PEER INNOVATION

Conceptualizing and assessing the role of peer networks for sustainable innovation

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Outline

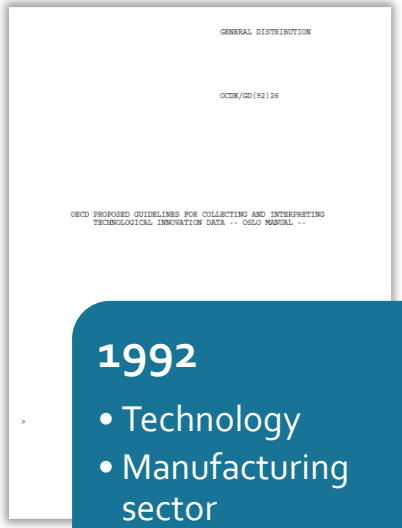
1. Introduction
2. Broadening the concept of innovation: peer innovation
3. Can/How can the TIS approach be used to study peer innovation?
4. Conclusions

Introduction

Research project „PeerInnovation“ (10/2019 – 09/2021)

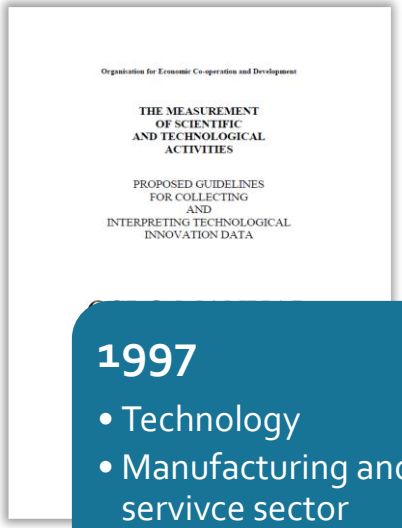
- joint research project of IÖW and TU Berlin
- funded by the German Federal Ministry of Education and Research
- contributes to further develop the indicator system for research and innovation
- aims to:
  1. better understand the role of peer collaboration in creating knowledge for sustainability transitions
  2. develop indicators to measure collaborative innovation activities in the household sector

Broadening the concept of innovation: The traditional view on innovation



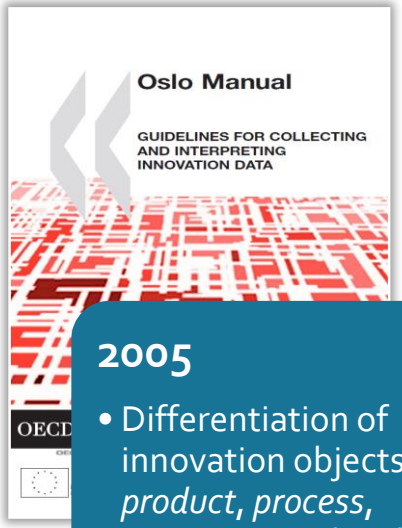
1992

- Technology
- Manufacturing sector



1997

- Technology
- Manufacturing and servivce sector



2005

- Differentiation of innovation objects: *product*, *process*, *organisational and marketing innovation*

2018

- Inclusion of non-commercial activities: *business innovation* und *household sector innovation*

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Broadening the concept of innovation: More opportunities for transformative innovation policy

- Growing evidence and recognition of the importance of consumers for conventional innovation processes (economics community)
- Policy shift towards mission-orientation (policy community)
- Need to consider many other relevant processes of change (relations, practices) besides the commercial development of industrial technologies in order to explain how society can be transformed (transition community)

Peer innovation: A different mode of innovation

- Digital technology enables commons-based peer production
  - Digital fabrication allows codification and easier transfer of knowledge
  - Online platforms (e.g. Wikifactory, GitHub) promote peer collaboration and broader diffusion of knowledge
- Needs orientation determines search processes
  - Consumers start to innovate when market products do not meet their needs, peer communities form around commonly perceived problems
  - More than 30% of the projects on Wikifactory address at least one UN Sustainable Development Goal (SDG)
- Does peer collaboration create different technologies?

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Peer innovation: other concepts of innovation

	Open Innovation	User innovation	Household sector innovation	Free Innovation	Peer Innovation
(1) Leading actor					
Business	•	(•)			
Private individual		•	•	•	•
(2) Predominant motivation					
Commercial interest	•				
Personal use	•	•	•	•	•
Other self-rewards	•		•	•	•
(3) Essential features					
Free sharing				•	•
Collaboration	•				•

household sector

all kinds of self-reward

free & collaborative

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Can/How can the TIS approach be used to study peer innovation?

- Functional approach of the TIS Framework allows for analysing innovation systems without assigning functions to specific structural elements
- (Peer) networks already included in the set of structural elements
- However, market and science orientation is inherent to the description of system functions and the proposed indicators
  - Revision of functions: interpretations, indicators and linkages

Can/How can the TIS approach be used to study peer innovation?

Functions	Critique	Suggested amendment
Entrepreneurial Experimentation (F1)	Actors who are interested in experimentation are not necessarily interested in financial rewards. The variety and diversity of actors involved in experimentation may therefore be much wider than the TIS	Combine functions F1, F2 and F3 and redefine as 'collaborative experimentation' by entrepreneurs as well as other actors (such as peer innovators)
Knowledge Development (F2)	Need for alternative indicators to measure knowledge production as none of the traditional indicators capture the activities of peer innovators.	
Knowledge diffusion through networks (F3)	Given that much peer innovation happens online, mapping workshops and conference may not be appropriate but mapping the (digital) network size and intensity over time is certainly relevant.	

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Can/How can the TIS approach be used to study peer innovation?

Functions	Critique	Suggested amendment
Guidance of search (F4)	Peer innovators self-allocate their efforts in reaction to the actions of other peers. Mutual coordination is the result of positive and negative feedbacks. The direction of search may be influenced by challenges or reinforcing peer signals.	Recognise the importance of the interaction environment on the direction of search and the importance of platform providers with regard to F4.
Market formation (F5)	Peer innovators do not act with commercial intent. Market formation is no precondition, nor does it improve the chances for peer innovation. However, it may help the wider diffusion of peer innovations through entrepreneurial coalitions.	Conceptualise F5 as a function that affects diffusion (and thus the creation of social value) rather than knowledge development process.

Can/How can the TIS approach be used to study peer innovation?

Function	Critique	Suggested amendment
Resource mobilisation (F6)	Peer innovators contribute their own resources based on self-rewards, if there exists an environment that enables and integrates their contributions.	Recognise access to the physical and intellectual means of production as a required resource of peer innovation.
Creation of legitimacy/ counteract resistance to change (F7)	Rather than resistance, peer innovation systems need to overcome ignorance. Processes of legitimation are important factors in drawing the attention of a critical mass of peer collaborators towards contributing to the development of a certain innovation.	Recognise the importance of legitimization processes for guidance of search (F_4) rather than market formation (F_5)

Proposed amendments to the TIS frameworks

- New function „collaborative experimentation“
  - Experimentation, knowledge creation and application not separable (F1+F2+F3)
  - Extent interpretation to self-motivated actors without commercial intent
- Check essentiality of function
  - Market formation (F5) not essential for knowledge development (F1)
  - But, business ventures may create social value through market diffusion (F3)
- Different linkages and dynamics („motors of change“)
  - Self-reinforcing dynamics because of strong network effects: legitimacy (F7) -> resource mobilisation (F6) -> F7 -> F6 -> …
  - Self-organisation and self-coordination through continuous loops of evaluation: legitimacy (F7) -> guidance of search (F4) -> collaborative experimentation -> F7 -> …
- New community-based indicators
  - Collaborative experimentation: e.g. community size, number of „forks“ and „merges“
  - Resource mobilisation (F6): e.g. total money/hours spent hacking/prototyping

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Conclusions

- Re-definition of innovation creates space for policy to support alternative modes of innovation
- But: need to define and develop new approaches to measure such modes of innovation
- Definition of peer innovation: peer collaboration as emergent source of innovation
- Transformative potential of peer innovation: need re-orientation, inclusiveness and disruptive power
- Revision of the TIS framework‘s focus on market and science
- Our empirical approach: explore digital footprints as data source

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GEFÖRDERT VOM

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