What Can Studies of Infrastructuring Learn from Participatory Design and Vice-Versa?

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Trial lecture

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What Can Studies of **Infrastructuring** Learn from **Participatory Design** and Vice-Versa?

- An analytical lens vs. an approach to design
- Evolved separately in the literature, but interacted
- Same challenges: distribution, continuity, heterogeneity
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PARTICIPATORY DESIGN (PD)
Participatory Design

- Work-oriented proactive **design** strategy

- Born in **Scandinavia**, mid-1970s (Nygaard, Ehn, Kyng)

- **Collaboration** between researchers, workers, trade unions
  - End users actively included in technology design
  - Dynamic inclusion of their **skills**, **experiences**, and **interests**

- A **democratic** ideal: Reaction to possibility of de-skilling and loss of control following introduction of computer-based systems in organizations
  - Greater *control over work / Redistribution of power*

- An *end* rather than a means
Participatory Design

Traditional design in «context»

UTOPIA project (1981, see Ehn 1993):

• Design-by-doing

• Collaboration with the Scandinavian graphic workers’ unions

• Computer-based system for paging and image processing in newspaper production

• For typographers

«...new computer-based tools should be designed as an extension of the traditional practical understanding of tools and materials used within a given craft or profession.» (p. 57)

Proactive approach

Collaboration

One system for one specific task set

Homogeneous user groups

Skills, experiences, and interests of users

Pilot installation at newspaper (Sundblad 2011)
Participatory Design

• Historically contingent phenomenon
  – A green field
  – Strong unionization
  – Law: technology should accommodate users

• Imported in North America
  – Promoted by management
  – Means rather than end: Towards usability and efficiency

• PD today
  – (Virtual) community(ies) more than workplace
    • E.g., ecological research, dog breeding, NGOs
    • Incorporated into other fields
  – Losing some of its political roots: a means rather than and end?

See e.g., (Björgvinsson et al. 2012; Bødker 2015; Grudin and Pruitt 2002; Karasti and Syrjänen 2004; Kyng 2010)
Open challenges in modern ICT

• Distributed

• Interconnected

• Long-term

• Heterogeneous user categories

• New forms of user involvement

• Users’ privacy

Picture credit (Edwards et al. 2013)
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INFRASTRUCTURE & INFRASTRUCTURING
Information infrastructure

Socio-technical system of systems:

- **Unbounded in time and space**
- **Built on an installed base**
- **Transparent to daily use**
- **Visible upon breakdown**

Not an artifact, but a **relation**

Adapted from (Star and Ruhleder 1996)
See also (Edwards et al. 2013; Monteiro et al. 2013; Star and Bowker 1999)
Example: MACS
Multicenter AIDS Cohort Study (Ribes and Polk 2015)

- Multi-site organization
- Medical doctors and scientists from several disciplines
- Cohort Study of AIDS natural history
- Over 30 years
- Resources:
  - Specimens and data
  - Calibrated instruments
  - Approx. 7000 gay and bisexual men

Distributed organization
Heterogeneous user categories
Interdisciplinary collaboration
Long term organization
Installed base
Picture credit (Ribes and Polk 2015)
Slide adapted from original presentation by David Ribes (2014) with permission
Infrastructuring

- **Descriptive** lens on infrastructure-in-the-making
  - **Variety**: materials, users, purposes, integration efforts
  - **Flexibility**: work to maintain the infrastructure
    - Future concerns + Installed base
    - Designers + users
  - **Continuity**: No design/use/implementation/repair separation

See, e.g., (Bossen and Markussen 2010; Karasti 2014; Karasti et al. 2010; Pipek and Wulf 2009; Star and Bowker 2002)
An example of infrastructuring (Ribes and Polk 2015)

- To study AIDS by collecting any sort of possible specimen «as long as it wasn’t aliens.» (p. 10)

- Moment of «breakdown»: discovery of HIV as causal agent
  - Repurposing of the infrastructure to go on with research activity «as before.» (p. 14)
  - From searching agents to investigating behaviors linked to AIDS transmission, ethnicity, co-morbidity

Picture credit (Ribes and Polk 2015)
Can PD and infrastructuring be used together?

• Are they really commensurable?
  
  – Different approach: Normative vs. Descriptive
  – Different scope: Design-in-context vs. Boundless
  – Different focus: Pivotal user role vs. Infrastructural relations
  – Different values: Political roots vs. Limits of politics

  – Similar roots: Socio-technical soul
  – Similar methodologies: Ethnographically inspired study of work in context
  – Similar tendency to shade users/researchers/designers boundaries
They are being used together

To face common challenges of ICT:

- Distributed
- Interconnected
- Long-term
- Heterogeneous user categories
- New forms of user involvement
- Users’ privacy

WHAT CAN PARTICIPATORY DESIGN LEARN FROM STUDIES OF INFRASTRUCTURING?
Infrastructuring Participatory Design

• Infrastructuring as an opportunity for supporting scalability:

1. **Time**: *when/how long* does user participation unfold?

2. **User/participation**: how to deal with *user heterogeneity*?

3. **Space**: *Where* does user participation unfold?
Infrastructuring Participatory Design

1. Scaling – Time

- **Infrastructur-**ing

  ➢ **Continuing design**: past + long-term (Karasti et al. 2010)

  ➢ **Blurring boundaries** between design time/use time (Ehn 2008)

  ➢ **Longitudinal** studies
    - Focus: Technology/activity **co-evolution**

  E.g., HIV/AIDS research
Infrastructuring Participatory Design

2. Scaling – Users

• From users to stakeholders (Le Dantec and Di Salvo 2013)

• No a-priori distinction between social and technical elements (Ehn 2008)
  ➢ Also non-humans

• Unit of analysis: Ongoing work of stakeholder alignment
  ➢ Community interests + local usefulness (Karasti and Syrjänen 2004)

• Method: Follow the infrastructural relations (Star and Bowker 1999)
  ➢ Different ways to «participate»
Infrastructuring Participatory Design

3. Scaling – Space

• **Multiple levels of analysis** (Pollock and Williams 2008)
  - Different end users, technology vendors, consultants

• **Methods to include otherwise «invisible» actors** (ibid.)
  - Follow the marketization/creation of products
    - E.g., ERP systems

  ➢ **Intermediaries** who mobilize stakeholders
    - E.g., industry analysts at Gartner

  ➢ From offices to agonistic **arenas to manage consensus** (Björgvinsson et al. 2012; Pollock and Williams 2015)
    - E.g., software analyst conferences
WHAT CAN STUDIES OF INFRASTRUCTURING LEARN FROM PARTICIPATORY DESIGN AND VICE-VERSA?
Challenges to infrastructure/-ing

«Infrastructure becomes visible upon breakdown»
(Star and Ruhleder 1996)

«Good working infrastructure is transparent to use, yet good participatory design makes the problematics of use visible»
(Neumann and Star 1996)

PD as occasion to problematize how and why (in)visibility is mobilized
(cf. Larkin 2013)
PD for infrastructuring

- PD as an opportunity for ICT design:

  1. **Democracy**: How to problematize issues associated with participation?

  2. Implications for **method**: How to take the **user** into account in infrastucturing?
PD for infrastructuring

1. Democracy

• Infrastructures always exist in a socio-political context

➤ **Empowerment** of «invisible» stakeholders
  • PD can reveal **power structures** (Björgvinsson et al. 2012; Le Dantec and Di Salvo 2013)
  • E.g., environmental coordinators in oil companies

➤ Making the **mundane relevant**
  • Reinvigorating **maintenance** and **repair work** (Jackson and Buyuktur 2014)
  • Associated with wage, labour law, (de)skilling
  • E.g., specimen curation in MACS
PD for infrastructuring

2. Methods: User-orientation

- [infrastructure design] + [work practice]
  - Remember the **humans**
    - Critique to overly technological accounts of infrastructure
    - Privacy, security risks, IPR (Kyng 2010; Clement et al. 2012)
  - Learn to understand **commitments and imaginaries** (Star and Neumann 1996)
    - Temporary stakeholder alignment around matters of concern
    - Long-term relations with stakeholders
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Scalability:
1. Time
2. Stakeholders
3. Space

1. Democracy
2. User-orientation
CONCLUDING REFLECTIONS
Concluding reflections (1/2)

• The two directions blend into each other
  – Same scalability challenges overpower differences
    • Heterogeneous users, distributed sites, long-term duration, variability

• Larger corpus using infrastructuring for PD
  – Infrastructuring as a perspective on design as a continuum of activities
    • Useful examples
    • But not easy to translate into more appropriate design techniques

  – At least: to identify stakeholders
    • Voluntary cohorts in MACS
    • Consultants at Gartner
Concluding reflections (2/2)

«... centralization of the Internet, big data and large-scale infrastructuring challenge the core democratic ideals of PD.»
(Source: Call for participation to PDC 2016, Aarhus, DK)

- PD can be influential during the infrastructure design phase
  - PD is losing its original political thrust...
  
    - Reinvigorate its political orientation to contestation at societal level
      - Constructive controversies
      - Users’ rights, risks, and accountabilities
        - Cf. early-stage union involvement to represent users
        - New forms of engagement: Crowdsourcing? Open data sharing?

- Empowering stakeholders from all types of domination
  - Technical: privacy issues (e.g., surveillance systems)
Bibliography (1/2)

Thanks for your attention!