



## **An event-based approach for the “intermediate step” in process studies of IT-related organizational change**

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### **Abstract**

In order to understand and explain IT-related organizational change, information systems researchers have adopted several practice-oriented theories from sociology, and science and technology studies. These “grand theories” are often complex and operate on a high level of abstraction, thus, making them suitable for collecting rich process data while following multifaceted empirical phenomena over time. As a consequence, it may be challenging to organize and analyse the abundant process data in order to create a foundation for theory building, while also being loyal to the “grand theory” as well as to the logic of process research. The purpose of this paper is to propose a systematic approach in order to facilitate this “intermediate step” of sensemaking between data collection and theory building.

The suggested approach comprises three interrelated and iterative processes for organizing and analysing process data in order to build a foundation for theorizing: process data are chronologically organized and a thick case history is written; the case history is interpreted as a narrative informed by the “grand theory” and coded as events; chains of events are bracketed together and graphically represented in terms of episodes, separated by critical events that challenge the path forward. In this way, comparable units of analysis are created facilitating the analysis of patterns within and among episode, as well as the identification of underlying mechanisms.

By making explicit the “intermediate step”, the approach bridges the gap between data collection and theory building in a way that is substantiated by empirical data, the “grand theory”, and the logic of process research. The paper demonstrates how the approach can be employed by examples from an in-depth longitudinal case study.

**Keywords:** Event-based approach, process research, the mangle of practice, intermediate step.

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## 1 Introduction

Several practice-oriented theories and frameworks stemming from sociology, and science and technology studies (STS) have recently been applied in information systems research in order to “take seriously the recursive intertwining of humans and technology in practice”, as Orlikowski (2007:1437) posits. Practice-oriented theories are appropriate for studying multi-faceted and entangled organizational phenomena over time (Feldman and Orlikowski 2011); thus, they are also well suited to heed Leonardi’s and Barley’s (2008:161) call to “study the relationship between development and use in order to understand how the practices of designers effect users and vice versa”.

These theories are considered “grand theories” (Bacharach 1989): such as structuration theory (Giddens 1984), practice theory (Schatzki 1996), the well-known actor-network theory (Callon 1986; Latour 1987; Law 1987), and the perhaps lesser known mangle of practice (Pickering 1995). Such theories provide language and logic, which enables the reflection of the recurrent and relational nature of everyday practices (Feldman and Orlikowski 2011). A number of ideas with a more practical and pragmatic focus have also begun to develop more recently from within the information systems field itself: such as the work system method (Alter 2002) and work practice theory (Goldkuhl 2005).

Along these lines, information systems research has been equipped with new concepts and new ways of understanding the emergence of IT-related organizational phenomena over time (e.g. Walsham 1997; Orlikowski 2000; Mähring et al. 2004; Jones and Karsten 2008; Wagner et al. 2010). These “grand theories” may shed new light upon information systems phenomena in terms of rich accounts; however, information systems scholars are faced with the challenge of explaining such phenomena with reasonable accuracy and generalizability, while rendering these explanations simple enough (Lyytinen and Newman 2008).

Hence, when it comes to organizing and analysing the process data in order to build a foundation for theorizing “grand theories” are not only a source of inspiration; they also put demands upon the researcher (Pozzebon and Pinsonneault 2005; Cho et al. 2008). This process of sensemaking has sometimes been called an “intermediary step between the raw data and a more abstract conceptualization” (Langley 1999:702). Thus, different strategies for bridging the gap between data collection and theory development have been a growing concern among process researchers during the last decade (Langley 1999; Smith 2002; Van de Ven 2007). By combining strategies for organizing and analysing process data with different “grand theories”, a number of “middle range” approaches have been developed in the information systems field (e.g. Newman and Robey 1992; Cho et al. 2008; Lyytinen and Newman 2008; Newman and Zhao 2008). These “middle range” approaches are positioned between rich “open” ethnographies and “closed” factor models (Lyytinen and Newman 2008).

Since both the theoretical framework and the logic of process research need to be adapted to the research interest at hand, there is no single best way to carry out this kind of research. Therefore, what then becomes interesting is how the “intermediate step” is grounded in a tripartite substantiation between empirical data, the “grand theory”, and the logic of process research (Markus and Robey 1988; Newman and Robey 1992; Orton 1997; Van de Ven 2007; Goldkuhl and Cronholm 2010). The purpose of this paper is to make a methodological contribution by proposing a new

event-based approach that facilitates and renders explicit the “intermediate step” between data collection and theory building.

The remainder of the paper is structured as follows: previous event-based approaches in the information systems field will initially be discussed, as will the use of different strategies for organizing and analysing process data. Secondly, the proposed event-based process approach will be presented. Third, I will use examples from an in-depth longitudinal case study to demonstrate how the approach can be employed. Finally, the paper concludes by discussing the contributions and limitations of the suggested approach as well as avenues for further research

## 2 Approaches for making sense of process data in information systems research

Langley (1999) has drawn upon previous studies of organizational change, when she describes and systematizes seven different strategies, which can be employed in order to organize and analyse process data. These strategies have been labelled as narrative, quantification, alternate templates, grounded theory, visual mapping, temporal bracketing, and synthetic. These each possess different strengths and weaknesses, and are often combined in research practice in order to fulfil a particular purpose during the research process (Smith 2002; Pozzebon and Pinsonneault 2005).

Newman and Robey (1992) combined the strategies of *temporal bracketing* and *visual mapping* in a seminal study of how the relationship between user and system analysts changed over time in a systems development effort, and developed what is known as the encounter-episode approach. The temporal bracketing strategy aims to divide the stream of events in the systems development process into a sequence of shorter episodes. In this case, encounters, in which the relationship was likely to change, interrupted the episodes, in which the character of the relationship between users and systems analysts remained stable. The episodes are not to be seen as “phases” that follow in a sequential and necessary order driven by a program or code (c.f. Van de Ven and Poole 1995). Rather, they are blocks of activity representing a certain continuity within each episode, which are interrupted by certain discontinuities in the beginning and at the end of each period (Newman and Robey 1992). This strategy helps to elucidate mechanisms that underlie the observed change in the subsequent episodes. Thus, episodes constitute comparable units of analysis for process theorizing. The visual mapping strategy strives to make it possible to represent large quantities of information in a condensed way, thus, gaining the advantage of obtaining an overview of the process under investigation as well as facilitating the identification of patterns within and among episodes (Miles and Huberman 1994; Langley 1999).

While being a major methodological contribution to process theorizing, Newman’s and Robey’s early approach does have some shortcomings seen from the perspective on IT-related organizational as a sociomaterial practice. Lyytinen and Newman (2008) point out two weaknesses: the approach is not substantiated in any “grand theory”, nor is it fine-grained enough to account for the typical problems of IT-related organizational change.

More recently, a number of studies have employed the encounter-episode approach in combination with “grand theories”. Newman and Zhao (2008) employ Leavitt’s (1965) socio-technical theory to the encounter-episode approach in a study

of ERP-implementation and business process re-engineering in Chinese SMEs. In this way, they refine the analysis of how IT-related change projects develop over time, with respect to Newman and Robey's original model. Lyytinen and Newman (2008) conceptualize and develop this approach as the Punctuated Socio-technical IS Change (PSIC) model.

While the original approach was one-dimensional, the PSIC model is multi-dimensional, thus, taking into account events that correspond to the analytical distinction between development and use (Orlikowski 1992), as well as the organizational context and environmental context (Pettigrew 1990). However, even though the PSIC model accounts for the interplay between the development system and the work system, it is not grounded in a practice-based theory. Leavitt's lens observes critical events, thus, challenging the path forward, in terms of "gaps" between structure, people, technology, and tasks. However, it does not account for how these "gaps" are created, maintained or remedied in the work practices.

Cho et al (2008) use the logic of the encounter-episode approach in combination with the practice-oriented actor-network theory in an empirical study of the contextual dynamics during the implementation of health information systems. Episodes, in which the actor-networks were relatively stable, were interrupted by critical events with the potential of disturbing these configurations. In this way, comparable units of analysis were created in which the dynamics that influenced the course of events could be analysed. Thus, the encounter-episode approach was used to structure the application of actor-network theory.

In order to compensate for the moderate accuracy that the temporal bracketing strategy offered (Langley 1999), the recent aforementioned encounter-episode approaches are combined with a narrative strategy that provides a detailed account of how and why the course of events evolved the way they did. The narrative strategy focuses upon how the actions of actors advance the "plot" in context (c.f. Pentland 1999). By employing the narrative strategy, some degree of granularity is ensured and a higher degree of accuracy may be reached. The sociomaterial "grand theory" equips the researcher with an analytical lens and a vocabulary in order to focus upon relevant aspects of the phenomena, thus, providing an account that is in line with the call for practice-based sociomaterial research.

The narrative, however, may be written on very different levels of abstraction, ranging from micro level accounts of individual actions and consequences to broad-ranging events on the macro level. The same applies to the temporal bracketing strategy. Pozzebon and Pinsonneault (2005) distinguish between fine-grained and broad-ranging temporal bracketing. For example, in his study of the introduction of CT scanners in two different American hospitals, Barley (1986) broke down the events in order to make a finely-grained analysis of the interplay between numerous small actions and the institutional context over time. In this sense, the tactics of Lyytinen and Newman (2008) and Cho et al (2008) represent a temporal bracketing approach that is not so finely grained, since the researchers do not delve into the systematic analysis of discrete events building up the episodes between these critical events.

The aforementioned studies are not intended to represent a full review of the application of the encounter-episode approaches in information systems research. Rather, the intention is to point to a promising development of process-based approaches in information systems while also highlighting two critical issues when it comes to the application of these approaches. First, in order to heed the call of Or-

likowski (2007) as well as Leonardi and Barley (2008), the approach needs to be substantiated in a practice-based sociomaterial “grand theory” that is able to take into account the interplay between development practices and use practices. Secondly, the approach also needs to be grounded in the logic of process research (Markus and Robey 1988; Newman and Robey 1992; Orton 1997; Van de Ven 2007).

With respect to previous approaches, there appears to be room for a more finely grained event-based approach that goes beyond the episode, thus, taking as the smallest unit of analysis the discrete events that constitute the episode. This would provide the opportunity to give a more finely grained basis for analysing patterns of IT-related organizational change, as well as identifying the underlying mechanisms (as long as it is made explicit how these events are related to the “grand theory” chosen). However, this puts demands upon the researcher to demonstrate the link between the empirical data, the interpretation made with the lens of the “grand theory”, and the logic of process research in the “intermediate step”. By doing so, the researcher enables the reader to form an opinion of how the researcher has climbed the ladder of abstraction from process data to the foundation for theory development (Van de Ven 2007). In the following section, an event-based process approach will be proposed with the aim of suggesting how these issues may be handled.

### **3 The event-based process approach**

The approach suggested in this paper consists of three interrelated and iterative processes for organizing and analysing process data in order to build a foundation for theorizing. First, process data are chronologically organized and a broad case history is written to account for how empirical incidents advances the story, thus, highlighting the actions of the actors in context. Secondly, the case history is interpreted as a narrative informed by the “grand theory” and the incidents are coded as events. Third, dividing the stream of events into episodes that are interspersed by critical events creates comparable units of analysis. The flow of events is then graphically mapped.

These three steps are not to be followed, as one would read a recipe: in a sequential manner beginning with process data and ending with a visual map. In practice, these research processes are highly interrelated and the work process is iterative (Petigrew 1990; Lychnell and Demir 2011). For example, while analysing patterns within the episodes, it may be necessary to reconsider which incidents were included and how the events were conceptualized (c.f. Poole et al. 2000). In this way, the links between process data and the foundation for analysing patterns and identifying mechanisms may be made explicit. Moreover, with the iterative way of working, this link is interactively substantiated in empirical data, the “grand theory”, and the logic of process research.

#### **3.1 From process data to case history**

During the last decades, there has been a growing interest in research that builds upon process philosophy in IT-related organizational change. While being a doctrine rather than a theory or methodology (Rescher 1996), process-based research spans a range of disciplines and different sets of ontological and epistemological assumptions (Van de Ven and Poole 1995; Van de Ven and Poole 2005). Several authors have suggested the event as a unit of analysis in process-based studies (Abbott 1992; Van de Ven and Poole 1995; Peterson 1998; Van de Ven 2007). From a philosophical point of view,

Rescher (1996:38) argues that “Processes are correlated with occurrences or events: Processes always involve various events, and events exist only in and through processes. Processes develop over time.” Thus, events and processes constitute each other.

However, empirical observations may take many different forms and it might be a challenge to map them into events that are informed by the concepts of a “grand theory”. This becomes especially demanding when the empirical level and the conceptual level are not clearly separated. Therefore, it may be of good help to distinguish between the *case history* that describes the chronology of empirical incidents and the *narrative* informed by theory with explicit analytical features (c.f. Pettigrew 1990). This could be related to Alfred Schutz’s distinction between the first-order constructs of everyday life and the second-order constructs of research (Lee 2003). In the case history, process data is chronologically ordered with the purpose of presenting a basis for further analytical work. In the same vein, differentiating between *incidents* and *events* has been suggested: “incidents are operational empirical observations, while events are abstract concepts of bracketed or coded sets of incidents” (Van de Ven 2007:217).

In doing so, it often becomes clear that process data are eclectic in character, found on different levels of abstraction, and collected from different time frames (Langley 1999). For example, a one-hour meeting between a CEO and consultant in which an agreement about implementing a new information system is reached may constitute an incident. The implementation of an information system that takes a couple of months may be another incident; yet another incident may be constituted by an emergent change in work practices that becomes noticeable only after a year. However, an incident may also be very sudden, such as a major breakdown in the daily work practices of the organization when an information system unexpectedly stops working. All of these incidents may be interpreted as events that contribute to explaining how and why IT-related organizational change is shaped over time. Processes move across the boundaries of traditional units of analysis (Rescher 1996) and what is regarded as one incident on the empirical level may be several events on the conceptual level (Van de Ven 2007).

### 3.2 From narrative to events

The concept of event is closely related to the narrative strategy, and can be defined as “what key actors do or what happens to them” (Van de Ven 2007:155). Actors tie sequences of events together and events become meaningful when they are related to the context and the “plot” (Pentland 1999). In IT-related organizational change, a central narrative theme is about humans acting to implement or change information systems in organizations in order to achieve changes in work practices. As demonstrated in numerous studies, these attempts often result in unexpected and sometimes unwanted consequences that, in turn, lead to new measures (c.f. Orlikowski 1996; Orlikowski 2000; Mähring et al. 2004; Chae and Poole 2005; Cho et al. 2008; Wagner et al. 2010). This points toward a view of IT-related organizational change as iterative involving several cycles of trial and error.

Several sociomaterial practice-based theories are well suited to analyse this type of development from slightly different perspectives, all having their strengths and weaknesses. For example, while structuration theory focuses only on human agency, actor-network theory equalizes human agency and material agency in a way that may be problematic (Jones 1998; Chae and Poole 2005; Jones and Rose 2005). More

recently, the mangle of practice (Pickering 1995) has been suggested as an alternative approach (Jones 1998; Chae and Poole 2005; Orlikowski 2007; Orlikowski and Scott 2008). It takes into account both human and material agency, as well as disciplinary agency, i.e. “the sedimented, socially sustained routines of human agency that accompany conceptual structures as well as machines” (Pickering 1995:29). Moreover, as opposed to actor-network theory, it recognizes the difference between humans and artefacts regarding intentionality.

Pickering (1995) has described the iterative process of trial-and-error as *a dialectic between resistance and accommodations*. In this case, resistance should be understood as a block on the path to some goal, and not as in the classical notion of resistance as the user’s unwillingness to use an information system (c.f. Bhattacharjee and Hikmet 2007). For example, resistance could also occur when an information system does not function as intended or when organizational routines produce unwanted outcomes when they are performed. In this way, resistance is not limited to the realm of human agency; rather, it is allocated to the interface between human agency, material agency, and the disciplinary agency of practices (Pickering 1995).

When translated to the context of IT-related organizational change, and described asymmetrically from a managerial perspective, the dialectic of resistance and accommodations may go something like this: When managers try to achieve their intentions (for example, increase productivity or lower costs), they initiate change efforts in which typically information systems are built or modified, organizational routines are re-designed, and users are trained in order to acquire sufficient knowledge. Thus, intentions are used here in an everyday sense (Pickering 1995). However, consequences occur when the information systems, routines, and knowledge are used in practice. In this way, the social and the material is “mangled” in practice, thus, resulting in a number of unpredictable outcomes. Many times, these consequences are not fully in line with the managerial intentions.

As a response to resistances, managers try to accommodate to the emerging practice by again modifying the information systems, routines, knowledge, and so on. This could also be seen as a process of tuning “in the sense of tuning a radio set or a car engine, with the caveat that the character of the ‘signal’ is not known in advance” (Pickering 1995:14). As a special case of accommodation, sometimes the intention or goal itself may be revised. In this way, the dialectic between resistance and accommodation continues back and forth until an interactive and temporary stabilization is reached. That is when information systems, routines, and people sustain each other in practice: interactively, reciprocally, and emergently. If something happens in this delicate balance, resistance might occur again and the dialectic between resistance and accommodation starts again.

The above illustration was described asymmetrically from a managerial perspective. This framework, however, offers the opportunity to explore other perspectives as well. For example, from the perspective of employees, when the information systems, routines and knowledge are used in practice, employees might be hindered from performing their work and reaching their intentions. In this way, resistance does always occur in relation to some intention of some stakeholder.

In addition to the dialectic between resistance and accommodation, Pickering’s framework provides a rich language for exploring IT-related organizational change as a narrative that takes into account the intertwining of the social and the material. However, elaborating upon this goes beyond the scope of this paper, which is to sug-

gest an approach for facilitating and making explicit the “intermediate step” in process theorizing.

### 3.3 Critical events, episodes, and further theorizing

The temporal bracketing strategy may be applied in order to divide the flow of events into comparable units of analysis. Occurrences of resistance are considered critical events in the suggested approach, since they challenge the path forward. Accommodations occurring between critical events are bracketed together into episodes as a series of one or more accommodations. These episodes constitute comparable units of analysis.

When it comes to episodes, it is possible to distinguish between more or less fine-grained approaches (c.f. Pozzebon and Pinsonneault 2005). In empirical studies based upon the encounter-episode approach (Newman and Robey 1992; Cho et al. 2008; Newman and Zhao 2008), the episode in itself is treated as a “closed box” in the models. The authors identify critical events; yet, they do not regard episodes as aggregates of discrete events, which would otherwise provide a basis for analysing patterns within and across episodes.

In the proposed approach, it is suggested that observed incidents are linked to events informed by theory and bracketed together into episodes (or chains of events). Therefore, it becomes possible to search for patterns within and among episodes, while the link to the incidents is made explicit. I propose that it is possible to search for patterns of accommodations in development and use that occur between the critical events of resistance. In this sense, the suggested approach is less of a closed-box approach than some “middle range” approaches; however, it is not as fine-grained as Barley’s (1986) study.

In this way, a foundation for further analysis has been created in order to enable further conceptual contributions, such as analysing patterns and identifying mechanisms (Van de Ven 2007; Langley and Tsoukas 2010). Similarities and differences between episodes may be analysed in order to identify different types of accommodations in which IT-related organizational change is shaped. For example, by comparing the character of accommodations in and between episodes, Lychnell (2010) identified four patterns in his case study of how IT-related organizational change came about: planned development, improvisation in use, change of the conditions for development, and adjustment of the original intention.

Nevertheless, while patterns may be a useful step, it may or may not be enough (Sutton and Staw 1995); this is dependent upon the purpose. Thus, there may be requisite in addition to patterns to search for an underlying logic or generative mechanism, which may explain how and why these patterns evolve (Van de Ven and Poole 1995; Tsoukas 1989). For example, Cule and Robey (2004) studied a transformation of a consulting and service company, identifying a “dual motor” that leads the course of events. A teleological generative mechanism was identified on the individual level to capture how managerial actions promoted the change effort. However, a dialectical generative mechanism was identified in order to account for how differences in perspectives on the organizational level also advanced the course of events. These examples point toward some options to proceed from the “intermediate” step to further theorizing. However, it is beyond the scope of this paper to discuss in detail the analysis of patterns and the identification of underlying mechanisms.



## 4 An example of the application of the event-based approach

In demonstrating how the suggested approach may be applied, I will give an example from an in-depth longitudinal case study that investigates how IT-related organizational change was shaped in interplay between development and use at a travel agency (Lychnell 2010). The purpose of the study was to explore the sociomaterial, emergent, and unpredictable character of IT-related organizational change (Orlikowski 1996; Orlikowski and Scott 2008), as well as how development practices affected use practices and vice-versa (Leonardi and Barley 2008). Process data was gathered concerning five change efforts initiated by the management, which had unfolded over a period of two years. Data was collected through interventions, interviews, observations, and archival documents.

The process data was chronologically organized, incidents that advanced the plot in each change effort were identified and case histories were written that focused upon the actors, their actions, and the context in which they came into play. The case history was then interpreted by employing the language of Pickering’s (1995) framework; the incidents were coded as events of either accommodations or resistance. The following paragraphs illustrate how the incidents of the case history were interpreted as a narrative informed by a sociomaterial framework. The passage below is taken from one of the change efforts aimed at lowering the cost for airplane tickets by changing the supplier and implementing a new information system.

*Case History:* There were not any problems when sales representatives booked airline tickets for customers using the new information system; however, when the data was to be transmitted to the internal booking system, an unexpected problem occurred. The previous system for ticket booking had been integrated into the internal booking system, which made it possible for sales representatives to transmit the customer data from one system to the other by simply pressing a button. When this did not work, they were forced to solve the problem by manually entering the necessary information into the internal booking system, so that the itinerary could be printed and sent to the customer prior to departure. This was very important since excellent customer service was one of the travel agency’s trademarks.

*Theory-Informed Narrative:* When the sales representatives, the airline ticket system, the internal booking system, and the customer data were mangled in practice, resistance did not occur in relation to the manager’s intention to lower the cost of tickets. However, resistance occurred in relation to another intention: namely the sales representative’s intention to provide the customers with excellent service. In order to reach this objective, the sales representatives accommodated their work practice and started manually entering the customer data into the internal system.

These paragraphs illustrate how a case history may be interpreted as a narrative informed by Pickering’s framework. Next, to illustrate how events may be coded and displayed in a visual map, I will use an example from another change effort of the case study; this one aimed at improving customer communication.

A visual map is used in figure 1 to display the stream of events in the current change effort. The line in figure 1 illustrates how a process always involves various events, as I have described. The vertical dimension in the graph indicates whether the plot is advanced by development practices (D) or use practices (U), or whether the path forward is challenged in the intersection in terms of resistance in relation to an intention of some kind. The graphical representation provides an overview of the

change effort as a whole, as well as how it is divided into consecutive episodes that consist of one or several events of accommodations, separated by critical events of resistance. By numbering the coded events in the theoretically informed narrative (from #1 to #9 in the example), it is possible to relate each event in the graphical representation to a certain place in the narrative. In order to facilitate later analysis of patterns, the episodes are also numbered (from E1 to E3 in the example).

When the course of events began (#1), the new CEO recognized that the way the travel agency worked with customer communication was not in line with his intention: the cost for producing printed newsletters was too high and the frequency was too low. I interpreted this as an occurrence of resistance (R) in relation to his intention, which thus formed the first critical event represented by a circle.

The course of events then turned into development practices, and the travel agency established a relationship with a new supplier who offered a tool for writing and distributing electronic newsletters (#2). I interpreted this incident as an accommodation (A) in development practices, represented by a box in the upper half of the graph. In order to fulfil the intention of the CEO, the relationship with the supplier and the tool, as a material aspect, changed the conditions for developing new work practices within the travel agency. The new tool was implemented once the forms for collaboration had been established, which resulted in the change of the booking procedure that the sales representatives carried out (#3). As a natural part of the interaction with customers in their daily work practices, the sales representatives were supposed to register all customer data necessary for marketing purposes into the new booking procedure. This was also interpreted and coded as an accommodation (A) in development practices. However, when the users began adopting the new procedures in their daily work, the course of events turned into use practice (#4). This accommodation took place when the new procedure was used as opposed to the previous accommodation in which the blue print of the procedure was changed (c.f. Ramiller and Pentland 2009). Thus, the fourth event was interpreted and coded as an accommodation (A) in use.

When using the information system, there was no resistance in relation to the original intention of lowering costs and communicating more frequently with the customers. However, the booking routine became troublesome after a while, since it demanded a lot more work from the sales representatives (#5). I interpreted and coded this event as resistance (R) in relation to a second, alternative intention: the previously expressed and commonly supported intention of having an effective booking routine. The critical event challenged the path toward the original intention, and the first episode (E1) ended and a new episode (E2) began. The beginning and ending of episodes is marked with brackets in the graph.

As the visual map indicates, the plot was advanced by another three events (#6, #7, #8) before the interplay between development and use stopped, and the course of events came to be temporarily stabilized (c.f. Law 1992; Pickering 1995; Orlikowski 2000). As indicated in the figure, these accommodations emerged in use practices rather than as a consequence of development initiatives (c.f. Orlikowski 1996).

## An event-based approach for the “intermediate step”

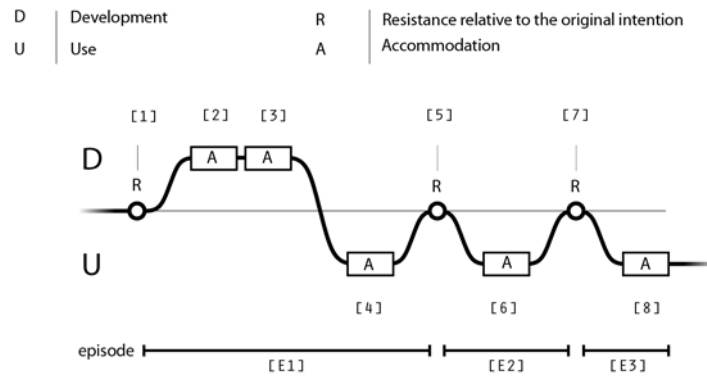


Figure 1: Events and episodes in a change effort

In this way, all the change efforts in the case study were presented as case histories, interpreted as theory-informed narratives, coded into events and critical events, and displayed in visual maps. A total of 18 episodes were identified. The more “open box” approach made it possible to identify patterns within and across those episodes, thus, demonstrating four different types of accommodation chains (see figure 2). These patterns have been labelled as planned development, condition development, improvisation, and adjustment of the intention (see Lychnell 2010).

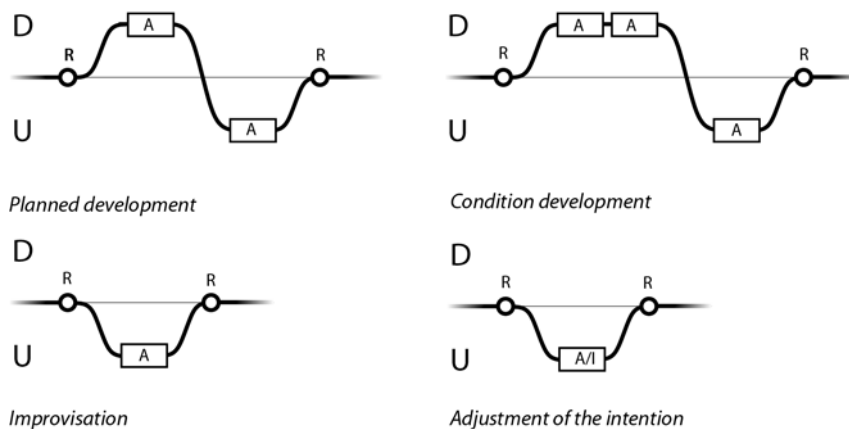


Figure 2: Four patterns of accommodation chains (Lychnell 2010)

In order to explain why these chains of accommodations were triggered, generative mechanisms were matched with the different patterns (Van de Ven and Poole 1995; Van de Ven 2007). For example, managerial intentions triggered some of the episodes while other chain of events were triggered by conflicts between managerial intentions and the intentions of the sales representatives. Thus, combinations of teleological and dialectical generative mechanisms were identified as working as a “dual motor” that advanced the course of events (c.f. Cule and Robey 2004).

## 5 Concluding Remarks

As a starting point, this paper took the significant contribution of ideas to the field of information systems from sociology, and science and technology studies; addition-

ally, we explored some of the challenges that come with employing “grand theories” in empirical research. “Grand theories” often build upon open concepts, thus, facilitating a rich understanding of the process of IT-related organizational change. However, these concepts put demands upon the researcher when it comes to the process of sensemaking in the “intermediate” step between data collection and theory building, since they are not coupled with any systematic approach. An obvious obstacle is organizing eclectic process data on different levels of abstraction and along various chronologies in order to provide a basis for theorizing.

This research suggests a systematic approach for going from “messy” process data to a foundation for theory building; this is substantiated in empirical data, the “grand theory”, and the logic of process research. The approach takes a sociomaterial practice perspective on IT-related organizational change and accounts for the interplay between development practices and use practices. Moreover, it focuses upon how resistance may occur in relation to intentions of different stakeholders over time. By emphasizing different perspectives in the “intermediate step”, the approach offers a promising route to developing a deeper understanding of how and why change efforts run into trouble and how these situations might be amended. However, the systematic approach that I have presented should not be seen as a sequential “recipe” that one should blindly follow. Rather, it may serve as a “handrail” while walking up and down the ladder of abstraction in the “intermediate step” of process research.

Different strategies with different trade-offs regarding accuracy, generalizability, and simplicity are combined during the process of moving from process data to a foundation for theorizing (Langley 1999). Together, they provide a set of overlapping and interrelated explanations (Weick 1999) on different levels of abstraction. For example, the theory-informed narrative provides good accuracy: the bracketing into episodes increases the generality; lastly, the visual maps help simplify the explanation. The more explicit the links between empirical data, the “grand theory” and the logic of process research, the greater the chance a reader will form an opinion about the cogency.

By dividing the stream of events into comparable units of analysis, the approach also offers an opportunity to analyse patterns within and across the episodes. In contrast with previous encounter-episode approaches, this approach offers a more fine-grained analysis with respect to how discrete events advance the plot within episodes. This opens up for an analysis of patterns within and across episodes that is grounded in specific empirical incidents and informed by the “grand theory”.

One cannot ignore that this approach also has its share of limitations. One obvious limitation is the extensive space that may be needed in order to account for both the case history and the theory-informed narrative. Therefore, the approach may be more suited for a monograph than it would be for a journal publication. However, by providing a language to describe “the intermediate step”, the approach may contribute to building a common vocabulary that may be applied when working with “middle range” process approaches.

Furthermore, when abstracting the events and analysing them separately, there is always a risk that the analysis of events decouple from the empirical material. This may lead to a “narrative positivism” (Abbott 1992) where complex processes are reduced to their lowest common denominator; what remains are sequences of objectively-coded events (Pentland 1999). However, the intention behind making explicit the link between the empirical data, the theory-informed narrative, and the abstracted

events in the suggested approach is that it should be possible to see how well the different levels of abstractions are aligned.

Moreover, it should also be mentioned that focusing too much upon coding the incidents with the concepts of the “grand theory” might blind the researcher to other alternatives (Weick 1999). However, Pickering’s framework provides a rich language to describe the intertwining of the social and the material that has not yet been fully explored in the field of information systems. The exploration and adaptation of these ideas could, indeed, be an avenue for future research.

The growing stream of “middle range” approaches in the information systems field offers a promising alternative to ethnographic accounts and factor models. However, while approaches will vary with research interests and the phenomena under investigation, there will never be one single optimal way to carry out process research on IT-related organizational change. Thus, it may be a fruitful line of development to build knowledge around three different aspects: the nature of these event-based approaches; on what bases the alignment between empirical data, the theoretical framework and the logic of process research can be made; and, lastly, the application of these approaches in empirical research. In this way, we can build common knowledge, while keeping the “middle-range” strategy open to allow for the multi-faceted character of IT-related organizational change.

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