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Time and process in business network research

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Abstract

This Special Issue of *Industrial Marketing Management* brings together a range of articles by authors who have undertaken the difficult task of researching time and process in business networks. Understanding interaction processes within a business relationship and network perspective requires the elaboration of time, the central construct by which humans grasp and comprehend change. As an introduction to the articles we present the concept of human time and delineate accordingly three methodological approaches available for the study of network processes. We also introduce the authors' contributions to the special issue that broadly divide into two groups: those that deal with methodological issues concerning the study of processes in business networks and those that consider the role of time and timing for studying business processes.

Keywords: Business processes, interaction, time periods, time flow, business networks, research methodology

Highlights:

- Argues for a more profound treatment of time in business network studies
- Suggests human time to be applied in process research of business networks
- Conceptualizes human time as: before time, periods, flow, flow and periods, different times
- Describes business processes as an interplay between human time and network space
- Puts forth a methodological framework for process research in business networks
- Suggests and evaluates flow mapping, sequential mapping and point mapping as alternative process methodologies

1. Introduction

There has been an increase in interest about the construct of time across the social sciences (Adam 1995; Ancona, Goodman, Lawrence & Tushman 2001a; Bluedorn 2002; Clark 1985; Hassard 1991). Time and space are central constructs, which are applied by humans in gaining an understanding of our physical and social reality. The meaning of almost every human construct relies, either explicitly or implicitly, on understandings of time. However, this role of time is forgotten in our everyday living (Adam 1995) and as a result research that truly accounts for time is difficult (Ancona et al. 2001a). These issues are also apparent for process research in business networks, where a more pronounced understanding of time is clearly needed (Ford & Håkansson 2006a; Ford et.al. 2010; Andersson & Mattsson 2010a, 2010b).

The way *time* is conceptualized affects our understanding of business processes. Human conceptualizations of time are continuously created and re-created by managers and researchers. Thus, business relationships and networks are not “fixed and taken-for-granted structures of predetermined categories” (Medlin & Saren 2012), but rather they are concepts that are continuously re-created over and through time. The two imperatives of the Industrial Marketing and Purchasing (IMP) approach are interaction processes (Håkansson 1982) that denote the temporal dimension, and relationships and networks (Håkansson & Snehota 1995) that grasp the spatio-temporal dimension. The spatio-temporal concepts also cross-fertilize each other, in the context in which they come into play. Time is a central element in understanding how the IMP-Group deals with its own reality.

Process research deals with how events come into being and unfold over time in a context. The difficulty in achieving a deeper understanding of process in empirical studies is the multi-faceted nature of time in research (Andersson & Mattsson 2010b, 61). The notion of time that a researcher adopts affects in a crucial way the kind of process understanding that is created. Despite this fact neither time nor process have been particularly strongly discussed or developed within IMP research (Halinen & Törnroos 1995; Medlin 2004; Ford & Håkansson 2006b; Håkansson et.al. 2009; Quintens & Matthyssens 2010). The scientific value of process studies in business networks would be improved if the researcher’s view of time, and how that notion shapes process, were made more explicit.

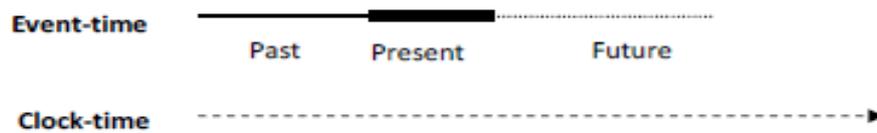
This introductory article focuses on human time in process research using a constructivist approach to interaction in business networks. We aim to offer conceptual alternatives and methodological tools for conducting process research on business networks. We also introduce the articles of this special issue that contribute to current knowledge of time and process in the business network context. The contributions bring new viewpoints into the understanding of process, they instruct us on how time can be dealt with, and they offer methodological insights on how processes in business networks could be studied.

2. A temporal view of business networks

Processes are defined, following Van de Ven and Poole (1995, 512), “as the progression (i.e., the order and sequence) of events in an organizational entity's existence over time.” This definition highlights the point that time is a characteristic of the entity, rather than a value related to external x-axis time. Processes in business networks also progress in a spatial network (Dicken 2007, Håkansson et.al. 2009), but in this article we are concerned more with the event-based, human time view of processes. The event network view, which is defined as the connection of events and processes through time and in time, provides one basis for our analysis (Hedaa & Törnroos 2008). Events are given their meaning by their human connection to past, present and/or future events within an event-time network. This event-time network is socially constructed on the basis of human interpretations of events (Hedaa & Törnroos 2008).

Event time is a social construction, which is literally *social time* in the sense described by Adam (1995). The social construction of event time is displayed in Figure 1, where the boundaries of the present rely upon a past and future time (Medlin 2004). Event time is distinguished from clock time, which is also a human construction. The development of clock time was based on human understanding of absolute time, with invariant periods flowing and pressing into the future. How event and clock time perspectives are differentiated and related is discussed next.

Figure 1: Event time and clock time



2.1 Event-time and clock-time as human time concepts

The idea that time is a human concept is widely accepted in social sciences (Adam 1995; Bluedorn 2002; Davies 1994). Time is an elusive notion, possibly because it is so essential to all human understandings of our world. However, the ways that time is socially constructed remains a focus for on-going research. Berger and Luckmann (1966) theorize that time is constructed between humans as they interact within commonly understood social structures. Orlikowski and Yates (2002), applying the concept of structuration (Giddens 1984), consider time structures as negotiated through everyday action. Kavanagh and Araujo (1995) consider time and timing as contested constructs between and relative to at least two different entities. Being a human construct, all of these representations are a part of time construction.

So the question is: how should time be understood within and as a background for the business networks in which firms are continuously interacting?

The absolute concept of time, as x-axis time, where time is the ultimate independent variable, would consider business interactions as occurring within the container of time. In this perspective, time is a variable that separates any two identical events, so that they are distinguished from each other (Ackoff & Emery 1972). Equally, and as a corollary, x-axis time allows conceptualization of clock time, and together with the institutionalization of clock time they serve the human necessity of a conceptual tool for event synchronization (Davies 1994).

However, x-axis time is not so useful for understanding business networks, as events occurring in x-axis time are not connected to each other in meaning. Rather x-axis time (and clock-time) simply separates events treating them as observations. Such a view of time does not accord with the constructivist approach to human shaping of business networks. The view

put forward here is constructivist, or at least moderately constructivist in its nature (Lincoln & Guba 2000).

In the constructivist perspective, time and timing are not absolute. Time refers to event time, or social time, where events are connected to each other in meaning and time is a property relative to the entity (Bergmann 1992; Elias 1992; Hedaa & Törnroos 2008; Nowotny 1994; Sorokin & Merton 1937). From an event time perspective the nature of the entity shapes time. Thus, time is understood in multiple human ways according to the characteristics of the entity's culture, organization and/or personal aspects (Halinen & Törnroos 1995). Elaborating the entity in a business network sense, time is constructed by organizational forms such as firms and business relationships, along the lines of Hassard (1991).

Events also carry a relative nature with respect to past, present and future. Events shaped by humans and enacted through social construction together form the event-time. Hence, in this paper we consider time from a human perspective, as an individually and socially constructed event-time, and suggest that using the entities' event times together with clock-time can notably improve our understanding of processes, change and development in business networks.

2.2 Properties of human times

We may distinguish five properties in the way humans apprehend time. These are *before time*, *time flow*, *time periods*, *the connected nature of time flow and periods*, and *different times*. These will be presented next.

Before time. The first human apprehension of time is through one's senses. This sense of time is not a thing (Whitehead 1920); rather time is only subjectively and personally known. Holding in our thoughts this primal human and especially individual apprehension of time is useful for noting a contrast with social constructions of time

Time flow. The second aspect of human apprehended time is flow. Time passes and is known socially and collectively in everyday life as an inter-subjective category: time is a noun indicating flow. The concept of time as flow was recognized in early Greek culture as

Chronos (Hedaa & Törnroos 2002). Chronos has been aligned in modern culture with clock-time (Orlikowski and Yates, 2002), but modern clock-time is more than simply time flow as it divides time in measurable units based on their duration (e.g. minutes, hours, days).

Humans, with the passing of incidents and events, either social or physical, note time flow. This variation in time flow is recognized in the literature (Ancona, Okhuysen & Perlow 2001b; Kavanagh & Araujo 1995). Variations are evident when incidents and events transpire either quickly or slowly within time flow (Medlin & Saren 2012). However, ways to understand, describe and communicate time flow are poorly elaborated for business processes.

The nature of an incident, or event, is critical to human understanding of time flow. The dictionary meaning of an event is an incident, which is ‘a definite occurrence’ (Wilkes & Krebs 1985, 567). Thus, an event is only known through an inter-subjective communication process which defines agreement that something has happened. For instance in a business environment, finding that raw material supply is disrupted, or that a new product is launched by a competitor, are examples of events. In many cases the agreement is achieved on the basis of past social categorization. For new and complex business situations for which evident categorizations do not exist the agreement can only occur after the event (Weick 1995).

When focusing only on time flow there are a number of apparent distinctions. First, time flow is on-going, but not necessarily continuous or composed of equal intervals. Time flow is ongoing and punctuated with events. Second, time flow is only in one direction, towards the future. This so called ‘time’s arrow’ is a term adopted in 1927 by astronomer Arthur Eddington to note the one-way direction or asymmetry of time (Eddington 1928). In other words, time is irreversible (Adam 2000, 138). Thus, cycles of times (Ancona et al. 2001a) are not repeating of time; rather time flows and cycles of events repeat in the on-going flow. Third, the rate of time flow can appear to move quickly or slowly and the rate of time flow can also change at a point in time. These three elemental properties of time as flow, ongoing, irreversible and varying in rate, are inherent in all forms of human time.

Time periods. The third aspect of a human and social view of time is that of periods. Periods are the way humans have categorized parts of time flow (e.g. past-present-future, year-

month-week-day-hour-minute-second, financial year). Compared to the concept of time flow, periods are more differentiated in human language and thought.

Time periods are a strong element of Adam's (2000) concept of timescapes, and also a strong feature of time mapping in the elaboration of time by Ancona, Okhuysen and Perlow (2001b). A period is a socially constructed portion of time flow that is stabilized in meaning. Periods are essential to an understanding of clock and calendar time. But periods are also important within entities for classifying parts of time flow, for instance, into past, present and future.

There are many forms of period time, but at the least this form of time is punctuated either with beginnings and ends (potentially with events), or involves whole periods. Often human time apprehension manifests as a point (a unique event) or a period (a more stretched event). The social construction of periods means they are mostly of unequal length (e.g. geological time, or business relationship development period), with clock time being an exception. Also, since time periods are derived from time as flow, there is necessarily a directional nature to time periods, both within a period and from one to another. This leads us to discuss the connections between time flow and periods.

Connected nature of time flow and periods. Time periods serve an important role in the way humans deal with the concept of time flow. Time flow is a difficult concept for inter-subjective communication, so humans stabilize the flow by differentiating it into time periods and further into discrete points in time. The greater is the complexity of a task, the more the period will be differentiated, so enforcing the idea of a punctuated sequence.

For humans, time flow and periods rely on each other. Time flow is known by events that mark periods. Humans can only describe and communicate time flow, relative to periods of time. Time flows within periods and across them, and periods exist within the flow. Periods can also be seen as nested within other periods. For example, clock and calendar time can have specific times nested within, such as organizational time (Bluedorn & Denhardt 1988; Hassard 1991), work group time (Roy 1959), and personal subjective time, all of which are forms of event time in which time is seen in relation to events within an entity. Or conversely, many periods exist that are defined in event time and then given synchronization meaning by application of clock time.

The inter-subjective nature of time flow and periods is an important characteristic of human times. The time structuration process outlined by Orlikowski and Yates (2002) requires both flow and periods to have meaning. Equally, time flow and time periods are a part of Berger and Luckmann's (1966) conceptualization of time construction through human interaction. In addition, without time flow and periods Kavanagh and Araujo's (1995) conceptualization of time and timing as contested and relative constructs between two entities would be meaningless. Every concept of human understanding follows from an inter-subjective process embedded within conceptualizations of time flow and periods.

Different times. There is one more property of human time, which is only apparent when the first human time aspect, the before time, is contrasted with the flow and period aspects, namely different times. Different social groups can categorize time in different ways. The implication is that different times are moving into the future. These different times, or 'multiplicity of local times' (Kavanagh & Araujo 1995, 118), can be based within any entity, social group, a national culture, or across time zones (e.g. Greenwich Mean Time). Within business networks of several actors and human representatives the idea of different times is particularly relevant. Different times are likely to come together and move apart in defining a business process. How the human time properties and processes in business networks relate to each other is discussed next.

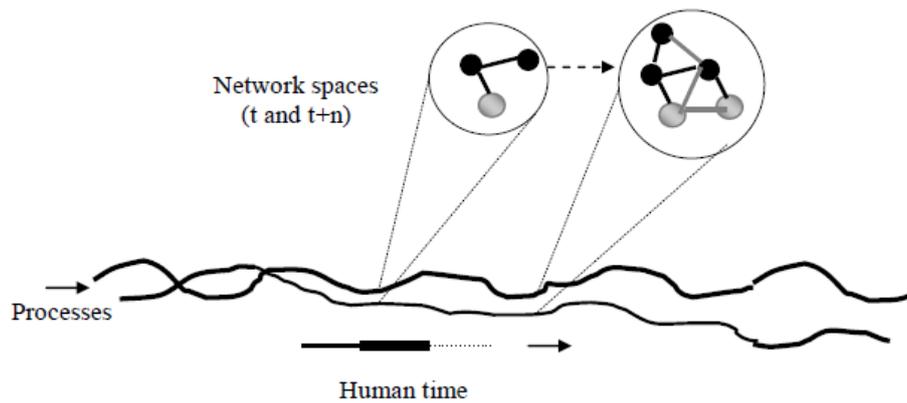
2.3 Integrating human times into business network research

The IMP Group's elaboration of business interactions was initially conceptualized in terms of interaction, episodes and business relationships (Håkansson 1982), and later divided into activities, resources, actors and business networks (Håkansson & Johanson 1992; Håkansson & Snehota 1995). The IMP Approach has mostly focused on the application of network concepts that represent structural elements (i.e. firms, relationships and the network) so as to understand stability and change and the ways in which business activities, resources and actors shape and are shaped by these structures. It is implied that business interactions, episodes and processes are found and defined by managers and researchers within the context of business networks that have both a spatial (i.e. network space) and an event-time character (e.g. Ford et al. 2010).

The IMP tradition of business networks could, however, benefit from a deeper treatment of time and space. This would be needed in particular for building better understanding of networks as processes. To extend current knowledge (Ford & Håkansson 2006b; Halinen & Törnroos 1995; Håkansson et al. 2009; Andersson & Mattsson 2010a, 2010b) we propose the broadening of the time dimension by integrating the human time perspective with its notions of time flow and periods into business network research. By analogy with organizations (cf. Borch & Arthur, 1995; Tsoukas & Chia, 2002), networks can be seen as sites of continuously evolving interactions performed by individuals on behalf of companies. This draws attention to human interaction as the primary driver of network processes over time.

Figure 2 describes our thinking on human time as a key denominator of business processes and ultimately of the network space. The figure shows how time and space, in a general sense, are constructed in the processes of interaction between business actors, and also that the socially constructed time and space both constrain and enable the process. More specifically, business interactions that form the process lead to a differentiation of the network space in and over time. In other words, the focal process under study defines which actors, activities and resources in the network are of importance at each time (see the upper part of Figure 2). This perspective is convincingly described in the article of Chou and Zolkiewski (this issue). What we suggest in addition is that human time is used to grasp business activities since human interactions underpin all business processes (see the lower part of Figure 2). The different human times, both event time and clock time, define how the process evolves and becomes punctuated in the minds of business managers and consequently in researchers' reproductions of the process. Clock time serves a secondary role in allowing synchronization of processes.

Figure 2: Interplay between the human time, the process and the network space



The following five basic properties of human time are all applicable to the study of networks: before time (individual sense apprehension), time flow, time periods, the connected nature of time flow and periods, and different times. They all involve the idea of time as on-going, irreversible, and varying in rate of progression. However, all of these properties of time follow from the individual sense apprehension of time, time flow and time period, as root concepts. Although the first is not inter-subjective in nature, all three are required to arrive at inter-subjective categorizations of time necessary for the social construction of time in networks.

Sense apprehension provides a personal knowing of inter-subjective times; living and interacting in time flow gives access to an understanding of process: and period time leads to inter-subjective meaning creation of interaction processes. For researchers combining time flow and periods provides fruitful access to understanding business relationships and networks. Further, for managers, nested periods inside time flow provide the conceptual and social means for informing and implementing business strategy.

In conclusion, we note the reasons for the importance of this time schema. Many schemata have been proposed (e.g. Adam 2000; Ancona et al. 2001b; Bluedorn 2002). Each presents specific strengths for thinking about time and also leaves some aspects of time unexamined. The present schema is important as an introduction, or preface, to these other categorizations. Our elaboration covers the essentials of a human understanding of time. The elements of human time allow a researcher or a manager to continually differentiate and elaborate times. All of the complex times involved in social structure and institutional relations are socially created and re-created upon these time notions. With this compelling schema we are better

equipped for empirical investigations of processes in business networks, which we will discuss next.

3. A temporal view of process research methods

The concept of human time, especially time as flow and periods, offers a potential basis for delineating process methods for network studies. Supported by the latest process methodological contributions by scholars from organization and strategy research, a few options for process research on networks can be distinguished.

Process research methodology has been the focus of intensive discussion among organization and strategy researchers over the past two decades (Ancona et al. 2001b; Langley, 1999, 2009; Pettigrew, 1990, 1997; Van de Ven, 1992; Van de Ven & Poole, 1995). In the study of business networks the issue has received only scant attention (Easton, 1995; Halinen, 1998; Halinen & Törnroos, 1995, 2005; Hedaa & Törnroos, 2008). Yet, many of the methods and ideas that have been developed to detect and unfold processes within organizations could also be used to enrich the methodological repertoire of business network study.

One such idea is the division into weak and strong process (Tsoukas & Chia 2002; Langley 2009; Van de Ven & Poole 2005). Weak process sees the world as made of things and views process as a change in entities, while strong process views the world as a process in which things are reifications of processes and in a constant state of becoming (Van de Ven & Poole 2005; Tsoukas & Chia, 2002). Drawing on the ideas of weak and strong process Van de Ven and Poole (2005) divide process research into two types that we see as useful for the study of networks. *The process studies of change in organizations* “conceptualize change as a succession of events, stages, cycles or states in the development or growth of an organization” (Van de Ven & Poole 2005, p. 1389). This type of study draws on the notion of weak process and contemplates the world in terms of things where change is observed. The other approach labeled as *process study of organizing* draws on the idea of strong process and focuses on the unfolding of social processes.

Taken into the business network context, the weak process refers to the study of networks as changing entities over *periods of time* (see e.g. the study by Tidström & Hagberg-Andersson in this issue). Change happens in a network when it moves along different stages in time,

where various events occur and contingent forces influence the process. The strong process view, on the other hand, would focus on the emergent processes of networking, where the web is unfolding through the interactions between its members (see Araujo & Easton in this issue). This corresponds to *time as flow*; networks are considered as fluidly emerging spatio-temporal entities in constant becoming, or viewed in the opposite direction as in continuing decay.

By combining the notion of human time with idea of weak and strong process we may divide process research in networks into three potential types – flow mapping, sequential mapping and point mapping (see Table 1).

Table 1. Three types of process research

	<i>FLOW MAPPING</i>	<i>SEQUENTIAL MAPPING</i>	<i>POINT MAPPING</i>
<i>Apprehension of human time</i>	Time as flow	Time as flow and periods	Time as periods
<i>Researcher access point to process</i>	Tracking events as they emerge and unfold in the process	Choosing specific periods through which the process is studied	Plunging into the process at different points in time
<i>Longitudinal approach to data</i>	Continuous real-time study	Studying specific periods in real time and in retrospect	Retrospective study of events and stories told ¹
<i>Perspective to understanding</i>	Event-driven approach by the sensemaking of actors	Grasping events in their context	Framing the process through many points in time
<i>Nature of the analysis process</i>	Experiencing/sensing what happens in the study context	Interpreting events within and between chosen periods	Reconstructing and deconstructing events through actors' memory
<i>Relation to research object</i>	Long-term constant involvement	Involvement during the chosen periods	Short visits and immediate responses
<i>Researcher's position</i>	Inside the process	Inside and outside the process	Outside the process
<i>Informants' time perceptions</i>	Time in action in its full complexity	Time as perceived and acted upon	Re- and deconstructed time

In Table 1 the methodological choices of empirical process research are described by using the human time notion as a starting point. We also pay attention to (i) how empirical access to process is created, (ii) how a longitudinal study is empirically designed, (iii) how understanding of process is created, and (iv) which type of analytical process is used to create this understanding. In addition we note the researcher's relation and position vis-à-vis the research object. These choices are strongly related to how closely the researcher works with the actors of the studied network process, and this in turn affects which alternative she/he has in integrating individual actors' time perceptions into the analysis.

¹ We note here that a human elaboration of the present is always in the past

Each type of process research aims at portraying how actors develop relationships, how networking in specific contexts takes place and how business actors form network structures through mutual interactive processes. All three types also take the event-driven approach to process “that is often associated with a ‘process theory’ explanation of the temporal order and sequence, in which change events occur based on a story or historical narrative” (Van de Ven & Poole 2005, p. 1381). What differentiates the three methodologies is how they utilize the human time notions and thereby provide different knowledge and findings about network processes.

Flow mapping comes closest to the idea of strong process. The strong approach aims to give a picture of the unfolding of the processes under scrutiny as *events in time flow*. This stresses the constant becoming, and decay, of the network as an enacted process and requires a continuous real-time presence in the process.

Point mapping, on the other hand, connects to the weak process idea. Such study examines the process from a distance, by noting events after their emergence, using informants’ accounts of the past, or of possible futures (see Corsaro and Snehota, this issue) as the primary data, thus complementing it potentially with secondary sources. Also, change in network structures can be examined along the timeline of the study (see e.g. Abrahamsen, Henneberg and Naudé, this issue). Process is approached through *planned points in time*, a process which reflects the view of human time as periods. Events are studied retrospectively, counting on informants’ narratives about the past or the future.

Sequential mapping acts between the two, emphasizing either (or both) the strong networking view or (and) the weak change view of networks and studying events and activities through both periods and flow notions of time. The process is approached through one or several sequences and investigated in real time and in retrospect. Various combinations are possible. We therefore contend that sequential mapping may be the most powerful process method for constructivist network research. In the following we will shortly discuss each of these three research approaches and how they are suited for specific research settings and perspectives.

3.1 Flow mapping

Flow mapping is suited for processes that have not been studied before in depth or demand a closer examination, for example innovation processes in networks or emergence of new networks. Such strong process research is demanding and needs good access. Participant observation is one alternative, as well as action research. A constructivist, socio-anthropological and narrative approach would work well together with flow mapping. The nature of the analysis process is experiential, where events come into play in real life and can be felt and noticed by the researcher. Making sense of the events in ongoing situations forms the key perspective in building contextual understanding.

The risks involved include that the researcher is too close to the research object and cannot see the forest for the trees. Overflow of impulses and events looms large, especially in large organizations, and the key events may remain unnoticed by the researcher. Qualitative narratives often also contain enacted descriptions that can be somewhat biased on the part of the researcher.

Another challenge with flow mapping arises from the removal of time periods from the research. In flow mapping, there is no easy delineation between past, present and future. Thus, change is more difficult to fathom. Flow mapping implies the enactment and feeling of events as they emerge. For the researcher this feeling of the flow and the emerging events may become important in later interpretative stages of their research.

3.2 Point mapping

Point mapping, or snapshots, is a feasible alternative when the researcher is in close contact with the informants so that events can be detected and apprehended. The better the access to informants whose role is central in the evolving events the better is the researcher's ability to understand the meanings and consequences of events. For successful point mapping, the time horizons between the study points should be relatively short. Short time periods reduce the risk of memory loss by the informants and allow the mapping of process between data-collection points through historical reconstruction of events.

In point mapping the researcher is acting outside of the process, which means that good interpretative skills are required from both the informants and the researcher. Post rationalization of key events on the part of the informants may create a reliability problem.

Also personal interests or bias on the part of the researcher in relation to what actually has happened may hamper the study. Time-distance to the studied events potentially causes epistemological problems.

3.3 Sequential mapping

In the sequential research mode, one or several periods can be chosen for data collection and all these may involve both real time and retrospective inquiry. The timing of data gathering and the duration, where there is close contact with network actors and events, are decisive.

It may be difficult to know in advance what is a suitable period to study. One may always study events retrospectively through the “selected window of time”, but if the aim is to grasp the events in their context by following the network for some time there may be a problem of choice (see also Ancona et. al. 2001b, 516). Some industries are prone to specific cycles (economic cycles or related to season, like fashions) that open opportunities for sequential research in a meaningful manner. Another possibility is to access the network when new technologies are introduced or political change occurs (e.g. the change after 1989 in Eastern Europe or the opening up of China or the post-apartheid era in South Africa). These transitions between sequenced periods of time might display punctuation, variation in rate of change and elements of on-going processes along with new parallel processes. Both time periods and time flow can potentially be studied through the selected sequence.

The length of periods where the researcher is following the events intensively and the length of those where the researcher is absent from the context influence the study design. Close involvement with the process helps in detecting cues and interpreting what happens in the context over time while analysis from the periods of absence needs to be done on the basis of informants’ stories and reconstruction of the past. Hence, interpretation through lived experience needs to be aligned in a convincing manner with that of a reconstructive approach. Such combination might reduce the risks of selective memory and help in revealing event trajectories in network evolution over time. Sequential mapping with several periods of involvement is feasible when only a few actors and informants among the actors are used to instruct about events.

3.4 Challenges of process research in business networks

Conducting process research in a network setting implies specific challenges for a researcher whatever research approach is selected for the study. Networks are nested structures of individuals, firms, relationships and nets, these being key entities. To fully explore the ways processes are enacted through time flow and time periods, and the way in which the nested structure shapes the process, interaction at all of these levels should be attended. For making sense of processes it is essential to connect events and processes from different levels to each other².

Another challenge is that a variety of processes evolve in parallel. Several different micro-level processes may create upper level processes and vice versa, and several processes are also likely to be going on parallel to each other at the same level of analysis, but even more so at different levels of analysis, as discussed by Makkonen, Stenroos and Olkkonen (this issue). Depending on the context and situational complexities, it can be hard to find root causes and events that would have a decisive impact on the studied change process.

Another challenge is that networks involve multiple actors' views on time and process. This can be regarded as a challenge, but also as a challenging opportunity. In qualitative business network studies data is typically collected through personal interviews. This allows the researcher to interpret the respondents' implied application of diverse time concepts and to compare them across and between different actors within interaction processes. In Table 1 there are careful distinctions made between the position of a researcher and the options of including informants' time concepts into the study. In the flow perspective it is possible to treat time in action and reveal how different actors' views in ongoing situations differ or align. In a sequential approach, through frequent visits to the field, it is possible to note changes and transitions of personal time perspectives. In point mapping one only grasps time through post-rationalizations or *ex ante* perceptions of actors at the moment of data collection, a point elaborated further by Aaboen, Dubois & Lind (this issue). In all cases it should be possible to contrast various actors' stories and descriptions and the multiplexity of the time notion in them (see Corsaro and Snehota in this issue). The researcher needs to explicate how he/she translates and potentially contrasts the different views to create deeper understanding of the process and network configurations under study.

² Here we acknowledge the fact that levels are inventions on the part of the researchers as they try to make sense of the networks and their embedded nature.

The three methods of flow mapping, point mapping and sequential mapping, offer network researchers alternative approaches to explore how time is perceived and how it becomes part of understanding network processes.

4. Contributions in this special issue

The eleven articles of this issue cover a range of topics pertinent to process research in business networks and create a contribution in multiple ways. Four of them (Araujo & Easton; Hoholm & Olsen; Makkonen, Stenroos & Olkkonen; Ryan, Tähtinen, Vanharanta & Mainela) are conceptual papers that apply established theoretical, philosophical or methodological approaches from social sciences to business network research. Six articles build on empirical foundations, i.e. on case studies on business relationships and networks, which is the traditionally used research strategy within the IMP School. Some of the empirical papers look at processes of change at the relationship level (Corsaro & Snehota; Mason & Leek; Tidström & Hagberg-Andresson), while others take a focal company perspective to the broader network (Aaboen, Dubois & Lind; Chou & Zolkiewski). In many empirical papers the process view is also complemented with spatial configurations of business networks, either as existing and evolving structures, or as mentally constructed. Finally, the article by Bizzi and Langley takes a number of empirical network studies from different fields under investigation, and provides in this way significant methodological implications for process research on business networks.

The eleven articles contribute importantly to the most challenging and neglected areas of process research in business networks: the methods for studying network processes over time, the meaning of time and process, and the issue of timing of business action. In most papers these issues are developed in close interaction with each other. We group and order the papers according to their primary focus into two categories: methodological papers and time and process papers.

The lack of methodological tools for the study of network processes poses a major challenge for business network research (Halinen & Törnroos 2005). The complexity of business networks as a study object leads inevitably to increased complexity in the methodological

domain. Business networks are temporally and socially embedded structures. Companies are connected to each other through direct and indirect relationships, adding to the complexity and methodological difficulty (Easton 1995). Methods are also contingent upon the notion of time adopted. In business marketing research time is typically taken for granted (e.g. Quintens & Matthyssens 2010) and treated as a simple, absolute measure, which results in an utterly one-sided and mechanistic view of process. Making sense of business interaction would require a more profound exploration of time. Several papers in this issue make primarily a methodological contribution (Bizzi & Langley; Aaboen, Dubois & Lind; Chou & Zolkiewski; Corsaro & Snehota; Makkonen, Stenroos & Olkkonen; Ryan, Tähtinen, Vanharanta & Mainela). Many of the papers illustrate point mapping or deepen in some respect the methodological approaches we propose in Table 1.

The interactive nature of business relationships forms another key challenge for process research (Ford and Håkansson 2006a). The basic tenet of the IMP Interaction and Network Approach is that change and dynamics are based on interaction processes between active and purposeful actors in the network where no actor can, however, operate fully independently. In such conditions change and process are difficult to theorize and to depict. Also time, the key category through which humans perceive their world and through which the process becomes comprehensible, is a complex and varied concept as discussed in this article. Accordingly, the perspective on time and temporality bears an important influence on how process is conceptualized. Timing of managerial activity, on the other hand, importantly affects the way process unfolds. A number of articles take the notion of time as a starting point (Araujo & Easton) or focus on a particular process in business relationships and networks, describing how it develops (Mason & Leek; Tidström & Hagberg-Andersson; Hoholm and Olsen). Only one paper, that of Hoholm and Olsen, places timing as the focus of analysis.

We start the special issue with an invited paper by **Bizzi and Langley** on studying processes in and around networks. Their article opens a window onto the varied landscape of process methods by discussing exemplary studies and providing opportunities for benchmarking and learning from studies conducted in other fields of business research. Bizzi and Langley offer concrete ideas for network researchers on how to extend the variety of process methods used and how to apply known methods creatively in new combinations. Their elaboration on weak and strong process in terms of change and flow in the network context is particularly valuable. They define requirements for applying the strong process notion in business

network research and complement the discussion with examples of network studies adopting the flow view. Their ideas both support and deepen the typology of process research we suggest in Table 1.

The paper of **Aaboen, Dubois and Lind**, illustrates through a longitudinal multiple case study about strategizing in new technology-based firms, how change processes can be captured methodologically. They propose the use of theory-driven network drawings as a researcher's tool for analyzing on-going processes. They describe how the drawings can be used in grasping the rolling past, present and future, in order to support case analysis and the revealing of patterns of change that are amenable to case comparisons. The study exemplifies how point mapping can be used as a process methodology to unfold events in network evolution. The study indicates that point mapping is potentially the most feasible methodology for making case comparisons on process. The use of researcher-generated drawings also is proven to be valuable in gathering a variety of informants' subjective time perspectives into an overall description of the studied process.

The article of **Chou and Zolkiewski** on "Decoding network dynamics" reports a rich longitudinal case study from the optical recording media industry, where major technological changes are considered as drivers of relationship dynamics, leading ultimately to the evolution of the studied net. The authors raise a discussion of five methodological issues that they consider central for the decoding. They discuss the necessity of limiting the network boundary and the use of conceptual tools, and reveal the role concept as particularly valuable in analyzing network change. They argue for the merits of employing several process theories as well as time concepts to provide rich descriptions of network dynamics. Their methodological approach can be described as point mapping. Depicting a 10-year evolution of the technology-bundled business net, a reconstruction of milestone events in focal relationships is used to reveal the process.

The paper by **Abrahamsen, Henneberg & Naudé** digs deeper into actors' role perceptions in forming understanding of network dynamics. They apply a cognitive and sensemaking perspective of actors in order to study change processes in relational webs between firms. The paper focuses on how a network changes over time as a result of how actors act in relation to their perceptions of positions and roles in their cognitive contextual network space. The results from the seafood industry between Japan and Norway indicate that position alone

is not sufficient to understand change, but the enacted role in the network forms a key issue. The study relates closely to a point mapping exercise in its methodological approach.

The paper by **Corsaro and Snehota** also applies the point mapping technique to consider managers' perceptions, by each party, of business relationship change. At two points in time these researchers collect managers' interpretations and re-interpretations of past developments, outcomes and desired outcomes. They also introduce *the relationship path picture*, a research method for mapping perceptions of relationship development over time. The results display an inconsistency of attribution between the firms in business relationships, and an inconsistency of perspective on the relationship development process through time. The authors find that the construction and re-construction of meaning appears to be shaped by intentions, more than by past developments. That is, rather than business relationship history, potential future interactions shape present framing.

The conceptual article by **Makkonen, Stenroos and Olkkonen** scrutinizes process research in business networks using a narrative approach. This is done by developing a meta-framework for conceptualizing processes in networks and by analyzing interaction between individuals from the acting organizations. The narratives can be used in capturing the actors, their motives, interests and activities as well as the complex interplay between these elements in their context. The paper develops a conceptual as well as a methodological framework for the study of network processes and offers implications on how network processes can be studied using narratives as a base.

Ryan, Tähtinen, Vanharanta and Mainela provide a detailed research method and set of questions to guide a researcher or manager in conducting research within a critical realist framework. The method and questions described provide different means to develop perspectives of the business network as a research object. Focusing on time and process research of business networks, these authors present researcher considerations that can be applied in any of the methodologies described in Table 1.

The last four papers focus on time and timing in business processes. **Araujo and Easton** take a particular look at temporality in business networks drawing on narratives and management technologies as tools for negotiating uncertainty and to stabilize the world in flux. They focus on managers involved in formulating an uncertain future in an innovation context, and the

role of A series *versus* B series time (flow and/or periods *versus* clock time) in this endeavor. They resolve the issue of dual times by drawing on the concept of a *situated actor*, forever present in the flow of time but through narrative weaving an objectified story based on managerial technologies contextualized in B series time. Narrative allows a manager to change the meaning and outcome of managerial technologies and products, as an innovation unfolds in flow time. Araujo and Easton thus provide insight into how managers live and create within flow, and also within combined period and flow times, and in so doing provide ideas on how researchers could apply changes in narrative to understanding processes and change in networks.

In a longitudinal study about communication practices in a business relationship **Mason and Leek** look at how specific tasks and changes in business relationships affect the media used in communication (Emails, face-to-face, phone and other communication modes). The study uses task–media fit theory and four distinct temporal modes (horizontal, vertical, standard and planned time) in analyzing how these shape a new business relationship. Three results emerge from the study. First, it is shown that the temporal modes are used in many ways when actors use different communication practices that in turn affect relationship dynamics. Second, the analysis demonstrates that actors use adapted ways to communicate in order to reach specific objectives set with regards to the relationship atmosphere that prevails. The third result shows patterns of communication norms evolving between partners.

The paper by **Tidström and Hagberg-Andersson** deals with the process that changes co-operative business relationships into competitive ones. The study is based on four qualitative case studies of SME-relationships that describe how the process develops over time and in space. Critical events and their connections in combination with what is labelled as *inner* and *outer network space* surrounding these events are studied. Events emanating chronologically, such as information sharing, sales-related and opportunistic activities are detected. Also the role of third party actors in relation to these events in their contextual settings (spaces) comes to the fore. The interplay between space and event-time is used as a means of unfolding the process studied.

Hoholm and Olsen integrate concepts from IMP and Actor-Network Theory (ANT) to offer a conceptual model on how innovation unfolds in time as dialectic between mobilizing forces and explorative learning. Mobilizing other actors to follow a directed path towards

commercialization of an innovation is pitted against the continuing explorative learning between the actors, which tends towards a divergence in meanings and applications for the innovation. These diverging paths are considered by the authors as reified processes, which shape time and timing as well as spaces and business relationships between the actors. Conversely the actors shape time and timing and relationships as they negotiate the dialectic of explorative learning and actor mobilization.

5. Concluding comments

This Special Issue is an outcome of a special conference track at the Annual IMP Conference in Budapest 2010. The interest shown in this special track and the intense discussions around process research, time and timing in connection with network studies clearly showed the need and relevance of developing this perspective. We also look forward to more contributions from this line of inquiry in developing both our understanding of network dynamics and change processes, and alternative analytical and methodological tools.

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