

Change Over Time: Research Approaches to ICT-Enabled Emergent Change

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Organizational change related to information and communication technologies (ICT) has been a well-discussed topic over the last few decades. Both positivist approaches, such as technological or organizational determinism, and socio-economic and socio-technical approaches have been prevalent as research approaches in ICT change literature. Within the interpretative realm embodied in the social approaches, the concept of emergent change – that is, change as emerging or enacted over time – has been paramount. This paper provides an overview of the development of emergent change approaches and theories, with the body of the review focusing on the primary lines of approach developed and used in the last decade. It goes on to review research studies performed in the current environment, and assesses how they correspond to the approaches and questions raised therein. It concludes with a critical view on the application of emergent change theory in modern practice.

1. Introduction

Within IS and organizational change literature, a great amount of research has been performed as to how organizations change, either as a result of direct stimulus or over time. Numerous researchers have approached this subject in different fashions, as summarized by Orlikowski (1996). In recent literature, the concept of emergent, situated change has arisen as researchers look at organizational change as it relates to technology over time (Orlikowski, 1996; Suchman, 1987, 2007). Other approaches advance the structurational view as a lens with which to consider technology and organizational change (Orlikowski & Robey, 1991; Orlikowski, 2000). This has been approached in a number of different ways, as summarized by Orlikowski & Scott's analysis of three decades of literature reviews, and has led to a call for a new, sociomaterial approach. Finally, Ciborra (2006) has criticized the overall approach to 'situated' change as being divergent from the original concepts of phenomenology, and among others there has been a push for a more critical approach. It is the intent of this paper to bring this all together into a comprehensive summary of the current state of this field.

The next section provides a brief description of methods and approaches. Following that is a chronological overview of the development of emergent/enacted change theory, starting in the late 1980s. The final analytical section critically reviews organizational studies performed in the current environment. This paper then concludes with a summary of the ongoing trends in the modern application of these approaches.

2. Approaches and Methods

The preponderance of emergent change literature is strongly rooted in the administrative realm. Further, studies in emergent change often adopt a process-based, interpretivist approach (Orlikowski & Scott, 2008). As such, in an effort to distinguish between the different studies, conventions of classification from Orlikowski and Iacano's 2001 classification of the IT artefact, and from Avgerou's 2000 critique of IS science, will be used where applicable. Other sources of critique include Crotty's 1998 work on social research foundations, and multiple analyses by Claudio Ciborra (1996, 2002, 2006). In particular, theoretical perspective, ICT theory, technological embodiment, approach, and rationality have been considered in this review.

3. A Lifetime of Theories

In this section we look chronologically at the development of emergent change and related approaches, choosing as a starting point a timeframe around the seminal work of Lucy Suchman in 1987. It progresses into the early formative years of ICT organizational theory, the decade of 1990, and closes with recent developments in emergent change approaches. Despite the temporally convenient delimiters, it will become clear that the division between the three bodies is distinct in approach and theme in addition to numeric prefix.

3.1 The Early Years

Prior to the late 1980s, positivist approaches and variance theories dominated the ICT literature on organizational change (Barley, 1986; Markus & Robey, 1988; Orlikowski, 1996). These approaches emphasized the concept of determinism in their analysis of technology and organizational change. Barley (1986) accurately pointed out that many of these approaches had failed to create repeatable findings, and accepted the contradictory results as repeatable. Structure was then introduced as an emergent property that could be applied to technology. This approach showed marked similarity to later perspectives, such as the ensemble view. However, the final application of structuration in Barley's work moved away from those original concepts, focusing on structure-in-place as an institutional and slowly dynamic entity. An interesting point in this early application of theory is its socio-historical, contextual awareness – at one point it provides an injunction against reviewing organizations with different cultural environments and histories.

Two other key concepts in this period influenced much of later theoretical developments. The concept of situated change was introduced (Suchman, 1987), and an in-depth analysis of causal structure in IT organizational theory was developed (Markus & Robey, 1988). Suchman's work ascribed reactive, linguistic, and opaque properties to artifacts, and linked these properties to a framework for situated action. This practice framework, perhaps intentionally, did not explicitly prescribe emotions to the actors involved, giving it a more dialogic and contextual view.

In contrast, Markus & Robey (1988) performed a review of causal structures, highlighting the preponderance of imperative, variance-based studies and presenting the utility of emergent, process approaches. Their conclusions supported the further development of emergent approaches, especially

in the use of mixed-level analysis. The dominant perspective of technology used was that of the web ensemble, although within that framework they did not completely identify the role of the actor. This was pioneering work, and was a strong influence in the development of the interpretive viewpoint.

Between the three studies are roots of many of the modern approaches to ICT organizational change. As conceptual frameworks, they all have slight omissions compared to the current comprehensive view, which may have contributed to the meandering path research approaches have taken since that time, such as the late-90s minimization of emotion and history (Ciborra, 2006). However, these core approaches were vital to the development of many of the approaches to come.

3.2 Research Structuration

The 1990s comprised a period of significant advancement for interpretivist organizational change theory in ICT, even though positivist views still dominated many journals (Orlikowski, 2001). In particular, the structurationalist view developed by Anthony Giddens was expanded extensively. This era saw a series of trends develop in the approach of theory, and a number of lenses were developed as alternative analysis approaches. For example, one paper's introduction references no less than 26 other papers detailing other theories (Orlikowski, 2000). For reasons of space this review only covers a selection of the current dominant theories relating to the approach of situated or structured emergent change.

In early 1990, the concepts from Markus & Robey (1988) were pulled into structuration theory (Orlikowski & Robey, 1991). This view set forth a structured ensemble view that actors shape the world at the same time as it shapes them, and utilized a dialogic view, similar to Suchman's practice based work in 1987, to help understand this concept. A contextualist approach, it does not incorporate macro-organizational factors, such as government or industry forces, directly on technology, instead focusing on a definition of human action in institutional contexts of use. It also asserts that due to mutual dependence, technology cannot determine social practices, only mediate them. The framework lends itself to both quantitative institutional reviews and qualitative reviews of human action, but it is interesting to note that few studies in the scope of this review had strong qualitative elements. Nonetheless, this approach lent itself as a catalyst for further research and refinement (Orlikowski, 2000).

After a period of critique, the structuration approach was refined into an 'in-practice' view (Orlikowski, 2000). This posited that the structurationalist view represents a static embodiment of structure in technology, and that study should focus on 'enactment,' or structures that emerge through recurrent interaction with technology. This approach prescribes a lens for aligning technology properties with social-organizational characteristics. By focusing more closely on enacted technology properties, such as only focusing on specific, current, technologies-in-practice (Orlikowski, 2000), it can potentially further abstract the researcher from macro-economic, engineering, or individual socio-historic concerns than the prior approaches. Additionally, due to its situated and active nature, this paper argues that application of the lens is subjectively more difficult in practice.

Two other major developments are included during this timeframe. The first was the formalization of micro-level emergent change as 'situated' – making sense of the world over

time, depending on situational variables and daily improvisations or 'slips' (Orlikowski, 1996). Ciborra (1996a) refers to this process as 'drifting.' The studies that support situated change primarily relate to groupware (Orlikowski, 1996; Failla, 1996; Ciborra & Patriotta, 1996; Ciborra 1996b; Bikson, 1996) and are primarily social interpretivist, administrative, focused on active ethnographic techniques, and treat technology as an embedded ensemble. It is interesting to note that the cases of successful situated change were predominantly on a smaller scale than the macro-level attempts, even when organizations tried to match technology to working processes. This would suggest that on a larger scale the difficulty of applying a situated approach becomes progressively greater. This is supported by the concept of groupware being 'fragile' (Ciborra, 1996a); that groupware is easy to subvert if situational and cultural factors do not support its use.

The second development was the connection of emergent literature to socio-technical design theory at the end of the decade. So far, most analyses have been directly concerned with emergent change. In an analytical review, Lin & Cornford (2000) contrasted nine principles of socio-technical design (adapted from Cherna, 1976), with approaches to systems-in-use. What is interesting is the use of the perspective of ensemble in the developmental sense, with a socio-technical engineering background, which is unusual for the literature reviewed here. Advocating the radical view of 'use-design-analysis' as a new development model, they directly associate the principles of compatibility and incompleteness with emergent design, but find that others are more problematic and need to be reconsidered. While space is insufficient for full discussion, a quick contrast between emergent requirements as outlined above and in the concept of the 'platform' (Ciborra, 2002c), indicates that perhaps some of the other principles – support congruence, information flow, sociotechnical criterion, and boundary location – could be used as an evaluative tool for aligning one's organizational characteristics to support an emergent platform.

3.3 Critiques and Developments

Above we have looked at the development of structured, situated and emergent theory. Their application over time resulted in a drift towards consensus and a loss of focus on power, historicity, and emotions (Ciborra, 2006). This was revealed by asking a simple question – are research approaches losing the original historical and emotional grounding originally embodied in phenomenological research? Does it have a place? Through review of the original work of Lucy Suchman in 1987, contrasted with one of Heidegger's early works, it is shown that the sense of history and emotion, of being, is absent. Through analysis of the papers reviewed in this study, a similar conclusion can be drawn – emotional approaches are not strongly present in modern emergent literature. Instead, while the approaches covered here make reference to historical (Orlikowski, 1991), emotive, or power-based (Orlikowski, 1996) capabilities, such applications are limited in practice.

As the above shows, the tenor of the 2000s was more reflective. This generated another critical view, phenomenological improvisation, by throwing out the methodologies of systems development and implementation (Ciborra, 2002b), and instead bolstering incremental learning through the adoption of strategic tinkering (Ciborra, 2002a). This would support the development of a platform of emerging adoption and techno-

logical hospitality to espouse constant capability for improvisation and emergent change (Ciborra, 2002c). As with other approaches introduced by Ciborra (Millet, 2008), while the core tenets are clear, such as dynamism in framing and management approaches, it is not a prescription for implementation. Nor, in its trivialization of ERP-style monoliths, does it readily answer how to compete with these efficient monoliths within crowded markets when flexibility, not efficiency, is the priority. However, this perspectives' study of Olivetti (Ciborra, 2002c), has a characteristic seldom seen in the emergent literature reviewed here – concepts that may be relevant to nurturing emergence over time.

Recently, the approaches of Actor-Network Theory (ANT) have been applied to organizational change theory, under term 'sociomateriality' (Orlikowski & Scott, 2008). ANT's broad definition of 'actor' allows it to provide a wide-lensed approach to organizational issues, in particular change over time. Unfortunately, its application to IT-enabled emergent change could be said to have been hindered by its complexity and scope. It is argued that prior approaches were hindered by specific periods of relevance, obscured views, and distinct entities, and instead should be viewed as a relational mangle. Luna-Reyes, et al (2005), show this to be true for earlier approaches, as their practice study, incorporating structuration, institutional, social construction, and tech-in-practice concepts, highlights only specific spots in time and features numerous organizational, technological, and institutional structures. Indeed, their study takes the approach of dualizing structure and dualizing technology independently at the same time, highlighting the need for the new conceptual fusion to address increasing interpenetration.

The sociomaterial approach brings together a number of concepts developed in prior literature into one overarching theory, including Suchman's revised work (2007) detailing embodied knowledge, and enacted dialectic concepts such as performativity (Orlikowski & Scott, 2008). As this is a very new approach, it generates more questions than can be answered at this time. An overarching theme found throughout this review is the increasing complexity of applying the various complementary models, methods and lenses to properly approach a research study. Orlikowski and Scott raise this issue, acknowledging that approaches need to be tailored to the sociomaterial approach. As for its applicability, for situations like emerging internet-based systems the relevance is clear, as given with the example of Google (Orlikowski & Scott, 2008), and with other contemporary web-based collaboration tools and networking. On the other hand, while it references acknowledgment of political approaches, overt attention is not paid to the emotive-historical 'whole person' concept, prior criticized by Ciborra (2006).

4. Studies and Practice

Bringing the conclusion of the review of emergent organizational change development over the last three decades to a close, we now turn the remainder of this review to a brief overview of studies performed in this area in recent years, using for the example studies of a less-than-malleable technology, ERP systems. Following that, we conclude with a review of our ongoing questions and conclusions from the development of organizational change.

One of the theories studied in recent years has been the improvisational view (Ciborra, 2002). Elbanna (2006) applies this theory to a non-malleable ERP deployment, using an

ANT-based hermeneutic approach. Elbanna concludes that Ciborra's improvisational theory can be applied to ERP technologies and similar inflexible systems, in addition to the groupware analysis his prior work was based on (Elbanna, 2006). The analysis focuses on guiding the implementation of the ERP system, therefore serving as an analysis of pre-implementation (rather than post) managerial and organizational agility. While it aptly shows the applicability of improvisation in an alternate context, it does not extend the full concept of the improvisational platform to static, emplaced systems, nor does it prescribe how to address such emplaced systems in other environments.

In a different study of ERP systems, a tech-in-practice, social constructivist approach is taken (Dery, et al, 2006). The analysis follows Orlikowski's practice approach closely. This is notable as it provides a contrast against the earlier analysis by Luna-Reyes, et al, which diverged significantly from the framework, using a blend of multiple approaches. Dery concludes that management of social context is vital in the successful implementation and post-implementation of ERP systems, especially in situations where alternate options are available. While this demonstrates the applicability of the approach, a further conclusion was that the technology-in-practice approach paid insufficient attention to organizational factors.

A drastically different approach is the use of the mangle-of-practice framework also used in sociomateriality to tie structuration and ANT together (Chae, Poole, 2005), with further focus on social institutional theory. The reason given for this approach was a critique that even refined structuration approaches were not fine-grained enough to account for human, material, and disciplinary agencies and modalities. A unique benefit this approach was that it allowed for the inclusion of power in the analysis.

Over this admittedly brief review of emergent ERP studies, it can be shown that there is a limited consensus on which theories fit organizational scenarios. Further, even within the more common approaches, such as structuration or tech-in-practice, researchers posit that certain aspects are not adequately covered, leading to refinements and modifications. This leads to an inevitable question – how to define the appropriate level of complexity without generating an unmanageable glut of information?

5. Conclusion

The development of interpretivist organizational change theory has been reviewed chronologically. Each era reviewed is characterized by a different theme. The first steps towards emergent causal structuring were taken in the late 1980s. Following that was a decade of theoretical development, with multitudes of interpretivist approaches developed, each with strengths and weaknesses. This decade was characterized by a focus in both professionally-focused literature and the developments of interpretivism (Avgerou, 2003). In turn, the closing years of the current decade are showing a more mature selection of critical new approaches and refinements, however, they run the risk of returning us to an overabundance of complexity.

Some limitations must be acknowledged in this analysis. First is the matter of space. With greater room, analysis would be extended into other emergent theories and older studies. Time is the other factor, as sociomateriality is new, and analysis and critiques have not developed yet, limiting

analysis.

The realm of theory that has been reviewed, even in part, is immense. A researcher in this space has a huge range to choose from, each with its own merits. These options can be a hindrance. One of the strongest points in this review is the rising complexity of the theory base. For example, the structured practice lens is applied inconsistently (Luna-Reyes, 2006; Dery, 2006), and disregarded or criticized for being too broad (Chae, 2005). This concept of complexity applies even more to sociomateriality. Will its large breadth reduce the ability to apply it and acquire meaningful results? This is further complicated by the largely unanswered call for a return to emotive-historic roots (Ciborra, 2006).

Another recurrent question for further study is how to apply the benefits of interpretivist research. While improvisational and socio-technical applications of emergence show evidence of guiding principles, other areas of emergence are exploratory and less applicable to organizational application, as shown in the contextually grounded ERP studies. This may account for strong positivist trends in professional literature.

A final question that comes to mind is the situatedness of situated change. What factors, such as technological malleability or organizational approaches, have been missed by the lenses used? Is 'successful' situated change a result of only open-ended, or unambitious, projects, where features are deployed for exploratory purposes? Or are these factors unrelated? This area does not appear to be substantially covered by the literature reviewed for this study.

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