

Chapter II

Adapting the Structurationist View of Technology for Studies at the Community/Societal Levels

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ABSTRACT

The multilevel framework proposed in this chapter is particularly useful for research involving complex and multilevel interactions (i.e., interactions involving individuals, groups, organizations and networks at the community, regional or societal levels). The framework is influenced by three theoretical perspectives. The core foundation comes from the structurationist view of technology, a stream of research characterized by the application of structuration theory to information systems (IS) research and notably influenced by researchers like Orlikowski (2000) and Walsham (2002). In order to extend the framework to encompass research at the community/societal levels, concepts from social shaping of technology and from contextualism have been integrated. Beyond sharing a number of ontological and epistemological assumptions, these three streams of thinking have been combined because each of them offers particular concepts that are of great value for the kind of studies the authors wish to put forward: investigating the influence of information and communication technology (ICT) from a structurationist standpoint at levels that go beyond the organizational one.

INTRODUCTION

Understanding the influence of *information and communication technology (ICT)* in social life is complex, no matter what lens is adopted to study it. In the information systems (IS) field of research, a range of different social theories have been borrowed and adapted in order to gain insight into the interaction of ICT (its design, adoption, implementation and use) and people at different levels (individual, group, organizational and macro). We found institutional theory (Avgerou, 2000), structuration theory (Barley, 1986), critical social theory (Doolin, 1998; Yetin, 2006), actor network theory (Sarker et al, 2006), social construction of technology (Williams, 1997) and symbolic interactionism (Gopal & Prasad, 2000) to be among the most influential social theories applied in IS research.

A number of recent papers have outlined the particular importance of one of these social theories in IS research: structuration theory. Although structuration theory is not specific to IS, but is rather a general social theory, it has been argued it is used in IS research more than in other areas of organizational research (Pozzebbon & Pinsonneault, 2005). In a recent and comprehensive review, Jones and Karsten (2008) noted that structuration theory has been cited substantively in more than 330 IS papers to date, including conceptual and empirical studies. What's more, the contribution and potential of structuration theory in general, and more particularly of the structurationist view of technology, for gaining insights on ICT phenomena, is widely accepted.

In this paper, we propose a multilevel framework that extends the structurationist view of technology to investigate the adoption, implementation and use of ICT at the community/societal levels. In line with Burton-Jones and Gallivan (2007), we apply the term multilevel to refer to a type of framework that entails more than one level of conceptualization and analysis. However, where we differ from the latter authors

is regarding the ontological stance. While they place multilevel research within an organization science perspective that adopts a functionalist, positivist and variance-oriented stance (p. 3), we place our multilevel framework within a constructivist tradition that views any social research as processual and *inherently multilevel*.

We also argue that most studies that use the structurationist view depict technology as reinforcing or transforming the institutional properties of *organizations*, i.e., that can be associated with research at the organizational level. Jones and Karsten (2008) highlight such a limitation and identify opportunities for future structurationist IS research to address the relationship between ICT and people in broader contexts than just the specific organizational setting. Greater effort should be made to “broaden the scope of IS research from its traditional focus on phenomena associated with computer-based information systems at the individual, group, and organizational levels, to address the broader institutional and social developments in which IS are increasingly implicated” (Jones & Karsten, 2008, pp. 150).

The organizational level of analysis has hitherto dominated discussion not only in IS but, to a large extent, in management research which arguably correlates with the power held by corporations that occupy a privileged place in the economic world. Nonetheless, *the importance of studies at the community/societal level is rising, as researchers worldwide become more aware that, as a society, we will be incapable of dealing with important issues such as social welfare, social equity and sustainability if we continue to focus merely on doing what we are currently doing more efficiently, research included. New forms of social and economic relations as well as new ways of balancing human needs and natural resources are likely to emerge. These needs transcend those organizational problems that IS researchers have traditionally focussed on: productivity, performance, risk, satisfaction and other constructs related to the impact of IT at the organizational or inter-*

organizational levels. Although these areas remain relevant, their dominance has overshadowed other levels of analysis, and the dynamics of ICT at the community/societal level remains comparatively ill-defined and under-researched. The emergence of theoretical frameworks that address these levels should help to resolve the current imbalance.

In this light, the conceptual framework proposed in this chapter is particularly useful for research involving complex and multilevel interactions between individuals, groups, organizations and networks at the community/societal level. The presence of multiple levels of analysis, from individual to macro, draws attention to the linkage between individual micro-level actions and institutional macro-level contexts. However, the design and application of a multilevel framework cannot preclude serious challenges. How can a structurationist view of technology be applied to more purposively understand the influence of ICT on change or permanence at the community/societal level without drawing attention away from individual practices? What other alternatives could contribute to addressing such a difficult theoretical question?

BACKGROUND

The multilevel framework is influenced by three theoretical perspectives: structurationist view of technology, social shaping of technology and contextualism. In this section, we present and discuss the fundamental premises and concepts of each of these perspectives.

Structuration Theory and Structurationist View of Technology

Structuration is seen as a promising theory for resolving the longstanding debate concerning the relationship between structure and agency, a challenge not confined to ICT or even to organization theory, but having a place among the most ubiq-

uitous and difficult issues in the whole of social theory (Giddens & Pierson, 1998). Rather than opposing objective-subjective or voluntarist-determinist dimensions, Giddens (1984) challenged the premise of mutual exclusivity and assumed the duality of structure and action, proposing the *theory of structuration* and offering a form of social analysis that goes beyond dualistic ways of thinking and helps to bridge micro and macro levels of analysis. Other well known alternatives to historical dualistic views are Bourdieu's (1977) interplay between objectivism and subjectivism, Bernstein's (1983) move beyond objectivism and relativism, Bhaskar's (1989) account of positivism and postmodernism, and Fay's (1996) discussion of science versus hermeneutics. Pozzebon (2004) argues that these accounts are not really competing but alternatives to structuration theory, and that the choice among these alternatives is often a matter of ontological affinity.

Structuration theory has received significant attention, making British sociologist Anthony Giddens one of the world's most-cited sociologists (Jones & Karsten, 2008). It is not our purpose in this chapter to provide a complete overview of Giddens's structuration theory, as a number of comprehensive and authoritative texts on the topic already exist (e.g., Cohen, 1989; Giddens, 1984, 1989, 1990; Giddens & Pierson, 1998; Held & Thompson, 1989). Instead, we have chosen to highlight the stream of IS research applying structuration theory that we term the *structurationist view of technology*, its implications for empirical research and the *main concepts articulated to compose a multilevel framework*.

The *structurationist view of technology* represents a chief stream within IS research, and has been analyzed and revised in detail by Pozzebon and Pinsonneault (2005). It encompasses the work of authors like Barrett and Walsham (1999), Heraclous and Barrett (2001), Montealegre (1997), Ngwenyama (1998), Nicholson and Sahay (2001), Olesen and Myers (1999), Orlikowski (1991, 1992, 1993, 1996, 2000), Orlikowski and Yates (1994),

Sahay (1998), Sahay and Robey (1996), Walsham (2002), Walsham and Han (1993), and Yates and Orlikowski (1992). Although the way structuration theory has been interpreted and applied by these authors varies, they can be distinguished as a group when compared to another influential stream of IS research claiming to espouse structural concepts, the *adaptive structuration theory* or AST (DeSanctis & Poole, 1994). AST has been widely applied by IS researchers like Chin et al. (1997), Fulk (1993), Majchrzak et al. (2000), Maznevski and Chudoba (2000), and Miranda and Bostrom (1993-1994, 1999). While DeSanctis and Poole's (1994) original elaboration of AST draws on Giddens' main concepts, its subsequent application in empirical studies has departed from the fundamental premises of Giddens' theory. This explains why most studies recognized as AST studies are based on nomothetic assumptions and use survey and experimental methods to test causal models (Pozzebon & Pinsonneault, 2005).

Two authors have been particularly influential in shaping the path of the *structurationist view of technology* stream: Orlikowski and Walsham. The work of Orlikowski is widely recognized as relevant not only in IS but also in organization studies. Two seminal papers published in *Organization Science* in 1992 and 2000 respectively mark two different phases of her influential work.

In the first phase, seeking to extend the understanding of IT from the structuration point of view, Orlikowski (1992) proposed a structural model of technology. The model posits that IT is simultaneously the product and the medium of human action, and that existing institutional properties (knowledge, resources and norms) influence human actions when interacting with IT. Concurrently, when human actors interact with IT, they act upon institutional structures either to sustain or change them. "Technology embodies and hence is an instantiation of some rules and resources constituting the structure of an organization" (Orlikowski, 1992, pp. 406). Technology is created and changed by human

action at the same time that human action is mediated by existing technologies. Such a recursive notion of technology is what Orlikowski termed the *duality of technology*.

In the second phase, Orlikowski (2000) challenged her own previous work on the structural model and developed concepts that address the role of emergence and improvisation in technology and *technology-in-use* or *technology-in-practice*. She emphasizes appropriation of the structures inscribed in the technology, and moves towards a more proactive and practical lens that focuses on emergent rather than embodied structures and replaces appropriation with enactment (Orlikowski, 2000). Adopting such an alternative view, Orlikowski points out that there are always boundary conditions on how to use physical properties of artifacts, and that people always can (even if they do not) redefine the meaning, properties and application of a given technology after development or implementation. Her practical lens focuses on human agency and the open-ended set of emergent structures that may be enacted through the recurrent use of a technology.

We selected **technology-in-practice** as a central concept in a multilevel framework aimed at investigating the influence of ICT at a community/societal level. The focus is on the enactment of technology, outlining that there are always boundary conditions on how people redefine the meaning, properties and applications of a given technology during and after implementation, and allowing a better understanding of the emergence or non-emergence of new social structures.

Our view of Walsham's contribution to the structurationist view of technology lies in his emphasis on understanding the influence of ICT in social life, not only as embedded within its organizational context but also within wider social systems, such as those at the nation state level (Walsham, 1993; Walsham & Ham, 1993). In his leading book about interpretivism in IS research, Walsham (1993) combines elements from structuration theory and critical theory,

raising concepts such as power and control. More recently, Walsham (2002) put particular emphasis on culture and cross-cultural studies, once again applying structuration theory to macro analyses of social change and encouraging IS researchers to enlarge their scope of analysis, as advocated in this chapter.

In summary, the studies identified here as belonging to the *structurationist view of technology* have offered worthwhile contributions to increasing our understanding of interactions between individuals and groups and ICT within organizations but still fail, except for Walsham's attempts, to purposively address mixed levels of analysis with complicated networks of players. In a collection of constructivist studies on technology, which adopts a purposive political account and integrates macro and historical analyses, we found concepts that help extend the structurationist perspective. They sharpen the focus by incorporating a broader and more heterogeneous set of players.

Constructivist Approaches and Social Shaping of Technology

The second source of theoretical foundation comes from social shaping approaches, which can be divided into two broad categories: socio-economic shaping of technology (e.g., MacKenzie & Wacjman, 1985; Williams 1997) and social construction of technology (SCOT) (e.g., Pinch & Bijker, 1984; Bijker & Law, 1992), the latter category being *strongly influenced by sociology of knowledge* (Berger & Luckmann, 1967). The special issue of *Technology Analysis & Strategic Management* (volume 12, number 1, 2000) and the book *Innovation, Organizational Change and Technology* (edited by McLoughlin & Harris, 1997) provide a set of papers on technology and political processes within management and organizations that are centered on the social shaping of technology. They adopt a political account and integrate macro and historical analyses.

Like Orlikowski's *technology-in-practice*, social shaping studies outline opportunities in which technology can be interpreted or reinterpreted in different ways. *Aiming at overcoming the rather deterministic conception of technology often found in mainstream technology management literature*, which tends to take technology for granted as a well-defined tool (Dawson et al., 2000), social shaping studies *view technology implementation as the outcome of social processes of negotiation between networks of social actors*. Strongly influenced by social constructivist approaches, this *view pays special attention to the diversity of factors' interpretations of the meaning and content of technology (technological frames) and emphasizes the identification of opportunities where decisions and actions regarding technology management and change may be undertaken*. In order to *identify occasions, spaces and mechanisms* that are open for negotiation and change, they incorporate a *broader, complicated and heterogeneous network of diverse players* (Clausen & Koch, 1999; Koch, 2000). *We retain three important concepts from social shaping studies: ICT implementation and use as a negotiation process, relevant social groups and technological frames*.

ICT implementation and use is seen as a **process of negotiation**, where not *only the content of the technology itself, but also the different interests, commitments, perspectives and positions of the network of players interacting with the technology, will influence the process and outcomes of technologies-in-practice and the emergent social structures*. *The identification of occasions, spaces and mechanisms open for negotiation and change becomes crucial*.

The implementation of a new ICT in a community or region can be seen as an opportunity to change information flow, resource allocation and responsibility attributions. "IS are drawn on to provide meaning, to exercise power, and to legitimize actions" (Walsham, 2002, p. 362). For this reason, by implementing a new ICT,

people can reproduce, transform, adapt and even reinvent their daily practices. In order to take into account a broader, complicated and heterogeneous network of diverse players interacting in a given community or region, we delineate the concept of relevant social groups. The meaning of community merits a separate discussion in itself, and a huge number of different definitions of community can be found in literature and the Internet, e.g., geographic communities, communities of culture, communities of interest, etc. In this chapter, we adopt the concept of community as it has been traditionally defined in sociology: a group of interacting people sharing a common geographical or virtual territory (these people interact in networks and can take part in coalitions, teams, organizations, associations, etc.).

Relevant social groups refer to a set of people who share a common geographical space or occupy the same functional boundaries. In addition, from a constructivist point of view, relevant social groups also share a set of assumptions about a given subject of interest, for example, the expected benefits of the implementation of a new technology (Sahay and Robey, 1996). Subgroups and alliances between groups form social spaces and play important roles in the choice of management strategy and use of technology.

The assertion that people within a social group are likely to share a set of assumptions leads to the concept of interpretive frames. People act in

the world on the basis of how they interpret and re-interpret it. *Interpretive frames are mental models that shape people's interpretations, influencing their actions and decisions.* The idea of interpretive frames is similar to those of *interpretive schemes* (Giddens, 1984; Bartunek, 1984), *technological frames* (Orlikowski & Gash, 1994; McLoughlin et al., 2000), and *provinces of meaning* (Ranson et al., 1980; Weick, 1993). Table 1 shows previous research on interpretive frames.

Orlikowski and Gash (1994) suggested that technological frames are particularly useful for examining how and why people act around ICT, describing their approach as cognitive and establishing a distinction between cognitive and political perspectives. Accordingly, while the former helps explain contradictory outcomes due to different interpretations of a technology, the latter helps explain particular outcomes due to the loss or gain of power. In this vein, Davidson (2002) also adopted technological frames as a socio-cognitive perspective complementary to analysis of power.

Other authors do not corroborate such a disconnection between cognitive and political dimensions, believing that *interpretation* and power cannot be separated. Gallivan (1995), Giddens (1984), McLoughlin et al. (2000), and Ranson et al. (1980) are some examples. What Orlikowski and Gash (1994) call “frame incongruence” and

Table 1. Concepts related to interpretive frames

Denomination	Examples of studies
Cognitive maps	Bougnon et al. (1977); Eden (1992)
Interpretive schemes	Bartunek (1984); Giddens (1984)
Interpretive frames	Bartunek and Moch (1987)
Frames	Goffman (1974)
Mental models	Argyris and Schon (1978); Schutz (1970)
Provinces of meaning	Ranson et al. (1980); Weick (1993)
Technological frames	Gallivan (1995); McLoughlin et al. (2000); Orlikowski and Gash (1994); Yoshiota et al. (1994); Davidson (2002)

“divergent technological frames,” McLoughlin et al. call “frame dominance” and “competing accounts,” essentially because interpretive frames represent competing or converging accounts, which can be related to competing or converging interests regarding the outcomes of the implementation of a new technology. *This view of the inseparability of cognitive and political aspects* is supported by Giddens: although separated for analytical purposes, meaning and power are intrinsically related - frames of meaning incorporate differentials of power.

Similarly, *Ranson et al. (1980) propose that people create “provinces of meanings,” which represent the basis of their orientation (Ranson et al., 1980)*. Although individually held, interpretive frames, *articulated with value preferences and sectional interests*, are shared across groups (Gallivan, 1995). Therefore, different stakeholder groups are likely to have diverse interpretive frames, which not only reveal different perceptions and knowledge, but different expectations and interests as well. *The resolution of competing frames hinges on dependencies of power and domination. In other words, the results of conflict among groups holding conflicting perspectives will depend in part on the comparative power of these groups to make their perspective heard (Ranson et al., 1980)*.

Technological frames refer to basic assumptions, beliefs, and expectations that people hold about a specific technological application (Davidson, 2002), including not only the nature and role of the technology itself, but the specific conditions, applications and consequences (intended and unintended) of that technology in particular contexts (Orlikowski & Gash, 1994). Technological frames might be shared within a relevant social group because members are likely to share common perceptions, expectations and interests regarding the implementation and use of a given ICT application. Similarly, technology frames might differ between different relevant social groups.

Although social shaping of technology and the structurationist view of technology share several common premises (both are strongly influenced by constructivism) and have some overlapping areas (for example, the concept of technological frames was borrowed by structurationist studies from social shaping ones), they also have distinctiveness that justify their inclusion in and complementarity with our framework. Among the most important contributions of social shaping studies, when combined with structurationism, is their familiarity with macro level analysis and their capability of broadening the scope of IS research.

Contextualism

The contextualist approach was first introduced by Pettigrew (1985, 1987, 1990) and has gained significant attention among IS researchers (Ngwenyama, 1998; Orlikowski, 1996; Walsham, 1993). Arguing that much research on organizational change is non-processual and non-contextual in character, Pettigrew (1985, 1990) emphasizes three elements: context, process and content. Pettigrew claims that these three elements are equally important and should be considered in concert. He also outlines how different levels of analysis are interconnected and interdependent.

Contextualism is depicted in IS research like a “theory of contextualism” (Karyda et al., 2005), as a methodology (Walsham & Sahay, 1999) and as a type of organizational change framework (Klein & Myers, 1999). Despite these different ways of referring to contextualism, all the IS studies reviewed emphasize similar properties of such a theoretical foundation: it allows the examination in detail of actions and perceptions of human actors without neglecting the historically situated context within which these actions took place and perceptions are formed (Walsham & Sahay, 1999). As Pettigrew (1990, p. 269) explains, when applying a contextualism lens, we look for “continuity and change, patterns and idiosyncrasies, the actions of individuals and groups, the role of contexts and

structures, and processes of structuring” over time. Adapting context, process and content to ICT, we consider that:

- Context refers to the social setting where the ICT application is being implemented and used. It helps define the boundaries of the investigation and includes the identification of different relevant social groups interacting in a given social and cultural setting that makes up the research context. It also includes identification of technological frames for each social group, allowing the recognition of shared and conflicting perceptions, expectations and interests that characterize the context.
- Process refers to understanding how the IT application is implemented and with what kinds of consequences (intended and unintended). The analysis of the process focuses on how relevant social groups, and the identified technological frames, influence the negotiation taking place around the implementation and use of ICT. It also includes the identification of occasions, spaces and mechanisms open to negotiation and change.
- Content refers to the socio-technical characteristics of the IT application being implemented, as used by particular actors at a given level of analysis. The technologies-in-practice resulting from the process of negotiation are considered here.

The contextualism approach did not add new concepts to the framework, but it was valuable for proposing a **frame in which** to organize the four selected concepts in terms of three dimensions: **context, process and content**.

MAIN FOCUS OF THE CHAPTER

The *multilevel framework* combines the structurationist view of technology, social shaping of technology and contextualism. It is multilevel because it incorporates inextricably linked levels of analysis: individual, group and local community. It combines four central concepts: technology-in-practice, negotiation, relevant social groups and technological frames. These concepts are linked according to three interconnected dimensions, as posited by contextualism: content, context and process. This multilevel framework aims at helping to identify occasions, spaces and mechanisms for implementing and using ICT applications at a community/societal level. Each of these concepts, selected to set out the framework, is important for different reasons.

First, because the level of analysis of our framework combines individual (e.g., local people coming from a low income population), organizations (e.g., firms, cooperatives, etc.) and networks of organizations within a region or local community (e.g., associations of cooperatives, arrangements between firms, ICT providers serving a group of firms), we look at ways to take into account actors in a multilevel context. Between individuals and community, there is the group level, which is articulated through the key concept of *relevant social groups*. It is a way to conceptualize and make sense of how people interact within a given community, whether individually or as part of a group, an organization or a network. The notion of relevant social groups allows us to recognize individuals and groups without reducing the complexity of intra- and inter-group relationships.

Second, because of our focus on ICT, the concept of *technological frames* helps us to recognize what kind of interests, assumptions and expectations different social groups attach to the adoption and use of a given technological artifact. Convergence or divergence, dominance or conflict among technological frames reveal

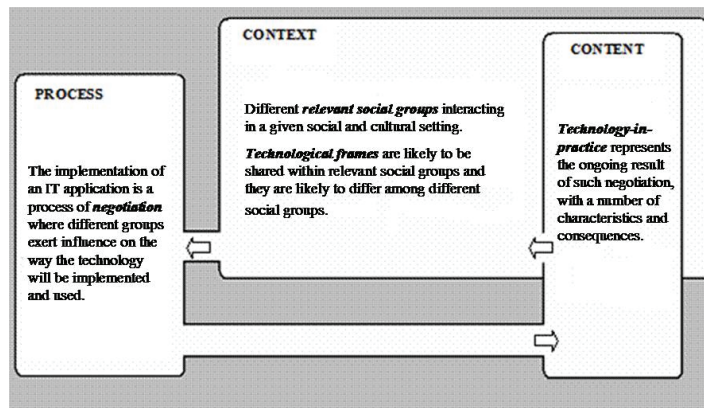
important mechanisms in negotiations among relevant social groups.

The identification of relevant social groups within a given community, as well as the individuals that we consider representative of these groups, and the identification of the technological frames attached to these relevant social groups (shared and conflicting perceptions, expectations and interests), define the initial boundaries of the investigation and help establish the *context* in which the implementation and ICT use are being negotiated.

Third, the *negotiation* itself is the next concept that underlies our process-based approach. The negotiation is the *process* (contextualism) that corresponds to the identification of occasions, spaces and mechanisms by which relevant social groups interact over time.

Finally, the concept of *technology-in-practice* can be considered one of Orlikowski’s main contributions to the application of structuration theory in the investigation of ICT phenomena. In our framework, we pay particular attention to technology-in-practice as the result of the negotiation process among different social groups, in order to recognize the interests or assumptions that have prevailed in the implementation and use of ICT, those *characteristics* in terms of use that have prevailed, and the *consequences*, both intended and unintended, for the different social groups involved. Because technology-in-practice represents the ongoing results that grow out of the actual use of an ICT, allowing recognition of socio-technical, political and cultural characteristics of ICT in use, we characterize it as representing the contextualist dimension of *content*.

Figure 1. A structurationist and multilevel framework



	Context	Process	Content
<i>Individual level</i>	The connection between individuals and the local community goes through the relevant social groups interacting in a given social and cultural setting.	People build their technological frames over time. This implies the identification of <i>assumptions, expectations and interests</i> attached to the implementation and use of a given technology.	The implementation and use of ICT is a negotiation where different groups exert influence on how the artifact will be implemented and used. Implies the identification of <i>occasions, spaces and mechanisms</i> open for negotiation.
<i>Group level</i>			
<i>Community level (could be extended to societal level)</i>			
			Technology-in-practice represents the ongoing results of such negotiation, with a number of <i>characteristics and consequences (intended and unintended)</i> .

The result of the combination of the four concepts organized in terms of the three interconnected dimensions of the contextualist frame is presented in Figure 1. The arrows indicate that context influences the process, which influences the content, which influences the context and so on. The framework respects the core characteristics of process theory as earlier defined by Orlikowski and Robey (1991); it accommodates multiple levels of analysis, is contextually and temporally situated, and avoids the blinders of non-historical accounts of social phenomena.

It is multilevel because it incorporates inextricably linked levels of analysis: individual, group and community. The community represents a network of social groups interacting in a given geographical or virtual space and having in common the fact that they are involved in a process of implementation or use of a given technology. The community level could be extended to the societal one if, for instance, the investigation entails implementation and use of ICT at a national level. However, the aim of an investigation applying the multilevel framework is to build a macro account of broader interactions among a network of players without neglecting everyday interactions within relevant social groups. The line that commonly separates macro and micro levels of analysis is removed, rendering it difficult to understand the macro without plunging into the micro level. The actors, individually, through their daily actions, reproduce or reinforce structured rules, norms and meanings (Orlikowski, 1992). By their articulation within subgroups, they constitute social spaces and play important roles in the choice regarding management and use of technology (Clausen & Koch, 1999). In effect, changes in community or societal levels emerge from individual practices and groups or coalitions.

We call this a conceptual framework for “analytical induction” because no hypotheses or propositions are offered but only a framework that will guide the empirical work. Although key concepts are identified (e.g., relevant social groups

and technological frames), their relationship and interaction with particular contexts remain to be discovered. Recently, researchers have used analytical induction with important results (Lapointe & Rivard, 2006). The use of this model has the goal of increasing understanding of “how” IT applications are drawn upon to provide meaning and to legitimize certain outcomes to the detriment of others in different contexts.

Because understanding of the process is seen as fundamental, their relationship and interaction in particular contexts remain to be discovered during data collection and analysis. The goal is to start with a general theoretical model and to distil such a model within an iterative process that does not take the initial model for granted but allows us to recognize new categories and refine existing ones in such a way as to enrich our understanding of the research problem (Patton, 2002).

FUTURE TRENDS

More discussion is needed to refine the proposed multilevel framework as well as to offer alternatives that seek to engage seriously in broader levels of analysis than the organizational one. For instance, as the combination of micro and macro levels of analysis is not an easy task, Pozzebon et al. (2006) have proposed a multilevel frame to identify occasions and opportunities for breaking down ICT rhetorical closure at three levels of analysis: individual, organizational and segment. At the individual level, opportunities were associated to daily users’ practices, depending on empowerment and training. At the organizational level, opportunities were related to ongoing organizational decisions and negotiations regarding ICT adoption and implementation. Finally, at the segment level, opportunities were related to forming coalitions, networks and groups of users.

Articulating three levels of analysis, the authors were able to identify occasions and opportunities to help decision-makers preserve their

ability to make informed choices at both the micro (e.g., investing in skilled and capable employees) and macro (e.g., networking with other firms) levels. Likewise, Burton-Jones and Gallivan (2007) have proposed a multilevel perspective of system usage. They argue that although the relevance of multilevel issues when studying IT is widely accepted nowadays, the conceptual and methodological tools to conduct multilevel research have only recently matured and so only recently has in-depth multilevel research become feasible. These recent articles suggest that great opportunities exist to extend exploration of multilevel accounts in IS research.

The concepts related to technological frames—cognitive maps, interpretive frames, provinces of meaning—evoke Weick's (1993) paper titled *The Collapse of Sensemaking in Organizations: The Mann Gulch Disaster*. In this seminal paper, Weick analyzes a tragedy that occurred in 1949 in the rugged mountains of Montana, where 13 forest service smokejumpers died trying to battle a violent forest fire that burned fiercely in very difficult terrain. Weick uses this event to examine how the sensemaking processes of highly trained groups break down when the orderliness of the universe is called into question because both understanding and procedures for sensemaking collapse together (Lawrence, 2005). Although this perspective has influenced well-known IS researchers, as was the case with Ciborra (1999), we can argue that the potential of sensemaking theory has not yet been significantly explored in IS research.

Finally, regarding the identification of occasions, spaces and mechanisms open for negotiation, we believe that future research should include a better articulation of emergent action-based lenses in the examination of the negotiation phase. We believe that theoretical approaches like negotiated order (Heracleous & Marshak, 2004), situated-action (Ciborra & Willcocks, 2006) and actor-network (Pentland & Feldman, 2007) could be of great value in providing operationalized

concepts that help to recognize, as contextualism wish, the details of actions and perceptions without neglecting the richness of historically situated contexts.

CONCLUSION

It may be argued, i.e., Jones and Kartsten (2008), that IS researchers using structuration theory have done so in a wide variety of ways, and that they should seek to explore the full scope of theories they borrow from other disciplines. We are trying to engage seriously in structuration theory without neglecting the contribution of complementary approaches. As the influence of ICT on social life broadens in scope, heterogeneity in terms of actors involved, diversity of interests and technological views, IS researchers need to rely on conceptual approaches so as to build a multilevel understanding of the technological phenomena. The multilevel approach proposed in this chapter is still under construction, though. Since any conceptual approach is only valid to the extent to which it is adopted by a significant number of researchers and is validated by relevant empirical analysis, the effective contribution of this presented multilevel approach to the IS research field must be proven under use. And as we believe that technology takes shape only after being adopted in practice, we also believe that the evolution of our proposed approach will have a definitive shape only when other researchers have adopted it and contributed to its evolution.

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KEY TERMS AND DEFINITIONS

Actor Network Theory: Also known as ANT, this is a sociological theory developed by Bruno Latour, Michel Callon and John Law. It is distinguished from other network theories in that an actor-network contains not merely people but objects and organizations. These are collectively referred to as actors, or sometimes as actants.

Adaptive Structuration Theory: DeSanctis and Poole adapted Giddens' theory to study the interaction of groups and organizations with information technology, and called it Adaptive Structuration Theory, also known as AST. This theory is formulated as "the production and reproduction of the social systems through members' use of rules and resources in interaction".

Critical Social Theory: Critical research focuses on the oppositions, conflicts and contradictions in contemporary society, and seeks to be emancipatory, i.e. helping to eliminate the causes of alienation and domination. The main task of critical research is seen as social critique, whereby the restrictive and alienating conditions of the status quo are brought to light.

Institutional Theory: Institutional theory attends considers the processes by which structures, including schemas, rules, norms and routines, become established as authoritative guidelines for social behavior. It examines how these elements are created, diffused, adopted, and adapted over space and time; and how they fall into decline and disuse.

Social Construction of Technology: Also referred to as SCOT, this is a theory advocated by social constructivists that contends that technology does not determine human action, but,

rather, that human action shapes technology. It also argues that the ways in which a technology is used cannot be understood without understanding how that technology is embedded in its social context.

Structuration Theory: The theory of structuration was proposed by British sociologist Anthony Giddens in a number of articles in the late 1970s and early 1980s, culminating in the publication of *The Constitution of Society* in 1984. It is an attempt to reconcile theoretical dichotomies such as agency/structure, subjective/objective, and micro/macro. The approach does not focus on the individual actor or societal totality “but social practices ordered across space and time.”

Symbolic Interactionism: Represents a major sociological perspective derived from American pragmatism and particularly from the work of George Mead, who argued that people’s selves are social products, but that these selves are also purposive and creative.