Understanding the role of objects in interactive innovation

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Employees

Customers

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Background

- **Gap in research:**
  - Deep understanding of the capabilities of (boundary) objects for the integration of different types of innovators (i.e., interactive innovation) is missing.

- **Relevance:**
  - An organization’s ability to innovate is closely related to the use of collective expertise and expert knowledge from diverse functional background (Subramaniam & Youndt, 2005).
  - Organisations can choose among a sheer multitude of objects to foster interactive innovation but lack structured guidance of how to best design them for their specific purposes (Neyer et al., 2009).

- **Attempt to address gap in research:**
  - Juxtaposing two theoretical lenses, i.e. the concept of loose coupling as well as the pluralistic understanding of objects
  - Development of a framework for the role of objects in interactive innovation
  - Refining the framework while designing the “IP Industry Base” project for interactive innovation. The IPIB is an innovative analytical database in the field of competitive intelligence (CI).
Interactive innovation: A loose coupled perspective

Outside innovators (e.g. customers)

Interaction routine dynamics

Process Dimension

The processes constituting interactive innovation, i.e. how responsive are the involved individuals towards interaction

Bounded rationality; sematic & pragmatic boundaries

Individual Dimension

The individuals’ abilities and experiences that underlie interactive innovation, which are grounded in individuals’ identity.

Ambiguity

Situational Dimension

The situation in which interactive innovation takes place

Core inside innovators (R&D)

Peripheral inside innovators (“employees”)

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A pluralistic approach for studying objects in interactions

Practices of interaction are more than constellations of “intersubjectivity”; they are constellations of “inter-objectivity” (e.g. Latour, 1996)

A focus on “boundary objects” is not sufficient to understand and design objects for interactive innovation (e.g., Nicolini et al. (2012).

Four perspectives for studying objects in cross-disciplinary interaction (Nicolini et al., 2012)

Material infrastructure
Boundary objects
Epistemic objects
Activity objects
Framework for the role of objects in interactive innovation

Employees

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Framework for the role of objects in interactive innovation

Outside innovators (e.g. customers)

Core inside innovators (R&D)

Interactive innovation

Concept of loose coupling
- Process Dimension
- Individual Dimension
- Situational Dimension

Pluralistic understanding of objects
- Material infrastructure
- Boundary objects
- Epistemic objects
- Activity objects

Peripheral inside innovators ("employees")
Objects in interactive innovation: Lessons learned from designing the IP Industry Base Project

IP Industry Base – analytical database about the service providers in the IP industry

http://ipib.ci.moez.fraunhofer.de/companies/awapatent
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Material infrastructure
Boundary objects
Epistemic objects
Activity objects

issue-tracking
project management software
(our approach: „make communication simple, fluid and ubiquitous“)

situational dimension
tickets as central point of reference; reducing ambiguity through context and history

individual dimension
deep integration of the system – reducing pragmatic boundaries by „following-up a conversation with one click“

process dimension
Implementation of standardized patterns of interaction for all innovation routines through the system
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Material infrastructure
Boundary objects
Epistemic objects
Activity objects

specific improvements of the system, like the company DANN (our approach: „make ideas tangible asap“)

situational dimension
using sketches, mock-ups and early prototypes to translate ideas into ambiguity reducing artifacts

individual dimension
by knowing all these artefacts especially the outside innovators are supported to easily formulate their ideas of improvement

process dimension
all conversation about iterative improvements is done based on these artefacts (which are easy to access from the issue tracker as material infrastructure)
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Material infrastructure
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situational dimension
the active promotion of the IPIB (and its improvements) to all innovators makes it to an object of curiosity and change

individual dimension
by using the analytical features the innovators understand the general power of the data and algorithms in the IPIB and can shape further ideas

process dimension
all types of innovators can share their sudden inspirations for improvements of the IPIB through the material infrastructure (issue tracker) and follow up a routine

the IPIB itselfs as an epistemic object
(our approach: „make the innovators curious“)
Objects in interactive innovation: Lessons learned from designing the IP Industry Base Project

Material infrastructure
Boundary objects
Epistemic objects
Activity objects

**Material infrastructure**
- **Boundary objects**
- **Epistemic objects**
- **Activity objects**

**situational dimension**
the „imperfectness“ of the competitor matrix motivates all innovators to work on further improvements

**individual dimension**
each innovator is stimulated to actively work on research issues in its own discipline to improve the competitor matrix

**process dimension**
far reaching innovations in the IPIB (like the competitor matrix) are presented at conferences to include further perspectives and ideas

**the competitor matrix as activity object**
(our approach: „make the innovators to drive the change“)

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Discussion & Conclusion

- Goes beyond – and suggest some challenges – to extant organizational innovation and information system research, viz.:
  - How to better understand and trace the different – and shifting – roles of objects in interactive innovation?
  - How to shift the focus from “what” types of object fit best for interaction towards “when” do they fit best?
  - How does the understanding of different objects and its functions refine the requirements of engineering settings and practices in software projects?

- Proposes a contingent relationship between interactive innovation, the design of objects and its functions and performance of interaction innovation

- Next steps: longitudinal follow-up to verify causal relationships; investigation of communication patterns within the material infrastructure; implementing and verifying the approach in “non-open-end” projects