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The Temporal and Processual Dimensions of Practices for Enhancing Knowledge Exchange

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&

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ABSTRACT

This paper examines time and process issues that can contribute to knowledge exchange practices within network or case based research. We firstly address both the problems of time and network boundaries in network analysis and propose introducing organisational routines as a way to appreciate how actors perceive temporal structures in a dynamic environment. A dialogical analysis of data, looking at real others, imaginal others and artifacts, revealing different temporal structures in routines, is proposed as the substantive core of knowledge exchange practices. Case data from a University-Industry inter-organisational context is discussed to illustrate these negotiated temporal structures. We argue that knowledge exchange practices should consider the problem of time and might be conceptualised as a problem relating to multi-levelled analyses. It is through a multi-levelled analysis that we find different temporal structures and thus different ways of temporal organising in a dynamic environment. We conclude that multiple levels of analysis in network research provide a more comprehensive picture of the network from a process based knowledge exchange perspective.

Keywords: Knowledge Exchange, Internships, Temporal Structuring, Inter-Organisational Routines, Dialogical Analysis, Multi-Levelled Analyses

1. INTRODUCTION

This paper addresses questions of time and process in knowledge exchange research, which are important as they give some pragmatic direction to managers and researchers as to how they can propose bounds for their business networks. We show how from a process perspective boundary and time are the two most important dimensions of knowledge exchange for those actors in our case research. We mobilize our interest in processes in connection with organisational and inter-organisational, which indicate that the bounds of knowledge exchange activities and their networks are shaped by entities or actors additional to individuals' imagination and cognition.

Feldman and Pentland (2005, p.795) show that organisational routines 'depend on the connections, the stitching together of multiple participants and their actions to form a pattern that people can recognise and talk about as a routine'. By implication, if actors wish to extend or intensify their business activities, they should consider how they can act with and on routines as processes over time. Orlikowski and Yates (2002, p.684) argue that 'time is experienced in organisational life through a process of temporal structuring that characterizes actors' everyday engagement in the world. As part of this engagement including exchange, people produce and reproduce temporal structures to guide, account for and refer to on-going activities. Hence, our paper addresses important conceptual and methodological questions, of how managers and researchers can draw boundaries spatially and temporally around their phenomena, such as their knowledge exchange practices.

Empirically, we examine a process of knowledge exchange practices between a university business school and a large pharmaceuticals company as undertaken through student internships. Martinelli et al. (2008) develop a model of the 'entrepreneurial university', which

contributes to society and economic development through a relatively recent third mission of knowledge exchange, distinct from its missions in teaching and research. Following Yusuf (2008), knowledge exchange involves both the development of know-how among universities and their networks of users, and the development of these into embryonic technologies and viable technologies with a focus on processes and practices, which among other things, shorten lead times.

Our contribution is three-fold, to show how temporal structures specific to a business relationship are particular qualities of routines; how temporal structures contribute to stabilizing actors' activities and relationships and the bounds of activities and relationships; and how temporal structures have different levels. This paper's case highlights how actors organise their business processes differently with respect to temporal structures, which we see as a particular expression of a routine (Ringberg and Rehlen, 2008). Furthermore, by focussing on the process of knowledge exchange practices, we examine inter-organisational routines, with particular reference to actors negotiating dynamic and new temporal structures, adapting and adjusting the workings of the internship routine between the university, its students, and the pharmaceuticals.

In the following section, we develop a framework for integrating the concepts of organisational routines and temporal structuring. This is pertinent to addressing questions of business networks research of achieving stable boundaries of networks over time. In Section 3, we present our case study of the knowledge exchange project between the university business school and a pharmaceuticals company. In Section 4, we develop our argument further by assessing how the routines and their temporal structuring are, in the case study, co-existing at different levels within all the parties involved in the knowledge exchange programme. Multi-levelling is an achievement of the interaction among all parties and

provides a diffused way in which the actors can interact at and across levels and stabilise their network boundaries and activities over time.

2. TEMPORAL STRUCTURING AND NETWORK BOUNDARIES IN KNOWLEDGE EXCHANGE

– INTRODUCING A RECONCEPTUALISATION

In this section, we focus on two challenges faced by researchers using the case method in network studies: of temporal structuring; and of network boundaries. Together, these challenges provide a theoretical foundation for using organisational routines as our basis of understanding processes of knowledge exchange in a network context within and across different levels of organization.

2.1 The Problem of Time – Introducing Temporal Structuring.

Orlikowski and Yates (2002) propose that the notion of temporal structuring is a ‘way of understanding time as an enacted phenomenon within organisations’. They argue that a temporal structure is a shared practice bridging the subjective-objective dichotomous perspective of time. To illustrate this bridging Orlikowski and Yates (2002) and Czarniawska (2004) refer to the kairotic concept of time, as opposed to the chronological one. With kairotic time, actors develop concepts internally within organizations following such processes as meeting cycles and financial reporting cycles. In the University-Industry context we can represent kairotic time in the academic calendar including the annual internship process for institutional and employer actors. Student actors however might perceive the internship process chronologically as it is lived once from their perspective.

Temporal structuring forms a conceptual foundation for this paper. We expand on the notion of temporal structuring in two ways; that temporal structuring is a network phenomenon

experienced by actors across and within organisational routines in a business-to-business context, and secondly that we arrive at shared temporal structures through a negotiated dialogue as a knowledge exchange practice. Actors seem to arrive at a negotiated temporal structure through processual organising, or temporal organising. Halinen and Törnroos (2005) argue that time has been built into interactive understandings of network research, and with clear yet under-explored methodological implications. In earlier research, Easton (1995) argued that the unit of analysis, the knowledge-rich entity exchanged by actors, is essentially dynamic and that interactive network analysis has an explanatory power when considering changes that are occurring in a particular network.

Whereas most temporal research has been at the level of the individual (Andersson and Mattsson 2010) this paper aims to fill a gap toward considering a holistic overview of a network phenomenon at different levels. This forms the foundation to our discussion later in the paper that multi-levelled analyses are more appropriate in a network context. In summary, where actors have different perceptions of time and processes, network researchers should consider the concept of temporal structuring at different levels of analyses.

2.2 Using Organisational Routines to address the Problem of Network Boundaries

In relation to boundary specification, or the ‘boundary problem’ in network studies, Marsden (1990) notes that ‘the researcher faces the problem of specifying boundaries on the set of units to be included in a network’. This is a parallel concern to that of the researcher defining the population to which research results are to be generalised. Marsden refers to how an ‘omission of pertinent elements or arbitrary delineation of boundaries can lead to misleading or artifactual results’. The implication is that researchers require a strategy in specifying a boundary prior to data collection. Table 1 below illustrates clearly the potential for debate relating to boundaries that can reflect different temporal structures. Philosophical questions are raised as the presence of a clear boundary, or indeed multiple boundaries, may not be

obvious from the outset (Araujo, et al., 2003). This concern supports a proposed multi-levelled boundary specification strategy so as to arrive at a richer description of network phenomena rather than pursuing a predetermined boundary identification strategy, as suggested by Marsden (1990). Actors' subjective identifications should form the boundary. This conceptual debate has methodological implications that can be illustrated using the organisational routines literature (Feldman, 2000) which discusses how actors subjectively identify routines through their lived experiences and act on those routines. This is not unlike the argument relating to the network horizon level of analysis when delimiting a case (Holmen & Pedersen 2003). The implication is that the debate as to identifying a network's boundaries moves to a more 'dynamic' context where multiple subjective boundaries are acknowledged; including physical, social and mental boundaries (Harrison, 2005) across and within levels of analysis.

2.3 Organisational Routines – A Review of Related Constructs

Organisational routines can be used to tackle questions of time and processes raised in network theory research. Organisational routines have traditionally been seen as unchanging, static and closed (Nelson and Winter, 1982). Recent developments suggest that routines are more complex than previously thought (Feldman, 2000; Feldman, 2003) as we recognize their 'internal dynamic' and their 'potential for change' (Feldman, 2000). This represents a shift toward seeing structure in organisational theory as a process rather than a thing (Feldman 2000 p. 613; Cohen, 2007). A second reason for acknowledging organisational routines is that they can be seen, according to Feldman (2000), as 'producers of ideas'. As mentioned 'one can think of routines as flows of connected ideas, actions, and outcomes, which implies a sequence. Ideas produce actions, actions produce outcomes, and outcomes produce new ideas' (Feldman, 2000). A third reason for using this conceptualisation in temporal and process research is that people involved in the routine are not separated from

the routine itself making the routine a dynamically ‘richer phenomenon’ and can also be seen as an ‘actor’ of creation according to Feldman and Pentland (2005).

The focus on processes within the network perspective finds its historical roots in systems thinking and processual analysis, which is one variant in process research identified by (Van de Ven, 1995; Van de Ven, 2007). These threads of research are supported by the literature on static organisational routines within a single organisation (Pentland, 2005). In contrast, the recent discussions of dynamic routines move away from an emphasis of structure and toward process emphasising agency with a routine’s ‘ability to remember the past, imagine the future, and respond to present circumstances’ (Feldman, 2003). The perception of organisational routines is that they ‘*re-enact the past*’. Hence, Orlikowski and Yates (2002, p. 684) draw attention to the ‘role of people in shaping the temporal contours of their lives, while also acknowledging the way in which people’s actions are shaped by structural conditions outside their immediate control’. However, this might be a short-sighted perspective of the organisational routine as it too has the ability to ‘adapt to contexts that require either idiosyncratic or ongoing changes and reflecting on the meaning of actions for future realities’ (Feldman, 2003). This suggests that Feldman and Pentland and others perceive the routine ontologically as something other than linear but kairotic in nature due to the nature of agency being introduced to the flexible and change perspective of the routine operating across different levels of analysis (Per, 2010) and possibly in an inter-organisational context.

In the field of creativity and organisational learning a dialogical theory for creating organisational knowledge is outlined (Tsoukas, 2009). Tsoukas asks ‘what are the generative mechanisms through which new organizational knowledge is created?’ He notes that the concept of ‘interaction’, or as is mentioned later ‘social interaction’, has been identified by previous studies of organisational knowledge as the ‘*bedrock*’ for knowledge exchange

practices. The question now is ‘what is in interaction’ that gives rise to new organisational knowledge or in what particular form should ‘interaction’ take? This research, while focusing primarily on the subjectively identified routines considers the nature of how the actors interact dialogically within and across these routines. This paper conceptually draws on a dialogical analysis within inter-organisational routines.

2.4 Network Research Questions in Knowledge Exchange

In summary, organisational routines can be used to understand boundary issues in network research as it highlights subjectively lived processes. The temporal issues within these processes arise as individuals’ conceptions of time differ from the organisational and inter-organisational conception. Through negotiated temporal organising we arrive at temporal structures. Therefore organisational routines are explicitly linked to our understanding of temporal questions at different levels of analysis. To understand how researchers can incorporate the concept of time, we argue that a temporal perspective must also acknowledge the problem of a multi-level analysis. We discuss a temporal approach explicitly later. First, we present our context and case data in order to demonstrate the differences across levels of analysis.

3. AN APPLICATION OF TEMPORAL STRUCTURING & DIALOGUE WITHIN ORGANISATIONAL ROUTINES: COLLECTING CASE BASED DATA IN KNOWLEDGE EXCHANGE

3.1 The University to Industry Student Internship Context

The data presented in this section are taken from a study conducted in an inter-organisational context between an academic institution and an industry pharmaceutical employer representing evolved interaction and longstanding relationships with multiple student actors. This theory-practice context was considered an appropriate for understanding how knowledge

exchange occurred within inter-organisational routines. The researcher was embedded with the links and internship service in a quality assurance and mentoring capacity having direct access to institutional, student and employer actors through over fourteen months. The relationship between academic institutions and employers as linked by student actors is an under-researched phenomenon. Little research has been published about the performance of students when they move from the academic institution into practice based workplace. Whether the performance of the academic institution has been a 'success' in terms of knowledge exchange practice, innovation or preparation for industry roles is under researched (Huff, 2000, 2001).

3.2 Data Collection – Multiple Data Sources

Data were collected at the micro-actant and macro-actor inter-organisational level. 'Employer actors' and 'institutional actors' were interviewed as were internship participants or 'student actors'. The collection of multiple sources of data at multiple levels of analysis was arrived (Yin, 1994; Visconti, 2010). The case study of employers was selected due to the numbers of student actors being employed and the number of employer actors interacting with those student actors. This increased the opportunity to reveal internal organisational routines. The three actors can be illustrated in the following diagram.

<INSERT FIGURE 1 HERE>

Student Actor Data: Onsite and follow-up interviews were conducted with student actors in relation to their experiences with the employer organisation, employer actors and internal processes. Further clarifications of routines and processes they encountered were sought. With the view of seeking out multiple sources of data, student actors were tasked with completing reflective logbooks and separate reflective projects outlining their experiences.

This was used as a basis for analysing their role in and perceptions of various organisational and inter-organisational routines in their micro-actant roles. This will be discussed in more detail later in this paper.

Employer Actor Data: Interviews were conducted with employer actors directly responsible for managing student actors on site. Further documentary evidence including Internship Assessment Forms with open ended questions directed at employer actors were also used. These provided additional evidence as to how organisational and inter-organisational routines contributed to knowledge exchange practices from their perspective.

Institutional Actor Data: Additional data were collected from the Internship Manager, Academic Manager, Academic Mentors, Careers Service and Internship Quality Assurance Officers linked with the internship. As an embedded researcher this data took on many forms including unstructured meetings, informal conversations, anecdotal hallway comments. These were also extensive field notes recorded. In addition 'Internship Classes' were conducted between the Internship Officer and Student Actors. This was recorded as a non-participant direct observer. This 'class' was particularly relevant for understanding the inter-organisational aspect between employers and institutional actors. By way of clarification the close relationship between main employer actors and the internship manager was also a factor in selecting this context so that inter-organisational routines could be discussed at a macro-actor level. In addition these 'classes' also revealed dynamics relating to the relationship between the internship service and student actors in the case study. Desk research documents from employers and supporting published material and industry reports in the internship industry were also used revealing trend analysis of the internship or internship industry in Ireland. It should be noted at this stage that individual 'actant' as well as macro-organisational 'actor' interactions were highlighted ensuring that a multi-level analysis could

be supported. Our use of the constructs of actant and actor will be discussed in our discussion later on a multi-levelled analysis.

3.3 Stages of Data Analysis

Feldman (2000) provides a detailed framework for data collection in the context of identifiable routines. Her paper discusses college housing routines and the stages outlined have been relied on here as a basis of structuring data analysis. The following broad stages of collection and analysis were followed.

Stage 1: Internal and inter-organisational routines, as lived and identified by the interviewed actors were focused on for coding purposes in the context of the Internship Routine that connects all actors.

Stage 2: Within the context of identified routines ‘actors’ (both human and non-human) were identified. Artifacts (documentary evidence and artifacts identified by human actors) were considered for the purposes of understanding ‘dialogue in action’.

Stage 3: Dialogical examples, representing routines at differently levels of analysis, between actors were then analysed as the basis of interaction. Tsoukas (2009) provides an outline for analysing available dialogical data discussing three types of actors engaged in performative dialogue We draw upon this typology as a starting point for organizing the data;

1. The **Real Other** – considers human to human actor dialogues.
2. The **Imaginal Other** – dialogues with ‘the organisation’ or ‘the employer’ is considered. This is of particular interest in relation to how student actors perceive the stereotypical ‘employer actor’ and vice versa. This is pre-dominantly analysed on an inter-organisational level and was predominantly found in the Internship Classes data where the requirements of ‘the employer’ of the ‘ideal student’ as an imaginal actors were revealed.

3. **Artifacts as Actors** - Items that result in action including CV's, 'job specs' for interviews, training manuals, standard operating procedures, student logbooks and internship assessment forms and intranet sites were assessed dialogically. These items within the links/internship process have the potential to 'cause', to 'guide' and to be relied on to 'account' for action.

<INSERT FIGURE 2 HERE>

For the purposes of analysis the potential dialogues can be illustrated in the diagram above. For illustrative purposes we can see that the description of different actors contextually differs from our analysis of different actors as we would understand them dialogically. This can be seen in Table 1 (below);

<INSERT TABLE 1 HERE>

Stage 4: Given the simple framework for our analysis, there are nine potential 'dialogues' of which the 'real other' to 'real other' dialogue is arguable the most important across different levels of analysis. These levels of analysis incorporate varied and differing temporal and boundary issues resulting in a consolidation of potential dialogues (Feldman, 2000). Using the dialogical theory based on organisational routines the interview transcripts have highlighted some interesting examples of routines which at different levels present different temporal perceptions held by actors and different forms of temporal organising.

4. EMPIRICAL FINDINGS

4.1 Findings – Negotiated Temporal Organising

Actors' perceptions of the internship routine leads to temporal organising as indicated above: Each actor in the case study has a different perception of time, however each actor is not

autonomous and through dialogue, within routines, arrives at a negotiated temporal structure through 'temporal organising'. For example the Institutional actor's behaviour is influenced and guided by the year-long academic calendar with overlapping activities. This calendar or artifact guides the actors behaviour, determines when things should be done and/or repeated to meet the routines goal of having all students placed. student actors are also influenced by the academic calendar but they don't see the internship routine in an kairotic annual context in their exchange with institutional and employer actors. Employer actors in this context appear to be influenced primarily from the interviewing aspect of the routine to departure of the student from the job for micro-actant employers. Their perception of the internship routine is even shorter than that perception held by macro-actor employers and student actors. Three themes of negotiated temporal organising were arrived at from the data collected.

Negotiated Temporal Organising - Institutional Actor & Employer Actors: The Academic Actor is in constant contact with the macro employer actors, however it should be noted that for micro employer actants the internship routine is much shorter and chronological as they are not exposed to annual kairotic temporal organising. These employer micro-actants enter the routine from the CV review, interviewing and hiring sub-routines through to student departure.

Negotiated Temporal Organising - Institutional Actor & Student Actors: Students don't see the internship routine in its fullest extent in that 'preparatory internship classes' were seen broadly as a 'waste of time' and the data illustrated frustration within this dialogue, on the institutional actors , part to get the students to engage in the routine. For student actors the routine commences closer to CV preparation and interviewing and there was significantly less engagement prior to this stage in what could be described as a self-preparatory sub-routine.

Negotiated Temporal Organising - Employer Actors & Student Actors: This dialogue was variably influenced temporally by the presence of job specs, induction programmes, training manuals that facilitated the dialogue within the inter-organisational routine and influenced the negotiated temporal nature of the routine and student lived sub-routines. Student actors while on internship have commented on the repetitive nature of tasks representing possibly a kairoic perception of time as opposed to chronological perception

Artifacts influencing Negotiated Temporal Organising: Student actors engaged with academic and on-the-job artifacts that structured their behaviour prior to and during the internship. The institutional and employer actors relied heavily on policy and training artifacts to guide and account for their actions which was not fully understood by student actors.

4.2 How dialogical data aid our understanding of temporal structuring

Three examples illustrate how dialogical theory can illustrate temporal structuring. The data collected represented multiple sources across different levels of analysis;

1. **Internship Classes illustrating Imaginal Others:** The internship classes provided some insight into two dialogues; the internship officer to macro-employer actor dialogue. At this stage this employer actor is an 'imaginal other' as it highlights what the stereotypical employer would want from the stereotypical student, also an imaginal other. From a first level of analysis it is clear that the actors interviewed simultaneously switch between individuals as micro-actants and organisations as macro-actors. It is within these dialogical contexts that evidence of temporal structuring and thus organising can be found. Each dialogue reveals an inter-organisational routine or internal organisational sub-routines. In turn each routine reveals a temporal structure. As noted the internship officer's temporal perception was more kairoic as actions today were seen as having an effect in the subsequent internship cycle i.e. the actions of a student actor in an interview

or on internship would impact on the future availability of internship places. Student actors presented chronological temporal structuring as the internship routine was experienced once.

2. **Interviews with Student Actors illustrating Imaginal Others:** The second dialogue is the how student actor interprets the needs of the stereotypical employer actor. Student on-site interviews illustrated their perceptions of what 'the organisation' might think of their actions reflecting negotiated temporal organising as it impacted on the urgency of action within the internal organisational sub-routines. Not only were they dealing with their immediate superiors in the course of their daily work they also verbalised their relationship with 'the employer' and/or 'the organisation' as an 'imaginal other'. Expectations from institutional internship actor was captured in the logbooks and reflective projects.
3. **Dialogues with Artifacts:** Actors engaged with artifacts which results in a forced temporal organising requiring student actors to act within a time frame. On-site interviews revealed how artifacts guided action and allowed actors to account for their behaviour. Artifacts taking the form of interview transcripts, field notes (research journal) covering embedded/anecdotal conversations, internship logbooks and projects completed by student actors and internship assessment forms completed by employer actors provided additional dialogical data. A notable example of this was due to recessionary times the length and availability of internships decreased. The institutional internship actor relied heavily on reports, artifacts and industry documents to account for changes and thus prudent performative actions in the internship routine from an internship industry level perspective. The dialogues reflecting this were underpinned with a change for the kairotic perception of time for the internship actor but only a change in

chronological time for the student and employer actors as internships changed from sixteen weeks to shorter periods.

From the case based data different temporal structures, as perceived by the actors can be seen versus the negotiated temporal structures developed through dialogue. The negotiated temporal structures illustrates that actors are not autonomous and that the internship routine including all actors (human and non-human) influences and guides behaviour (action or inaction) while it is itself also a referencing point for knowledge exchange practices.

5. DISCUSSION: TEMPORAL STRUCTURING AS A MULTI-LEVELLED ANALYSIS PROBLEM

While temporal structuring is used to elucidate the problem of time, and the dynamic concept of organisational routines is used as a theoretical foundation for understanding processes within the network boundary problem. This section argues that this combination renders the problem of time to be a characteristic of the problem of multi-levelled analysis in network or case based research. By utilising the methodological framework in the organisational routines literature and a dialogical approach to data analysis, temporal structures across and between multiple levels of analysis can be revealed. We discuss this ontological consideration in terms of how processes in the internship routine can be conceptualised from a multi-levelled perspective.

5.1 Temporal Structuring - an Ontological Perspective

By focusing attention on what actors actually do temporally in routines, implications for the study of network phenomenon at different levels of analysis can be revealed and made more explicit. Three analytical levels; the firm, the relationship and network levels have been discussed in the context of how interaction occurs (Håkansson, 1995). However routines

from an individual ‘actant’ level, where actor and social bonds can be created (Medlin, 2004), up to macro inter-organisational routines involving macro-actors reveals not only knowledge exchanges practices. By focusing on inter-organisational routines within which actors (both human and non-human) as addressed in actor-network theory (Czarniawska, 2005) interact, our use of temporal structuring, unencumbered with dualism (Farjoun, 2010) based restrictions allows us to push beyond ontological restrictions and see temporality occurring at and between levels as a characteristic of the problem of multi-levelled analysis. Table 2 illustrates examples of temporal structures at different levels of analysis. However illustrating temporality, at and between levels, within on-going routines is not served by rigid categorisations of temporal structures and requires further research.

<INSERT TABLE 2 HERE>

<INSERT FIGURE 3 ABOUT HERE>

Temporal Structuring is key to understanding dynamic environments and yields some interesting methodological statements and recommendations – as temporal structuring is ‘practice based’ and is neither objective/clock based nor subjective/event based. Thus ‘multiple paradigms and methodologies offer distinct and important analytic advantages for understanding the role and influence of time in organisations’ (Orlikowski, 2002 #389).

In Table 2 it should be noted that the influence of kairotic and chronological time varies across these levels. Arriving at an objective agreed temporal structure; the process of temporal structuring is done through temporal organising. This occurs in the context of some form of dialogue leading to a negotiated temporal organising. This implies that a perceived temporal structure is linked to the actor whereas temporal organising is linked to the

negotiated dialogue at different levels. This debate can be expanded on under the following two headings;

- From Dualism to Duality
- Kairotic and Chronological Aspects of Time

From Dualism to Duality: This practice based view is presented as an alternative to the dualist debate. This third view says that ‘time is experienced in organisational life through a process of temporal structuring that characterises people’s everyday engagement in the world’. By acknowledging the active role of people, whose human agency is argued as being dynamic (Feldman, 2003) it allows network research to ‘bridge the gap’ between these two perspectives of time. People’s actions help shape the ‘temporal contours of their lives’ while at the same time their actions are ‘shaped by structural conditions outside their immediate control’. The analogy of a pendulum might be an appropriate here as at various different stages the influence of subjective perceptions can swing toward objective structures in determining time. We see this in Table 2 where an objectified temporal structure is negotiated between actors. A basic outline of an alternative perspective on time in organisations ‘that is centred on people’s recurrent practices that shape (and are shaped by) a set of temporal structures is provided. The difficulties in bridging this gap can be seen when we discuss kairotic and chronological perceptions of time (Farjoun, 2010).

Kairotic and Chronological Perceptions of Time: At the individual or actant level temporal structuring from a kairotic perspective may present itself in the data. . In the University-Industry context here the internship actor perceived the internship process as a circular with repetition, influenced by the institutional academic calendar representing an institutional artifact. Thus the kairotic concept of time is a circular point in time and as a temporal structure is often related to the perspective of the actor. As we move to discussing organisational routines the perspective of time becomes more complicated due to a mixture of

negotiated kairotic and chronological perspectives. As this paper solves a boundary concern by acknowledging the subjective nature of the routines there is also a decidedly objective nature in routines. The nature of the organisational routine is thus influenced heavily by the concept of 'temporal structuring' which provides an alternative to the subjective-objective dichotomy in assessing time and social timing. This alternative perspective centres on peoples' 'recurrent practices'. The use of the word 'recurrent' would suggest repeatable, regular or reoccurring or kairotic practices. In the University-Industry context, where the theory-practice divide is an appropriate context for assessing inter-organisational knowledge exchange, clear structures influence the perception of time, which in turn structures the phases of inter-organisational routines. The temporal nature would seem to make sense at the inter-organisational level of analysis as well as at the individual level of analysis. As we process to a dyadic or triadic level of analysis organisational routines can be re-conceptualised as 'dialogical processes' (Tsoukas, 2009) illustrating phenomenon between organisations at a macro actor-level and between individuals at a micro-actant level of analysis (Czarniawska, 2005). A dialogical analysis as presented above between actors within subjectively identified organisational routines is used as a basis for arriving at a negotiated temporal structure through the process of temporal organising. This negotiated perspective of time has a linear or chronological quality to it. Indeed as we move to a network perspective certain aspects take on a deterministic perspective of time. This paper argues that these differences are more a function of a problem of multi-levelled analysis than a function of a problem of time per se. So for this reason it is a useful perspective to consider a multi-level analysis.

5.2 The Problem of Multi-Levelled Analysis in Network Research

Following the discussion of 'dynamic environments' the temporal nature of processes should acknowledge that things change. The role human actors through agency is deemed to be

‘dynamic’. It should also be acknowledged that current descriptions are often limited snapshots of phenomenon. Capturing data from truly dynamic environments has eluded network researchers. However, some theories and constructs, including organisational routines (Feldman 2000), are making strides in getting closer to a dynamic and temporal nature of network theory. But temporal issues while interesting must bring about some practical implications i.e. a structure for interrogating data to elucidate a new perspective or toward a conception of time not previously considered managerially relevant. Having multiple levels of analysis to find organisational routines makes sense so as not to miss out on these issues. A multi-levelled analysis emphasises the temporal dichotomy at different levels. One quote broadly captures this point;

‘focusing on one side or the other misses seeing how temporal structures emerge from and are embedded in the varied and ongoing social practices of people in different communities and historical periods, and at the same time how such temporal structures powerfully shape those practices in turn’ (Orlikowski and Yates 2002).

Within the problem of a multi-levelled analysis, recognition of how organisational routines shape everyday human actions and at the same time how human agency can influence subjective perceptions of time will bring a holistic perspective when data collecting for network researchers.

While the literature on organisational routines sheds light on the ‘boundary problem’, researchers acknowledge that there are multiple boundaries at multiple levels of analysis. In relation to the ‘ontological dimension’, this paper contends that to understand process and time issues in network research, a multi-levelled approach to data collection is preferred as different temporal structures exist at different levels of analysis as illustrated in Table 2 and Figure 3. In conjunction with this our understanding of temporal issues in research can be improved through the multi-faceted lens of the multi-level approach. For this reason the

problem of a multi-levelled analysis should be added to the list outlined by Halinen and Törnroos (2005). In addition it is this paper's contention that to truly get to understand time in network theory we need to move past basic descriptions of temporal events.

This multi-levelled perspective is acknowledged in the IMP tradition (Per, 2010) and has an important implication for the methods used in data collection informed by the multi-level argument. The issues raised in this paper are supported by and meet Easton's (1995) list of choices to be made in industrial network research. If the network is envisaged as a large number of 'connected nets' the concerns relating to 'representativeness' and 'choosing the sampling unit' dissipate. Easton states;

'The aggregation to the network level therefore requires a more subtle but explicitly argued process. Alternative, small unit studies could be used deductively to test industrial network theories. Thus trade-offs become inevitable. Studying a single large network retains the connectedness that is a defining feature of the phenomena that raises very real issues of representativeness and restricts access to the majority of methodologies, in practice, demand replication'.

By considering more levels of analysis, connectedness is maintained in the connected nets while the concern regarding trade-offs between representativeness and identifying sampling units can also be achieved and managed. In addition the complexity of a dynamic unit of analysis that is the network, as referred to by Easton, is catered for especially in this paper where the participation of the triad actors clearly influences the boundary of the network.

Easton continues by suggesting that time is important when researching networks which are by their 'very nature dynamic and susceptible to change'. We argue that multiple levels of analysis toward identifying inter-organisational routines which in themselves have temporal structures, subjective and otherwise, better describes the true dynamic of industrial networks.

6 CONCLUSION

By considering actors' roles in recognizing organisational routines and by undertaking a dialogical analysis to arrive at actors' negotiated temporal structures, this paper aims to show how the 'problem of time' could well be handled and reconceptualised through the 'problem of multi-levelled analysis'. Following the conceptual framework presented at the beginning of this paper we introduced temporal structuring into network research. Its effect is to make us more aware of the differing and co-existing levels of analysis, with different temporal structures and processes of organising that should be considered to get a more complete picture of the network. Whereas this has been considered implicitly this paper argues for a more explicit treatment of the temporal issues in a practice based context, not as a problem of time but as a problem of multi-levelled analysis. Through this explicit recognition of the problem of multi-levelled analysis in conjunction with the boundary problem this paper proposes that the organisational routines literature can cater to the theoretical demands presented in the argument above. A dialogical analysis can help to bring researchers closer to understanding holistic network phenomenon including temporal structuring and organising.

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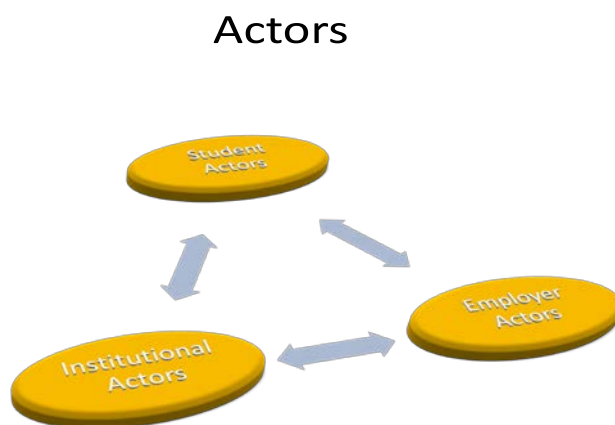


Figure 1: University-Industry Actors

Actors/Actants – Multi-Levelled Approach

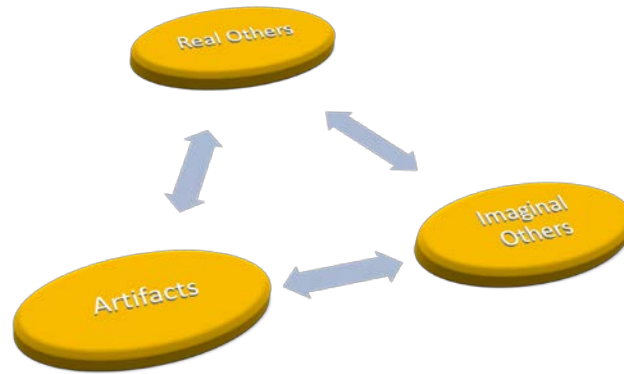


Figure 2: Actors/Actants – A Multi-Levelled Approach

Ontological Dimension Description of Actors in the Context	Methodological Dimension Analysis of Actors (engaged in dialogues)
<p>Student Actors</p> <p>Student Actors predominantly play micro actant roles within the routine.</p>	<p>Real Other</p>
<p>Institutional Actors</p> <p>Internship Officer, Academic Managers, Mentors (including the researcher), & Quality Assurance Officers.</p> <p>These actors play micro actant roles and/or macro-actor roles within the Internship Routine</p>	<p>Imaginal other</p> <p>‘the employer’</p> <p>‘the perfect student’</p> <p>‘the organisation’</p> <p>‘the profession’</p> <p>‘the recession’</p>
<p>Employer Actors</p> <p>Macro Employer Actor are employers involved in the inter-organisational aspect of routine performance.</p> <p>Micro Employer Actant were predominantly involved with day-to-day sub-routine performance as experienced by the student actors while on internship.</p>	<p>Artifacts</p> <p>Academic Calendar</p> <p>Job Spec Forms</p> <p>CVs</p> <p>Logbooks</p> <p>SOP’s</p> <p>Assessment Forms</p>

Table 1: Contextual Description of Actors & Analysis of Actors Dialogically.

Level	Micro Actants / Macro Actors	Ostensive Aspect of the Organisational Routines	Temporal Descriptions at Different Ontological Levels of Analysis
Individual	Micro Actants	Predominantly within organisation sub-routines for micro actants.	Individuals lived experiences of routines; can predominantly be linear if routines are lived once; subjective in nature especially for inexperienced student actants. being influenced by a circular kairotic perspective of temporal structure is the time.
	Macro Actants	These routines were organisational or potentially inter-organisational in nature	Individuals lived experience as 'macro actants' can see the temporal structures as kairotic and circular in nature as they have a over view of the routines they are in engaged with. The internship officer as a macro actant influences the routines they live individually. Employer actants engaged on the day-to-day while macro actants over see the inter-organisational routine..
Group	Micro Actants	Sub-routines and organisational routines	As a level of analysis it requires some common agreed of temporal structures as illustrated as the 'third way'. This temporal organising as discussed above is often linked more to the dialogue than to the individual actor. Student macro actants as a group can influence the inter-organisational aspects of the routines they live as a group.
	Macro Actants		
Organisational	Actor	Organisational Routines	Has organisational norms and organisational routines that act as a truce regarding temporal organising. Group and individuals negotiate an organisational culture reconstructing routines reflecting some form of temporal organising. It is thus more objective in nature. This is back to how the routine influences behaviour but also how behaviour influences the performance and development of the routine. Firm Level – with the firms actors, activities and resources {Medlin, 2004 #422}.
Dyadic Inter-Organisational Relationship	Actors	Inter-Organisational Routines	Organisational norms influence the inter-organisational routine. Temporal structural norms are thus agreed as the routine is established and lived at this level of analysis. Relationship Level – the analogues of actors, activities and resource being actor bonds, activity links and resources ties {Medlin, 2004 #422}.
Triadic Inter-Organisational Relationship	Actors	Inter-Organisational Routines	The process toward agreed negotiated norms becomes influenced by different organisational temporal structures resulting in more complex organisational routines within and between different levels of analysis.

Nets of Organisations	Macro Actor	Inter-Organisational Routines	This can be seen as boundaries with a focal actor or a micronet-macronet as discussed by Halinen and Törnroos (2005). This reflects how an actor's view of the network is extended through a network horizon. Temporal structures in this context become negotiated and inter-organisational routines become more complex and dynamic. Network Level – where actor web, activity pattern and resource constellation is considered {Medlin, 2004 #422}.
Network Level Analysis	Macro Actor	Inter-Organisational Routines	Temporal Structuring at this level incorporates all of the levels above recognising the complex temporal structures that influence and are influenced by dynamic routines at different levels of analysis.

Table 2: Temporal Descriptions at Different Ontological Levels of Analysis.

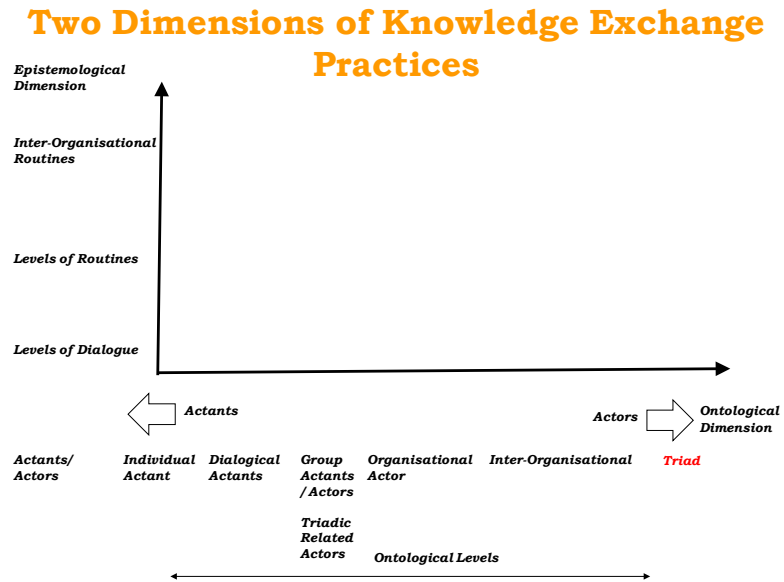


Figure 3: Ontological Discussion on Knowledge Exchange Practices showing different routines, different types of actants/actors at different levels influenced by temporal structuring.