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Workshop Summary: Collaborative Infrastructuring – Conceptualizing Emergence and Design of Information Infrastructures

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Abstract. The workshop examined issues around the collaborative design and use of information infrastructures through a collective sharing and analysis of case studies. We welcomed as position papers analyses on empirical studies or descriptions of cases that the authors are familiar with. The workshop approach was a collaborative activity involving a 'live metareview' over participants' case studies. That was, the group will consider in turn a number of issues emerging from the cases. For each issue we discussed whether and how it manifests in the particular infrastructure settings that each participant is familiar with or has studied. This enabled the participants to gain a richer understanding of the research space around infrastructure design and use. Goals of the one-day workshop were: case studies explored, key issues and special problematics identified, a poster prepared for the conference poster session, a journal special issue planned – and networking.

Introduction

There is a growing interest in information infrastructures and their multiple facets. With a focus on large-scale technological systems, they have been studied as increasingly ubiquitous (e.g. e-society, e-government, e-science/cyberinfrastructures, e-research, e-health) conglomerates of technologies and practices (Ciborra et al. 2000, Atkins et al. 2003, Jirotka et al. 2006, Edwards et al. 2007, Olson et al. 2008). With a focus on their taken-for-grantedness independent of their scale, they have been studied as 'work infrastructures' (Hanseth & Lundberg 2001, Pipek & Syrjänen 2006, Pipek & Wulf 2009) even on smaller scales. Although there is an impressive history of research on infrastructures (Star 1999, Star & Ruhleder 1996, Edwards et al. 2007, Ribes & Finholt 2007), and although much of that research remains highly relevant even as technologies have changed and become more pervasive, nevertheless there remains much to be learned.

We particularly struggle to design good, robust, flexible and adaptable infrastructures that can scale well and remain useful over time. Our success is mixed, and to a certain extent many approaches assume a passive perspective on infrastructure processes as developing phenomena. For a design turn, we need to assume an active perspective on infrastructure processes as phenomenon development. Can we do better than a Darwinian model of constantly building new ones and hoping that some will prove fit enough to survive and be replicated? The need emerges to complement existing research with a closer look at the stakeholders and collaborations that produce and manifest infrastructure (Lee & Dourish 2006), and to consider approaches that see infrastructure-making as a process.

Information infrastructures are multi-scale in terms of spatial extent, temporal orientation, and conceptual breadth. In recent times there has been a growing emphasis on how to create infrastructures that are large scale and can operate for the long term (Karasti & Baker 2004). This provides impetus to comparative studies across the continuum of network activities from micro to macro. As large-scale initiatives, they involve top-down elements such as coordination and provision of access to scarce resources. However, at the same time they may need to be integrated with local practices and existing systems sometimes referred to as the 'installed base'. As 'taken-for-granted' systems they develop a certain dynamic of innovation around breakdowns and the resolution of reverse salients. Infrastructures come about through wide-ranging chains of innovation that eventually bring their usages into effect. These innovations can involve the end users themselves, either by intention of the infrastructure designers (Dittrich et al. 2009) or unbeknownst to them (Karasti & Baker 2008, Twidale & Floyd 2008).

People in multiple roles – not only professional designers – establish and shape an infrastructure through various kinds of encounters over extended timeframes. People can innvovate by programming, but also by tailoring, or appropriating an application for a purpose its designers did not intend. They can combine existing familiar computer applications into a complex workflow, and exploit novel applications and web services as they become available. The activities involved are varied, relating to a) selection, adoption, combination, design, development, deployment, enactment, and implementation of systems and environments b) mediation, interpretation, elicitation, and articulation of issues by professionals in emergent roles, and c) adaptation, appropriation, tailoring, redesign, and maintenance by diverse individuals over time. Strategies for before-use, during-use, and future-use are intertwined. The suite of actions are intricately interconnected, interdependence made explicit by the infrastructures themselves. Long-term infrastructures can be thought of as a network of processes, i.e. multiple simultaneous, interleaved processes that require constant tending to shift in response to unexpected contingencies, to develop in response to local insights, and to counteract tendencies to drift from alignment. They are also often networks of application and services that can change as new technologies emerge and use patterns and needs evolve. It is this multifaceted, complex phenomenon that was explored in our workshop.

The workshop aimed to help develop a richer understanding of issues related to the analysis and design of infrastructures:

1) the concepts, issues and theories that can inform our analysis both of the infrastructures themselves, and of the processes of collaborative infrastructure design
2) the concepts, issues, theories and methods that can improve the processes of doing collaborative infrastructure design

In order to achieve these aims, the workshop involved a collective sharing and analysis of case studies.

Position papers were invited that include one or more case studies, empirical research or at least some description of an infrastructure setting that the workshop participant was familiar with and could discuss at the workshop.

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