

Work Practice between the Real and the Really Made Up

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ABSTRACT

This paper can be read as a motivation to do further research in relation to the physical aspects of work practice. A brief survey of contemporary conceptual frameworks is carried out with a focus on how these frameworks grasp the question of materiality in relation to work practice. In conclusion, it is suggested that in regard to further research, it could be fruitful to employ a concept of practice that builds on the notion that we live between the real and the really made up.

Author Keywords

Physicality, materiality, artifacts and computer supported cooperative work.

INTRODUCTION

The description and analysis of work practice has long been a central research focus within CSCW, with its aim to forge computer support for cooperative work.

In regard to work practices, Schmidt and Wagner [42] describe them as historically specific practices, grounded in the use of material artifacts. However, for years mainstream CSCW have implicitly been preoccupied with face-to-face interaction and taken conversation as the arch model of human interaction, all other forms of interaction have been accounted for as improvised. The prime motivation behind this preoccupation has been the desire to forge technologies that can support cooperative work over distance modelled on the conversation paradigm [42]. The focus on the conversation paradigm we could suggest can be traced through out the last decade in the interest for “media spaces” (e.g. [17, 36]), “collaborative virtual environments” (e.g. [3, 6]), “Virtual work spaces” (e.g. [13]), “instant messaging” (e.g. [39]), etc.

Conversations over the telephone, in emails, in the meeting room, etc. are of course parts of cooperative work. However, in a number of cases cooperative work is coordinated and interactions takes place through artifacts rather than by direct face-to-face interaction or by other forms of verbal interaction [15, 41]. For example signs left or modifications made by individuals on artifacts, may feedback on themselves or others, and trigger new actions on the artifacts, that in turn may feedback: activities are (partly) recorded in artifacts, and this record is used to coordinate collaborative work. This is just one example of

how cooperative work could be coordinated through artifacts.

If we divorce our selves from the preoccupation with “conversation” as the model of interaction in cooperative work, we can suggest that material artifacts play an important role in the contemporary cooperative work setting. It is the question of how to conceptualise this role that is at the heart of this paper. Perhaps at this point it would be timely to explicitly state the research interest of this paper: How can we conceptualise the simultaneously material and non-material (mental, psychological, cognitive) nature of work practice?

Of course this paper is far from the first attempt to address the material and non-material nature of artifact based practices in cooperative work in particular, or in human practice in general. A number of studies have been published over the years, as we shall see below. In the following we shall attempt to survey this research.

CONCEPTUAL FRAMEWORKS

In the recent years researchers within the research fields of CSCW and sociology of technology, have come to realize that material artifacts have a crucial role to play in the framing of human practice [1, 32, 41].

To begin with, ethnomethodologically informed studies demonstrated that material artifacts are key to the understanding of coordinative practices, they demonstrated the strong impact of material artifacts on human practice (e.g. [20, 21, 22]). Other ethnomethodologically informed studies pointed out how actors skilfully employ the affordances of the material work setting in order to articulate their cooperative efforts [24, 25, 44, 45].

More recently a variety of conceptual frameworks have been employed in order to account for the material and non-material nature of artifact based work practices. There has been a shift of conceptual framework, which can be observed in the increasing use of a number of theories such as ‘activity theory’ (see [29, 30, 38]), ‘distributed cognition’ (see [27, 28]), Gibson’s concept of ‘affordances’ [18], ‘actor-network theory’ (see [8, 33]) and research inspired by phenomenology (see [12, 14, 40]). These theories are not only seen as providing a framework for CSCW and sociology of technology studies, they are also seen as bringing focus to the relationship of actors and material artifacts. The immediate question to be considered

below is: do these theoretical approaches capture the non-material relations (mental, psychological, cognitive) as well as the material (facts like diamonds are harder than wood) entangled in artifacts, at the same time, without putting one in a black box left unexplored?

Activity theory, as contemporary advocates of the framework understands it, does pay attention to the materiality of the context of human action. Take for example Bonnie Nardi, in the book “Context and Consciousness – Activity Theory and Human-Computer Interaction”:

“Activity theory (...) extend the concept of consciousness past an idealistic, mentalistic construct in which only cognitive resources and attention “inside the head” are at issue, to a situated phenomenon in which one’s material and social context is crucial” [38, p.13].

Activity theory (as well as distributed cognition) diverges from other cognitive theories by incorporating the context of cognition [19, p.4], but does that include the materiality of the context, as Nardi [38] claims? In order to pursue this question, we shall have a look at the roots of activity theory and distributed cognition.

Contemporary activity theory and the subsequent theory of distributed cognition builds on L.S. Vygotsky a Russian psychologist and his successors Leont’ev and Luria’s work initiated in the 1920s and 1930s. Vygotsky had an ambition to ground his theory in historically evolving and culturally specific material practices, inspired by Marxist theory [41, p2]. His ambition was undermined, however, by his concept of “psychological tools”:

“In the behaviour of man we encounter quite a number of artificial devices for mastering his own mental processes. By analogy with technical devices these devices can justifiably and conventionally be called psychological tools [...].3. Psychological tools are artificial formations. [...] They are directed toward the mastery of [mental] processes – one’s own or someone else’s – just as a technical device is directed toward the mastery of processes of nature. 4. The following may serve as examples of psychological tools and their complex systems: language, different forms of numeration and counting [...], writing, diagrams, maps, blueprints, all sorts of conventional signs, etc” [49].

The concept of psychological tool is fundamentally problematic in that it suggests that skilful action is somehow determined by stable or concrete mental structures (psychological tools), the concept downplays the dynamic and temporal nature of human mental processes and denies materiality a part to play [41, p3.]. This dematerialised and all encompassing definition of the concept of artifact has continued in the tradition of activity theory. Kuutti [31] to take one, list instruments, signs, procedures, machines, methods, laws, form of work organisation and even activity theory as examples of artifacts. Kuuti [31], in the tradition of Vygotsky, fails to make explicit the

importance of materiality, especially in connection to the concept of artifact. A critique that applies to activity theory in general as it is advocated by Nardi [38], Kuutti [31] and Kaptelinin [30]. Distributed cognition does no better.

Distributed cognition uses the framework of classical cognitive science, slightly modified, in order to be applied to a unit of analysis that is larger than a person. Cognition, within the distributed cognition framework, is viewed as being distributed across a system of actors and artifacts localized in a historical and social context [26]. This framework, as contemporary advocates understands it, does pay attention to the material world. Take for example Hutchins [27]:

“The examination of the role of the material media in which representations are embodied, and in the physical processes that propagate representations across media. Applying the cognitive science approach to a larger unit of analysis requires attention to the details of these processes as they are enacted in the activities of real persons interacting with real material media” [27, p.266].

Hutchins draws attention to the “details of these processes as they are enacted in the activities of real persons interacting with real material media”, but on closer inspection material media or artifacts merely serve as vehicles of representations. That materiality plays a part is noted, but it is never explicitly and systematically explored. As Hutchinson describes the phenomena in connection with his and Klausens analysis of cooperative work in an airline cockpit:

“We can see that the information moved through the system as a sequence of representational states in representational media. From speech channel to internal memories, back to speech channels, to the physical setting of a device” [28, p.27].

Further more, information seems to migrate unchanged from mind to artifact to mind, maintaining unity and identity (Schmidt & Wagner 2002a, p.3) across materiality, minds and time. The practice of producing and reproducing meaning is neglected - order is presupposed. As Schmidt & Wagner (2002a) observe, by presuming the practice of producing and reproducing order, what is to be investigated and understood is taken for granted, in line with the idealistic precepts of cognitive science, and artifacts are treated as vehicles of stable units of information [41, p.4].

Both activity theory and distributed cognition are both first and foremost, theories about cognition [19, p.3], and does not include the notion of materiality in a strong sense as we have seen.

Turning to Gibson’s research and his influential concept of affordances [18], he describes the concept in the following way:

“The affordances of the environment are what it offers to the animal, what it provides or furnishes, either for good or for ill. [...] It implies the complementary of the animal and the environment”. [18, p.127].

An affordance, as mentioned, points two ways, to the environment and to the observer. Gibson's concept of affordances have been instrumental in bringing focus on the importance of materiality in the conceptualisation of the relationship of actors and material artifacts, and in the process of accentuating materiality (of things and the human body). However, Gibson have been criticised for not accounting for the role that culture and learned practice play in regard to establishing what an artifact affords (e.g. [12, 16]).

Considering Actor-network theory (ANT) it does not as much mediate between (materiality and humanity) as negate the difference [12, 48]. The theory argues that it is analytically fruitful to reject any a priori distinction between elements in an actor network [2, 8], including the distinction between humans and non-humans.⁴ The method employed in ANT analysis is to project a micro history of an actor network (of a technology rather than a society) that reveals the social character of changes in the material world and adds to this the material character of the physical components in the network (see [4, 7]).

If there is no trace of the human body in ANT (no distinction between humans and non-humans), it is at the centre of attention in the phenomenological tradition. In the phenomenological tradition the difference between humans and artifacts are explicit in terms of the notion of embodiment [40]. They embodied perspective emphasize that we do not observe the world in front of us, like a picture. We are in it [37]. However well the embodied perspective provides us with a lived through the body perspective, it is a perspective that seems centred on the individual; perhaps it does not provide any concepts that can fully account for interconnectedness of human practice [5, 47].

CONCLUSION

Summing up on the theoretical review above, we have proposed that Activity Theory and Distributed Cognition leans towards a non-material account of the relationship of artefacts in humans practice, that Gibson leans towards deculturising the relationship in his concept of affordances, and actor network theory negates the distinction of artefacts and humans, while lastly phenomenology lacks strong concepts that can account for any structural context that the actors acts in relation to. On this basis we could suggest that none of the conceptual frameworks considered above tells the whole story, in the sense that none of the frameworks seem to explicitly account for the entanglement of materiality and non-materiality in relation to work practice. Rather we could suggest that what they let us see and conceive of is patchy and incoherent, in the sense that there is no systematic and integrated approach to the simultaneously material and non-material nature of artifact

⁴ This quest for symmetry has created a lot of controversy around ANT (see Collins and Yearly, 1992; Callon and Latour, 1992).

based practice.⁵ Consequently, by virtue of their partial character, the various frameworks treat as separate what is interconnected in practice; no rigorous system architecture can be built on this as a basis. We could suggest that this state of affairs is unsatisfactory and needs to be addressed. There is a need for an approach that leaves room for the material side of being in the world as well as the non-material (mental, psychological, cognitive) side of being in the world. This approach must build on an ontology that includes both. I will, following Taussig [46], claim that:

“We live between the real and the really made up” [46, p.xvii].

Adopting such an ontology leads us beyond purely mentalist or purely materialist perspectives and includes the material side of being in the world as well as the non-material (mental, psychological, cognitive) side of being in the world. It does so in the sense that it employs on the one hand a “real” reality (physical facts like: paper is easily bend, stone is not) and on the other hand makes use of “the really made up”, social and mental constructs that structure our lives (in a very “real” way) such as plans or work ethics. Neither the mental side of being in the world nor the material side of being in the world is given precedence at the expense of the other. The truly interesting part, for our purpose, is of course how these two “realities” interplay in human practices, such as shaping and using artifacts in cooperative work⁶. In the investigation of these questions, it could perhaps be fruitful to employ a concept of practice that builds on the notion that we live between the real and the really made up.

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⁵ Please do not read this as an attempt to belittle the importance of the research mentioned above.

⁶ Writing for instance, evolved in close connection with the development of writing materials (Harris 1995), the “real” the material side of reality and the “real made up” interplayed in the development of a practice of writing.

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