

IIT Deliverable

D6.3 National level workshops documentation

Grant Agreement number	649351
Action Acronym	IIT
Action Title	Industrial Innovation in Transition
Funding Scheme	H2020 RIS / EURO-2-2014
Version date of the Annex I against which the assessment will be made	19 th October 2016
Start date of the project	1 st February 2015
Due date of the deliverable	30 th April 2017
Actual date of submission	24 th August 2017
Lead beneficiary for the deliverable	AALTO
Dissemination level of the deliverable	Public

Action coordinator's scientific representative

Prof. Erkki Ormala
AALTO –KORKEAKOULUSÄÄTIÖ,
Aalto University School of Business, Department of Management Studies
erkki.ormala@aalto.fi

This document has been produced in context of IIT project which is part of European Community's Horizon 2020 Programme. For avoidance of all doubts, the European Commission has no liability in respect of this document which is merely representing the authors' view.



This project has received funding from *the European Union's Horizon 2020 research and innovation programme* under grant agreement No 649351

Authors in alphabetical order		
Name	Beneficiary	e-mail
Cox, Deborah	UNIMAN	debbie.cox@manchester.ac.uk
Dale-Clough, Lisa	UNIMAN	lisa.dale-clough@mbs.ac.uk
De la Parte, José Alberto	ZABALA	jdelaparte@zabala.es
Erkama, Niina	AALTO	niina.erkama@aalto.fi
Georghiou, Luke	UNIMAN	luke.georghiou@mbs.ac.uk
Hahn, Katrin	TWENTE	k.hahn@twente.nl
Iriarte, Javier	ZABALA	jiriarte@zabala.es
Konrad, Kornelia	TWENTE	k.konrad@utwente.nl
Li, Yanchao	UNIMAN	yanchao.li@mbs.ac.uk
Linshalm, Enikö	JOANNEUM	enikoe.linshalm@joanneum.at
Marzocchi, Chiara	UNIMAN	Chiara.Marzocchi@manchester.ac.uk
Mattila, Jukka	AALTO	Jukka.mattila@aalto.fi
Ormala, Erkki	AALTO	erkki.ormala@aalto.fi
Ploder, Michael	JOANNEUM	michael.ploder@joanneum.at
Polt, Wolfgang	JOANNEUM	wolfgang.polt@joanneum.at
Sauer, Angelika	JOANNEUM	angelika.sauer@joanneum.at
Tukiainen, Sampo	AALTO	sampo.tukiainen@aalto.fi
Turkama, Petra	AALTO	Petra.turkama@aalto.fi
Yeow, Jillian	UNIMAN	Jillian.Yeow@manchester.ac.uk

Abstract

The Deliverable 6.3 reports the National level market-to-policy workshops that were aimed at both for academic and practitioner audiences.

The main dissemination document in these workshops is D 3.2 (Policy brief). The purpose of the National level workshops is to develop recommendations for bridging the gap between the current state of innovation policies in the eleven member states and the national level goals for innovations. The aim is also to disseminate general results of IIT for academic audiences.

Contents

1	Introduction	4
2	National workshops	5
2.1	Finland	5
2.1.1	OECD/ MINISTRY OF ECONOMIC AFFAIRS AND EMPLOYMENT OF FINLAND SEMINAR ‘THE ROLE OF R&D IN FOSTERING ECONOMIC PERFORMANCE; LESSONS FROM RESEARCH AND IMPLICATIONS FOR FINLAND’	5
2.2	UK	5
2.2.1	MANCHESTER INNOVATION FORUM, INDUSTRIAL INNOVATION IN TRANSITION	5
2.2.2	INDUSTRIAL INNOVATION IN TRANSITION: IMPLICATIONS FOR INNOVATION POLICY; DEPARTMENT FOR BUSINESS, ENERGY AND INDUSTRIAL STRATEGY	6
2.3	Austria	7
2.3.1	ALPBACH TECHNOLOGY SYMPOSIUM, CONFLICT AND COOPERATION	7
3	Dissemination in international conferences for academics and practitioners	8
3.1	SCIENTIFIC WORKSHOP ON TRANSFORMING INNOVATION POLICY	8
3.2	INTERNATIONAL CONFERENCE ON INNOVATION; BUSINESS AND MANAGEMENT (ICIBM)	8
3.2.1	INCREASING HOLISM: QUALITATIVE; CROSS-DIMENSIONAL STUDY OF CONTEMPORARY INNOVATION PROCESSES	9
3.3	EUROPEAN FORUM FOR STUDIES OF POLICIES FOR RESEARCH AND INNOVATION (Eu-SPRI)	10
3.3.1	ANTICIPATING IN INNOVATION ECOSYSTEMS: FROM INTERNAL TO COLLABORATIVE FORMS OF CORPORATE FORESIGHT	10
3.3.2	INNOVATION ECOSYSTEM STRATEGIES OF INDUSTRIAL FIRMS	16
3.3.3	IMPLICATIONS OF AN INNOVATION ECOSYSTEMS APPROACH FOR INNOVATION POLICY DESIGN AND MIX	19
3.4	INTERNATIONAL FORUM ON KNOWLEDGE ASSET DYNAMICS (IFKAD)	22
3.4.1	INNOVATIVENESS THROUGH EMBEDDED KNOWLEDGE: CONSULTANTS IN INNOVATION ECOSYSTEMS	22
3.5	THE INTERNATIONAL SOCIETY FOR PROFESSIONAL INNOVATION MANAGEMENT (ISPIM)	23
3.5.1	SUCCESSING THROUGH KNOWLEDGE EXCHANGE: ORGANIZATIONAL REQUIREMENTS FOR OPEN INNOVATION	24
3.6	R&D MANAGEMENT CONFERENCE (SCIENCE, MARKET & SOCIETY: CROSSING BOUNDARIES AND CREATING MOMENTUM)	26
3.6.1	INNOVATION ECOSYSTEM STRATEGIES OF INDUSTRIAL FIRMS	26
4	Conference tracks hosted by IIT	27
5	Summary	29

1 Introduction

Deliverable 6.3 reports the national level market-to-policy workshops of Industrial Innovation in Transition project (IIT). The workshops are aimed for both academic and practitioner audiences.

To be more specific, these workshops are dissemination events that aim to focus on policy recommendations rising from the IIT project. The main dissemination document is D 3.2 (Policy Brief). The purpose of the national level workshops is to develop recommendations for bridging the gap between the current state of innovation policies in the eleven member states and the national level goals for innovations. The aim is also to disseminate general results of IIT for academic audiences.

The project has defined in the Description of Work that the national market-to-policy workshops were held in three member countries: Finland, United Kingdom and Austria. Besides these workshops IIT has presented 7 academic papers based on the project also in several international conferences (6) around Europe and hosted one conference track (in Eu-SPRI conference).

Country	National market-to-policy workshops
Finland	MEAE & OECD SEMINAR, HELSINKI, 1 December 2016
UK	MANCHESTER INNOVATION FORUM, INDUSTRIAL INNOVATION IN TRANSITION, MANCHESTER, 16 June 2017 INDUSTRIAL INNOVATION IN TRANSITION: IMPLICATIONS FOR INNOVATION POLICY; DEPARTMENT FOR BUSINESS, ENERGY AND INDUSTRIAL STRATEGY, LONDON, 12 July 2017
Austria	ALPBACH CONFERENCE, ALPBACH, 25 August 2017
International (scientific)	SCIENTIFIC WORKSHOP ON TRANSFORMING INNOVATION POLICY, MADRID, 25 April 2017 ICIBM, AMSTERDAM, 14-15 May 2017 Eu-SPRI, VIENNA, 7-9 June 2017 IFKAD, ST. PETERSBURG, 7-9 June 2017 ISPIM, VIENNA, 18-21 June 2017 R&D MANAGEMENT CONFERENCE, LEUVEN, 1-5 July 2017

Table 1: Market-to-policy workshops



Picture 1: Manchester Innovation Forum, June 2017

2 National workshops

National level market-to-policy workshops were/are held in three member countries (Finland, Austria and United Kingdom) according to the Description of Work of the IIT project. The following chapter describes each of these events in detail.

2.1 Finland

2.1.1 OECD/ MINISTRY OF ECONOMIC AFFAIRS AND EMPLOYMENT OF FINLAND SEMINAR 'THE ROLE OF R&D IN FOSTERING ECONOMIC PERFORMANCE; LESSONS FROM RESEARCH AND IMPLICATIONS FOR FINLAND'

Time of the event: 1 December 2016

Place of the event: Radisson Blue Sea Hotel, Helsinki, Finland

www pages: <https://tem.fi/en/rdseminar-01-12-2016> The presentations can be found from the website.

Event organizers: OECD/Ministry of Economic Affairs and Employment

IIT participants: Erkki Ormala

Description of the dissemination: Erkki Ormala presented an overview of the IIT results in general and, in particular, for Finland. There was a long debate about the findings. Policy conclusions were discussed widely as the event was associated with the OECD review of the Finnish innovation policy. Many critical observations were presented about the recent developments in Finland. Ecosystem, open innovation and innovation management issues were considered highly interesting and their policy implications were widely debated.

Feedback from the audience: The OECD reviewers were most interested in the results and made number of references to the IIT presentation in their summary statements. Also the industry representatives referred to the presentation in their own interventions. In addition, all participating Ministries, Ministry of Finance, Ministry of Education and Culture and the Ministry of Economic Affairs and Employment wanted to have further dialogue about the IIT findings. These meetings will be arranged during the spring.

Audience description: OECD reviewers, policy people from the ministries and funding agencies, industry representatives and academic researchers both from Finland and abroad. Altogether about 200 hundred.

2.2 UK

2.2.1 MANCHESTER INNOVATION FORUM, INDUSTRIAL INNOVATION IN TRANSITION

Date of the event: 19th June 2017

Place of the event: Manchester

www pages of the event: <http://www.gmchamber.co.uk/events/1404>

Event organizers: Manchester Chamber of Commerce/Manchester Institute of Innovation Research, The University of Manchester

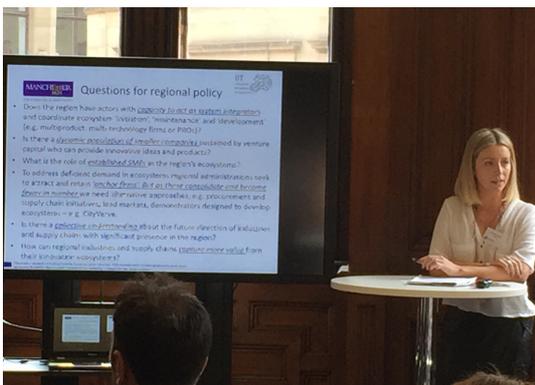
IIT participants: Luke Georghiou, Lisa Dale-Clough (presenters), Chiara Marzocchi, Deborah Cox, Jillian Yeow.

Description of the dissemination: This was an event organized to disseminate the results of the IIT project to a mixed audience of companies, development agencies and academics. It was hosted by the Manchester Chamber of Commerce in the centre of Manchester. Luke Georghiou presented on project key findings and Lisa Dale-Clough gave some early reflections on policy transitions from the project, including some questions arising for regional policy.

Feedback from the audience: The presentation elicited a range of questions from the mixed audience, including questions about mapping of ecosystems, venture capital funding, linking our results to innovation performance data and the ecosystem concept in the City Region.

Audience description: Scientific community (academics from the University including visiting academics from China and Italy), Industry (local companies including IT firms, Law and Insurance firms, an Engineering firm), other (Regional development agencies. In attendance MIDAS and Rochdale Development Agency)

Audience size: 31



Picture 2: Manchester innovation forum, 19 June 2017

2.2.2 INDUSTRIAL INNOVATION IN TRANSITION: IMPLICATIONS FOR INNOVATION POLICY; DEPARTMENT FOR BUSINESS, ENERGY AND INDUSTRIAL STRATEGY

Date of the event: 12th July 2017

Place of the event: London

Event organisers: Manchester Institute of Innovation Research (UNIMAN)

IIT participants: Professor Luke Georghiou, Lisa Dale-Clough, Chiara Marzocchi, Jillian Yeow

Description of the dissemination: Presentation of the IIT project findings and policy implications emergent from the UK data. The presentation was to several policy teams who lead on science, research and innovation in the Government Department for Business, Energy and Industrial Strategy (BEIS) and to the

shadow UKRI team, HM Treasury and colleagues from the business growth team who work with emerging disruptive sectors and technologies. The UNIMAN team gave two presentations: the first one on the findings of the IIT company research, and the second on the policy implications of the results.

Feedback from the audience: After each presentation a detailed discussion was held about the specifics of the project, the methodologies applied to derive the findings, and how the UK data compared to other countries. An hour long debate was then conducted concerning the scope and content of the UK industrial strategy in light of the research. The industrial strategy team requested further input from the UNIMAN team for the Industrial Strategy White Paper due to be published in autumn 2017. This was a follow up event from an earlier presentation Professor Luke Georghiou made to the UK Government BEIS Industry Strategy Team on 6th March 2017.

Audience size: 12-15

2.3 Austria

2.3.1 ALPBACH TECHNOLOGY SYMPOSIUM, CONFLICT AND COOPERATION

Date of the event: 25 August 2017

Place of the event: Alpbach

www pages of the event: <https://www.alpbach.org/en/>

Event organizer(s): Organisers by AIT Austrian Institute of Technology GmbH and (among others) by the Federation of Austrian Industries, supported by JOANNEUM RESEARCH

IIT participants: Michael Ploder, Wolfgang Polt

Description of the dissemination: In overall in the Alpbach Technology Symposium, leading representatives from the ministries, the Federation of Austrian Industries and the Austrian Council for Research and Technology Development will discuss current priorities, challenges and demands for a future RTI agenda in the digital age, addressing conflict as well as cooperation. In the framework of these lecture series we organized a short session to present our results from the IIT Project and discuss it with high level policy experts and important nation policy makers.

Expected outcomes of the event: An expected outcome of the workshop is to develop recommendations for further policy intervention, to fostering open innovation, economic ecosystem and well balanced national innovation policy system.

Audience description: scientific community, civil society, policy makers, media

Audience size: 5-10 participants

3 Dissemination in international conferences for academics and practitioners

Besides national level workshops the IIT members have been actively disseminating policy related results of the project also for academic audiences. In this part of the document the academic events where IIT has presented its results are listed. All accepted conference paper abstract related to each of these events are also included in the list.

3.1 SCIENTIFIC WORKSHOP ON TRANSFORMING INNOVATION POLICY

Date of the event: 25 April 2017

Place of the event: Madrid, Fundacion Ramon Areces

www pages of the event:

<http://www.fundacionareces.es/fundacionareces/cargarAplicacionAgendaEventos.do?verPrograma=1&idTipoEvento=1&fechaInicio=25%2F04%2F2017&identificador=2002&fechaFinalizacion=25%2F04%2F2017&nivelAgenda=2>

Audience: policy actors, company association)

Event organizers: Jose Molero Zayas, University of Madrid, Foro de Empresas Innovadoras (Innovative Firms Forum) and Foundation Ramon Areces

IIT participants: Kornelia Konrad

Description of the dissemination: Presentation 'Networked Forms of Foresight – Intermediary between Innovation Policy and Companies?' of IIT results on Future Mapping, discussion of potential of diverse forms of networked foresight for functioning as an intermediary between policy and innovation actors, in particular companies.

Feedback from the audience: Importance of transforming and adapting innovation policy to changed conditions of innovation shared, cooperation between different types of companies reluctant to engage with each other, e.g. small and large companies, needs specific attention

Audience description: scientific community, industry, policy makers

Audience size: 30-40

3.2 INTERNATIONAL CONFERENCE ON INNOVATION; BUSINESS AND MANAGEMENT (ICIBM)

Date of the event: May 14 - 15, 2017

Place of the event: Amsterdam, The Netherlands

www pages of the event: <https://waset.org/apply/2017/05/amsterdam/ICIBM/>

Event organizers: World Academy of Science, Engineering and Technology WASET

IIT participants: Sampo Tukiainen, Niina Erkama:

Description of the dissemination: Dissemination of key IIT scientific findings to international academic audience. The conference focus was on innovation management studies and its relationship to business management. Therefore, the conference focus was particularly well in line with the IIT research as well as its goals regarding the type of knowledge IIT has intended to disseminate from the beginning. The dissemination took the form of a conference presentation based on abstract and a research paper. The key message was that among the international innovation management research community, there is a need to adopt a more holistic approach in research design and research conclusions than what has been the recent tendency. This is because, such approach would enable to better understand the current innovation management practices occurring business organizations.

Feedback of the event: The audience was interested in the background of the study, particularly about what kind of innovation processes we had been studying. The presenters got an idea to develop another paper based on the project data focussing on the idea of innovation culture in local ecosystems.

Audience description: Scientific community

The following research paper was presented in the conference:

3.2.1 INCREASING HOLISM: QUALITATIVE; CROSS-DIMENSIONAL STUDY OF CONTEMPORARY INNOVATION PROCESSES

Authors: Sampo Tukiainen, Jukka Mattila, Niina Erkama, Erkki Ormala

Abstract—During the past decade, calls for more holistic and integrative organizational innovation research have been increasingly voiced. On the one hand, from the theoretical perspective the reason for this has been in the tendency in contemporary innovation studies to focus on disciplinary subfields, often leading to challenges in integrating theories in meaningful ways. For example, we find that during the past three decades the innovation research has evolved into an academic field consisting of several independent research streams, such as studies on organizational learning, project management, and top management teams, to name but a few. The innovation research has also proliferated according to different dimensions of innovation, such as sources, drivers, forms, and the nature of innovation. On the other hand, from the practical perspective the rationale has been the need to develop understanding of the solving of complex, interdisciplinary issues and problems in contemporary and future societies and organizations. Therefore, for advancing theorizing, as well as the practical applicability of organizational innovation research, we acknowledge the need for more integrative and holistic perspectives and approaches. We contribute to addressing this challenge by developing a ‘box transcendent’ perspective to examine interlinkages in and across four key dimensions of organizational innovation processes, which traditionally have been studied in separate research streams. Building on an in-depth, qualitative analysis of 123 interviews of CTOs (or equivalent) and CEOs in top innovative Finnish companies as well as three in-depth case studies, both as part of an EU-level interview study of more than 700 companies, we specify interlinkages in and between i) strategic management, ii) innovation management, iii) implementation and organization, and iv) commercialization, in innovation processes. We contribute to the existing innovation research in multiple ways. Firstly, we develop a cross-dimensional, ‘box transcendent’ conceptual model at the level of organizational innovation process. Secondly, this modeling enables us to extend existing theorizing by allowing us to distinguish specific cross-dimensional innovation ‘profiles’ in two different company

categories: large multinational corporations and SMEs. Finally, from the more practical perspective, we consider the implications of such innovation ‘profiles’ for the societal and institutional, policy-making development.

Keywords—Holistic research, innovation management, innovation studies, organizational innovation.

3.3 EUROPEAN FORUM FOR STUDIES OF POLICIES FOR RESEARCH AND INNOVATION (Eu-SPRI)

Date of the event: 7-9 June 2017

Place of the event: Vienna, Austria

www pages of the event: <https://euspri-vienna2017.org>

Event organizer(s): The Eu-SPRI Conference 2017 is organized by scientists of the AIT Center for Innovation Systems & Policy

IIT participants: Kornelia Konrad, Katrin Hahn, Deborah Cox, Lisa Dale-Clough, Chiara Marzocchi, Luke Georghiou, Jillian Yeow, Klaasjan Visscher

IIT partners presented in Eu-SPRI the following three research papers:

3.3.1 ANTICIPATING IN INNOVATION ECOSYSTEMS: FROM INTERNAL TO COLLABORATIVE FORMS OF CORPORATE FORESIGHT

Authors: Kornelia Konrad and Katrin Hahn, Deborah Cox

‘What is going to be innovative in the future and what will this future look like?’ is a crucial question for companies and policy makers who must try to ensure competitiveness and growth in the long-term. In recent years it has become increasingly obvious that innovation is a collaborative process based on distributed knowledge from both inside and outside the company (Smith and Robertson 2008). As previously described in academic papers (Adner and Kapoor 2010; Oh et al. 2016) and confirmed by research fieldwork undertaken by the ongoing IIT project, companies are increasingly reliant on their innovation ecosystem for their current innovation activities. This perspective prompts us to question company future thinking activity and to examine whether companies adopt collaborative approaches to consider their prospective environment.

There are various ways in which companies can anticipate future developments and make use of insights for strategy-building and innovation processes. There are dedicated methods and tools supporting corporate foresight conducted at the level of the firm, partly organised by specialised departments (Rohrbeck et al. 2015; van der Duin 2016). Companies may also gain insights from policy-induced foresight involving corporate actors. Martin and Johnston (1999) famously described the role of national foresight as being “to wire up the national innovation system”. More recently in corporate foresight research it has been suggested that we should pay attention to collaborative forms of ‘networked foresight’ – foresight which is conducted at the level of innovation networks and ecosystems (van der Duin et al. 2014; Heger and Boman 2015). Contributors and users of such a foresight approach are not confined to one organisation, as is assumed in the majority of corporate foresight studies and they do not necessarily include or are induced by policy actors but predominantly rely on diverse actors from an innovation network of large and small companies, public research organisations, and semi-public agencies. Georghiou postulated 20 years ago

that as firms become increasingly dependent on complementary and external sources of technology they do need to collaborate in their thoughts about the future (Georghiou 1996, p.361).

Whilst most foresight studies describe rather structured processes and projects the general understanding of foresight as a forward-looking, organisational capability not defining the specific methods of achievement¹, suggests that more informal ways should also be included in a study of how organisations develop an understanding of their future environment, especially as sophisticated foresight methods and processes may not be accessible to all, particularly smaller companies. It seems more likely that a great deal of information is gathered, interpreted and made sense of via discussions within organisations but also with partners, in professional communities, at conferences and fairs, following various media and scanning of literature. (Reger 2001). This is in line with an understanding of foresight and future-oriented expectations as anticipatory knowledge which emerges at the crossroads of various anticipatory practices and which exhibits different degrees of collectivity (Konrad 2006; Van Lente 2012; Alvial Palavicino 2016).

Thus, in our paper we want to shed light on the various forms adopted by innovating companies to anticipate their future environment by way of diverse sets of anticipatory practices. In particular, we examine the role of external partners and sources which belong to the innovation ecosystem of a company. In line with this, we consider not only how these practices and insights are used within the companies, but also how value is created for the network innovation ecosystem as a whole (Konrad et al. 2012; Musiolik et al. 2012; van der Duin et al. 2014; Heger and Boman 2015).

Our study is based on an exceptionally broad dataset built on approximately 700 semi-structured interviews with high-level managers in innovative European companies, including chief technology officers and R&D managers, collected for the H2020 IIT project (Industrial Innovation in Transition, <http://www.iit-project.eu/>). In interviews the project team addressed the innovation practices of the company, inquiring *inter alia* into the forms, scope and uses of mapping future environments, the role of innovation ecosystems and of policy frameworks. Due to the large size of the sample we are able to estimate the relevance of certain practices for innovative European companies and by delving (selectively) in more detail into the qualitative interviews we arrive at a richer understanding of the tangible forms and relevance for the company and its ecosystem. (A small set of additional more in-depth case studies is currently in process.)

In the paper, we specifically study the ways in which companies make use of their innovation ecosystem for anticipating their future environment, be it via dedicated joint foresight processes or by more informal means, such as participating in networks and associations deemed as important for forming an idea of future developments. We will describe how 'active' companies are in for example, initiating anticipatory processes and circles, and which types of actors are involved, including companies along the value chain but also other actors in the sector including research organisations and policy makers. Secondly, we report our findings on the uses and effects of these foresight activities, either within the company, for instance for strategy-building, initiating or challenging of innovation projects, or for the innovation ecosystems, for example for agenda-building or network formation. Collaborative forms of foresight are revealed to be not only a tool to improve corporate innovation foresight but also to position the company within an innovation ecosystem and shape or even steer its development.

¹ See a discussion of foresight definitions in Rohrbeck et al. 2016.

¹ See a discussion of foresight definitions in Rohrbeck et al. 2016. 2

Exploring the role of Open Innovation in Innovation Ecosystems: Intrinsic and Systemic Factors and Company Innovation Strategies.

Authors: Lisa Dale-Clough (University of Manchester), Katrin Hahn (University of Twente), Chiara Marzocchi (University of Manchester), Luke Georghiou (University of Manchester), Jillian Yeow (De Montford University)

This paper explores the links between open innovation and innovation ecosystems by asking the following:

1. Which types of company are using open innovation and in what direction?
2. Are intrinsic company characteristics (closed business model) such as size and main business activity better predictors of open innovation use and application than systemic characteristics like value chain position, innovation partners outside the production chain (open business model)?
3. What are the implications of the different patterns of open innovation use for managing, shaping or governing innovation trajectories within innovation ecosystem?

1. Innovation Ecosystems

The concept of innovation ecosystem is increasingly used to analyse how sets of companies, suppliers, customers and others actors interact and self-organise to realise value creation through innovation (Oh et al., 2016). Such perspective is linked to the shift in production practices where adapting new technologies, introducing innovations and maintaining competitiveness often can't be managed solely with internal resources and capabilities. This interdependence on the external setting, leads to theories that companies increasingly shape their external innovation environment to improve their innovation capabilities and processes, by reconfiguring processes and actors and (re)positioning themselves within the innovation value chain using external collaborative R&D (Coombs and Georghiou, 2002). The environment is one of co-competition: members compete, cooperate and co-evolve (Moore, 1993). Some companies will seek to shift the focus of the system in favour of their competitive advantage, others will try to gain access to or maintain their position within an IES through cooperation, and over time the different system entities will collectively evolve along a technological trajectory.

A recent review by Oh et al., (2016) highlights value chains as underpinning dynamics of innovation ecosystem creation and cohesion (citing Frenken et al., 1999; Geels, 2002; and Raven, 2005). Under the value chain logic, each actor's ecosystem role is based on their position and model for creating and capturing value in the production of goods and services, relative to other ecosystem partners. However, this perspective is challenged by the 'opening up' of value creation by changes in information technology and other developments driving increasingly collaborative innovation and extending beyond the production cycle (Adner and Kapoor, 2010). Subsequently, the innovation ecosystems approach requires new understandings of strategies for value creation and capture (Adner, 2006; Letaifa, 2014; Gummesson, 2008; Vargo and Lusch, 2008) and how firm's manage innovation as in an internal and external activity.

The ERA Rationales group (European Union 2008: 23) state innovation ecosystems operate through four key flows at European, transnational and trans-regional levels:

1. Money (Funding for research and investment in innovation);
2. Knowledge (IP and informal knowledge transfer);
3. People (e.g. Researchers);
4. Services (Scientific services such as metrology).

Actors within an innovation ecosystem may have different roles: there may be a focal company acting as a system orchestrator or integrator, other companies along the value chain (suppliers and customers), as well as independent actors like universities. These different roles imply a specific division of innovative labour, power constellations and dependencies that govern distribution of risks and rewards and control processes within the ecosystem. Whilst system capabilities are shaped through collaborations (Teece, 2007), not every collaboration enhances each collaborator’s internal capabilities: some provide opportunities for learning and improving competitive advantage since imitations are difficult, others develop complementary technologies that slow learning and encourage competitor imitation (Adner and Kapoor, 2010). Additionally, disruptive innovations with high technology and high modularity open the ecosystem for new actors, and low-end innovations appear to subtract actors from the system (Dedehayir et al., 2014). Subsequently, the type of innovation processes being applied within the ecosystem affects its shape and boundaries.

2. Open Innovation

Open innovation has been widely adopted as desirable innovation management practice (Chesbrough and Brunswicker, 2013 cited in Chesbrough and Bogers, 2014), based on the idea that firms can and should use methods, strategies and business models to increase the exchange of knowledge between different parts of organisations, networks, value chains and markets to improve the success rate of innovations (Chesbrough, 2003a,b; Chesbrough et al., 2006; Enkel et al., 2005; Gassmann and Reepmeyer, 2005; von Hippel, 1986). West et al., recently updated the definition of Open innovation to: *“a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization’s business model”* (West et al., 2014, referring to Chesbrough and Bogers, 2014). The core dimension is the direction of the innovation activity, and Chesbrough and Crowther (2006) distinguish two primary flows:

1. Inbound: companies use results of external R&D activities.
2. Outbound: bringing new ideas to the market using processes mediated with other companies.

Inbound practices are more commonly found and more frequently investigated (Chesbrough and Brunswicker, 2013; West et al, 2014). Whatever the activity, it should be understood in relation to a firm’s business model (Vanhaverbeke and Chesbrough, 2014) – see Table 1.

Table 1: Open innovation and business models

	Closed/Standalone Business Model	Open/Linked Business Model
Outside-In Open Innovation	Use other’s knowledge to	Use other’s knowledge to

	develop new offering	develop new Business Model
Inside-out Open Innovation	Unused knowledge generated by others	Internal knowledge accessible to others to develop a new Business Model
Closed innovation	Closed Innovation Model	Search for assets owned by others to develop a new Business Model

Source: Vanhaverbeke and Chesbrough (2014: 54)

Most examples in the literature sit within the left hand column, while the open business models in the right hand column have received less attention. Nevertheless, open innovation should be understood as a purposeful strategy for organising multi-actor innovation. This is logical as open innovation comes with certain costs involved in developing relevant competences; managing diverse expectations, cultures, and objectives, and obstacles in interoperability and integration of solutions (cf. Bender/Laestadius 2005). Open innovation does not always positively affect firm performance (Belderbos et al., 2010) and in the short term costs may exceed value generation (Faems et al., 2010). Companies of different sizes can tolerate different levels of openness and assess risks, costs and benefits differently (Lee et al., 2010; Ullrich and Vladova, 2016; van de Vrande et al., 2009). However, knowledge of practices, motivations and strategies of companies largely stems from case studies of high-tech multi-nationals and may not be representative of different company sizes and types (see van de Vrande et al., 2009 and Laursen and Salter, 2006 for exceptions).

3. Linking open innovation and innovation ecosystems

Oh et al (2016) identify open innovation as a common feature of innovation ecosystems as it facilitates knowledge exchange, bottleneck resolution and resource allocation. Some research indicates the presence of a connection between open innovation management and ecosystems value generation and extraction (Van der Borgh et al., 2012). We can analyse open innovation based on the four flows in innovation ecosystems (knowledge, people, finance and services), asking how open innovation facilitates movement across the boundaries of the firm and the boundaries of the ecosystem.

1. Firstly, open innovation mediates the actors interacting within ecosystems. One fundamental motive for engaging in open innovation is the recognition that ‘not all of the smart people work for us’ (Chesbrough, 2003a). Companies engaging in open innovation can introduce new actors to their innovation ecosystem, or remove others from the distribution of innovation labour as a result of new trajectories stimulated by open innovation.
2. Secondly, open innovation is chiefly about facilitating flows of knowledge using processes that enable companies to capture value from knowledge produced externally, or internally produced knowledge that is not being fully exploited – i.e. as a means of overcoming blockages (Oh et al., 2016).
3. Thirdly, these processes potentially alter the flows of finance within and between innovation ecosystems where open innovation leads to new innovation trajectories, new routes to market

or new ecosystems – working as means of increasing the efficiency of innovation assets and redistributing investment (Oh et al., 2016).

4. Fourthly, open innovation may create new services or involve collaboration facilitated by services such as intermediaries or professional technical business services (to regulate intellectual property and appropriation for example).

Consequently, open innovation affects the evolution and functioning of innovation ecosystems: connecting individual constituent members through flows of knowledge and people across firm boundaries, and establishing constellations of actors that influence ecosystem boundaries. If open innovation processes should be linked to company business models, how companies apply open innovation illustrates whether the open business model is being adopted - reflecting the increasing popularity of the innovation ecosystems approach – and illuminates the relative importance of systemic and intrinsic factors in company innovation management and strategy.

4. Research data and methods

The work is based on primary data collected from 694 interviews with Chief Technical Officers, Chief Executives and Innovation Managers in innovative industrial companies in 11 European countries². Each interview lasted 1-2 hours and followed a detailed interview guideline that collected a holistic account of each company, its business and innovation strategy, ecosystem and innovation management practices including interactions with ecosystem actors and use of open innovation. Data was also collected about the position of each company in their respective value chains, their business model and size, sector, market position and main activity. The interviews were carried out in the native language of the interviewee, and coded using a standardised coding framework to ensure reliability and comparability of results. The codes were compiled into a single database for statistical analysis³.

To understand open innovation activity, we asked each company whether open innovation was part of their innovation strategy. If so, we asked how it is used, coding responses into three categories: to 'solve technical problems' (inbound), to expand market prospects' (outbound), and 'other' (a mixture of inbound and outbound or another purpose).

To understand company engagement with their innovation ecosystem⁴ we asked each interviewee: what their ecosystem position/role was; how they maintain / strengthen their position; whether they influence the ecosystem as a part of their strategy; how they respond to the efforts of other players to alter or influence the ecosystem, and the main levers available to do so. These questions establish to what extent

² Austria, Czech Republic, Estonia, Finland, Ireland, Italy, Germany, Netherlands, Portugal, Spain and United Kingdom

³ The research was part of the Horizon 2020 project "IIT – industrial innovation in transition" (No 64935) focusing on changing patterns and strategies in industrial innovation. The project team consists of five partners from University of Aalto (FI, co-ordinator), Joanneum Research (AT), University of Manchester (UK), University of Twente (NL) and Zabala Innovation Consult (ES).

⁴ As the term innovation ecosystem is not necessarily well-known or understood in the same way in all 11 countries, the interview protocol dictated that interview questions about innovation ecosystems were introduced with the following preface in every interview: "Analysts today regularly refer to the concept of an

⁴ As the term innovation ecosystem is not necessarily well-known or understood in the same way in all 11 countries, the interview protocol dictated that interview questions about innovation ecosystems were introduced with the following preface in every interview: "Analysts today regularly refer to the concept of an 'innovation ecosystem' to describe the interdependencies firms have with collaborators, suppliers, customers, public research bodies, other infrastructure, finance and regulators. These typically involve flows of knowledge, people, finance and services. These may be international, national, sectoral or specific to a market. We have some questions about your interactions with this extended network."

each company's innovation strategy is orientated towards the innovation ecosystem (and the likelihood that their use of open innovation forms part of an open/linked business model).

Factor analysis is used to understand the correlation between different company characteristics (intrinsic and systemic) and the use of open innovation. The analysis will contribute to efforts to distinguish the explanatory power of an ecosystem approach from alternative explanations of the use of open innovation (such as capacity and resource based explanations) by comparing the strength of correlations between open innovation practices and a company's intrinsic characteristics (such as size and main activity) and systemic characteristics (such as the competitive structure of the company's main markets and dominant ecosystem actors).

5. Findings

By examining the factors influencing company strategies for exchanging innovation-related knowledge and resources, the analysis illuminates some underlying dynamics of company relations in innovation ecosystems. Given innovation ecosystems are not spontaneous phenomena, but designed and managed by large companies or platforms, patterns of open innovation adoption and application by different types of company provide an indication of ecosystem boundaries, and levels of openness (knowledge exchange, bottleneck resolution and inter-organisational resource allocation).

6. Discussion

We explore the correlations between company value generation and use of open innovation as a route to articulating how company innovation strategies affect the design and management of innovation ecosystems. Closed innovations are a reasonable way of innovating when costs and risks of open innovation exceed their benefit. So companies may opt for in-house innovation and also to vertically integrate new businesses. Keeping this in mind helps to contrast and identify specific conditions for open innovation and their practices.

Keywords: innovation ecosystem; governance; open innovation; innovation strategy and management.

3.3.2 INNOVATION ECOSYSTEM STRATEGIES OF INDUSTRIAL FIRMS

Authors: Klaasjan Visscher, Katrin Hahn, Kornelia Konrad, Lisa Dale-Clough, Luke Georgiou, Angelika Sauer

Keywords: Innovation Ecosystems, Company Strategies, Innovation Practices

Introduction

Innovations that impact the world are no stand-alone novelties created by single companies, but combinations of new products and services, produced by a multitude of firms (Iansiti & Levien, 2004). Innovations are created in networks, in which contributions of different parties are brought together to create value for customers. As a consequence, companies can only partly influence the odds of success of their innovations by internal management practices. They are to a large extent dependent on others' efforts and the dynamics in the broader network (Van de Ven et al, 1999). These networks do not only comprise the supply chains and innovation alliances of focal firms, but also producers of complementary innovations, user communities, research institutes, governmental agencies, standard setting bodies, financiers, and other actors (Coombs & Georgiou, 2002). To capture the complexity of these networks, the

strong interdependencies among actors, and the non-linear dynamics of innovation processes, the analogy of ecosystems has been introduced (Moore, 1993), which has gained popularity in both practice-oriented and theoretical management discourse (e.g., Adner & Kapoor, 2010; Gawer & Cusumano, 2014; Ormala et al., 2014; Adner 2017). There are different ecosystem concepts, including regional knowledge ecosystems, broader business ecosystems and innovation ecosystem, with different foci and boundaries (Clarysse et al., 2014). In this paper we will focus on innovation ecosystems, which can be seen as sets of actors, relations, and rules, which are needed to conceive, create, sell, and embed innovations.

Operating in innovation ecosystems comes with challenges of management and governance. These relate to strategic questions, including with whom to cooperate and with whom to compete (Van de Ven et al, 1999), how much to invest in the ecosystem as a whole versus investing in your own position within it (Autio & Thomas, 2014), and how to align internal innovation activities with technological progress in the ecosystem (Adner & Kapoor, 2010). Current literature pays attention to these and other questions, but this attention is fragmented and often based on a limited number of cases. No systematic and comprehensive research has been done on how firms act upon innovation ecosystems, and how they use these for their innovation efforts. A better understanding of the strategies of innovating firms will contribute to filling a theoretical gap in this emerging field (Autio & Thomas, 2014), and help managers to face ecosystem challenges.

In this paper we analyze how companies act upon innovation ecosystems. In this, we will take a dynamic perspective. Rather than seeing ecosystems as self-reproducing, gradually evolving, connected systems to which individual companies have to adapt in order to be successful – which is a contested view (Papaioannou et al., 2009; Oh et al, 2016) – we stress the fluidity of the system and the role of ‘agency’. Innovation ecosystems are in constant transformation – loosening and tightening, expanding and contracting, merging and splitting – and co-evolve with the technologies, organizations, and institutions that constitute it. These dynamics are not due to the internal logic of the system, but the result of a great many visible hands (Rip & Groen, 2001), of engineers, scientists, policy makers, managers, and others. This implies that managers do not only adapt to innovation ecosystems, but also have opportunities to shape it, and that these opportunities alter in the course of time. In their innovation journeys (Van de Ven et al, 1999), managers cope with dependencies from the past (Garud & Karnoe, 2001), they envision and anticipate future environments, and engage in reflective actions of shaping and adaptation in the present.

Research design

For this paper we will build on the conceptual and empirical work done within the Horizon 2020 project ‘Industrial Innovation in Transition’ (see www.iit-project.eu). This project is carried out by a consortium of Aalto University (Finland), University of Manchester (UK), University of Twente (the Netherlands), Joanneum Research (Austria) and Zabala Innovation Consulting (Spain). It aims to advise managers and governmental agencies on innovation strategies and policies, based on a mapping and analysis of state-of-the-art industrial innovation practices, thus stimulating innovation-based growth in Europe. The project started in 2015 and encompasses a large series of semi-structured interviews with CTOs and innovation managers of established industrial firms in 11 EU-member states, spread over different sectors (manufacturing, IT, cleantech, agrofood, and pharma). Interviews took 1.5 to 2.5 hours. They were transcribed and coded in MaxQDA. In this paper we will draw on 97 interviews conducted in the Netherlands and Germany.

Results

Understanding how companies act upon their ecosystem requires an understanding of their scope: Which parties are considered to be part of the relevant ecosystem? Some have a narrow view, limiting it to the supply chain and direct collaboration partners, while others include universities, companies creating complementary products, lobby clubs, etc.. Scope also concerns the innovation-related flows within the ecosystem, including products, knowledge, people, and finances. The scope of a company is related to its place in the value chain and the characteristics of the industries, but historically grown myopia sometimes also plays a role.

Related to the scope is the position of the company in the ecosystem. Companies may have grown into roles such as keystones or niche-players (Iansiti & Levien, 2004), component suppliers or system integrators. These roles impact the scope and the opportunities to actively shape the ecosystem. For instance, an industry platform provider has potentially more influence than a designer of niche applications. Role and power position are related to the roles and positions of other players, and to the overall structure of the ecosystem. Innovation ecosystems can be centralized around a single hub, contain competing hubs, or lack a center. These structures, and their dynamics, have influence on how companies act upon the ecosystem.

Considering the most important players in the ecosystem, and the related resource dependencies, companies adapt their innovation processes in many ways (Christensen & Bower, 1996; Pol & Visscher, 2010). This materializes in, for instance, customer-centered innovation practices, strengthening relationships with hub companies (Nambisan & Baron, 2013), or monitoring innovative moves of competitors, but also in adaptation to the structures on a regime level (Kemp et al., 2001), such as adherence to industry standards, and incorporating new national and European regulations. Adaptation further includes attempts to anticipate future developments in the ecosystem. Corporate foresight can play an important role in this (Rohrbeck and Gemuenden, 2011), especially when it is approached as a networked effort, which allows different partners in the ecosystem to contribute (Heger & Boman, 2014).

Companies do not only adapt to ecosystems, but also actively use it for their innovation efforts. By forming strategic alliances, acquiring IP, crowdsourcing, and other forms of 'inbound' open innovation, companies draw on the ecosystem for exploring and exploiting innovations. Interesting from an ecosystem perspective are especially collaborations with multiple parties from different parts of the system, and collaborations around ecosystem hubs. Profiting from ecosystems does not only entail finding the right partners and being good at handling collaborative projects, but also requires building a position in which others wish to cooperate with you. Hub companies become 'obligatory passage points' (Callon, 1986) for innovations, and niche players may grow into preferred partners for innovation processes.

On a higher level, companies may also attempt to shape a whole ecosystem and improve its robustness and productivity, in order to favor the chances of innovation processes within it (Iansiti & Levien, 2004; Adner, 2017). This includes orchestration activities of individual companies (Dhanaraj & Parkhe, 2006), such as creating and opening up industry platforms, hosting conferences, and facilitating regional networks, but also collective activities, such as lobbying, agenda building, and joint roadmap creation (McDowall, 2012).

In our paper we will elaborate and empirically illustrate the adaptive, anticipatory and active ecosystem strategies industrial firms deploy. Which specific strategies are used seems highly dependent on the structure of the ecosystem and position of a company, and on the perspectives of the management. In many companies, ecosystem strategies remain closely related to their regular (open) innovation, foresight, or public relations activities. Only a few companies have shown to deal with ecosystem challenges as part of their overall strategy.

Conclusion

This paper contributes to the emerging literature on (innovation) ecosystems by providing a comprehensive analysis and discussion of the strategies of industrial firms for dealing with and profiting from innovation ecosystems. It also offers valuable insights for policy makers. It identifies opportunities for facilitating innovation processes in ecosystems and for strengthening these systems themselves. The paper concludes with limitations and suggestions for further research.

3.3.3 IMPLICATIONS OF AN INNOVATION ECOSYSTEMS APPROACH FOR INNOVATION POLICY DESIGN AND MIX

Authors: Luke Georghiou, Lisa Dale-Clough, Katrin Hahn, Kornelia Konrad, Stefan Kuhlmann, Einkö Linshalm, Chiara Marzocchi, Wolfgang Polt,

Topic: At the systemic level, the now well-established 'systems of innovation' framework (Lundvall, 1992; Freeman, 2004; Edquist et al, 2001) has been extended by new perspectives such as challenge-based approaches (Eisenhart et al, 2016; Georghiou, 2013), systems transformations (Geels, 2002) and the 'new mission-oriented policy framework' (Mazzucato, 2016). All highlight deficiencies in institutional support for innovation and in particular coordination failures which point to an enhanced government role. A further overlay is that of government failure where the actions of the state may act to inhibit innovation.

The open innovation concept has highlighted the use of (and provision of) external ideas by firms to improve success in innovation, and a literature has developed around the methods and strategies needed to achieve this (Huizingh, 2011). If we extend the scope of firm innovation to the innovation ecosystem, the focus is upon the dynamics of the wider environment in which innovation takes place, including the role of institutions. The particular distinction of the innovation ecosystems approach is a focus on interdependencies and flows between actors. In seeking to understand the flows and interdependencies at a systemic level:

"The added value of thinking of this system as an ecology is the focus it brings to the distribution and abundance of research performers and knowledge and their interactions with each other and the broader environment" (European Commission 2008: 23)

Therefore, an innovation ecosystem perspective requires a focus on three categories of 'flow' or distribution, that of people, finance and knowledge. But what are the implications of these categories for innovation policy, and how does the ecosystems concept help us to evaluate and to develop new "systemic" policy measures (e.g. those identified by Smits and Kuhlman, 2004)?

Taking first the mobility of *people*, lack of capability to innovate is often associated with insufficient absorptive capacity in firms to take advantage of externally available knowledge (Cohen and Levinthal, 1990; Sptihoven et al., 2011). Absorptive capacity is in part determined by routines in the firm, and hence can be categorized as an organizational deficiency. It can also arise through an inability to recruit or train people with appropriate level of skills or talent in technology or management. Moving from the organisational to the ecosystem level, policy concerns include ensuring the population of skills in relevant technologies and entrepreneurship capability. Typical instruments include training and advice in capabilities and specific measures to encourage recruitment of these skills into deficient firms. Effective roles for people in an innovation ecosystem require maximum levels of mobility to match talent to opportunity. Barriers to this mobility include structural issues in the labour market such as portability of pensions. Other instruments may be designed to increase mutual understanding, inter-organisational learning and knowledge exchange, thereby supplying “system building” provisions.

Finance remains critical for innovating firms and is often a constraint for younger and growing firms. Assessing the right amount of public support is rarely (if ever) calculated on the basis of aggregate social returns and some consider that capital markets and therefore company management also underestimate the returns on innovation (e.g. Christensen et al., 2008). If that assumption is true then innovation ecosystems typically run with sub-optimal levels of finance available at key points. This area nonetheless is a focus for innovation policy with public finance through grants, loans and fiscal incentives accounting for the bulk of public support for innovating firms. There are also policies designed to mobilise private finance through co-investment, risk-sharing or other measures to facilitate the provision of venture capital. But approaching finance from an ecosystem perspective could place more emphasis on the need for policy measures to increase the rewards to those investing in innovation and to ensure that private and social benefits flow back to the source of investment. The financial contributions of intermediary actors (such as incubators) may also take on a new relevance.

That an innovating firm requires access to *knowledge* is self-evident, but the nature of that knowledge and the means of acquisition may vary considerably. The traditional distinction between tacit and explicit knowledge emphasises that the flows of knowledge between organisations, or even within them, goes well beyond that which is formally published - even if open access is facilitating that transfer. For decades innovation policy has focussed on promoting collaborative links between organisations to facilitate such flows and the joint production of new knowledge. The most frequent policy target has been science-industry links, with funding and incentives designed to bring universities and research organisations closer to business. Less visible in policy initiatives is the natural flow of knowledge between customer and supplier, but nonetheless initiatives have targeted supply chains and public procurement to provide demand-pull for innovation. A wide range of policy instruments also seek to stimulate diffusion of technologies with the aim of raising the productivity or competitiveness of lagging firms. The role of the intellectual property system in respect of knowledge flows is complex, as it brings knowledge into the explicit domain but then restricts flows except under transactional arrangements. Adjusting the balance between investor rewards and wider benefits from the diffusion of knowledge has also been the subject of policy intervention through instruments such as the patent box.

An ecosystem approach also requires us to understand the ways in which actors and institutions co-evolve and moderate or direct flows of knowledge people and finance. With this in mind, a policy approach based on the innovation ecosystem approach has a number of core precepts.

1. The first is a concern for the *population* of the actors in the ecosystem. Is there a balance between large multiproduct, multi-technology firms who can act as system integrators and a dynamic population of smaller companies who can provide innovative ideas and products? What is the role for established SMEs? How different does this ecosystem look across sectors and are those differences driven by the nature of the technology and/or market or historic drivers? A policy conclusion might be that there are insufficient innovative firms within an ecosystem, leading to the design of diffusion measures. Alternatively, there may be a need for more integrators that requires a policy focus on inward investment. Following from the population issue is the matter of *entry* to and *exit* from the ecosystem – what are the patterns of birth, growth, acquisition or death of relevant firms and does this enable effective selection of innovation opportunities?
2. Much policy discourse focuses on the adequacy of *intermediary institutions*. These provide support for innovation without normally having the role of taking the innovations to market. Research and technology organisations, standards bodies, measurement and testing services, consultancy support and more broadly services from innovation and business support agencies are all relevant here.
3. A concern about *finance for innovation* and the institutions that provide it. The most commonly perceived gaps are seed funding and second stage venture capital. This may reflect risk culture but can also be a feature of the *scale* of the ecosystem – large volumes of transactions (as in the USA) can allow specialisation and potentially higher returns on investment deriving from larger home markets. Similarly ecosystem concerns may pick up on the mobility and *supply of people and skills*, with shortages identified as targets for policy intervention. There may be clashes with wider restrictions on international mobility, which have consequences for highly skilled labour.
4. Addressing insufficient *demand* for innovation in a system, because of lock-in to existing solutions or issues like rigid procurement. This is particularly important when innovations require system transformation, for example to low carbon transport. *Regulations and standards* are important in determining the incentives for innovation and structuring markets. Regulation is especially important in the clean technology sector while standards are core to competitiveness in the ICT industry. Both can act as barriers to as well as drivers of innovation.

An overarching question is whether the role of policy makers within innovation ecosystems is different or changed from their role in other types of innovation system (e.g. spatial or technological). If policy makers, regulators etc. are considered as active players in an innovation ecosystem, does this offer new opportunities for developing and applying systemic policy measures, and what capabilities do policy-makers require? Conversely, does ecosystems policy imply a less directive role than in a territorial innovation system, which is oriented towards providing frameworks over specific instruments and support programmes? Furthermore, how is the issue of boundaries to be addressed in innovation ecosystems policy? National and regional innovation systems approaches draw boundaries that are easily mapped onto geographies of policy responsibility, and technological innovation systems follow technologies, which often resonate with the boundaries of sectoral or industry based innovation policy. If, innovation ecosystems are often international and not always clearly focused on a particular field of technology field, this creates challenges for organising innovation policy to address certain ecosystems. Is this a challenge that can only be resolved at company level? These questions are part of the more general question of who governs an innovation ecosystem and how?

Data and methodology: This article develops a framework to identify policy interventions which flow from an innovation ecosystems perspective and assesses the degree to which they correspond to corrections of deficiencies in innovation identified by firms. In the first part of the paper we review the innovation policy framework logic and develop a taxonomy of policy measures in the context of an innovation ecosystems perspective and the deficiencies that these seek to address.

The review will also establish the differences between innovation ecosystems and alternative innovation systems policy logics.

In the second part we review current assumptions about innovation policy deficiencies by analysing relevant aspects of in-depth interviews with Chief Executives, Chief Technical Officers, or senior innovation managers in 694 innovative firms in 11 European countries. The research was part of the Horizon 2020 project “IIT – industrial innovation in transition” (No 64935) focusing on changing patterns and strategies in industrial innovation and their implications for European and member state innovation policy. The project team consists of five partners from University of Aalto (FI, co-ordinator), Joanneum Research (AT), University of Manchester (UK), University of Twente (NL) and Zabala Innovation Consult (ES).

The third part, of the paper compares the taxonomy and the innovation policy deficiencies identified by firms to draw conclusions on whether the design and balance of policy measures currently available meets the needs of firms, and the distance between existing policy measures and those required to support dynamic innovation ecosystems. Conclusions are drawn on the nature of an ecosystems perspective for innovation policy logics, and its practical policy implications.

3.4 INTERNATIONAL FORUM ON KNOWLEDGE ASSET DYNAMICS (IFKAD)

Date of the event: 7-9 June 2017

Place of the event: St. Petersburg, Russia

www pages of the event: <https://www.ifkad.org>

Event organizers: Arts for Business Institute and Graduate School of Management St Petersburg University, Russia

IIT participants: Jukka Mattila, Anu Nuut

The following paper was presented in the conference:

3.4.1 INNOVATIVENESS THROUGH EMBEDDED KNOWLEDGE: CONSULTANTS IN INNOVATION ECOSYSTEMS

Authors: Jukka Mattila, Anu Nuut, Sampo Tukiainen, Erkki Ormala

Purpose – Consultants serve as providers of expertise and new methodologies, a change agent and a catalyst as well as a party bringing an independent, objective viewpoint to client assignments (Appelbaum and Steed, 2005; Schein, 1987). Consultants are considered as experts capable of bringing about change and increasing innovativeness (Armbrüster and Glückler, 2007; Hargadon, 1998). They are also seen to provide a wide basis of up-to-date knowledge of organizational development (Armbrüster, 2004; Hargadon, 1998; Schein, 1987), and they are valued as objective outsiders proposing development alternatives (Armbrüster 2004; Schein 1987).

Consultants and technological and management consultancy are a part of systemic relationships between invention, innovation and in particular the institutions which are present in a geographical or sectoral space which support and moderate the behavior of innovation actors. The purpose of this paper is to examine how companies use the help of consultancy as part of the knowledge transfer process in an innovation

ecosystem. We investigate empirically what kind consultancy companies are connected to firm's innovation ecosystems, what is their role in the systemic innovation, and how they help to co-create new value. We inspect the knowledge transfer mechanism by studying the role of management consultants in specific information flows, following the model proposed by Albino, Garavelli, and Schiuma (1998).

Design/methodology/approach – This paper is a phenomenon-based (von Krogh, Rossi-Lamastra, & Haefliger, 2012), empirical grounded-theory study (Strauss and Corbin 1990) in which we build on a qualitative study, conducted as semi-structured interviews in Finland (n=69) and Estonia (n=80). The qualitative approach provides a design that enables us to examine in rich detail the reciprocity in the consultant-client relationship in knowledge transfer and value co-creation. The aim here is to provide a substantive explanation. The approach taken in this study serves to specify causal networked relationships and processes between events, which contribute to an organization's innovativeness. The qualitative research strategy chosen here is not to test by means of empirical data a theory which is drawn up in advance, but qualitative research produces inductively a new theory or conceptualizations from empirical research material. (Raunio 1999) Following the "humanist" tradition (Raunio 1999) the concept of theory in this study has been conceptual-inductive rather than hypothetical-deductive. The researcher has had no set starting point for a theory to guide his work; rather the theoretical concepts are the results of the research process. This study develops a theory; it does not test any a priori presumption.

Originality/value – This study shows how outside experts and knowledge brokers (Hargadon 1998) connect to a company's innovation ecosystem. The study widens the view on client-consultant relationship in knowledge intensive client work (cf. Sturdy et al., 2009; Ciampi, 2007; Todorova, 2004; Nikolova & Devinney 2012), as well as creates an empirically grounded boundaries for the concept of innovation ecosystem (Lundvall 1992; Freeman 1995; Iansiti and Levien 2004; Adner and Kapoor 2010). In demonstrating how consultants link to the companies' innovation ecosystems, our study provides new interpretation of the creation of knowledge. The emphasis in our work is to study the interlinkages of consultants, from the "knowledge broker" perspective, proposed by Hargadon (1998; 2014), how consultants act as a bridge between nodes of knowledge.

Practical implications – The proposed results of the analysis provides a framework, which allows the clients of consultants better understand the capabilities and potential of the consultancy they acquire, and to improve the design, briefing and guiding the consultancy processes. From the consultant's perspective, the results of this study contribute to a view which encourages to design facilitation methods, which strengthen the involvement of the client's intellectual capacity in co-creation of knowledge, and hence, in successful delivery of consulting services.

Keywords – Consulting, Innovation ecosystems (*max 5 words*)

Academic Research Paper

3.5 THE INTERNATIONAL SOCIETY FOR PROFESSIONAL INNOVATION MANAGEMENT (ISPIM)

Date of the event: 18-21 June 2017

Place of the event: Vienna, Austria

www pages of the event: <http://www.ispim-innovation-conference.com>

Event organizer(s): ISPIM

IIT participants: Angelika Sauer

The following research paper was presented in ISPIM conference:

3.5.1 SUCCEEDING THROUGH KNOWLEDGE EXCHANGE: ORGANIZATIONAL REQUIREMENTS FOR OPEN INNOVATION

Authors: Angelika Sauer et al.

Problem: What specific innovation management problem does the submission focus on?

The recent popularity of Open Innovation (OI) practices and business models relates to their capacity to increase knowledge exchange and improve the success of company innovation (Chesbrough, 2003). However, not all companies succeed through OI practice. Instead, many companies have been confronted with challenges especially related with protecting their intellectual property leading to uncertainty and rejection of OI (Ulrich and Vladova, 2016). The existing literature traces the success or failure of open innovation projects to structural characteristics of the companies involved, such as firm type, size or sector (van de Vrandea et al., 2009). A more general requirement for successful OI is an existing routine for collaborative innovation, which provides tools, strategies and competences for shared learning and knowledge creation. However, the links between company characteristics, wider norms and the competences required for OI have not been examined in detail. Based on 684 qualitative interviews and a web-survey we explore tools (e.g. for sharing knowledge), processes (e.g. management models) and competences (e.g. technical) that provide a strong platform for engaging in OI across sectors/countries.

Current understanding: What is known about this problem, who and how has it been tackled before?

The popularity of the OI concept comes from the expected benefits to companies from being exposed to external ideas, thereby reducing the development costs and risks associated with innovation (Chesbrough, 2003). It is becoming apparent that OI is not a randomly emerged innovation procedure but is rather a purposeful strategy to organize innovation between different actors (Enkel et al., 2005). However, companies operating in this open manner are confronted with challenges related to different competences, diverse expectations and cultures, conflicting public and private objectives, the use of different measuring and benchmarking methods, as well as obstacles in interoperability and integration of solutions. Subsequently, companies face trade-offs between short term negative impact on a firm's market value, the costs and complexities of value appropriation in collaborative innovation and potential long term benefits (Faems, De Visser, Andries and Van Looy, 2010). Consequently, the practices, competences and capabilities associated with OI are specific and different from single-company innovation and require further attention. Specific knowledge related competences and processes have been addressed by Lichtenthaler and Lichtenthaler (2009) for industrial firms that conduct R&D; and Dahlander and Gann (2010) also conclude from an extensive literature review that internal R&D is a necessary requirement for outside-in OI.

Research question: What is the submission's goal?

However, the existing open innovation literature does not provide a coherent and detailed picture on the instruments, processes and competences companies need to establish in order to engage in effective OI and how they relate to company and sector characteristics. Therefore, we state the following main

research questions: Which organisational characteristics are relevant for Open Innovation (technologies, processes, size, sector)? Which competences are needed to operate effectively in an open innovation environment (innovation and knowledge management)?

Research design: How precisely was / will the study/work (be) executed - describe your methodology or approach

A sample of 694 interviews with company representatives such as CTOs and innovation managers in 11 European Member States such (e.g. Austria, Germany, United Kingdom, Spain) build the empirical basis of the paper. Interviews were conducted in the five main sectors ICT, Manufacturing, Biopharma, Agro-food and Cleantech. The interviews especially elicit information on company innovation practices with a particular focus on OI and novelties in the innovation behaviour. Currently, an initial quantitative analysis of the coded interviews is made to get a first impression of the data set. Furthermore, case studies and a web-survey will be carried out to test the deductive hypothesis from the qualitative data collection.

Findings: What are/will be the main outcomes and results?

From our first data review, we learned that OI plays a considerable role in almost two thirds of the interviewed companies. By contrasting business models, innovation management processes, competences and stakeholders of the companies using OI, against the companies not using OI, we can build the argument that effective OI has certain requirements (e.g. risk-taking innovation routines; differentiated IP strategy, participation in heterogeneous partner networks). Furthermore, we are excited to see if the applications of OI varies between specific cases and where and when more openness is desirable.

Contribution: What do the outcomes and results add to current understanding or theory in the innovation management community?

Our research contributes to a more complete picture of the engagement in OI practices. We will show important requirements to build an efficient environment for open innovation.

Practical implications: Who will gain, why and in which way from the findings

The wide consultation of companies regarding innovation practices with a particular focus on OI and novelties in the innovation behaviour allows innovation practitioners from different sectors and fields to benefit from the findings. Companies already engaging in OI may use them as an up-date on OI methods, processes and competences. Companies who have yet to adopt open innovation as part of their innovation toolbox may use them as guidance for future strategies and investment.

RESEARCH-IN-PROGRESS ONLY - Feedback: Which areas/questions do you want feedback on at the event?

On the one hand, we would be especially thankful for OI practitioners' experiences regarding organisational requirements for effective OI. On the other hand, it would be of great interest to hear, why other innovation practitioners do not engage in OI and if they think that this is due to a lack of organisational requirements for OI.

3.6 R&D MANAGEMENT CONFERENCE (SCIENCE, MARKET & SOCIETY: CROSSING BOUNDARIES AND CREATING MOMENTUM)

Date of the event: 1-5 July 2017

Place of the event: Leuven, Belgium

www pages of the event: <http://kuleuvencongres.be/rnd2017/articles>

Event organizer(s): R&D Management Conference

IIT participants: Klaasjan Visscher

Description of the dissemination: Conference presentation

Audience description: Researchers and practitioners in the field of innovation management

Audience size (number): around 300 (in the conference as a whole), maybe 15-30 at the presentation in the parallel session

The following paper was presented in the conference:

3.6.1 *INNOVATION ECOSYSTEM STRATEGIES OF INDUSTRIAL FIRMS*

Author: Klaasjan Visscher

Abstract: There is a growing interest in innovation ecosystems. Embedding innovation processes in these ecosystems comes with several managerial challenges. The aim of this paper is to understand which strategies and practices managers of industrial firms have developed to deal with these challenges. How do they adapt to, act upon and attempt to shape innovation ecosystems and their dynamics? We draw on a large set of interviews with CTOs and R&D managers in five European countries, from which we specifically selected those who explicitly recognized the importance of innovation ecosystems and developed relevant strategies. Based on theory and findings we identify two layers of innovation ecosystems, one more open layer aimed at exploration, another more closed aimed at exploiting opportunities and technologies. Between these layers synergies and tensions exist. Companies have developed a variety of strategies and practices to deal with both layers and their relationship. The identified innovation ecosystem strategies contain communalities, but there are also notable differences, which may be related to the company's position in the ecosystem, industry structure, and business strategy.

4 Conference tracks hosted by IIT

IIT hosted a conference track (track number 10) in the 2017 Annual Conference of the EU-SPRI Forum: “The Future of STI – The Future of STI Policy”, Vienna, June 7-9

Name of the track: Innovation Ecosystems – a Governance Challenge for Companies and Policy Makers?

Track organizing IIT members: Kornelia Konrad (University of Twente), Lisa Dale-Clough (University of Manchester), Katrin Hahn (University of Twente), Chiara Marzocchi (University of Manchester)

Description of the track:

Innovation system concepts have become a major reference for innovation policy and proven to be a useful lens for capturing features of innovation processes which transcend the boundaries of innovating organizations, such as institutions or networks. Innovation system concepts have been used to analyze innovation dynamics and the specific conditions for innovation at national or sectoral levels, or in particular technology fields. In doing so, they have been productive for deriving innovation policy approaches (Wieczorek & Hekkert 2012; Smits et al. 2010a; Smits & Kuhlmann 2004).

While these concepts are useful for capturing systemic features at highly aggregated levels, they are arguably less tuned towards capturing the dynamic evolution of innovation systems (Smits et al. 2010b) and how the organizations within an innovation system make use of and interact with this system in their innovation processes and strategies, or how they actively contribute to shaping these systems (for exceptions see Planko et al. 2016; Musiolik & Markard 2011). Empirical research shows that companies cannot typically manage the challenges of adapting new technologies, introducing innovations, establishing and sustaining business interrelations, and maintaining competitiveness using just internal resources and capabilities. Companies are systematically shaping their innovation environment to improve innovation capabilities and processes (Coombs and Georghiou, 2002). These interactions are both directional, such as creating more or stronger co-operations, and reactionary responses to environmental change or changing positions within an innovation value chain, which create new system boundaries e.g. insourcing specialised innovation activities.

The concept of an innovation ecosystem (IES), which emerged from the innovation management literature (Autio & Thomas 2014; Adner & Kapoor 2010; Moore 1993), has received increasing attention because of its potential to address system-level phenomena from a company perspective, respectively the interface between companies and ‘their’ innovation (eco)system. This idea pays particular attention to the flows of money, knowledge,

people and services between organizations, to identify interdependency, as in a biological ecosystem.

“The added value of thinking of this system as an ecology is the focus it brings to the distribution and abundance of research performers and knowledge and their interactions with each other and the broader environment.” (European Commission 2008: 23)

A company’s innovation ecosystem (IES) is not limited to an industry sector or specific region as implied by concepts such as sectoral, regional innovation systems or clusters (Malerba 2002; Braczyk, et al., 1998,

Porter 1998), or to a particular technology as implied by the technological innovation system concept (Carlsson and Stankiewicz 1991). It is comprised of all the contacts and inter-linkages to other organizations around specific products or technologies, and thus companies may have to manage and manoeuvre within multiple or overlapping innovation ecosystems. The innovation process involves suppliers and customers but also competitors or universities, investors and policy actors, each of whom may control important resources or dependencies in a specific IES. This perspective has new implications for Governments, whose policy concerns will encompass the stability/change in populations and configurations of actors within IES'; facilitating interactions across sectors, geographies and value chains; ensuring effective flows of ecosystem resources, and addressing systemic imbalances.

We invite contributions which discuss conceptually or empirically:

- Strategies: the ways that innovating organizations strategically mobilize their innovation environment and/or try to shape it as part of the innovation process and/or anticipate the future environment.
- Ecosystem change: how do ecosystems change? What strategies can companies and governments use to respond to or induce ecosystem change?
- Concepts: what are the conceptual merits and shortcomings of the IES concept? How does the concept relate to other innovation system concepts?
- Governance and policy implications: how are innovation ecosystems governed and by which actors? What is the role of policy-makers within innovation ecosystems and what are the approaches and policy instruments for supporting and directing innovation within IES? How is the tension between the diverging boundaries of often international and highly dynamic innovation ecosystems, and national and regional innovation systems and policy frameworks, and how may policy address this challenge?

5 Summary

The objective of this Deliverable 6.3 is to report the market-to-policy workshops where IIT policy results have been disseminated. The project has participated in four national workshops (1 in Finland, 2 in UK and 1 in Austria). Besides these national policy workshops the IIT groups has presented altogether 7 research papers based on the IIT project in 6 academic conferences. The policy brief of the project (D 3.2) has been then updated also based on the feedback that the group has received in these events. IIT groups has also hosted one conference track in EU-SPRI conference.