European Patent Office (Munich). Mr. Guellec has authored several books and many articles on patents, innovation and economic growth. His (co-) publications in English include The Economics of the European Patent System (Oxford University Press, 2007); and From R&D to Productivity Growth: the Sources of Knowledge Spillovers and their Interaction (Oxford Review of Economics and Statistics, 2004). Of French nationality, Mr. Guellec is a graduate from the École nationale de la statistique et de l'administration économique (ENSAE, Paris).



Peter Leihn is Commercial Director for Data61 Australia. Data61 is the digital innovation business unit of the Australian Government R&D organisation CSIRO.

Peter has been responsible for business development and commercialisation for the group since its inception in 2015. Previously he held the position of Business Director with NICTA, the nation's former Centre of Excellence in ICT research. Prior to this Peter was Director of the Office of the Chief Scientist for the State of New South Wales where he led science policy development and had oversight

for strategic investment in the innovation ecosystem. This followed a long career in Asia Pacific market and product management with global ICT companies Hewlett-Packard and Autodesk.

Peter holds an Undergraduate Degree in Applied Science and a Double Masters Degree in Science and Law. He is currently undertaking a PhD in Innovation Economics.



Michaela Muruianu is the programme lead for Artificial Intelligence at Digital Catapult, currently focusing on Machine Intelligence Garage programme delivery and development. She works closely with internal and external stakeholders to identify needs and deliver interventions that help startups as well as large businesses grow. She brings a diverse expertise, with a background in law and experience of having co-developed from idea to commercialisation a consumer electronics accessory startup. In her previous role as an Innovation Coordinator at Digital Catapult, she was convening large business, startups and academia for collaborative challenge solving.

Jean-Michel Dalle is the Managing Director of Agoranov, a leading science-based incubator in France, and a Professor at University Pierre et Marie Curie (UPMC). Over the past decade, Agoranov's incubation and acceleration program has given birth to 300 innovative startups, among which success stories Criteo (listed on the NASDAQ), Anevia, Biophytis and Pixium (listed on Euronext) and Aldebaran Robotics. These companies altogether represent 5000 direct active jobs and have raised over 300 M€ from private investors.

As an academic, M. Dalle teaches the economics and the management of innovation and entrepreneurship. His research has been funded by several academic agencies including

France's ANR and CNRS, the European Commission and the NSF in the USA (in collaboration with Stanford University). M. Dalle holds degrees from Ecole Polytechnique, ENSAE (Ecole Nationale de la Statistique et de l'Analyse Economique) and EHESS (Ecole des Hautes Etudes en Sciences Sociales) and a PhD in economics also from Ecole Polytechnique. He is a former Visiting Fellow of All Souls College at the University of Oxford and currently a Vice-President of RETIS, France's national association of technology parks and incubators.



Claire C.M. Stolwijk PhD: works as Scientist on Strategy and Innovation Policy at TNO. She coordinates various National and European projects that focus among others on the digitization of the industry. She is also involved in research at Delft University of Technology about Company Innovation Systems, Business Ecosystems and Sectoral Innovations Systems. Before joining TNO she worked as Senior Finance analyst at the Unilever Supply Chain Company. She was responsible for the financial analysis of the European Home and

Personal Care market of the firm. Prior to that, she completed her PhD at Delft University of Technology. In her PhD research she investigated the strategies of semiconductor firms to maximize their innovative and market performance during different phases of the technology life cycle.



Steven Drew has helped to lead InnoCentive's activities in Europe for more than six years, guiding multiple high profile companies across the region to exploit crowdsourcing to obtain innovative and diverse solutions. Steven has 15 years of experience in the innovation arena.

InnoCentive is the pioneering open innovation and crowdsourcing company that partners with government entities, global companies and non-profit organizations to develop solutions to their business, development, scientific and technology issues. Since its inception in 2001, InnoCentive has leveraged its Challenge Driven Innovation methodology and Challenge Center to

crowdsource solutions for over 2,300 facilitated Challenges from a global network of 400,000 problem solvers that spans some 200 countries.

13h00-14h30: Lunch

Session 3: Opportunities and challenges for developing and commercialising innovation in the context of digital transformation

14h30-16h00

The development and commercialisation stages of innovation have also been affected by the digital transformation. For instance, once developed, new software is fundamentally different from physical products such as cars – the latter requiring production before they are taken to the market, while the former can be quickly disseminated at little cost. This has been referred to as "scale without mass." As intangible product components are increasingly important, the development process of innovation is gradually shifting towards this new model. Commercialisation is also changing in this context, with new ways of launching products and services, nearly instantaneously and at global scale, and benefitting from networks. This offers more opportunities for small actors to compete with larger ones compared to the past. However, platform dynamics and network effects may disproportionately compensate larger players, with an opposite effect on the actual opportunities for other to innovate.

This panel will focus on opportunities and challenges across different sectors, with a focus on the agrifood, automotive/transportation and retail sectors – representatives of primary, manufacturing and services sectors, respectively. These sectors (and their own boundaries) are changing with the digital transformation, and constitute excellent examples to illustrate the pervasiveness of digital transformation across the whole spectrum of economic activities, at the same time that allow distinguishing different sectoral dynamics.

Questions:

- To what extent has the digital transformation changed opportunities for different actors to develop and commercialise innovations across different value chains?
- Are changes similar across actors and industries and in particular across agro-food, automotive/transportation and retail sectors?
- What can policy do to ensure more widespread opportunities?

Perspectives from ongoing TIP work:

• Sandra Planes-Satorra, Junior Policy Analyst, Directorate for Science, Technology and Innovation, OECD

Speakers:

- Zoltán Cséfalvay, Ambassador, Permanent Representative of Hungary to the OECD, and author of TECHtonic Shifts
- Frank Nagle, Assistant Professor, Marshall School of Business, University of Southern California (USC)
- Ido Dor, Executive Vice President and General Manager Ag-Biologicals, Evogene, Israel
- Eija Laineenoja, Senior Adviser, Ministry of Economic Affairs and Employment, Finland
- Young-Jun Moon, Senior Research Fellow and Chief Director, Department of National Transport Technology R&D, Korea Transport Institute (KOTI)



Sandra Planes-Satorra is a Junior Policy Analyst at the Directorate for Science, Technology and Innovation of the OECD. She is currently conducting research in the fields of digital and open innovation, in particular assessing how digital transformation is impacting innovation models across sectors, and how innovation policy should adapt to respond to the emerging challenges of the digital economy. She has also conducted research in the fields of knowledge transfer between industry and science and innovation policies for inclusive growth. Prior to joining the OECD, she worked at the European Commission and at Milieu Ltd – a policy

consulting firm. She holds a BSc in Economics and a BSc in Political Science and Public Management from Pompeu Fabra University, and a MSc in Local Economic Development from the London School of Economics (LSE).



Ambassador Zoltán Cséfalvay took up his duties as Permanent Representative of Hungary to the OECD on 29 September 2014. Mr. Cséfalvay was born in Máriakálnok, Hungary, on 27 March 1958. He received his Master degree in Geography in 1982. In 1986 he obtained the title of Dr. Univ. from the Kossuth Lajos University of Debrecen, while in 1996 he obtained his PhD in Geography from the Hungarian Academy of Sciences. Mr. Cséfalvay received his habilitation in Geography from the Kossuth Lajos University in 1999.

Mr. Cséfalvay started his professional career in 1990 as Head of the Ministerial Cabinet Office in the Ministry for Industry. From 1991 to 1995 he was

appointed Advisor to the President in the Hungarian National Bank. From 1995 to 1998 Mr. Cséfalvay was Managing Director of the Hungarian Centre of Trend Research and subsequently, from 2000 to 2002, Deputy Secretary of State of the Department for Regional Economic Development in the Ministry of Economic Affairs.

Mr. Cséfalvay participated in various research activities. He was research fellow in the following universities: the Institute for Geography of the Hungarian Academy of Sciences, the Institute of Economic Geography of the Ludwig-Maximilian-University (DAAD fellowship), the Institute of Geography of the University of Heidelberg (Alexander von Humboldt Fellowship), the Institute for Urban and Regional Research from Austrian Academy of Sciences and the School of City and Regional Planning from the Cardiff University (Marie Curie Fellowship). He was a Professor of Economic Geography in the Andrássy Gyula German Speaking University of Budapest and in the Kodolányi János College of Székesfehérvár. Mr. Cséfalvay is the author of 14 standalone books and more than 60 articles in study collections and referred journals in English, German, and Hungarian language. In addition, he has recently published his latest book – TECHtonic Shift – that deals with the social and economic consequences of the current technological revolution. From 2010 until his nomination as Permanent Representative of Hungary to the OECD, Mr. Cséfalvay was Minister of State for Parliamentary and Strategic Affairs in the Ministry for National Economy of Hungary.



Frank Nagle is an Assistant Professor of Strategy at Harvard Business School. He studies the economics of IT and digitization with a focus on the value of crowdsourcing and his work has been published or is forthcoming at Management Science, Organization Science, MIT Sloan Management Review, and Research Policy. His research interests include free digital goods, cybersecurity, and generating strategic predictions from unstructured big data. His work utilizes large datasets derived from online social networks, financial market information, and surveys of enterprise IT usage. Prior to Harvard, he was an assistant professor in the Management & Organization Department at the Marshall School of Business at USC where he was also the co-director of

Marshall Digitopolis and a faculty affiliate of the Lloyd Greif Center for Entrepreneurial Studies and the Annenberg Research Network on International Communication. Prior to his academic career, Frank worked at a number of startups and large companies in the information security and technology consulting industries. In these roles, he researched a variety of topics related to social network privacy and the economics of IT, spoke at numerous conferences, and developed and taught a 2 week course that all FBI cyber agents must pass before entering the field. He continues to work with companies of all sizes and is a technical advisor to multiple big data analytics startups. Frank earned his doctorate in Technology and Operations Management from Harvard Business School. He also earned a BS and MS in Computer Science from Georgetown University and an MS in International Business Economics from City University, London.



Ido Dor was appointed as Executive Vice President & General Manager Ag-Biologiclas in January 2018, previously serving as Executive Vice President & General Manager Crop Enhancement from November 2015. Mr. Dor joined Evogene in 2011 as a Director of Business Development and led the business activity of the Ag Chemicals division. Since 2015 he is leading Evogene's Ag Biologicals activity, overseeing research, development and business aspects. Prior to joining Evogene, Ido headed the Israeli Small & Mid-Size Enterprise business activity at SAP, the world leading organizational software company. Prior to his role at SAP, Ido led a business unit at Niram Gitan Group, a leading

Israeli management-consulting firm. Mr. Dor holds an MBA degree and a B.Sc. degree in Industrial Engineering – both from Tel Aviv University.



Eija Laineenoja works as a Senior Adviser at the Department of Innovations and Enterprise Financing of the Ministry of Economic Affairs and Employment of Finland. Her main tasks include coordination of the National Growth Programme for the Transport Sector and developing other measures related to digitalisation and innovation policy. She has previously worked, for instance, at the DG CONNECT of the European Commission and at the Nordic Innovation under the auspices of the Nordic Council of Ministers. She holds Degrees of the M. Sc. of Administration (Local governance) and the M. Sc. of Economics and

Business Administration.



Dr. Young-Jun MOON is a chief director of the Dept. of National Transport Technology R&D in the Korea Transport Institute (KOTI). He has joined KOTI in 1998, right after he had graduated in the Univ. of Illinois at Urbana-Champaign (UIUC) with a doctoral degree of Transportation Engineering in the Dept. of Civil and Environmental Engineering. He started his career as a research engineer in the Agency for Defense Development (ADD) in 1987, developing Korean Surface to Air Missile (KSAM) for the military weapon systems. He participated in ITS World Congress and the International Standard Organizations in ITS area as a leader of ITS R&D in Korea from 1999 for

developing a variety of ITS projects. Since then, he has been involved in ISO/TC204 as not only an expert in WG14 for vehicle/roadway warning and control system but also a Convenor of WG17 for nomadic & portable devices. He has been a member of the international program committee (IPC) of ITS World Congress since 2005 and also a chair of IPC for the 17th ITS World Congress in Busan, 2010. He has joined a committee member of Transportation Research Board (TRB) on ITS since 2013. He became a member of National Science and Technology Commission (NSTC) under the President House in 2010 until now, and a chair of Construction & Transportation Committee. He is also a consulting director of transportation division in PyeongChang 2018 Olympic and Paralympic Winter Games Organizing Committee since 2010. He is designated as an Advisory Director to the Minister of Land, Infrastructure and Transport (MoLIT) from 2016 until 2017.

Session 4: Innovation policy implications

16h30-17h30

This session will take stock of the previous discussions and explore how innovation policy should adjust to those new realities in order to ensure different actors leverage the potential of digital innovation. The discussions will involve all workshop participants that will gather in four small groups (see below). Each group will develop a policy proposal that addresses one of the core challenges posed by digital innovation.

The topics of focus will be:

- Data access policies for innovation (group 1)
- Speedy and agile policies in the digital age (group 2)
- Investment in core technologies and the contributions of public research (group 3)
- IP and market competition in the digital age (group 4)

Breakout group 1 (room CC4)

Topic: Data access policies for innovation

Chair: **Jerry Sheehan**, Deputy Director, National Library of Medicine, National Institutes of Health, USA

Ice-breaker intervention: **Margherita Russo,** Professor, University of Modena and Reggio Emilia, Italy

Support: **Diogo Machado**, Junior Economist/Policy Analyst, OECD

Rapporteurs: Jerry Sheehan and Margherita Russo

Breakout group 2 (room MB2122)

Topic: Speedy and agile policies in the digital age

Chair: **Byeongwon Park**, Research Fellow, Center for Strategic Foresight, Science and Technology Policy Institute, Korea

Ice-breaker intervention: **Kai Husso**, Enterprise and Innovation Department, Ministry of Economic Affairs and Employment, Finland

Support: Sandra Planes, Junior Policy Analyst, OECD

Rapporteur: Byeongwon Park and Kai Husso

Breakout group 3 (room MB3122)

Topic: Investment in core technologies and the contributions of public research

Chair: Agni Spilioti, Director, Policy Planning Directorate, Ministry of Education, Research and Religious Affairs, Greece

Ice-breaker intervention: **Tiago Santos Pereira**, Head, Studies and Strategy Office, Foundation for Science and Technology, Portugal

Support: Martin Borowiecki, Junior Economist/ Policy Analyst, OECD

Rapporteur: Agni Spilioti and Tiago Santos Pereira

Breakout group 4 (room MB5122)

Topic: IP and market competition in the digital age

Chair: David Legg, Lead Specialist, Economics, Performance and Strategy Department, Innovate UK

Ice-breaker intervention: **Ana Nieto,** DG RTD-OECD Co-ordinator, Directorate-General for Research and Innovation, European Commission

Support: Andrés Barreneche, Policy Analyst, OECD

Rapporteur: David Legg and Ana Nieto

Conclusions

17h45-18h00

- **Göran Marklund**, Deputy Director General for External Matters, VINNOVA, Sweden, and Chair of the OECD TIP Working Party
- Final quiz

