



Technology as we do not know it: The extended practice of global software development



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ABSTRACT

In this paper we propose an understanding of spatially and temporally extended practice. By introducing the notion of ‘appresentation’, we describe how global IT business actors make sense of matters that they cannot know directly. We make appresentation apparent by discussing how vendors take account of the needs of future customers and also of their current users of whom they have no direct knowledge. Based on long-term research into Information Technology market dynamics, we offer three examples of appresentation, used strategically by global IT vendors to link to sites and times that they have no direct experience of and examine how they extend their sense-making resources outwards from the local situation. The work that we call appresentation consists of a set of strategies including (i) preparation; (ii) user endowment and (iii) user segmentation. We contribute to existing perspectives on extended practice by describing how *not knowing* is used to produce knowledge that extends beyond the single site.

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1. Introduction

Technologically mediated situations are becoming extended. Scholars are increasingly addressing how learning (Vaast & Walsham, 2009), knowing (Nicolini, 2011, 2007) and sense-making (Monteiro, Jarulaitis, & Hepsø, 2012) are achieved across the situations that characterize global infrastructure that may be far-removed in time and space. The emphasis has been on how the actor can apply what is known from the past to each new site (Almklov, 2008). Despite current interest in such extended sense-making, little research has been done on how, in making sense of (temporally/spatially) distant settings we take account of matters that we do not know. This may pertain to the future of a technology, for example, or the needs of a customer base that is too large and diverse for a vendor's sales arm to engage with.

Global software packages provide an instructive case for studying how IT vendors and their clients use something that is beyond their reach to accomplish their work. The difficulty of assessing complex software products has been an issue ever since Williamson's (1985) seminal work on information products. They are generic packages which, to be useful, need to be continually developed to offer new functionality answering to current and emerging needs (Pollock, Williams, & D'Adderio, 2007). This calls for sustained investment in a package by the vendor, and buyers need to know that the supplier will serve their sector in coming years (Pollock & Williams, 2010).

The extended nature of software packages – including Enterprise Resource Planning (ERP) Systems, the particular package we refer to here – has become an object of scrutiny in existing social science literature on information systems. The question is how vendors and their clients learn to manage future uncertainty and differences between user sites (Pollock, Williams, D'Adderio, &

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Grimm, 2010). One emerging approach is to argue that actors make sense of future and distant sites by socially constructing any new situation as an occasion of something that they already know (see, for example, Almklov, 2008; Almklov & Hepsø, 2011). The work of making sense of space-time distant practices has been studied so far in organizations (Vaast & Walsham, 2009) and in knowledge domains – medicine and geology, respectively – (Monteiro et al., 2012; Nicolini, 2011) where a certain degree of standardisation is apparent or desirable. However, the work of comparison in ERP development is problematic for a number of reasons. Given the large investment required to procure these systems, buyers cannot afford to learn about the ERP product by trial and error (Tingling & Parent, 2004). It is also extremely hard to assess the properties of a packaged enterprise system as these cannot be readily discerned by direct inspection and are only evident when implemented and used by an organization. As Smith (2009) points out, the audience tends not to agree on what was seen in ERP demonstrations. Vendors and their clients seem therefore to be engaged in a more nuanced activity than just comparing dispersed user sites and technological practices. To describe this activity we widen here the old phenomenological concept of *appresentation*. Schutz and Luckmann (1989: 2, 131–132) use the term ‘appresentation’ to refer to the process of making available to participants ‘what lies spatially and temporally beyond their reach’. Accordingly, we understand *appresentation* as an emerging social skill whereby the global IT industry (suppliers and buyers) makes sense of usage sites that are beyond what a vendor can reach for direct information.

Our analysis will address the *appresentation work* of global ERP vendors as well as their clients, who are seen as active participants in shaping enterprise technology. We will describe how IT vendors and the buyers of their products *appresent* differences between globally distributed client organizations. Rather than a limitation, we found that referring to something that is not known is an essential part of successful sense-making in the extended negotiations that lead to ERP development and use.

The paper is structured as follows. The next section reviews studies that approach technology development as an extended situation. We identify some gaps and offer a proposal to address the research question. We illustrate our proposal using studies of a key moment in ERP systems uptake in which vendors address a new sector. These settings provide an important opportunity to reveal how business actors make sense of what is beyond their reach and develop the skills required to undertake *appresentation*. We will then discuss how our approach complements current theoretical understanding of technologically mediated practice extending in space and time.

2. An approach to sense-making in extended settings?

When exploring social studies of Information Systems literature, in search of approaches to sense-making in extended settings, we are faced with an interesting paradox. Approaches that deal with sense-making¹ (i.e., situated studies of technology and work) are often criticized for not covering extended settings, such as those involved in ERP development; while approaches that address the extended situation, do this at the expense of a concern for social actors' sense-making.

A particularly important tradition in the social study of ICT is the study of situated activity (Hutchins, 1995; Lave, 1988; Orr, 1996; Suchman, 1987). These were key studies in revealing that such sophisticated technologies cannot be understood as particular finite and thus knowable technical systems but are instead accomplishments of a complex dialectic relationship between discursive and material practice. However recently, in the field of Information Systems, there has been discussion on how existing modes of research, inspired by interactionism, frame the analysis (Ciborra, 2006; Pollock & Williams, 2009: 80). The argument is that most studies of corporate information infrastructure are framed, somewhat unreflexively, by particular socially/temporally bounded locales. This includes both work influenced by interactionist perspectives (e.g., Suchman, 1987) and also case studies of packaged software implementation developed without a strong theoretical and conceptual framework (Pollock & Williams, 2009: 81).

The socially/temporally bounded framing seen in interactionist perspectives seems, according to these authors, particularly ill equipped to get to grips with complex technologies such as ERPs, which are instantiated at multiple sites and evolve over time (Monteiro, Pollock, Hanseth, & Williams, 2013). This argument resounds with a similar preoccupation voiced by other authors in the field of social studies of Information Systems. For example, Vaast and Walsham (2009) recognize that there is a blind spot left by ‘practice-based research in terms of accounting for the relationship between instances of situated use (i.e., work practices) that are separated in space and/or time’ (Vaast & Walsham, 2009: 540). Similarly, Kallinikos (2004) focuses on how integrated systems such as ERPs make issues of situated forms of action increasingly intractable.

These authors seem to converge in identifying a ‘localist’ bias in social studies of ICT influenced by situated approaches. They point to the need for alternative theoretical frameworks that are more effective in revealing generalized and long-term shaping processes. Technological systems, it is said, involve a large array of technical and organizational factors that may not be apparent at the level at which humans operate or come into contact with technology (Borgman, 1984). In order to overcome the risk of ‘localist’ bias in any situated study, critics of this approach tend to claim insight deriving from extended fieldwork across sites and over time. There has been valuable research in the direction of developing alternative frameworks based on methods adopting a multi-site approach (Kaniadakis, 2012) or an approach that extends fieldwork over time (Hysalo, 2010). There is however a risk that research designed along these lines can reproduce a view of the social researcher as having a privileged standpoint to capture these extended practices, at the expense of a concern for actors' sense-making: that is for how members themselves (ERP vendors and buyers in our case) may have methods to make sense of extended practices.

To answer the question of how ERP vendors make sense of their extended user base, we need an approach that retains the benefits of a focus on member methods without the costs of confining actors' sense-making to the small space.

¹ By sense making we mean the quotidian ways whereby actors build an intelligible social order relying on their commonsense procedures (Drew & Heritage, 1992: 588). Far from being trivial, we consider these ordinary procedures to be what makes social actors expert members of a society (including professional societies).

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