DISCONTINUITY IN NETWORKS : INITIATORS, ISSUES AND INITIATIVES

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ABSTRACT

This paper is concerned with analysing dynamic processes in industrial networks. Starting from a discussion of stability and change in industrial networks, the paper proceeds to analyse the dialectic continuous / discontinuous change. What is important here, we argue, is to conceptualise and elaborate on the second order processes which give rise to both stability and change, whether of a continuous or discontinuous nature. Evolutionary models of industrial networks are analysed and compared with other evolutionary models in the physical and social sciences. The paper proceeds to discuss one specific mode of discontinuous change in industrial networks caused by actors' bounded rationality and imperfect knowledge of the network context in which they are embedded. The role of institutions and rule systems in shaping actors' perceptions and behaviour is acknowledged and the implications for the understanding of change are discussed.

The paper elaborates on an argument for the understanding of change at an intra and interorganisational change as the product of identifying issues and instituting initiatives aimed at dealing with one or more sets of issues. We argue that both action and decision rationality can act as catalysts of change. Both issues and initiatives offer a bounded and coherent set of elements upon which actors can focus and cognitively simplify their world. They provide the equivalent of a paradigm in science. They provide priorities and the social context of organisations and networks reinforces the recognition of the associated activities as being important. Similarly the process of mobilisation of actors in a network can be achieved as the result of a 'cognitive community' which believes that a particular form of change is desirable. The final point in this argument is that issues and initiatives provide one explanation, one set of driving forces that can create discontinuity in the evolution in an organisation or industrial network.

INTRODUCTION

The purpose of this paper is to explore aspects of dynamics in intra and interfirm networks and to provide suggestions for one treatment of one aspect of change within the network approach. The centrality of change in the current state of the paradigm goes almost unquestioned. Taking the metaphor 'network' at the most general level to mean connectedness between relationships amongst different economic actors, a network approach to industrial systems must place the (networking) processes underlying this connectedness as its core object of study. Arguably, 'connectedness' is best illustrated in the context of triadic relationships where changes in one relationship have either positive or negative effects on the other relationship (Cook and Emerson, 1984). In other words, networks as set of connected exchange relationships are not pre-constituted categories of observation in socio-economic life and can best be conceived of as layered effects of connected changes in dyadic, exchange relationships.

Networks are thus the medium and outcome of connectedness effects in a world of interdependent economic actors. Both change and stability must be understood as the product of the recursive processes organised in the socio-technical networks of industrial systems. Our point of departure is to focus on those processes underlying the reproduction / stability and transmutation / change of industrial network structures. Our objective is not to formulate a deterministic model of network evolution. We do not believe that any search for invariant laws underlying the production of events in industrial networks is likely to be fruitful. At the highest level of generality, we do not subscribe to timeless theories of socio-economic life (e.g. neo-classical economics) that regard any sequence of events to be the end-product of the predictable unfolding of actors' behaviours (e.g. based on the invariant principle of utility maximisation).

We take a rather different position on these matters. For us economic actor are embedded in structured sets of exchange relationships, situated in concrete time-space frames, which are both constraining and enabling. These structures are constraining in the sense that actors are tied up in relationships that require time and investment to set up, maintain and exit. Sunk costs, patterns of specialised resource commitments and inertia are some of the factors that contribute to the reproduction of these structures and ensure that actors remain tied firmly in place to established relationships. At the same time, these structures are enabling because economic actors can always find novel ways of using knowledge gained in some relationships to force changes in other relationships, find new ones and exit others. Also, and at a more general level, through strategic reflexivity and monitoring, economic actors are able to transform relationship-specific, local knowledge and resources into general-purpose, relational knowledge and resources. In other words, economic actors are capable of learning through experience and possess strategic agency.

From this perspective, the evolution of industrial networks is neither a deterministic, timeless process subject to invariant principles nor a series of disconnected, random events subject only to local rules. The traditional way in which industrial networks theory has dealt with this dilemma is to posit that network evolution is a dialectical process, the continuous struggle of opposite tendencies : the tendency to increasing order vs. the tendency to increase heterogeneity and disorder, the tendency towards increasing control and hierarchy vs. the tendency towards decentralisation and simpler, flatter structures (Håkansson, 1992). This account of network evolution parallels similar debates in social theory regarding the role of agency and structure in social life (Lukes, 1977 ; Giddens, 1984). Lukes (1977, p. 29), for example, considers that " ... social life can only be properly understood as the dialectic of power and structure, a web of possibilities for agents, whose nature is both active and structured,

to make choices and pursue strategies within given limits, which in consequence expand and contract over time".
Furthermore, large-scale changes in networks occur as a result of co-ordination activities and mobilisation of actors and resource in response to imbalances in resource structures (Lundgren, 1992). But, as network theorists constantly remind us, even large-scale changes in some dimensions require stability in other dimensions (cf. Håkansson, 1992). In other words, even change itself has to be understood against the background of its opposite, stability.
In this paper we will explore the nature of change and stability as it has been portrayed in industrial network literature and the way in which change itself can be conceptualised. We then move on to explore the differences between continuous and discontinuous change and suggest that one way of explaining one kind of network discontinuity is to by reference to actors' bounded rationality and embeddedness in an institutional environment.

CHANGE AND STABILITY AS NETWORK EFFECTS

If network change can only be observed against a background of stability, then we have to specify what both change and stability mean in a dynamic world, where the continuous flux of time and events casts doubt on the very notion of 'stability'. Our starting point is that stability is not the conceptual equivalent of 'no change' in a timeless world. Networks as we have seen, are both constituted and characterised by the activities they comprise. Stability therefore can be defined as meaning change below threshold values for any of the variables characterising a particular activity or set of activities. The way those threshold values are defined and measured is immaterial to the thrust of the present argument. The important point is that both stability and change are defined by mutual opposition and the boundary between stability and change is an arbitrary point, establishing their separateness as well as their conceptual dependence.
The mere fact that flow of time is irreversible and that the reproduction of activities requires purposeful human action and well-honed, routines means that the activities themselves will be different if they occur at different points in time. Thus stability itself, even in the extreme case of 'perfect' reproduction of activities or cycles of activity, is an effect conjured up by agents embedded in network contexts, who could have decided otherwise - e.g. to engage in a collective mobilisation of interests and resources to effect a major change.
A principle of symmetry (Bloor, 1976) can be applied here : both stability and change must be explained on the same terms. Both are relational effects resulting from the same network, second-order processes. Change must be considered against a background of 'dynamic stability' - to coin an oxymoronic term. The key question becomes : what are the second-order processes that account for both stability and change in industrial networks ? The most comprehensive answer to this question is to be found in Håkansson's (1992) model of evolution in industrial networks.
Håkansson (1992) introduces the notion that although the network emerges as a product of interactions, these take place in accordance with the 'network theory' held by each actor. The network is not merely an aggregation of interaction episodes but is contained and represented in each episode in the form of theories, propositions and beliefs held by each actor on their own and others' context of activity. Thus network structure is not an invariant and overarching framework constraining each actor in the same way, but is a set of rules and relations differentially distributed in a population of actors characterised by an uneven distribution of power and knowledge.
The metaphor of chess is next introduced in two different but interrelated ways to explain network evolution. First, the metaphor is used to exemplify the complex

relations between each interaction and the network in which it is embedded, by using the relationship between an individual move and the unfolding sequence of moves in a chess game as the base domain. The second use of the chess metaphor exemplifies the existence of a logic driving the development of a network. Håkansson (1992) distinguishes between the existence of a theory of chess based on existing rules and the common knowledge, distillation of best practice, and each individual's appropriation and interpretation of what best practice might be. This metaphor is then used to illustrate both the need for rules of interaction and the development of an individual logic of playing the 'interaction game' that gives rise to an emergent, macro logic of evolution at network level.

The set of questions raised by this formulation of network evolution is of vital importance to enlighten how the second-order network processes contribute to a dynamic model of industrial networks. To borrow a framework of problematic relationships in the social sciences (Storper 1988, pp. 165-6), what is at stake here is :

a) What is the relationship of network structures to events or outcomes of interaction episodes ?

b) What is the relationship of concrete events and outcomes of interaction episodes to the development, reproduction and change of network structures ?

c) How are events connected over time, within and across interaction episodes, and how are small events related to large scale, network processes ?

Håkansson attempts to answer these questions in terms of a processual model of network evolution that contemplates mainly the answer to (c), but in so doing touches on many aspects related to both (a) and (b).

Change is regarded as having both systematic and random elements. It is the systematic, orderly and predictable component of the change equation that warrants the label 'logic'. This logic of development emerges as the infrastructural engine that drives - but not completely determines - network evolution. The logic is governed by two elements traced back to network processes. The first element reintroduces the notion of actors engaged in the combination and recombination of activities. The second involves the element of control over resources and activities. The structure and workings of the network are partly explained by the local and momentary outcomes of these two processes.

In both network processes two opposite tendencies are at work : in the first process a tendency to elaborate on existing order (structuring) is opposed by a tendency to disrupt the prevailing organisation and create new forms of organisation (heterogeneising). In the second process a tendency towards more centralised control (hierarchisation) is counteracted by a tendency to decentralise control (extrication) over resources and activities. Again, every term is found to imply its opposite and the process of evolution of networks is regarded as driven by the momentary equilibria generated by the resultant of these opposite forces.

Each of these forces is anchored in specific functional goals ascribed to the system. The structuring of a network has its origins partly in certain technical connections between resources and activities and partly in human needs for security and stability. In stating that structuring satisfies a human need, Håkansson is introducing a functional form of explanation, attempting to show how the system's processes can be explained in terms of their contributions towards maintaining or realising the goals of the system. The tendency to heterogeneise is also regarded as dependent on the same technical and social elements as the structuring tendency.

The process of network structuring is illustrated with the aid of another metaphor - the development of a road system in a modern country. This metaphor invokes the cumulative and incremental nature of the process of network structuring with interorganisational relationships, likened to tracks inscribed in a landscape, making it

easier to travel with - rather than against - the grain of those inscriptions. As in the case of road development, where planners do not start with a clean slate and a virgin territory, network structuring tends to travel along the safer tracks of the existing system of relationships.
A similar form of functional explanation is used to account for the processes involved in the control of resources and activities (hierarchisation and extrication). The distribution of power in a network is assumed to be unevenly scattered and to change over time. At any time, this distribution is regarded as the momentary outcome of a struggle in which actors try to increase their power - i.e. their control over activities or resources. The driving forces behind this struggle are human attributes such as greed and lust for power in combination with the fact that many resources are scarce (Håkansson 1992, pp. 139-40). Interestingly, self-seeking opportunism with guile (Williamson, 1985), one of the foundational elements of transaction cost analysis, is introduced here to partly account for network evolution.
The struggle for power is both an organising and disorganising process. Actors seek to increase control by developing new forms of association and enrolment of other actors. At the same time, relationships and forms of association are disrupted and dissolved thus introducing an element of disorganisation in the system. The struggle for control includes both co-operative and competitive elements in interorganisational relationships. This process generates two opposite and co-existent tendencies : one towards increasing order and consolidation of existing structures and the other towards increasing disorder and disruption of existing structures. The two dimensions introduced to explain the evolution of networks are regarded as interwoven with each other and as creating a particular pattern of development for a network.

CONTINUITY AND DISCONTINUITY

The dependencies between the processes leads Håkansson (1992, pp. 141-2) to elaborate briefly on the morphostatic and morphogenetic cycles created by the combination of these two dimensions. In general, Håkansson argues, one would expect patterns of structuring and increasing hierarchisation to be punctuated by shorter, episodic discontinuous waves of heterogeneising and extrication, leading to a new cycle of structuring and hierarchisation.
The construction of this evolutionary model revolves thus around the notion that each tendency generates its own counter-tendency and that the resultant pattern of evolution will depend on the equilibria thus generated. The system will oscillate between different meta-stable states, dependent on the degree of mobilisation behind each tendency. But there will always a gradient of resistance to the movement of each tendency, as actors whose interest are being challenged, will attempt to counteract the effects of a particular mobilisation.
Thus change in industrial networks, as conceived in Håkansson's model, is mainly of an incremental nature, punctuated by episodic discontinuities. What is less clear in Håkansson's model is how discontinuities may actually occur in the process of network evolution. Continuity is ensured by the path-dependent nature of past investments in resources and activities undertaken by network actors (cf. Arthur et al, 1987). The interwoven structures of actors, resources and activities constrain future behaviour and the system's future is partly determined by its history. Regardless of whether change is conceived as continuous or discontinuous, the systems' past and momentum will always play a role in either its self-reproduction or in setting the stage for its own transformation. Discontinuities represent, at least partly, a break with the past and the beginning of a new cycle. Some relationships may be disrupted, past investments may have to be written off and new cycles of activities may involve new actors and exclude others. The succession of meta-equilibrium states is broken but

how far the system has to travel away from equilibrium for discontinuities to occur is somewhat unclear in Håkansson's model.
This punctuated equilibrium model that Håkansson's model hints at is partly inspired by developments in biology and physics amongst others (e.g. Eldredge and Gould, 1972 ; Prigogine and Stengers, 1984). Though not without its critics (Dawkins, 1986), punctuated equilibrium models have proved particularly popular in the social sciences, economics and strategic management (e.g. Mokyr, 1991 ; Hodgson, 1992). In punctuated equilibrium models systems evolve through the alternation of periods of equilibrium, in which persistent underlying structures allow only incremental adjustments of the parameters characterising and governing the system, and episodic periods of revolution in which the underlying structures are fundamentally altered (Gersick, 1991)
In Håkansson's model the logic of development of a network provides the underlying deep structures according to which evolution will proceed. To return to the chess metaphor, deep structures may be thought of as design of the chess board, the definition of the role of the pieces and the objective and rules of the game. Equilibrium periods resemble the actual game in play and revolutionary periods the fundamental alteration of the rules of the game (e.g. by redefining the number of squares on the board or the role of a piece).
Håkansson's model provides an opportunity to re-examine an important and somewhat neglected dialectic of change in industrial networks : continuous and discontinuous change and the relationship between the two. As in the case of stability and change, we regard continuous and discontinuous change to be mutually defining and their distinction to be arbitrary and dependent on the definition of threshold values. The distinction between the two types of change becomes more interesting and important in the context of the punctuated equilibrium model and changes in the deep structures that characterise industrial systems. As before, the more pertinent questions relate to the second-order processes that govern both equilibrium periods and trigger revolutionary episodes. Again, we intend to respect the symmetry principle mentioned previously : whatever the criteria we use to distinguish between continuous and discontinuous change we must resort to the same explananda to account for both types of change. Continuity and discontinuity are both effects of these second-order processes and have to be defined against the same referential system - e.g. by comparing magnitude of change in a number of parameters measured at two distinct moments in time and compare them with pre-established threshold values. Before we focus on the sources of discontinuities in industrial networks, let us examine briefly potential sources of explanation of revolutionary periods according to the logic of punctuated equilibrium models.
According to Gersick (1991, p. 23) the inertia of equilibrium periods can be broken at least in two ways : the attraction of new actors to a crisis situation and the system's arrival at key temporal milestones. Under the first heading, Gersick discusses Kuhn's concept of paradigm revolution in the sociology of knowledge and theories of organisational change. In both cases the persistence of unresolvable anomalies provides the setting for a crisis and a platform for revolutionary change. In both cases too, something akin to a political revolution happens : a growing sense, often restricted to segments of the political / scientific community, of unease and frustration directed against existing institutions / paradigms that have ceased to function adequately in response to problems created by an environment they helped structure (Kuhn 1970, p. 92).
Taking the political metaphor a step further, Kuhn observes that revolutions can be said to occur to the extent that solutions to political problems can no longer be contemplated and contained within the institutional matrix which sets limits and possibilities for political change. Because there is no recourse to a supra-institutional

framework for resolving political differences, parties to revolutionary conflicts must seek other means, namely techniques of mass persuasion and force, to achieve their aims. Scientific and political revolutions are thus discontinuities driven by the accumulation of problems and provided an outlet by a novel, frame-breaking paradigm or political institutions. In both cases, the conditions that produce the accumulation of problems that triggers the onset of revolutionary cannot be specified a priori nor are the outcomes of revolutions predictable. There is nothing deterministic or inevitable about the path of history and things could have easily been otherwise (Arthur, 1989).

In organisational change terms, revolutionary periods are likely to be preceded by crisis and marked by both personnel changes in the upper-echelons of the organisation and a fundamental re-orientation of the organisation's strategy and systems (Tushman and Romanelli, 1985). Likewise, in technological change discontinuities are often associated with the clustering of innovations around what Thomas Hughes (1987, 1992) labelled 'reverse salients'. Reverse salients constitute elements of a system of interrelated components that are out of phase and lag behind other components in the system. Lagging behind means, in this context, that they are less efficient, function less harmoniously with other, more advanced components, or in some other way retard the further growth and advance of the system (Hughes 1992, p. 99). As Hughes (1987) also observed, the removal of these reverse salients is often performed by individuals or organisations that have no prior investments in established technologies and were not constrained in their problem choices by mission oriented organisations with a high degree of inertia. Thus technological discontinuities have both competence-enhancing and competence-destroying effects (Tushman and Anderson, 1987). The removal of reverse salients sets the stage for rapid increases in the system's performance which may lead to significant technological, social and economic discontinuities - 'industrial revolutions'. As in other punctuated equilibrium models, discontinuities are closely related to the past. Reverse salients are often well-defined and bounded problems as attested by the number of people working on the problem and the cluster of patents around the reverse salient. Discontinuities emerge often as unpredictable and unintended effects of resolving one problem associated with one or more components of a system.

Gersick (1991) provides another intriguing source of revolutionary change. According to her, revolutionary change may also arise as a result of system's members heightened perception of the salience of temporal milestones as potential opportunities to break with routine and the past. Events themselves do not determine the beginning of a revolutionary period. It is the perception of events and temporal milestones - i.e. the construction of the continuous flow of time as a discrete, discontinuous process - that sparks agents' initiatives to influence deep structure changes. Because individual and organisational lives are marked by chronological codes that divide time into discrete frames, often marked by discontinuities (e.g. financial years, deadlines for completion of projects, fixed period loans), the potential to use these temporal milestones as self-imposed signals for revolutionary change should not be underestimated. Discontinuities don't have to be the product of crisis and the accumulation of small problems ; at any time, actors can exercise agency, within limits, to modify the structures in which they are embedded.

A general model of discontinuity and revolutionary change can be derived from this brief review of some existing, more specific models. The central concept, and one borrowed from the physical sciences, is that of unstable equilibrium. The most often used metaphor is that of a ball on the crown of a hill. A very small push will not dislodge the ball so that it remains in a stable (i.e static) situation. However a greater push sends the ball down the hill in a revolutionary and discontinuous event. Three further concepts are required to complete the picture. The first concerns the forces

and constraints that allow the unstable equilibrium to remain, nevertheless, an equilibrium position however temporary. In other words what are the counter revolutionary forces?. The second concept is that of the pathway(s) by which the system can escape to a new equilibrium position, represented by the slope of the hill in the metaphor used earlier. The final notion is that of the initiator; that small push which moves the system onto the pathway to accelerating change. In Hughes' model the eradication of the reverse salient provides the stimulus. Other metaphors might include the final piece in a jigsaw or the straw that broke the camel's back. In this paper we will draw on all the components of the model but concentrate upon the idea of initiators.

In particular the possibility that discontinuous change may be self-imposed rather than occur as the result of externally generated forces leads us to the discussion of one source of discontinuous change in industrial networks : the cognitive limitations of individual actors embedded in complex network structures, and incapable of fully understanding the complexity of their own structural position. Actors' perceptions and network theories is always an important factor in discontinuous changes whether that entails fundamental and discontinuous in the patterns of resource use and the cycles of activities undertaken by firms and industrial networks or not. And, needless to say, changes in patterns of resource use and cycles of activities undertaken also affect and shape actors' perceptions and network theories. In this paper we wish to concentrate on actors' perceptions and network theories rather than articulate a broad model of how these changes in one dimension of the actor-resource-activity triad affects the other dimensions.

BOUNDED RATIONALITY AND INSTITUTIONS

In the network approach, actors in socio-economic systems are endowed with a number of characteristics (Håkansson and Johanson, 1992). For the purposes of the present discussion, three characteristics assume particular importance. First, actors' objectives are to increase their control over the network. This general principle assumes the same function in industrial networks theory as the principle of utility maximisation in neo-classical economics. The emphasis in control stems from the assumption that control is a prerequisite for achieving other goals. Secondly, actors have differential knowledge about other actors, activities and resources in the network. This knowledge is assumed to evolve as a result of 'learning-by doing' and experience and most of this learning is local - i.e. closely related to previous activities and relationship-specific. Thus an actors' knowledge of the network is patchy an is likely to be greater in the case of nearer than further parts of the network. An actor's centrality in the network is therefore likely to be correlated with a more detailed and comprehensive knowledge of the network. But structural position alone will not determine the stock of knowledge held by any single actor. Knowledge of the network is mediated by actors' cognitive structures and their perceptions of what constitutes information and how that information is to be represented and incorporated in 'theories' on how the network operates. In turn, actor's beliefs and network theories are partly moulded by their experience and history of prior interactions in the network.

Lastly, actors are assumed to have interests and to pursue their interests when acting (Håkansson and Johanson, 1993). One of the consequences of interdependence is that changes in the way one actor controls resources and/or activities will probably affect other actors. In general, an increased control over a resource by one actor is likely to have two effects : it may be achieved at the expense of a decreasing control by other actor(s); and/or it may lead to an increased control by other actor(s). This means that actors in the network may have both conflicting and common interests (Håkansson, 1992). This heterogeneity in the distribution of interests, power

asymmetries and network theories of actors create sources of imbalance and potential change in industrial networks. Interests may vary across actors and for the same actor may vary across situations and over time. The role of interests in influencing individual and collective actors' behaviour in industrial networks has been somewhat neglected. At one extreme, interests may help determine perceptions and shape individual and organisational agendas, influencing how they will behave in specific interaction episodes. At the other extreme, interests may play a secondary role and be subjugated to the demands of the constraining set of relations in which the individual or organisation is embedded. In other words, the role of interests in accounting for behavioural differences is closely related to the exercise of agency and is an open, empirical matter.

However the network view of agency rejects the atomised individual actor as the unit of analysis and instead views individuals as embedded in social systems of rules and institutions (Granovetter, 1992 ; Hodgson, 1993). Institutions play a vital role in modern life and provide a bridge between individual cognition and social life. Hodgson (1992, p. 253) defines institutions as the " ... commonly held patterns of behaviour and habits of thought, of routinised and durable nature, that are associated with people interacting in groups or large collectivities. Institutions enable ordered thought and action by imposing form and consistency on the activities of human beings". Thus institutions as repositories of sedimented experience and suppliers of rule systems can help shape individual cognitive processes by providing frameworks for interpreting sense data as well as intellectual habits and routines.

We regard the behaviour of individual actors in networks as guided by sets of cultural rules that have evolved in different institutional spheres of individuals' lives, are differentially distributed across populations of individuals and have different degrees of formalisation (Burns and Flam, 1987 ; Dietz and Burns, 1992). Systems of rules may be highly structured and constraining (e.g. in relationships governed by formal contracts) or rather informal and local (e.g. how does an organisation treat late payments by a customer). The complexity of modern life places the individual actor at the junction of rather distinct and contradictory systems of rules for each domain of life.

As Dietz and Burns (1992, p. 189) remind us, the constant need to interpret which rules are to be used in each situation preclude any possibility of cultural integration and one set of rules (e.g. those prescribed by the organisational 'culture') to dominate others (e.g. those prescribed by professional codes of conduct). The view that individuals' behaviours is governed by rule systems doesn't mean that we ascribe primacy to structure over agency. Rules must be interpreted, to be of any practical use, and interpretation requires defining and constructing the context for their application as well as selecting which rules should be applied. In other words, rules provide actors with scripts for interaction with others, but they are free to decide how to enact each situation and whether existing rules are appropriate to govern their interaction. Through reflexive monitoring and control, actors have always the possibility of stepping outside the boundaries provided by existing rule systems, improvise and rewrite the script according to a new set of rules.

The complexity of life and the contradictions imposed by different institutional rule systems favours the frequent use of meta-rules, generalisable across contexts, that reduce equivocality and complexity in the stream of information an individual is constantly exposed. The biases and heuristics identified by decision theorists (March, 1988) can be regarded as the consequence of individuals' bounded rationality but also as action-oriented meta-rules, imposing a degree of order in an otherwise chaotic environment and allowing action to take place in the presence of uncertainty and imperfect information. Heiner (1983) argues elegantly that the regularities in behavioural patterns or rules emerge because of uncertainty in distinguishing

preferred from less-preferred behaviour. Uncertainty exist because agents cannot decipher all the complexity of the decision problems they face and are forced to simplify their decisions by recourse to sets of rules that can be reliably administered. The emergence of repertoires of rules can thus be seen as the smoothing over of uncertainty and incomplete knowledge by agents with limited knowledge and imperfect information.

Weick (1983) explored the idea that thinking is interwoven with action in managerial work and that presumptions of scientific rationalities and linear problem solving might be misapplied in the context of managerial work. Most managerial activities are seen to contain gaps, discontinuities, loose ties among people and events, indeterminacies and uncertainties. Weick (1983, p. 228) argues that managers having first thought these gaps and having tied these loose elements cognitively, tie them together again in reality when they act and impose covariation on events. In this light, decisions are less accurately portrayed as discrete episodes but as small steps that gradually foreclose alternative courses of action and limit what is possible. Action is seen as shaping the data that determines the next decision and what is decided next will influence, in a mutual causation process, what action will then seem appropriate.

In the context of industrial networks, for example, the interdependence between relationships conducted by a focal organisation forces the organisation to simplify and standardise the range of rules it employs when dealing with a portfolio of suppliers or customers. One such rule is, for instance, to categorise relationships differently and deal with each one and as if it was independent from any other relationship. Trade-offs amongst different relationships are notoriously difficult to make (limitation problem) whereas decisions within the context of single relationship (handling problem) are somewhat easier to cope with (Håkansson, 1982).

In the remainder of this paper we will suggest that one of the ways that individuals simplify their environment and cope with the range of problems affecting their organisation and the networks in which they are embedded, is to identify issues and institute initiatives aimed at coping with those problems. We will also contend that in many instances exactly the reverse happens : actors institute initiatives that are only tenuously related to perceived problems and issues and, in turn, contribute to reshape the strategic agendas of organisations and networks.

ISSUES AND INITIATIVES.....

Issues

Writing on organisational decision making, Starbuck (1983) proposes that organisational activities can be categorised under two modes : a problem solving mode and an action generation mode. In the problem solving mode, organisations identify problems and pursue courses of actions directed at searching for solutions to these problems. In the action generation mode, organisations undertake actions that are only symbolically related to problems and the usual sequential logic of problem identification followed by search for solutions is reversed. Starbuck further contends that the action generated mode accounts for the majority of activity sequences occurring in practice.

Taking Starbuck's useful distinction as a starting point, we propose to extend and refine his classification by applying it to an inter as well as an intraorganisational context. From Starbuck's framework we take the useful insight that organisations act unreflectively most of the time and that the programmes of action or interlocking routines that constitute them change slowly and incrementally. But we also argue that these programmes of action are subjected to continuous pressures for change, namely through the network of relationships in which the form is embedded.

In the problem solving mode, organisations react to identified problems here defined simply as " ..a difference between a current (or expected future) situation and some desired situation" (Easton 1992, p. 69). Problems thus provide a driving force as actors attempt to fill the gap between what is and what should be. An organisation can identify a problem of supply if one or more of its current suppliers fails to achieve previous levels of performance in quality or delivery. Likewise, if an single supplier starts to exceed expectations in a number of performance variables it may shift the standards of performance upwards and lead the organisation to perceive a general problem of poor performance of its other suppliers.

However the relationship between perceived problems and actions is by no means a simple one. Our contention is that organisations continuously swim in a sea of perceived problems, which change continuously as organisational members adjust their standards to the range of performances they observe and measure in their everyday lives. Furthermore not all problems are addressed directly or form the basis for concerted action. Many of them swirl around the lower levels of the organisational hierarchy, like molecules in a liquid. They may be either addressed and solved directly at the lower levels of the organisation, left unattended for long periods of time or simply be ignored.

But some of these problems may coalesce around interests at lower hierarchical levels of the organisation and be translated and packaged as 'issues' deserving of managerial attention. The process through which problems get translated into issues and the way managers allocate their limited attention to a wide variety of issues is addressed by Dutton et al (1989), Dutton and Ashford (1993) and Dutton and Penner (1993). In all these works, an issue is taken rather unproblematically as a meaning a problem in a broad sense. Strategic issues - taken from Ansoff (1980) - are defined as " ... events, developments or trends that are viewed as having implications for organisational performance" (Dutton and Ashford 1993, p. 397).

We want to avoid the implication of managerial attention as something that is only directed to activities that are perceived as critical for organisational performance. This view of what constitutes an issue already presupposes that managers have rather definitive maps on how issues can affect organisational performance and can use this *ex-ante* knowledge to filter what issues are worthy of immediate attention. We prefer to use the term issue in the sense of a problem or, more likely, a cluster of problems that can be labelled and clearly bounded - e.g. the 'quality' issue and that have within their definition implicitly or explicitly alternative solutions. An issue may thus have a series of nested sub problems of sufficient importance that may warrant concerted managerial attention - e.g. the 'quality' issue may involve internal procedures affecting several functional areas as well as external relationships with suppliers and, say, TQM consultants. Needless to say, what might constitute an issue for a management team in one firm may be perceived as an irrelevance for another and even for the same management team, the perception of what constitutes an issue might vary over time. An organisation with cash-flow problems, for example, might have trouble seeing any other issue until those problems are satisfactorily resolved.

Dutton and Ashford (1993) construct an elaborate framework for the understanding of internal issue generation activities that they label as issue-selling. Issue-selling is characterised as a social and political process directly tied to the characteristics of both top management teams and the issue seller(s). The process of issue-selling, namely those aspects concerned with issue-packaging, and the selling process are taken to be critical for the success of the selling task. Our approach whilst contemplating internal selling of issues as portrayed in Dutton and Ashford, is also concerned with the way issues make their way to managerial agendas through other routes.

The external environment can also play a key role in highlighting issues that management should concern themselves with. At the level of the dyadic, buyer-seller relationship both partners will have views about what constitute the key issues which have to be resolved and while these issues may differ from relationships to relationship, over time the population of such issues will be necessarily limited and definable. At the level of industry, defined in its broadest sense not as simply a set of competing firms, there are current issues which can usually be identified. Grinyer and Spender (1979) identified the role of industry recipes. These are the agreed solutions. However there will also be issues about which agreement is not forthcoming. For network change these issues need to be concerned with action that is interdependent with respect to the actors. The interdependence may be co-operative or competitive but in either case it can provide the stimulus to a change in the network structure as a result of the commonly held perceptions. Brito and Araujo (1993) provide an example of this kind of situation where in the Port Wine industry in Portugal where the network structure has become mediated by the emergence of collective actors, acting collaboratively to resolve issues which affect the whole network and which they perceive cannot be solved by actors acting individually.
At a more general level the institutional environment, through governmental action and regulations, and professional and trade association activities continuously surface issues that help influence managerial agendas. Other examples highlight the role of management academics and consultants and the business press in placing specific issues in managerial agendas - e.g. the reconfiguration of activity base of firms under the 'business process re-engineering' label.
As in the case of simpler problems, issues may or may not fit with managerial agendas, interests and competences. There is evidence to suggest that issues receive managerial attention only to the extent that they fit pre-existing managerial causality maps and agendas (Hall, 1984). Also, we suggest that managerial competences and interests may play a role in how issues are identified and prioritised. Management teams dominated by say, engineers, may find it difficult or uninteresting to identify and deal with financial issues (e.g. late payment by customers) whereas management teams dominated by accountants may find it hard to identify and deal appropriately with quality or technical issues.

Initiatives

When issues fit managerial agendas and attract managerial attention, they may generate actions designed to cope with one or more issues. These actions often take the form of what we have labelled as managerial initiatives - initiatives are, in our terminology, formalised programmes of action instituted to cope with a specific or set of specific issues. Initiatives thus take the form of a project type activity in that they are clearly labelled (e.g. the TQM initiative), staged and with relatively clear objectives (e.g. to obtain ISO 9000 certification). They may be instituted in response to a specific internally generated issue or sets of issues (e.g. a lack of consistent standards of performance across the organisation) or they may emerge as a result of the organisation interaction with customers, suppliers or other actors in the network (e.g. customers who are ISO 9000 certified demand that their suppliers become themselves certified).
But initiatives may also be instituted as a result of managerial interests and agendas that do not relate to any specific issue. TQM procedures, for example, may be instituted not because they are perceived as solution to an issue but because managers are persuaded of their value in, say, breeding a degree of co-operation across different functional areas in the firm. In this sense they create a a particular kind of problem i.e. an opportunity, by raising managerial expectations. Initiatives

such as these may be also taken as stepping stones or catalysts for more radical programmes of change. Business process re-engineering initiatives may be undertaken as a precursor to de-layering managerial structures and to outsource activities that had previously been internalised. To the extent that these initiatives achieve their aims, further initiatives (e.g. downsizing) may be undertaken to build on existing ones. Weick (1984) uses the term 'small wins' to refer to this series of cumulative and progressive initiatives. A small win is a "... concrete, complete, implemented outcome of moderate importance. By itself, one small win may seem unimportant. A series of wins at small but significant tasks, however reveals a pattern that may attract allies, deter opponents and lower resistance to subsequent proposals " (Weick 1984, p. 43).

Weick goes on to argue that small wins have a fragmentary character driven by opportunism and that careful steering of a series of initiatives to achieve predetermined is aims is impossible to envisage in a dynamic context. Much of the usefulness and artfulness of initiatives lies in labelling and interpreting small changes in a broader context, changes that otherwise could go unnoticed, subsumed under a variety of labels or framed under different agendas.

Managers may also institute initiatives to signal to other actors in the firms' institutional environment (e.g. competitors, financial institutions, trade associations) that the firm is managed by progressive individuals and is to be taken seriously as a forward looking player. As Powell (1991) points out these initiatives may be both inefficient and yet still enhance survival prospects. Conformity to perceived external demands may be inefficient to the extent that the adoption of such initiatives may be detached from any analysis of the specific context in which they will fit. On the other hand, such conformity may be instrumental in attracting the support of actors who control access to key resources for organisational survival.

Lastly, managers may institute initiatives in an exploratory and recipe-like fashion, hoping that somehow the initiative may tackle a number of issues that defy precise description and labelling. Thus firms may engage in periodic re-organisations as a response to poorly understood interdependences between departments or to changing demand conditions. Reviews of purchasing policies may be initiated on the assumption that internal efficiency is already at a maximum and further cost reductions can only be obtained at the expense of suppliers. In all these cases the organisation acts in a action-generation mode and initiatives are only loosely matched to perceived sets of issues.

.....IN INDUSTRIAL NETWORKS

So far we have concentrated mainly on how issues and initiatives match in an intra-organisational context. But there is no reason to believe that issues and initiatives respect organisational boundaries and managerial control. As mentioned previously, issues may concern more a set of interdependent actors. Take for example, the case of ISO 9000 certification. If a firm is particularly dependent on its inputs, obtaining certification might count for little if the firm's suppliers are on the whole not ISO 9000 qualified. Similarly, traditional competitors in an industry may face collective issues whose impact is both universal and differentially distributed. Regulations concerning import quotas, legal requirements for entering fields of activity, professional qualifications of employees and technical standards constitute examples of issues that transcend the capabilities and interests of individual actors. They require concerted and co-operative initiatives from a number of actors in the network. These initiatives may be channelled though existing business interest associations or formalised collective actors, acting on behalf of individual firms (Waarden, 1992). In

other cases, special interest groups may informally coalesce around an issue for a limited period of time - an issue based net (Brito and Araujo, 1993) - and disappear as soon as the issue is either satisfactorily resolved or drops from their agendas. Issue base nets thus constitute temporary and contingent forms of association amongst groups of actors aiming at changing or preserving the structure of the network(s) in which they are embedded.

As in policy making activities in modern democracies (Jordan and Schubert, 1992 : Marin and Mayntz, 1991), diverging interests within industrial networks may be mobilised around issues and initiatives promoted by an actor or groups of actors. Industrial networks may also be characterised as interaction fields populated by autonomous but interdependent actors, with temporary alignments of interest and issue-based coalitions and co-operative structures criss-cross the established order of economic exchange relationships. Mayntz (1993, p. 10) uses the term generalised exchange to refer to situations where " ... exchange is multilateral rather than bilateral, that it can be indirect (...) as well as direct and above all that it involves the trading of a large variety of resources, including support in particular, which have no market price - and hence call for bargaining." Mayntz proceeds to distinguish between networks characterised by economic exchange and those that aren't, a distinction we are less happy about. Industrial networks are characterised simultaneously by a logic of economic exchange as well as by a logic of non-economic or generalised exchange (Easton and Araujo, 1992).

Interorganisational relations are typically complex, multi-level and variable over time. They may incorporate variable degrees of both economic and generalised exchange. Fluidity and inconsistency over a disparate set commitments amongst different relationships and over time allows for relationships to be reconfigured according to changing demands and constraints. Thus firms may pursue different and coexisting strategies to pursue solutions to different sets of issues in different arenas - e.g. business interest associations, local chambers of commerce, professional associations.

DISCONTINUITY, ISSUES AND INITIATIVES

We have so far argued that issues and initiatives are ways in which managers can seek to understand and change their worlds intra and extra organisationally. But in what sense can they be said to be initiators of discontinuous changes in either of these contexts. To examine this question we have to return to our general model of discontinuous change. To be initiators of change, issues and initiatives must destabilize an unstable equilibrium. Two elements would seem to be required to enable this to happen. The first is that collective acceptance of an issue or initiative must be one of the preconditions for destablisation. This need not always be true but it would be a very unstable equilibrium that could be upset by, say, one individual recognising that a choice between two technologies is open to the firm or that a pre competitive joint venture would be a way forward for the industry. If we are to take a network view then we need to confine our attention to those discontinuities which are strongly affected by interfirm interdependence.

The second precondition is that the pathway(s) which lead to rapid change and therefore discontinuous change were invisible are and now made visible. In other words it is only the lack of actors perceptions of the way forward that holds the system in the state of unstable equilibrium. This principle has an obvious corollary. Should the system actually be in a situation of stable equilibrium and the actors perceive otherwise and attempt to change it then they will fail. There are only too many examples of issues which are identified and then forgotten because attempts to resolve them have failed. Similarly , it has been estimated that something around 80%

of TQM programmes remain incomplete. In the latter case there is strong anecdotal evidence to suggest that actors act in order to negate the effect of initiatives; that they find ways of appearing to conform while actually sabotaging the initiative.

CONCLUSIONS

The general model of discontinuous change presented earlier has been applied to one particular concept, initiators, and to one dimension; actors' perceptions. Clearly this offers a very limited subset of all the situations available. Nevertheless we would argue that it offers both insights and possibilities for further research and for further theorising. In particular it will be important to identify the dimensions which define the unstable equilibria and to model the actual processes of rapid change. It will also be fruitful to examine more thoroughly the relationship between dynamic stability and change and continuous and discontinuous change. The goal would be to incorporate them all within a single framework. Finally it may be that the complexity of network research is, for once, an advantage since it offers the possibility of identifying dimensions which are less explicit in simpler change situations.

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