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Plurality, Materiality, and Non-Users: Methodological Considerations for Studying ICT-related Organisational Change

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Abstract

Scholars from different backgrounds have developed a number of theories and associated methodologies to examine the interplay among technology and organisational change. The significance of context in organisational research has been highlighted by sociological perspectives. These efforts are promised on the centrality of social interactions and sense-making practices. This emphasis has generated valuable insights into the relationship between technology and organisations; however, some interpretations of technology cannot be re-examined through this lens. Considering the challenges emerged from an empirical case study, this paper seeks to explore and add to our understanding regarding ICT-related organisational studies. This paper will also introduce methodological opportunities of thinking about multiple technologies, the materiality of technologies, and the importance of non-users.

Keywords

ICT and Organisational Change, Technology Portfolio, Sociomateriality, Non-Users, Social Constructivism

Introduction

The growing research concerned with the interplay among technology and organisational change are accompanied by both theoretical and methodological challenges. Despite a number of investigations which addressed and accounted for technology in organisational context, "there is little agreement on the definition and measurement of technology, and no compelling evidence on the precise role of technology in organizational affairs" (Orlikowski 1992, p.398). As a result, exploring the relationship between technology and organisations has been an ongoing research agenda for scholars with different fields of study since the 1950th (Zammuto et al. 2007). Over time, various analytical frameworks evolved to conceptualise technology; these conceptualisations vary from technological deterministic views to completely social constructivist accounts. However, recent studies acknowledge the importance of both social and material factors in theorising the interplay among ICT and organisations (Leonardi and Barley 2008). Furthermore, a range of technologies is utilised in today's organisations to coordinate and control activities and interaction. This use of a configuration of technologies associated with each others requires rethinking studies which examine the role of single technology in organisations (Kane and Alavi 2008). Also, it is highlighted that we need to consider the role of non-users alongside with users of technology (Selwyn 2003; Watt 2003).

Aside from theoretical debates, there are some discussions about the ways in which research on technology and organisations are conducted. Methodology influences what can be found from an empirical study. Within the field of IS research, different methodological practices are proposed to be applied into conceptualising information technologies in the context of organisational studies (e.g. Orlikowski and Baroudi 1991; Walsham 1995; Myers and Klein 2011). Recent theoretical developments in conceptualising technology in management research call for thinking about methodological challenges associated with this research agenda. Building on the concept of technology portfolio, sociomateriality, and the importance of non-users, this paper generates some insights into future research on ICT and organisational change.

ICT and Organisational Change: Ongoing Subject

Theorising about technology and organisations has been of wide interest to both academics and practitioners. Scholars from various scientific fields such as organisation science, management studies, and information systems (Markus and Robey 1988) and science and technology studies have provided a base of relevant literature that addresses this challenging issue. However, this challenge is still an ongoing and vibrant topic for many scholars (Orlikowski 2010).

Historically, positivist-driven information systems research (Orlikowski and Bouradi 1991, Davison and Martinsons 2011) has tended to assume that technology was an exogenous driver of change within organisational contexts (Orlikowski 2010). By contrast, the idea of an *organisational imperative* was developed to reject technology-driven organisational transformation. The sources of change in this perspective are therefore the "intendedly rational" (Pfeffer 1982) choices of social actors. However, this view also considers technology to be a tool for dealing with organisational challenges (e.g. Noble 1984). In addition, cognitive scientists within the field of Human-Computer Interaction and Artificial Intelligence considered human mental models during the design process and therefore add some social considerations to the understating of complex technological systems (Heath *et al*. 2000). More recently, scholars with background in sociology have generated valuable insights into the role of social interactions and sense-making practices in examining technological artefacts. For instance, The book *Plans and Situated Actions: The Problem of Human-machine Communication* by Lucy Suchman (1987) is one of the more influential works that treats technology as an object of study in workplaces thorough a sociological lens (Heath et al. 2000). Situated Action discusses how common-sense practices are used by human actors to produce knowledge and make sense of people's actions in specific situations. (Doerry, 1995). Situated action and other *social constructivist* approaches are a set of sociological theories and methodologies used to explain social production of reality and social organisation of knowledge. In the light of these approaches, researchers have begun to believe that the

simplistic frameworks offered by deterministic views are not suitable for describing the vigorous and complex process through which technologies interact with society (Bijker 1989; Latour 2005). Such approaches highlight the conceptualisation of technologies not only before and after implementation, but also during the course of research, innovation, design, adoption, and use (Pollock and Williams 2009) though the sociological lens.

Organisational Meanings of a Technology: Following Users' Interactions

Sociological perspectives are not themselves analytical frameworks for conceptualising the interplay among information technologies and organisational change, but theoretically informed lens to study this challenge. These sociological tools are based on the notion that technology is 'socially constructed'. Considering what this set of theories has in common, they suggest that an actors' interpretations are mediated by social factors. These factors in general are "based on a social construction of meanings attached to behaviour, relations and symbolic artefacts, sustained by the flow of reiterated interactions, 'enacted' by individuals and groups and subjected to individual and collective changes through conflicts and negotiations" (Magala 2002, p.23). Negotiations and social interactions generate a social coherence in which technological systems are constructed (Harvey and Chrisman 1998). Adamant about the importance of analysing the sociohistorical contexts and social interactions which shape technologies (Bijker 1997) research on ICT-enabled organisational change studies are conducted by means of understanding the social interactions and the meanings created and held by actors who their actions are mediated by a shared assumption within their social world.

Berger and Luckmann (1967) argue that all types of knowledge (even the most common sense knowledge of everyday reality) is derived from and maintained by social interactions. In the course of people's interaction, the common sense of social reality becomes more solid, as such interaction occurs based on an interrelated, shared understanding of reality. Hence, meanings of technological artefacts therefore are derived from everyday, dynamic *social interaction*. The most fundamental notion here is thus interaction and related meaning creation (Barens 1995). The meaning of things is a social product which emerges from people's interactions (Blummer 1985). To interpret social reality, a social-constructivist researcher therefore studies how social interactions and situations among human actors are co-produced, deployed, (de)constructed and maintained (Archer 1995; Berger and Luckmann 1967).

Methodologically, the ethnographic-driven *ethnomethodologic approach* was introduced and utilised to study the shared background assumptions which shape people's day-to-day social interactions (Garfinkel 2002). The application of this methodological approach has the power to reveal how human actions are "constantly constructed and reconstructed from dynamic interactions with the material and social worlds" (Suchman 1987).

Challenges in the Empirical Study

In what follows, I endeavour to elaborate an argument with an emphasis on considering the social interaction that surrounds the artefact. Drawing on ethnographically-collected data as part of in-depth case studies, this research use a grounded theory method to discover the issues that surround the adoption of technology and its use in the context of a nonprofit organisation. The selected organisational context is a sport club that utilizes a well-established business software (HTK) and other technological systems (websites, e-sheets, paper sheets, an accounting system: ACC-TECH, etc.).

The staff members and volunteers utilise two-interrelated packages to handle both primary and administrative activities. Firstly, the software module is designed to facilitate inter-club competition management, while the second module is mainly used for administrative purposes. There has been

discussion among members about whether to migrate to a new cloud-based, web 2.0- enabled computer system (TMU). The figure illustrates a partial snapshot of the current situation.

Both paid members and volunteers have been interviewed and some observations on their day-to-day practices have been made. Additionally, some data were collected from vendor websites, the open discussion forum developed by HTK users, and weblogs and wikis discussing HTK and other alternatives. The market dominance of HTK is being challenged by TMU, especially because of the online management facilities it provides and its ability to accept data files from HTK; this feature urge migration from HTK to TMU. The immediate results from the fieldwork suggest that there are shortcomings in dealing with the different and sometimes competing views on the functionality of the current main computer systems; this limitations are identified when the researcher endeavoured to apply ethnographic method to study social interaction and created meanings among the club's actors. Hamish, a member of the management committee and the person designing the future vision of the club, has experienced working with the demo version of TMU. The power of the new package was advertised by the supplier when Hamish attended a conference. He does not explicitly defend buying a new system, but the quotation below shows his rationale to give up HTK:

"…the current club functional system is old; as the new [training and coaching] system would be less manually oriented, [HTK] would not be an option ... things should go more online.".

Lenora is a senior coach in the club. She too often meets Hamish for coaching purposes. Because of these regular meetings, she is one of the members who has lots of opportunities to talk with Hamish. She thinks that the current system would be fine unless the club decides to develop its operational area. Rose, the administrator of the club membership, has to work a lot with HI-TECH, as does Lenora. Because of the inadequacies of the current system, she has created an informal system to deal with the problem of re-keying data. Such "workaround" (Pollock 2005) stems from her personal interaction with the current system and the problems she has experienced. Moreover, she has contacted the supplier to solve this problem.

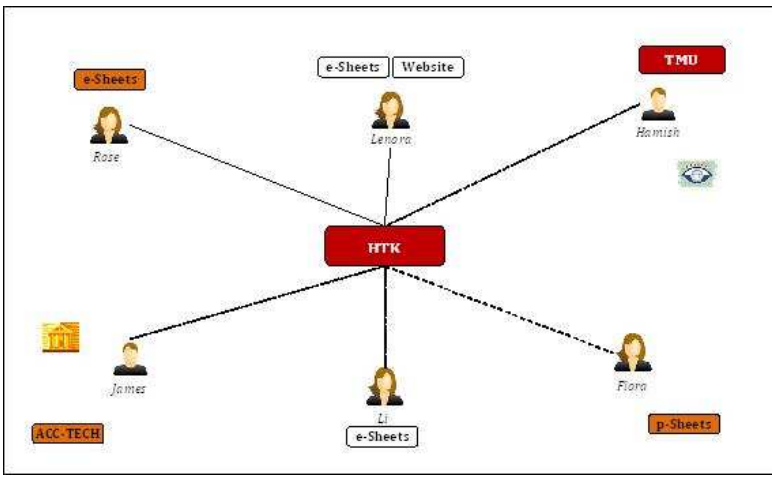

Figure 1

Unlike Rose, Liz, the external communication admin, has developed an electronic sheet for herself, basically because the activities which she manages are not built into the HTK. Hence, she has no concrete opinion about the current system. However, Flora, Hamish's wife and training manager, is not technologically savvy, the sheet is mainly kept and worked with physically. "HTK is hard for me to work with," she said, and although the current system offers some functions to support her duties, she prefers to use her own paper sheets since they make handling the duties easier for her. The point here is that almost all complaints about HTK from other members were accompanied with statements

about how there is a lot of pressure and responsibility on Flora. James, the financial manager, expresses a certain amount of satisfaction with the current software; in particular, for finance tasks, which are seen to be highly labour intensive regardless of what system supports these activities. His tasks are currently conducted on the accountancy standard software package ACC-TECH. The second module of HTK provides support for financial tasks with some integrated infrastructure; however, James does not fully exploit it, because ACC-TECH is more compatible with his background knowledge and skills. Observing an internet-based forum in which different users from different clubs share their knowledge about HTK, I found an IT-savvy user who has built a plugin that can be installed in the software to bridge a functional gap in HTK.

Taking social constructivism into consideration, the various interpretations of HTK should be analysed in terms of social interactions within and across the club. The application of social-constructivist accounts in this particular social context requires focusing on how human actors collectively do sense-making activities (Walsham 1993). It is important to reveal the black-box of HTK in this specific organisational context. To find out the socially-constructed meanings of the software, the researcher needs to unpack how James, Hamish, Liz, Flora, and Rose make sense of their intra- and inter-organisational interactions. In doing so, an inadequacy within frameworks that place a stress only on social interactions has been revealed. The **materiality** of HTK as well as the affordances offered by **other technological objects** such as TMU affects the ways people within the club create and maintain their constructed meaning of HTK functionality and its organisational consequences. In turn, such **interpretations** themselves shape the workarounds: the ways people (even **non-users** like Flora) build alternative solutions or discuss the addition of new features with the HTK vendor.

Multiple Technologies, Material Features, and Non-Users of Technology

Social-constructivist views provide a strong analytical tool to conceptualise ICT-enabled organisational change thorough unpacking social interactions while they pay little or no attention to "specific technological properties and affordances" (Orlikowski 2010, p.133). Their analytical power accommodates the production and use of the software in a particular social context and situation; however, oversocialised conceptions of technology result in disappearance of the technological side (Orlikowski 2010; Bloomfield et al. 2010). Considering the findings from the empirical data, I would argue that classic social-constructivist perspectives are not completely able to explain the various created meanings just by examining social interactions. Subsequently, ideas of ***sociomateriality, technology portfolio***, and ***non-users influence*** are introduced and then tied to each other for the purpose of proposing some methodological considerations in organisational studies.

Firstly, it is argued that interpretations by people are not only based on social interaction, but also on technology's material features (Leonardi 2009). Therefore, the constitution of the social interactions and the materiality of technology determine the level of success for a technology (Orlikowski 2007). For instance, Rose's negative interpretation has basically been mediated by the functionality of HTK. To examine such observations, the concept of **sociomateriality** has been mostly utilised by organisational researchers (Orlikowski 2010; Leonardi and Barley 2008; Suchman 2007; Stahl et al. 2011) to "propose that we recognize that *all* practices are always and everywhere sociomaterial, and this sociomateriality is constitutive, shaping the contours and possibilities of everyday organizing" (Orlikowski 2007, p.1444).

Secondly, in many cases within the club, sense-making practices have not been resulted from "sociomaterial assemblage" (Suchman 2007) around one specific technology (HTK), but rather other substitute (TUM) or complementary technology affordances effect the way people describe the particular technology. Similar empirical findings are elaborated by some information systems researchers: they have identified that results of a particular information system could be misleading if the research examines just one artefact or computer system in isolation. (Lyytinen and Yoo 2002; Carroll 2008; Kane and Alavi 2008). Carroll (2005; 2008) has applied the metaphor of a **technology portfolio** to emphasis this analytical challenge. This metaphor calls for rethinking traditions within the

literature that treat technological artefacts as a singular technology (Carroll 2008). In summary, within contemporary workplaces, people interact with a set of technologies and treat with each as a part of interrelated group.

Thirdly, it is discussed that **non-users** could have considerable effects on decisions about technology. We need to "begin to explore the category of non-use and what it means for science and technology studies" (Watt 2003, p.77). It is crucial to understand and categorise the reasons of not using a particular technology (Selwyn 2003). Without a doubt researchers need to analyse the users and producers, however, we should consider "the risk of accepting a worldview in which adoption of new technology is the norm" by just focusing on them (Watt 2003, p.78). Additionally, it is important to examine the ways different kinds of non-user may influence decisions about a specific technology in organisational context. This study, for instance, reveal that although Flora don't use HTK, her paper-based sheets influence the possible choices for adopting new club management system.

Conclusion: Methodological Considerations

Conceptualisation of the interplay among ICT and organisational change has been a challenging agenda of wide interest to scholars among different fields of study. In doing so, a number of approaches have generated insights into the relationship between technology and organisation. Focusing on the empirical evidences collected from a sport club, this paper concludes that researchers which consider the technology-driven changes in organisations can benefit from: the interpretation of social interactions, the examination of the technology's material features, the consideration of the affordances by other technologies around the targeted technology, and the significance of non-users of a specific technological artefact. Therefore, the concluding methodological implications are:

Firstly, technology studies should be equipped by various methodologies and theories which originate from social constructivism to increase their sensitivity to micro, everyday, and maybe ordinary interactions within and around the organisation. In particular, ethnomethodology and other ethnographic approaches are developed to expand sociological enquires.

Secondly, the concept of sociomateriality stress on studying the imbrication of human and material agencies (Leonardi 2011). This notion suggests the incorporation of human agency approaches into the materiality of technology to explain the role of technology in organisational change.

Thirdly, the empirically-developed metaphor of technology portfolio introduces multiple technologies studies. People in today organisations use a range of technologies to shape their own specific practices. As a result, conceptualising the role of specific technology in the organisation requires consideration of the affordances produced by other technologies.

Finally, although typically technology studies consider technology users and developers, non-users also matter in shaping the role of ICTs in organisational change. Their individual's reading of technology should be unpacked.

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