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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.

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-making[1] (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 (Hyysalo, 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).

3. Appresentation

Instead of looking for alternative theoretical frameworks to interactionism, we will demonstrate that the debate misses the more nuanced treatment of temporality in ethnomethodology (Garfinkel, 1967) and phenomenological sociology, preventing appreciation of the vernacular ways through which business actors conceptualize, refer to and make use of the 'trans-local'.

We agree with scholars who suggest that locating ethnomethodology at the 'micro' end of the sociological spectrum is a misleading characterization (Bittner, 1965; Coulter, 1996). We suggest that concepts can be found here to account for how members make sense of what is beyond their reach. This could help liberate the analytical potential of situated studies from the legacy of a focus on short durations and small spaces.

One clear case is the 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'. Schutz and Luckman inherit this concept from Husserl (1960, 1931), who surmises that 'the strictly seen front of a physical thing always and necessarily appresents a rear aspect and prescribes for it a more or less determinate content' (Husserl, 1960, 1931: 109). In Husserl, appresentation is the experience of seeing 'more' than concretely presented perspectival details: seeing that a house has an interior and a back when viewing it from the front. What is not concretely 'present' is implicated along with what is immediately apparent and, reciprocally, it determines the sense of what is seen (a house with an interior, etc.). Schutz further developed the idea of applying to social interaction 'appresentational pairing' (Schutz, 1971: 248). This is a way to conceptualize the reciprocal 'perception of the other': the appreciation by a recipient of what a speaker intends with an overt expression, together with the speaker's inner orientation to the recipient's (possible) understanding. As Schutz says: 'we directly perceive the moving body of another person, and we necessarily pair it with our general notion of an alter ego' (Schutz, 1971: 321). In phenomenological writing, appresentation is different from representation. Representation applies to the perception of a phenomenon that has been at least once an object of our consciousness. While existing research on extended situations refers to how participants perceive phenomena that have been at least once an object of their consciousness, appresentation refers to something that we always perceive as being present (e.g., the planet Earth in its entirety) with no original experience of it (Rodemeyer, 2006: 143).

Appresentation points to how members' sense-making resources should be understood in a context of reciprocal interaction, unfolding in time rather than a particular moment (or locale) of anticipation. Through offering this concept we want to contrast the view that interactionist perspectives necessarily conceive of sense-making as a somewhat closed, self-compensating, self-terminating circuit of interdependent action, always circumscribed by the small space of the 'workplace' (see Henke, 1999). By applying the notion of appresentation to the study of global software development, we make a number of contributions to existing literature on extended situations. We will complement notions such as family resemblance (Monteiro et al., 2012) and re-contextualization of existing knowledge (Almklov, 2008) by making apparent how matters that are not known are always and necessarily a component of extended sense-making. This applies even when direct inspection is an option. Strategic reference is made to what is not known (i.e., regarding distant and future situations) to make sense of what is available.

4. How ERP vendor and user make sense of the global user base

We have been studying for over a decade the complex ways in which vendors interact with their customer base in packaged enterprise systems. This paper is based on long-term qualitative fieldwork on the interaction of various packaged enterprise system vendors with their reference sites and prospective adopters. This is part of a larger programme of research on IT markets and how vendors interact with early adopters of packaged enterprise software. A key and revealing moment arises when they address a new sector to create a new vertical market. These ERP vendors like the German software giant SAP expanded into other markets 'one segment at a time', through the gradual extension of their offerings from the manufacturing sector to chemicals, financial services and recently public services, including Higher Education. Therefore, mapping out the early adoption dynamics which specifically address the time when a vendor starts to address a new market (not something that occurs on a daily basis) requires research designed to encompass multiple perspectives and timeframes (Pollock & Williams, 2009).

In the course of our research, we have been able to study how three global vendors attempt to enrol key users in selling their products in a new domain and often in a new geographical area. One study is of a mid-range enterprise software company (referred to as Metis) with offices in Scandinavia and the US, which at the time of our study began to address the European automotive market. Another study involves one of the world's largest software vendors which was expanding sales to the Public Sector. In this case we studied how the vendor (referred to as SoftCo) worked with a group of early adopters in the Italian public sector, who formed the first public sector SoftCo user group. The third case is an ERP system (PAMS) developed for Higher Education Institutions, built by a company we call 'Educational Systems'. PAMS was initially designed around the needs of a Scottish University but is now being used by more than 40 other institutions in the UK. At the time of our research the supplier was investigating the potential overseas market.

The bulk of what we report here stems from detailed data on the dynamics of early enterprise system adoption that both extend in time and are seen from multiple perspectives (of vendor and users, etc.). Our sample includes the three above settings. Sampling is based on identification of cases of early adoption of ERP systems in a new sector as they became apparent during the time span of our research programme.

Metis: a six-month participant observation was completed in the Scandinavian Metis headquarters. Data also includes 24 h of audio-video recording of vendor meetings with three European reference sites based in Poland, Italy and Sweden. Collection of data on vendor strategies to address early adopters has been complemented with excellent access to information on user sites.

Softco: having worked as a consultant in the context of an interregional collaboration project on administrative data, one of the authors had insider access to information on adoption of SoftCo by members of the first Italian public sector user group. Data on this case was collected during four years of fieldwork in various organizations taking part in the user group, including participant observation of the user group itself. At the same time, biographic interviews with key actors (Gubrium & Holstein, 2003; Portelli, 2004) allowed reconstruction of initial decisions concerning SoftCo adoption.

Educational Systems: the data from ES and their PAMS software stems from observations by one of the authors of what are sometimes called 'requirement prototyping' sessions (meetings in which suppliers demonstrate early versions of systems and elicit feedback), and user group meetings at supplier premises. A number of semi-structured interviews and informal discussions were also conducted with supplier consultants, programmers and users. Finally, one of the authors was commissioned to conduct a study on the suitability of launching PAMS abroad. The author met regularly with the management team to discuss strategies and potential markets. Material from this study is also presented here.

Initial outcomes from our study of early adopters alerted us to the concern of ERP vendors that, by developing close ties with the customer, their software will become identified with specific users and their particular needs and thus not widely marketable (Pollock, 2005). We also highlighted that for this reason vendors tend to remain vague about the specific functionalities of their products (Campagnolo & Fele, 2010).

These early ideas helped develop the analytical process. Data from meeting transcriptions, interviews and field-notes were coded based on in vivo categories (Lincoln & Guba, 1985) referring to the material and discursive strategies vendors adopt *not to* interact with users, *not to* have their software identified with certain uses or *not* being specific about their product functionalities. During initial coding, our effort to refine existing frameworks to describe the type of knowledge that interactants mobilize when faced with a new context (i.e., a new domain of application of enterprise software) included testing the data against several alternative explanations such as tuning, re-contextualizing or networking. However, as these notions pointed to proximity and engagement between vendor and the user site, we felt they were not robust enough to also account for emerging findings that highlighted disengagement and distancing as part of a strategy for knowledge creation. This is when we identified the notion of appresentation as an appropriate sensitizing concept (Glaser & Strauss, 1967) to capture what was emerging from the data on vendor–user interaction as a combined use of available resources and reference to what is not known. We then began purposive sampling (Strauss & Corbin, 1990) related to appresentation as a secondary category. The process continued until conceptual saturation was achieved (Glaser & Strauss, 1967).

Further clustering produced the following set of presentational categories, which correspond to moments in vendor–client interaction in early adoption where the notion of appresentation is more apparent: (i) *preparation*, that is when IT vendors prepare users to accept their own requirements as related to a generic set of uses; (ii) *user endowment*, as the moment when the responsibility for successful adoption progressively shifts from producer to early adopters in a new domain, and (iii) *user segmentation*, when the distribution of users into different groups shifts towards future-oriented criteria. These are the categories that inform the presentational narrative that conveys our findings in the remainder of the paper.

5. Preparation: software demonstrations

The empirical illustration which follows derives from a meeting between Metis sales people and a group of representatives of prospective European client organizations in the automotive sector. During the period in which development of a solution for a new sector takes place, vendors invite a selected number of potential users to join in meetings. The reported functions of these user meetings are to receive feedback on beta versions of the software and to continue the requirement gathering process. In this particular meeting, each organization is represented by four participants. User representatives are mainly engineers (planning, production and electronic engineers). While two user organizations were large automotive companies, the third was a smaller East-European producer of car parts (referred to as ECP). ECP was expanding and, in the process, considered adopting an ERP system to manage its partnerships with international suppliers. Metis was represented by a team of four salespersons. Although ECP was smaller than the other two large car manufacturers attending the meeting, this SME seemed very interested in the software and keen to spend time understanding how to use it. However, there was uncertainty about how the size of the company would have affected adoption. In the meeting, participants were asked by Metis to spell out how their particular requirements differ from the prototype or from the view being articulated by other participants. Adam, one of the ECP representatives, voiced his concerns as follows:

> *Adam:* The reason why we do not use any software tool for organizational aspects is because someone has to maintain it, has to deal with version changes, database changes and everything else … at some point you will find out: oh, this is outdated, this is outdated.

The vendor responds by encouraging them to search for similarities with other participants, mainly large manufacturers. Here Harold, one of the more active members of the Metis team, calls up ideas of growth and threshold:

> *Harold:* You're right. Most of our customers are quite large companies but what we are saying is: when companies grow at one point in time there is a threshold when they really need more structure … when people knowing each other is not enough any more …

What Harold is asking here is to imagine how, in the future, ECP might need more structure and an enterprise system that will help manage it. In other words, instead of taking the user's question as an opportunity to respond to a particular requirement – in this case how to maintain a large organizational information system and deal with version changes – the vendor takes this as an opportunity to

negotiate and reshape user expectations. In this case Harold directs Adam (ECP team member) to ponder how the system may be of use for them in the future, a future in which they will look more like the larger companies at the meeting.

Also, Harold invites participants to consider commonalities with absent users. In this quote, for example, the ECP representative wanted to know what these powerful systems could do for small and medium enterprises and for ECP in particular, specifically with respect to 'operationalizing' – that is automating – business processes:

> '… I am absolutely convinced about the richness of *Metis*, about the creation of different objects … with all these templates we can create very complex things … but now the immediate question is: what kind of operation we can do with these objects?'

In response, Harold – the vendor spokesperson – referred to the case of a large company with a remote control and communication problem rather than a business automation problem:

> 'We had a very successful project ten years ago when some major American manufacturing industries wanted to outsource some of their production to Korea. And they had a lot of control communication problems. […]. And when they started using *Metis* […] it really saved their project.'

The vendor does not respond directly but takes this particular question as an opportunity to show the wider audience the many different purposes that their system can serve. This seems less inappropriate if one thinks of those present.

Control and communication, rather than business automation, is a problem that is shared by the other users in the room. Indeed, the larger manufacturers seem to look at Metis as a way to streamline communication between design decisions and the operational side.

Through spending time in getting to know the size and complexity of the task of large car manufacturers, at the end of the meeting ECP team members appear far more accommodating in accepting that their requirements are 'generic' and not 'particular'. This also surfaces in the apologetic tone of the following quote:

> Adam: So we get the workflows captured, more or less yes … again my very old question … it is not that I am very impolite towards you, Harold … but we are friends and among friends we can ask … Do you expect our workflow to be executable?

The quote shows how posing questions on particular problems in such meetings is perceived as inappropriate, if not impolite. Participants are most frequently seen making reference to problems that aren't just common to the members of the audience, but to the wider industry. For example, talking about communication problems, Harold says:

> Harold: Microsoft and IBM are promising Boeing and companies in the US that in three years time they can forget about application systems…precisely what we said two years ago … and they announced it two weeks ago … the new way is coming …

Referring to 'the new way' that is 'coming', the vendor tries assimilate what is currently under discussion to a generic capability (i.e., overcoming separate application systems) that is also of concern to major players in the industry.

Our main point here is that vendors make sense of local user requirements by referring to other user cases that are beyond their reach. They address them as if they can all be resolved by using the same software system. Conversations are aimed at *preparing* users to accept their own requirements as generic, the same as those of other (often very different but prestigious) users.

In presenting their system to the user, vendors simultaneously take into account the particular requirement of the specific user, the requirements of the other participants in the audience as well as those of other absent (past or prospective) users. This is an example of *appresentation* as it concerns the social work of making-sense of the user base as a whole starting from what is locally available in the meeting. Reciprocally, something vendors (as well as users) do not have any original experience of (i.e., 'a way that is coming', 'a point in time when companies grow', something happening in Korea) is brought to bear on the conversation as a way to find agreement on the need for generic functionalities.

In the remainder of the empirical section we want to focus on two other moments, when ERP vendors and their early adopters mobilize methods to make what is not known become apparent: (i) the moment when the responsibility for successful adoption of the system progressively shifts from the producer to early adopters in a new domain, and (ii) the moment when users are segmented into different groups according to their inferred readiness to engage in future product development.

6. Shifting responsibility: user groups

To continue with our account of appresentation we now move from the vendor perspective to that of the user. Our aim is to show how appresentation is a collective achievement, where the responsibility for making sense of what is not known (e.g., the next user, the future development of a technology) shifts progressively from the vendor to the user community itself. We will show how resources that users have for reaching out to other users are stronger than those of the vendor; and how vendors strategically draw on the support of the user community. To do so we focus on another case of early adoption. This is the case of one of the world's largest ERP vendors (here called SoftCo); the 'user' is a community of early adopters in the public sector, forming the first Italian public sector SoftCo user group.

At the time, the SoftCo ERP system had been adopted only by private sector organizations. One of the early public sector adopters reported how collaboration with SoftCo proved problematic at the time. The user describes the contribution of one SoftCo consultant to their ERP project as follows:

> 'Last year a consultant came from a private airline company. He knew everything about *the private sector*. He thought he could apply that model in *** [name of local authority]. If he had told me he had worked for Bologna Town Council or Rome then fair enough…He was really way off…'.

As this excerpt illustrates, the local authority user was extremely critical about SoftCo. Key users reacted by raising many procedural demands because the product came from the private sector. Presenting them as necessary because 'the way the system is designed must adhere to regulations', key users required SoftCo to include in the system all possible exceptions typical of the public sector:

> The standard module [coming from private sector, ed.] was not good because the public administration is subject to constraints concerning authorization, budget, and allocations. The private sector does not have such rigid constraints.
>
> [(Interview with Public Sector key user)]

Responding to the demands of a growing public sector user base, SoftCo then established a partnership with one early public sector adopter (referred to as Dante County). The partnership involved SoftCo working with Dante County to design an ERP version that would become the standard for the Italian public sector.

In return for discounted deals on software updating, customization and training, the pilot user offered SoftCo full access to their site: 'often SoftCo runs projects in our organization that then develop into a software product' (Dante County IT manager). Also, as a reference site, the IT manager herself undertakes a substantial amount of work in promoting the SoftCo solution. Advertised by SoftCo as a public sector 'best practice', the Dante County IT manager attends a number of venues that SoftCo organizes, including online venues such as the SoftCo Community Network Forum or SoftCo Alliance (groups that offer user-training in SoftCo products) and physical venues like the SoftCo stand at Forum PA, the largest public sector trade fair.

Besides the more formal venues, the IT manager also describes 'an informal network' between public sector organizations with an interest for SoftCo. Dante County IT manager could name each and every one of the forty Italian public sector organizations that at the time of the interview were undertaking implementation of SoftCo's ERP. When asked whether any of these organizations had contacted her, she answers:

> 'Of course. […] Indeed, it happens often that in these conversations we make friends. This facilitates the exchange of experience concerning the ERP. […] People who contact us for clarification on our SoftCo experience do it directly, without going through SoftCo. They address me directly and they come here to my office or I go to them'
>
> [(Dante County IT manager)]

When the IT manager is asked to describe the nature of the user group she organizes, she says: 'we [i.e., the user group] did it spontaneously, with other SoftCo users. It wasn't a SoftCo initiative. […] SoftCo could have set up some type of user group but they didn't. […]. We think it should be the case that SoftCo take the lead and invite users…They would not miss out on anything by creating a user group. On the contrary they would gain from it…' (Dante County IT manager).

Interviews with user group participants at the time report a radical shift in attitude. After taking part in the user group, for example, one of our informants recognized that early ways of working – i.e., developing software in house with no sharing of experience – led to error: 'by doing everything in-house, we also made some mistakes' (Interview with user group member). This is a substantial shift in perspective if compared to the previous period when demands for policy were preventing the adoption of ERP modules being developed elsewhere. Growing willingness to learn from looking at what other organizations do is particularly surprising when considering the level of diversity of Italian local authorities. Asked to describe what type of collaboration user groups entailed, another participant reports that 'direct re-use of software (e.g., duplication) was unlikely…hampered by the differences among regulatory frameworks' (Interview, local authority ERP Project Manager). This shows that differences between local authorities are not necessarily easy to overcome. Indeed, local authorities in different regions have differing regulatory frameworks. Technically, a standard version of the system that is developed for a local authority is not necessarily a better fit than one from a private organization. What differs is the source of the request. It is not SoftCo to suggest adoption of a solution developed elsewhere. In this case, the proposal emerges from consultations among user themselves. This highlights an important point in understanding how vendors reach out to their next user. Knowing that invitations to consider similarities are much more successful when they come from other users, SoftCo preferred to develop ties with one specific pilot user (Dante County) giving them responsibility for reaching out to other users. Rather than developing a large sales force of approved consultants, SoftCo opted to turn Dante County into a 'seller' who can encourage other users to align their requirements with those of a user community.

Our account of the dynamics of early adoption of SoftCo in the Italian public sector shows another element of user appresentation. If during demonstrations, linkages with unknown users are created via conversational resources, here the future user is reached by active mobilization of users themselves.

This is another component of appresentation work. Passing the task of acquiring new users to existing users, implies that in certain cases the vendor may not ever have had direct contact (i.e., an *original experience*) with some of their clients. Furthermore, SoftCo is

said to resist taking any direct lead in coordinating the user community; while users like Dante County do promote user groups so that the vendor will maintain interest in this area as a viable and attractive vertical market.

To provide further evidence of how often direct engagement is not the preferred vendor strategy for extended sense-making, we now turn to a different moment in our study of ERP adoption, which refers to later stages in the development of a new market. This is when the user base grows to an extent vendor has to start and sift clients into different categories.

7. Future-oriented user segmentation

Another component of appresentation became apparent in our study of ERP in higher education. This concerned the practice called 'user segmentation'. We said earlier that vendors make sense of users that are beyond their reach by considering commonality with distant and absent cases (as early as during software demonstrations). The case of 'Educational Systems' and PAMS highlights a practice that vendors use at later stages of the package biography. Initially, 'openness' of the package is a useful strategy for building the community by involving users in the design process. We have seen in the case of SoftCo that the particularities of early adopters were all included in what would become the standard version of the ERP system in the domain (to quote one of our informants: 'often SoftCo runs projects in our organization that then develop into a software product'). However, at later stages of the package biography, this openness can be something of a draw-back. Software packages are designed around a basic organizational functionality, sometimes described as the 'generic kernel'. The idea is to paint the organizational reality of adopters onto this kernel by developing numerous 'templates', which users can then choose between and tailor to meet their local conditions. These templates form the 'outer layer' of the package, and are built up over time through interactions with past customers. Suppliers only reap benefits from developing new templates when they are able to use them again and again (recovering development costs). In the birth stages, Educational Systems found that rather than simply re-using templates, they were repeatedly forced to modify or build new ones. They found that with each new customer for PAMS, the templates required modification. The Sales Director describes this in relation to the 'Payment Schedule' process:

When we first wrote PAMS for [Scotia University] they produced a Payment Schedule that gave the student the choice of paying in 3 equal instalments (1 per term) or equal monthly instalments. The logic was therefore simple in that PAMS added up all of the charges and divided by the number of instalments.

However, when they made the next sale to 'Highbrow' university there were some differences which required changes to the software:

> The next customer, [Highbrow], also offered the choice of paying in termly instalments, but they massaged the amounts to take 40% in term 1, 40% in term 2, and 20% in term 3, as they wanted to get as much paid as possible before the student ran out of money. We therefore added a tick box on the payment plan to say 'use ratios', and this then gave access to an extra column that allows them to enter the % against each instalment.

Every time a change was made to the template this would be accompanied by a modification to the graphical user interface. A user was then forced to view a screen that included buttons and menus specifically intended for other institutions. As a result, there was now a need for increased training where users were told which options and buttons related to them and which did not. However, this mode of redressing the particularization of PAMS became problematic once the system was made available for general use. The Sales Director describes how early on, when the company did not yet have a finished system, it had to create an expectation among users that their specific needs would be met. It was now difficult to correct this view:

> … but, of course, it raises a level of expectation … you can be a year downstream in an implementation with somebody, and suddenly they throw up this requirement that has never been vocalized before, but because they bought as an early adopter they perceive that they have that type of relationship that means that you will do it for them. Even though they may well be the only people in the UK that actually want it!

This quote points out that over time the relationship with reference sites (such as Scotia Uni in the case of PAMS or Dante County in the case of SoftCo) changes. The strategy 'Educational System' came up with is as follows. Rather than simply refuse to cater for any kind of particular requirement, the Supplier had segmented the community into three distinct categories: as either 'strategic', 'consultative' or 'transactional' customers. While these terms were part of the vernacular of the PAMS team, they were still thought to warrant some explanation by the Managing Director, when he mentioned them to us:

> … it is where we perceive it is worth putting the effort: Strategic Customers, Consultative Customers and Transactional Customers. Transactional customers don't want to spend money. They want everything for nothing. So for every day you put into them you get nothing back. So you put your days into Consultative customers who want to work with and spend with you. Whereas Strategic are all about people who help share the vision of where the product is going to go over the coming years.

From his point of view, Strategic and Consultative customers were central to the future development of PAMS, whereas Transactional customers were peripheral to its evolution. The former were regularly quizzed and consulted on the addition of new features and the general direction of the package while the latter were actively kept at a distance. One example of how this strategy structured the users' interactions with the package was seen in the issue of 'customization' and the question as to whether a user could modify the generic kernel. During a conversation we had with a PAMS programmer, for instance, he praises a modification carried out by one

early adopter and describes how this has even been fed back into the generic package for use at other sites: '[The London Uni] have done a fair bit … 80% of that has been incorporated into the standard package … They were willing to run ahead … they had the resources'. During the same conversation, he criticizes another early adopter for making a modification to the kernel and describes how it was explicitly stated that they are not allowed to make changes to the source code: 'We make sure that it's in the contract that they don't do things like that. We have had customers manipulating the data … from the back-end … Very dangerous … They promised not to do it again.' This suggested that the ability of a user to customize PAMs, and still have their system supported by the Supplier, was directly related to the status they held at that time. This, of course, begs the question as to just how a user might find themselves placed in one or another category. Typically the status of a user was simply related to 'when' they adopted the system: the first group of users being closer to, and later-comers further from, the Supplier. However, with PAMS developing into an established pilot, the criteria changed. The key criterion for membership to the category of Strategic or Consultative user, from being based on past events, is now related to how willing a user is to reshape work practice to conform to the templates embodied within the new version of the system. The Managing Director of Educational Systems describes how:

> One of the other things we found about Consultative customers where they have entered into a dialogue with us is about how they might change how they do things. There is a lot of functionality in PAMS and there are areas where the universities aren't particularly efficient … So the Consultative customers are more willing to look at how they do their business and how they might improve their business based on suggestions for us based on existing functionality or commissioning us to add extra functionality.

Encouraging users to carry out organizational change to align with the system is an important strategy for managing the user base, and also a way to reduce the need for the further accumulation of particular functionality. Moreover, suppliers actively recruit new customers who appear willing to engage in such change, and they reward them with greater access to the shaping process.

User segmentation is a practice that falls into appresentation for two reasons. First, by classifying clients into pre-existing segments, vendors develop a proxy understanding of what happens when a new user comes in and therefore they do not need to have direct experience of every subsequent user. Second, we observed that segments capture the propensity to engage in future development of the technology by organizational users. This means that user segmentation is not simply based on a technical scrutiny of currently observable user requirements (i.e., original experience of them) but it also depends on an evaluation of the inferred user propensity to engage in future product development. This makes apparent that even when opportunities arise for fully co-located interaction – such as that with strategic adopters – vendors do not restrict the conversation only to observable user specifications or system properties. Rather, vendors prefer to determine the sense of what is immediately apparent by making reference to what is not concretely present (i.e., the user's propensity to engage in future development).

8. The complex social fabric of appresentation work

Observation of 'appresentation work' in global software development helps reveal the complex social fabric between ERP vendors and their clients. This fabric lets them make sense, and convey some confidence about matters on what they have no direct experience. We focused in particular on how vendors (and users) appresent the global user base. Vendors achieve 'user appresentation' by making users recognizably the same (i) through *preparing* them to conceive of their requirements in a form that is generic enough to fit the whole user community, (ii) by *passing* the task of assimilating users over to other users and (iii) by progressively changing the criteria for *segmenting* users from seniority to future-orientation. The concept of appresentation invites us to consider the strong link between the concretely presented circumstances of vendors' situated encounters with users (e.g., their co-located conversations about technical properties taking place in meetings, their closeness to reference sites), and what is not concretely 'present' (that is the need to look always for the next client and for further developments of the software platform). The notion of appresentation stresses the inescapability of the link between what is locally present and what is not. As Husserl suggests, what is not present is 'always' and 'necessarily' *implicated* along with what is immediately apparent and *determines* the sense of what is seen (Husserl, 1960, 1931: 109). In other words, vendors as well as their clients would be unable to work on the properties of ERP systems without referring to what is not present. For example, IT vendors meet groups of users not only to understand their specific problems, but also to turn them into 'sellers' (Rowlands, 2010) who can encourage other users elsewhere to align their requirements with those of a user community. When vendors establish a partnership with strategically important clients, it is to achieve a better understanding of the client's local organizational context. But, at the same time, it is also to confer on selected users a benchmark status for the future development of 'best practice software' (Wagner, Scott, & Galliers, 2006), i.e., software that can be used successfully by other organizations in the same sector. The concept of appresentation should therefore be taken as a lens that directs attention to the methods by which ERP vendors and their clients make sense 'locally' of what is beyond their reach and, reciprocally, actualize what is not present to make sense of local user interaction.

9. Global software development and the extended situation

Our findings on global software development complement existing understanding of extended practices. Existing understanding argues in various forms that sameness is achieved over time through more knowledge of a situation, i.e., getting closer to it. For example, in providing an account of the 'expansion of practice', Nicolini (2011) argues that 'knowing [has] to do with tuning and becoming absorbed in an ongoing practical regime' (Nicolini, 2011: 613). Emphasis on socialisation as a form of learning is also found in the

account by Monteiro et al. (2012), Monteiro et al. (2013) of how 'family resemblance' is achieved between time-space separated work practices. Their identification of the three strategies that constitute similarity across settings (differentiation, assembling and punctuation), refers to re-gaining intimate knowledge of each situation and so ultimately to understanding how far past lessons can be re-used.

'Becoming member of a practice' Nicolini argues, implies 'socialisation' and 'knowing how to interact with different ways of knowing' (Nicolini, 2011: 613). Our analysis complements these accounts. We address how knowing is possible, when becoming 'absorbed' in a situation is not an option. Surprisingly, we have also found that when close interaction is possible (our last case of Educational Systems and their strategic users as well as SoftCo's refusal to lead user community activities), vendors prefer not to get involved in specific implementations. In contrast with expectation deriving from a situated learning perspective (Lave & Wenger, 1991) in order to produce knowledge that extends in space-time, knowing how it may become possible *not* to have to interact, we argue, is as relevant as knowing how to interact. Learning how not to become too embedded in the context of a practice is therefore one neglected social form of extended practice. We argue that, in studies of standardisation and formalization practices that are crucial for understanding trans-local achievements, more attention should be given to social skills that allow participants to keep a distance (or create a distance) between them and the contingencies in which they operate. We agree with Kallinikos' notion of cross-contextuality when he argues against the view that 'technology is a servant of human agents, and if it fails to stand up to this expectation it can be ignored, resisted, or reshaped to achieve the goals that are usually perceived as being tied to its implementation in particular settings' (Kallinikos, 2004: 236). However, our examples demonstrate that participants in technology development are hardly seen as perceiving enterprise systems to be tied to a particular setting. We also agree when Kallinikos says, quoting Borgman (1984), that 'technological systems 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)'. However, we do not share the implication that user-centric approaches should be dismissed. Social actors, we argue, can perfectly well make sense of what is not apparent at the local level and engage in other forms of adaptation that surpass the horizon of the present. This includes routinely engaging with the language of 'unknown' (future or large-scale) dependencies, interoperabilities and institutional relations. We have seen how users have understood the need to become more similar, engage in influencing each other and propose themselves as strategic users. Although not based on contextual manipulation of the technological object, these are still ways of influencing technological development which are nonetheless very apparent in every single moment of the interaction. Our findings also strongly resonate with Nardi, Whittaker, and Schwarz (2002) when they argue that recently emerging forms of work – that take place between and across organizations with no stable organizational backdrop or predictable workplace interaction structure – have given inter-subjective level of analysis a new centrality (Nardi et al., 2002). However, while a great deal of study has been devoted to the role of inter-subjectivity when describing how knowledge developed in a certain context is translated elsewhere (Callon 1986, Ophir & Shapin, 1991; Shapin, 1998), less attention has been given to the way what is absent contributes to shape the context of knowledge production. It is not by coincidence that most of the alternative explanations of extended sense-making considered so far (Monteiro et al., 2012; Nicolini, 2011) refer to Wittgenstein (1953): here for the first time the question of the problematic move from case to case was asked: what can take us beyond the mere perception of a phenomenon? How can we know how to apply a certain category that has been elaborated on the basis of a finite number of cases to the next case? Wittgenstein answered the question by saying that we move from case to case by seeing them as similar to past cases. The term Wittgenstein uses is 'analogy' (Wittgenstein, 1978: 122–6). We know less about how the next case is used to define how we make sense of the present. This we maintain is the one level of inter-subjectivity that has been neglected so far in analysis of extended situations. Through our examination of social dynamics in early ERP adoption, we hope to have made apparent the need of more research in this direction.

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