

From Variables to Event Based Models of Business

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Abstract

Narrative Sequence Methods are an alternative to the more established, variables focused, variance based methods of developing theory of business development and change. We examine the assumptions of variance based approach and compare them to those of narrative methods, which leads to a discussion of the nature of causal mechanisms. We then illustrate the use Narrative Sequence Methods to identify some of the mechanisms underlying the internationalization of an intermediary in the electronic component industry, where internationalization can be interpreted as a form of innovation and entrepreneurship. We show how these methods, whose value is being increasingly recognized, allow us to introduce time, timing and temporal processes into the systematic analysis of business behaviour and evolution and to generate usable knowledge for managers and policy makers.

Introduction

Variables focused, variance based methodologies (VM) dominate research in most business disciplines. Theories are proposed in terms of one or more dependent variables being the result, directly or indirectly, of various independent or predictor variables, such as the performance or some behaviour of a firm being explained in terms of various attributes of the firm and its environment. Theories are tested by developing measures of the relevant dependent and independent variables and accounting for variance in the dependent variables in terms of some linear configuration of the variance of the independent variables using various multivariate techniques. In addition most empirical studies are cross sectional, gathering data at one point in time across a sample of relevant people, organisations and/or situations. VM has its origins in the way Western cultures seek to portray and understand the world in which they live. As Nisbett (2003) points out, Western cultures from Greek philosophers on see the world in terms of objects that can be separated from their context and studied as isolated units having particular essences or attributes.

Whereas, Eastern cultures find it difficult to make such distinctions and see the world in more holist terms as a mass of ongoing interpenetrating substances or processes rather than a collection of discrete objects.

While VM and associated methodologies are obviously useful and have contributed much to the development of our understanding of business, a focus on variables obscures our view and understanding of the actual processes taking place. Variable based studies implicitly assume some underlying behaviour taking place through the press of the variables at work but variables do not behave actors do, including people, organisations and other entities, and it is through their actions over time that the processes of development, response and evolution play out (Abbott 2001b). All behaviour takes place over time in a specific context, which includes when and where it takes place, the actions and reactions of others, the history of past actions and interactions, anticipations of the future and broader social, economic and material dimensions. VM tends to ignore time, history and sequence effects and to de-contextualise the focal phenomena, in order to seek general covering laws linking variables.

In order to focus attention more directly on the ongoing processes taking place we require different methodologies. Such methods have a long history in disciplines such

as sociology, history and political science, that focus on dissecting large-scale processes and structures to provide insights into epochal social, economic or political transitions and to identify underlying patterns and micro and macro processes of change. Such processes cannot be studied without recognizing the importance of temporal sequences and the unfolding of events over time (Emirbayer 1996; Emirbayer 1997; Mahoney and Rueschemeyer 2003; Pierson 2004; Skocpol 1979).

“Only history can show us of what elements the present is formed, on what conditions each of them depends, how they are interrelated; only history in a word, can bring us to the long chain of causes and effects of which [the present] is the result “ Durkhiem. 1906 (in Emirbayer 1996)

Case studies may be used to reveal some of the richness of behaviour taking place over time in real life contexts. They can provide rich accounts of interwoven narratives that describe the process of change in detail (Pettigrew 1997; Yin 1994). Multiple sources of evidence are used to develop converging lines of inquiry and more convincing and accurate descriptions (Yin 1994). Yet the very diversity of detail and interwoven narratives in descriptive accounts make deriving theory challenging (Langley 1999).

To progress we need a more systematic means of studying and modeling business processes over time - that contributes to theory building not just rich story telling. As Abbott (1990) suggests, we need to move from analysis of causation in terms interaction among disembodied proximate variables to a focus on the interaction of “events” taking place over time, in which actors act and interact; to go from ‘snapshots’ highlighting simple correlation between variables, to ‘moving pictures’ in which the timing and order of unfolding events is of central interest (Pierson 2004). In this paper we outline a methodology, Narrative Sequence Methods (NSM), that is designed to deal systematically with the analysis of narratives; with processes and events as they unfold over time. These methods have been developed and refined over the last decade or so by researchers in sociology (Abell (2004); Abbott and Tsay 2000), politics (George and Bennett 2005) and history (Gaddis 2002; Roberts 1996), as well as psychology, economics, archeology (Abbott 1995) and artificial intelligence (Carley 1996). More recently other disciplines have begun to explore NSM as a counterpoint to the more common variance based methods and it fits well with research on complexity and the dynamics and evolution of social and economic systems by providing real world benchmarks for calibrating dynamic models. We

refer to this methodology as Narrative Sequence Methods, although different researchers use other terms such as process tracing, narrative analysis or historical explanation to refer to similar types of methods that are at various stages of development.

NSM is based on various epistemological assumptions about the nature of reality and what explanation means. First, social reality is viewed as an evolutionary network of social interaction, in other words as a narrative (Abell 2004). NSM aims to capture the richness of descriptive narratives but not to know everything about the context of a particular phenomenon, which is practically or logically impossible (Gaddis 2002). The point is that what is too easily dismissed as context may in fact be absolutely crucial for understanding important social processes (Pierson 2004). Causes always have a context and to know the former we must understand the later (Gaddis 2002, Tan and Wilkinson 2005). The purpose of theory is to provide explanations that accounts for the causes of unique as well as replicable events and what causes something to happen has nothing to do with the number of times it has happened; the kind of conjunction of events that VM focuses on (Sayer 2000).

Case studies tend to study phenomena at a relatively superficial level of causal explanation; to be more descriptive than theory- oriented. However, the idiosyncratic nature of a case provides the opportunity to produce knowledge about how it is both specific to and representative of a larger phenomena, such as processes of change. It also does not prevent making comparisons; representativeness does not refer to 'covering laws,' to general rules of behaviour that apply to all phenomena of a particular type, but to analytical categories (Vaughan 1992), to the various mechanisms driving change. If a defensible causal explanation can be produced in one case then the constituents of that explanation provide a legitimate basis for theory development beyond that case (Easton 2003).

A single case confronts the researcher with aligning the research process with the philosophical bases of making causal claims in a given context produced by real processes. How do we go about our research so as to provide a "representative" case? How, if causation is complex, do we know the cause of anything? The researcher must start by trying to be explicit about the theoretical lenses informing their approach to understanding, iterating between theory, data and conceptualisation in an abductive manner (DuBois and Gadde 2002). The conception of the research changes over the course of the work, which contrasts with research methods that start with

hypotheses, instruments of data collection and analytical procedures specified in advance (Platt 1992).

The rest of the paper is organized as follows. We begin with an examination of the basic assumptions of the VM and compare them to NSM. We then describe NSM in more detail and illustrate it by mapping some of the causal mechanisms arising during a period of internationalization of an intermediary in the electronic components industry (Andersson 2002).

Variance Based Research Methods

In a series of articles Abbott (Abbott 1993; Abbott 2001b), Abell (Abell 1993; Abell 1987) and others (Poole and H.Van de Ven 2004) have discussed the various assumptions underlying traditional linear multi-variate methods and how they can obscure our understanding of the causal processes at work. The argument may be summarized in terms of the following assumptions

Assumption 1 – Fixed Entities with Attributes.

Variable based methods assume the existence of fixed entities with varying attributes or properties, which are the variables to be measured. These entities include people, organisations, as well as nations, cultures and environments. Using explained variance, or some goodness of fit statistic, dependent variables are summarized parsimoniously in terms of various independent variables and permit generalization to a relevant population. The functional specification of these relationships and the estimated parameters of the models are often given a causal interpretation formulated in terms of a covering law, such as that firm characteristic X leads to, is an antecedent of, or affects outcome Y. This is done despite knowing that correlation does not mean causation (March and Sutton 1997). There is a necessary connection between explanation and generalization in that one can not invoke causality without generalization (Abell 1987).

There are reasons to question the continuity of fixed entities, especially when the dependent variable in question is a social groups such as a firm. Firms merge, new firms arise and existing firms go out of business, spin off other firms and separate into different independent firms. Such changes are key events in the history of the firm but are excluded from consideration in VM. (Abbott 2001b).

Assumption 2 – One Way Causal Flow

VM require independent variables to maintain constant relevance. Causal factors are assumed to operate homogeneously across cases and flow from large units to smaller ones, but not visa versa (the firm may affect its members but not the other way around), ruling out such factors as: the influence of critical events, multiple causes operating unevenly in different parts of the firm at different points in time; and causes operating across different time scales and sequences of events that chain together in a contingent fashion. Decisions and events have both short term and long term effects and may be more important at some times than at others or at different stages of a person's or firm's development (Abbott 2001b). It is very difficult if not impossible for VM to capture the effect of non proximate variables, that a respondent may not be aware of or remember and which have their impact over varying time periods (Poole and H.Van de Ven 2004). Some causes may entail threshold effects, where processes have a modest or negligible impact until some critical level is reached, triggering major changes. Lagged variables, nonlinear terms and interaction effects are used to partially address these problems but their identification, let alone measurement, depends on our knowledge of the underlying processes driving behaviour over time.

Assumption 3 – Univocal Meaning

VM restrict the causal meaning for a given variable on another variable to one form within a given study. But a variable may take on different meanings and have different types of impacts depending on the context and interpretation of the actors involved. This again points to interaction effects between context and the nature of the impact of an independent variable but, as Abbott (2001b) argues, variance analysis puts main effects first and treats interaction effects as a necessary evil. Yet social and business life happens in unfolding events generated by interaction between multiple actors suggesting that interaction effects should take precedent. The challenge remains to reconcile ambiguous and complex causal mechanisms with the need to interpret the constituent relations.

Assumption 4 – The Absence of Sequence Effects

VM generally assume that the causal sequences of effects and the temporal sequence of outcomes do not influence outcomes; that the paths of causality remain unchanged and the dependent variable remains dependent (Abbott 2001b). However, some

processes operate in causal chains in which feedback effects occur, such that the independent variables become dependent variables. For example, many studies examine the way market orientation or other firm characteristics drive performance but ignore the effect of performance on perceptions of performance and on a firm's incentives to become market oriented (Wilkinson 2005). Over time the nature of a causal link can change, as when a firm's resource advantages lead to matching investments by competitors, thereby reducing their impact (March and Sutton 1997) or when prior knowledge and experience suddenly becomes important because it enables a person or firm to recognize the potential value of a new idea or invention (Shane 2000). In industries subject to network externalities such as the Internet, faxes or operating systems, the process of development leads to a winner take most outcome (Economides 2001) because of the way networks evolve over time (Ball 2005). Once advantage is achieved positive feedback tend to lock-in a particular technology and exclude competitors (Arthur 1996). The impact of firm characteristics is unimportant compared to historical accident and early mover advantages and would thus be overlooked in a variables based study.

Assumption 5 – Case-wise Independence

History plays out as a series of events with multiple complex causal mechanisms in which the social determinants are likely to be closely related to each other. However, closely related independent variables create statistical problems of collinearity, which lead to the exclusion of some variables, or to reducing multiple correlated independent variables to one variable through methods such as factor analysis, thereby losing any detail of deeper processes and factors at work (Abell 1998). VM also require case wise independence of the dependent variable, which is problematic when people and firms are embedded in networks of interacting and interdependent actors (Wilkinson 2001, Wilkinson and Young 2005). Part of the explanation of a person's or firm's actions and performance is in terms of the other people and firms they are connected to and their position in relevant networks. In other words the interdependence among cases is of central importance and needs to be directly addressed not ignored and suppressed.

Assumption 6 – Independence of Context

VM assume the causal effect of a variable can be isolated from its context in time, that this does not vary as other variables change, nor is it redefined by its own past. Including interaction effects can handle some of these issues. Over time industrial markets have become more complex, involving interactions between an increasing number of interdependent actors across industries, markets, technologies and nations. This increases the likelihood of unanticipated and potentially important second and third order consequences outside those originally intended. The outcomes of a firm's actions depend on the way others are reacting to it at the same time it is reacting to them and it is not possible to trace the outcomes to the individual actions of actors (March 1996) and what kind of adjustments lead to better results (Pierson 2000). Variable based methods treat unanticipated consequences as unexplained variance (Abbott 2001b)

Causal Mechanisms

Herbert Simon believed “to ‘explain’ an empirical regularity is to discover a set of simple mechanisms that would produce the former in any system governed by the later” (Augier and March 2004, p. 5). NSM try to explain the way things happen over time by identifying driving causal mechanisms in the spirit of Simon. While processes are descriptive explanations, when causal powers can be attributed to these process they take on the form of causal mechanism (Stinchcombe 1991). These are analogous to the kinds of explanations a bio-chemist, chemist or physicist uses to explain how our bodies work and chemicals, atoms and molecules behave. They conduct experiments and make controlled observations to identify how things happen and explain them in terms of physical, electrical and chemical forces. In social and business science we are limited in the kinds of experiments we can conduct to examine the effects of different factors. We are restricted to study what nature and business has left around for us to study and this results from one play of the tape of life – business life as it is (Langton 1989) . We cannot replay actual business behaviour and observe outcomes under different conditions to see what might have happened, except in very limited ways. As a result we are forced to identify causal mechanisms in other ways.

Explanation via causal mechanisms as opposed to statistical association exists in various disciplines (George and Bennett 2005; Hedström and Swedberg 1998; Roberts 1996; Stinchcombe 1991; Tilly 2001) and philosophy (Bhaskar 1986; Sayer

2000), where causal mechanisms focus on the internal and external behaviour of actors and their interactions, including people, organisations of people and inanimate objects as passive actors. There is no established categorization of causal mechanisms in social science. Instead they involve a mixture of the psychological, social, economic and physical forces at play in any situation and how they interact with each other over time. The aim is to account for the way actions and events are interconnected over time, how one thing leads to another, through the operation of these forces. Sequences of interrelated events or narratives can be described and explained at different levels of aggregation, from the more macro system levels of the firm, industry, network or nation to the more micro level of individual behaviour and cognition. Causal mechanisms also involve reconciling micro and macro processes and phenomena, to show how macro processes and outcomes emerge from or are at least consistent with micro-level processes and interactions.

Narrative Sequence Methods

A variety of approaches to narrative methodology have been developed to map and model sequences of events and their interrelations. Some are concerned to compare and contrast sequences of events across a range of cases, others focus on deriving causal explanations for the sequences observed. Despite these differences there is an underlying similarity of method that involves one or more of the following steps.

1. Identifying and classifying the kinds of events taking place, including the decisions, actions, reactions, consequences and interpretations of those involved.
2. Systematically identify narratives - the sequences of events that occur over time and place and how they are or are not connected (Abbott and Tsay 2000; Abell 2004; Abell 1987). This includes both intended or unintended consequences of the actions of actors as they have occurred or have been reported as occurring (Easton 2003).
3. Identify the causal mechanisms that drive the flow of events in terms of various types of psychological, social, economic or physical forces that account for the observed behaviour of actors over time (Sayer 2000).
4. Identify the nature and structure of the micro and macro entities that are produced, reproduced or changed through the operation of these causal

mechanisms over time. These entities are the structures or “stocks” resulting from the ongoing flow of events. They may be characterized in terms of four dimensions: (a) *activity structures* such as actor roles, activity links within and between firms and people; (b) *actor bonds* within and between people and firms such as trust, dependence, understanding and commitment; (c) *resources ties* within and between firms and people such as adaptations in products and processes and equipment; and (d) *schema couplings* within and between firms and people such as individual and shared mental models and plans, cooperative strategies, expectations, memories, and beliefs (Håkansson and Snehota 1995; Welch and Wilkinson 2002). These structural outcomes are not fixed but represent a snapshot of the ongoing processes at a point in time; they are continually in a process of being and becoming, in influencing future actions and reactions and being influenced by those actions and reactions and their consequences. They trigger, block or modify the actions of causal mechanisms and reproduce or change their physical or social impact in the future. (Sayer 2000).

We consider each of these steps in turn.

1. Classifying Actions and Events

A central issue in NSM is distinguishing between different types of actions and events. Sometimes this is done empirically in terms relevant to the specific domain of study and techniques such as inter-rater reliability are used to identify reliable and distinguishable categories of action (Sabherwal and Robey 1993). But more theoretically driven taxonomies have also been suggested (Abell 1987; Heise 1990). Abell (1987) has proposed a classification of eight types of action that can take place in a narrative. This is derived from three underlying dichotomous dimensions - doing unintentionally versus doing intentionally, doing actively versus forbearing to do, and doing positively versus preventing. These are then attributed to the actors in a narrative and placed in four separate contexts; intentional premises of action, cogitative premises of action, actual preconditions of action and consequences of action.

While narrative analysis focuses on explaining actions in terms of other actions or events a number of factors need to be taken into account in explaining a given action. Abell (1987) identifies four types of contexts that are relevant. First, is the history of

prior actions and events and their outcomes that come to bear on the focal action or event. Second, are the environmental conditions that are not the consequences of prior action by the focal actors. Third, are the beliefs, values and attitudes of the actors involved which stem from their prior socialization and which stem from relevant prior social actions and interactions. Fourth, are the strategies of the actors and their perceptions of what other actors may do, concurrently or subsequently. Abell's scheme provides a useful way of classifying actions but rests on the assumption that all actions reflect intention, whereas, as Abbott argues, we should remain 'explicitly agnostic' about the source of actions. Moreover, Abbott argues we should challenge the focus on actors acting and instead makes the existence of actors problematic and something to be explained as part of the analysis (Abbott 1996; 1990; 2001b). In this view actions are the primary units of analysis and the existence and identification of actors is explained in terms of the patterns of actions over time that define them, as opposed to being presumed to exist at the outset. People are biological and their bodies are open systems reconstituted over time by the repeated creation and use of chemicals and proteins to form our bodies and systems from the food we eat and the environment we live in. People play different roles in firms and organisations and in these roles are the actors in the firm. Roles are defined in terms of repeated patterns of action and interaction with other roles. Different people may play the same role over time and a role may evolve into a new type of role, which in effect creates a new type of actor in the firm. Similarly, firms are defined in terms of repeated patterns of action and interaction, both internally and externally, carried out by people playing different roles. The actual people or actors that give rise to these patterns of action and interaction change over time as people enter and leave the firm and change roles, even though the firm remains an identifiable actor through time. Over time the patterns of action and interaction among firms change giving rise to different firm, industry and network structures or dissipative structures (Wilkinson 1990).

Despite these differences both Abell's and Abbott's approaches attempt to account for narratives in terms of action that brings about outcomes – events, and this is explained in terms of the actions from which they eventuate. Events are the meaningful parsing of interconnected actions over time and place (Abell 1987). Events differ in their temporal duration and therefore boundaries becomes defined and evolve over time in terms of developing patterns of action and interaction with other actors, or what

Abbott refers to as a ‘systematic dimension of difference’ of social space or ‘proto-boundaries’. We may see this not just as the drawing together of biological individuals, but individuals with similar thinking, prior professional experience or knowledge or indeed views of the world (Abbott 2001b). It becomes clear that events may overlap, be nested or relatively long events may be decomposed into an enchainment of smaller events. We illustrate the parsing of a narrative into events in the illustration below.

2. Identifying Narrative Sequences of Events

A number of rules guide the researcher in mapping the course of events that lead to the outcome to be explained. First, it is important that the researcher defines the explanandum, the outcome to be explained, precisely (Roberts 1996). Outcomes we may think of as an event, the change of state of an object, suggesting something that happens at a point in time. However events “occur”, “happen” or “take place,” suggesting the passage of time (Abbott 2001a; Jervis 1997). An example from history illustrates this well. A battle may be viewed as an important event that changed the state of affairs of a country, as the Battle of Hastings changed the state of England (Wason 2003). However, within any battle there are many sub or micro-events within the macro-event that play out during the battle. Thus, in explaining the course of a battle it may be necessary to include narratives of the course of events that play out in a particular skirmish or within the infantry, the cavalry, or the archers. Simultaneously events play out with various groups on both sides of the battle. These may be independent or interdependent, intersecting at a point in time on the battlefield (place). Collectively these explain the course of events of the battle. It is this multiplicity of sub-events within events that makes it mandatory that the researcher define the explanandum exactly.

The second rule is that the researcher works backwards from the event to be explained or from a particular aspect of the event that is to be explained as part of a wider explanation. While history is “lived front to back” narratives are built backward through time (Abbott 2001b). To explain the outbreak of civil war in August 1642 a historian begins with Charles I raising his banner at Nottingham and with royalists flocking to that banner (Wason 2003). Providing causal explanation involves tracing back the chain of events that lead to this outcome.

3. Mapping Causal Mechanisms

The next stage is to construct temporal maps of events over time to reveal how events occur before or after others in time and which are connected to each other in some way e.g.; through an actors memory and experience; expectations of future events; through communication and other forms of interactions between actors related to events such as meetings or communications between them, media reports of pending actions; or direct feedback from clients or market research.

Case Example. To illustrate this and other stages of NSM, we draw from a case describing the internationalization of an intermediary (JHE) in the electronic component industry to illustrate various causal mechanisms. At the beginning of the period in focus global markets were characterized by smaller national and regional suppliers, wholesalers and buyers, but ended to a large extent with large, global actors after an intensified and concurrent period of internationalization during the 1990's (Andersson 2002) The events were classified by us based on the case description provided and no attempt has been made at this point to address the reliability of this classification.

Figure 1 shows a partial map of the sequence of 'global' events taking place in the case. Time flows down the table and each horizontal cut through the table constitutes a time period, in much the same way that a simulation might show the pattern of changes in a set of variables over time resulting from their interactions (Wolfrom 2002). The vertical lines represent different actors that exist through time and are involved in various events in the case. Other events and actions in which they are involved could be germane (e.g. going to lunch, chatting with a mate) but there is no information on these and hence they are ignored. Actions in focus are represented by the symbol ●, while those out of focus are shown in grey ●. The lines connecting actions represent our interpretation of 'leads-to' links between events across actors and context. Arrows-in indicate a prior history of relevance to the actor. Dashed grey lines indicate event boundaries.

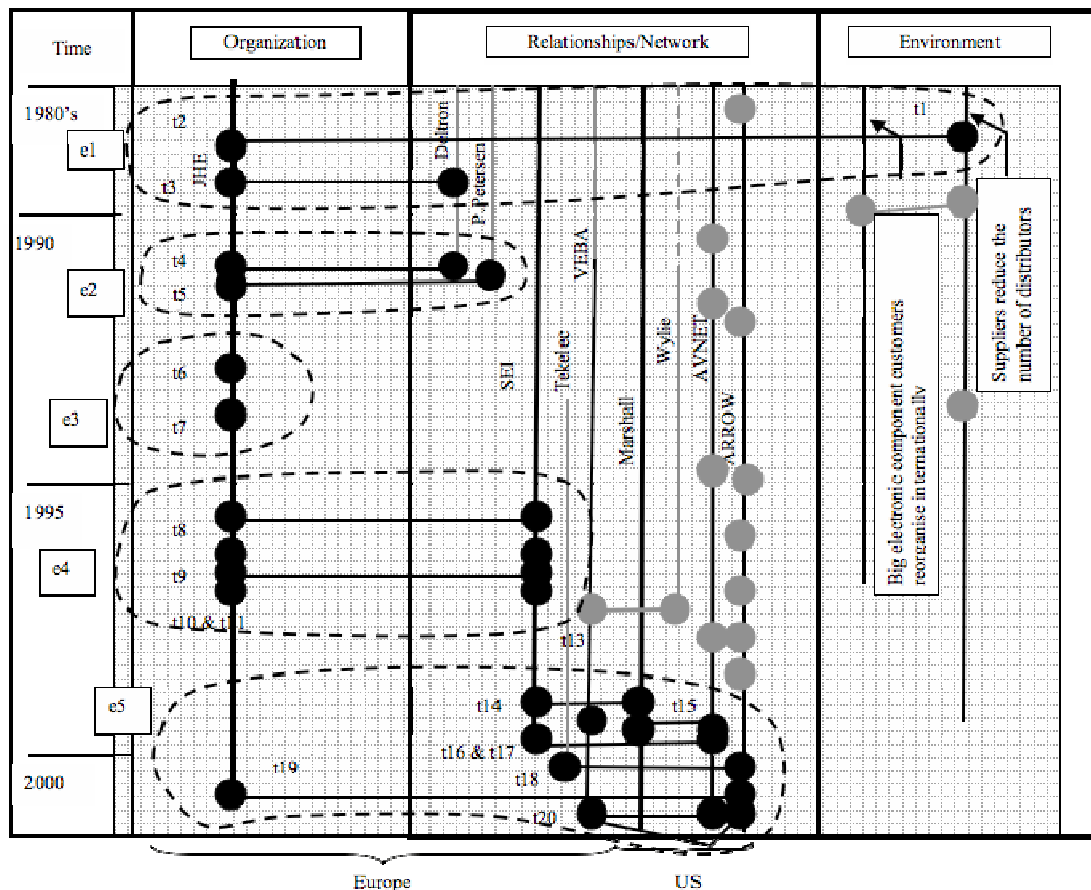


Figure 1 Narrative Sequence Map of the Internationalisation Case

In the case, causal mechanisms may take a number of forms and we attempt to map these systematically using a series of directed graphs (digraphs) (Abell 1987). This brings clarity to our illustrations and avoids getting lost in the labyrinth of connected and intersecting processes involved. In the following we discuss the issues that confront the researcher seeking to identify causal mechanisms in mapping narrative sequences.

Linear Explanation – this involves following a chain of events or conditions through the web of other events. Starting from the event to be explained the researcher selects each time the most disruptive or important driving prior event to which it is linked and so on until it is linked it to other prior events in a series of steps - in effect a series of causes and effects.

A narrative table, like Table 1 documents the chain of events to be explained. Figure 2 represents an example of a linear explanation of JHE's internationalisation process

during the 1990's. First is the expansion into Nordic countries through acquisitions, followed by an attempt to create a pan-European business through a strategic alliance with SEI. Finally, the alliance is broken as first SEI and then JHE were acquired and integrated into the global networks of the two biggest American distributors, Avnet and Arrow.

Table 1 Narrative Table

Event	Abstraction
e1	Suppliers centralize marketing and create regional markets
e2	JHE expands by buying wholesalers in Nordic countries
e3	JHE further expands in Nordic region through Greenfield investments
e4	JHE joins SEI in a strategic alliance
e5	JHE & SEI coordinate handling of key customer relationships
e6	Avnet acquires SEI
e7	JHE acquired by and integrated into global Arrow organization

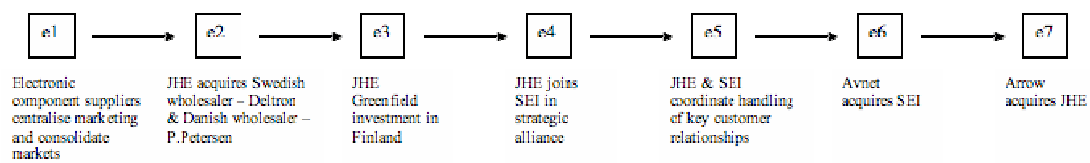


Figure 2 Linear Explanation of Internationalisation of JHE

Linear explanations such as this are simplistic and leave out a great deal. The researcher is constantly faced with problems of choosing among a variety of possible “disruptive” events that may contribute significantly to a focal outcome. There is also a problem of infinite regress or how far one goes back along the chain in search of a “beginning.” This is a matter of judgment for the researcher and the emphasis of the explanation to be provided (Gaddis 2002). The beginning may be a prior turning point, crucial event or the point in the past where the normal chain of events ceases to endure or began (Roberts 1996).

Convergent Explanation is where not one but a series of conditions fan out as narratives are traced back in time from the explanandum. The researcher treats each event as an explanandum and maps the conditions that caused the occurrence. This adds a daunting array of sequences to be mapped and explained, requiring some explanatory closure by shortening the number of narrative sequences that deserve inclusion. The researcher must decide which is more important and or somehow weight the alternative events that are potential explanations (Roberts 1996). One way is to distinguish necessary conditions from the sufficient conditions (Krieger 1994; Sayer 2000), but this risks subjectivity as the researcher may arbitrarily identify a causal explanation and intentionally ignore others. However, historians do this as a matter of course and favour multi-causal over uni-causal explanations, or select the necessary cause and assume all other things being equal (Gaddis 2002). While this may address the issue of closure it does not weight the causes. It may be possible to identify the cause that departs most from the normal course of events. It may be that this remains the judgment of the researcher, which raises a problem of the precision of interpretation rather than divergence in judgment. In many situations it is a case of explaining macro-events by tracing the complex and intricate micro events that comprise them through a process of analytical colligation, the procedure by which the researcher proceeds from description of an event to the discovery of the actors and the etiology of their actions (Roberts 1996).

To argue that a particular sequence was crucial appeals to counterfactual argument, that had it not happened there would have been a different outcome. In practice this involves weighting the consequences of alternatives, only one of which is realized, as a way of identifying key causal sequences. Appeals to counterfactuals can be problematic. It is safer to infer causal relationships where only one step in the sequence is concerned, or where succeeding steps are predictable. However, it is dangerous to appeal to counterfactuals that extend over a long sequence of events, as each step in the sequence multiplies the possibility of error (Roberts 1996); the more remote the causal event the more difficult proving the enchainment or flow of the cause. At each step there may be concurrent causes about whose presence or absence the researcher may be ignorant, or some things may have simply happened by chance (Rescher 1995). While some events may be observable at the time, we only make sense of other events well past the point when they take shape. Sometimes we can

only make sense of past events through events that happen in the future (Abbott 2001b).

Figure 3 demonstrates how the internationalization process of the focal firm JHE converges with that of SEI and is eventually influenced by the concurrent internationalization processes of both Avnet and Arrow.

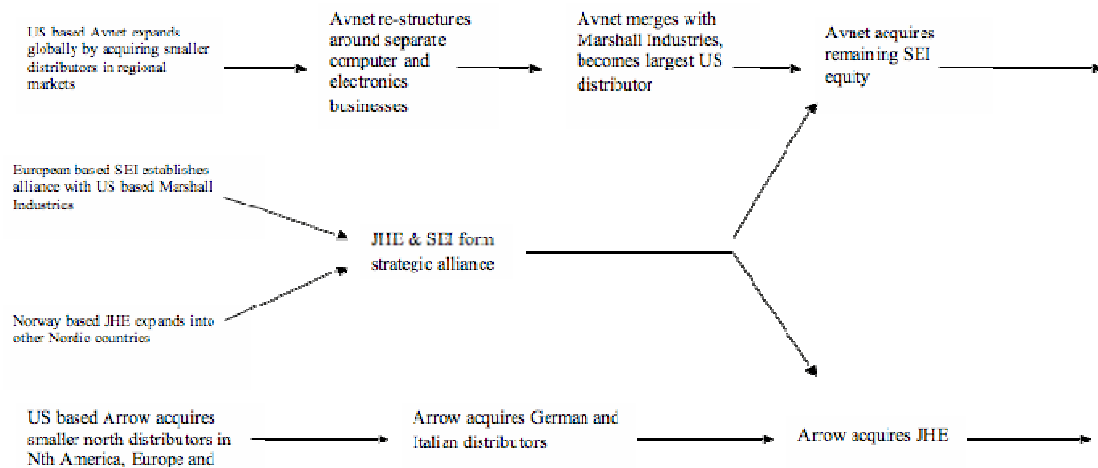


Figure 3 Example of Convergent Mechanisms influencing JHE's Internationalisation Process

It may not be necessary to trace each sequence backward in time because some sequences play a more important role in explaining the eventual outcome. This may vary depending on what the researcher seeks to illustrate. The researcher may distinguish causes from means, focusing on those causes necessary at the expense of those merely sufficient causes in order to be parsimonious in providing explanation. These may be crucial events which deserve emphasis, such as critical junctures or turning points, abnormal events from which the normal or predictable flow events diverges (Gladwell 2000).

A focus on conjunctures sheds light on interaction effects between processes that become linked at particular points in time and generate causal sequences depending on relative timing. Some causal processes operate more rapidly than others and are constrained by slower moving processes. Others are subject to threshold effects and still others involve chains with several links and require some time to work themselves out (Pierson 2003).

Divergent explanations focus on the way one event leads to diverse events. Not all divergent sequences may be relevant, some sequences are blind alleys that do not lead to a relevant explanandum event. The existence of genuine and preempted causal sequences leads to consideration of over-determination as applied to the existence of alternative causal sequences of events. Here the researcher may resort to counterfactual arguments to distinguish between a genuine or preemptive sequence of events (Roberts 1996). Events may occur at the intersection of independent causal sequences. These sequences may be somewhat regular and predictable but by chance intersect at a particular moment in time and space, highlighting the role of contingency, chance and luck in the unfolding of events. This raises the issue of the unpredictability of the course of future events. The mapping of sequences can illustrate and explain the causes of events after the event occurs but the role of contingency and chance makes prediction impossible, except where there are predictable causal sequences or where equifinality (Von Bertalanffy 1950) prevails, such that many alternative paths lead to the same outcome event. Abbott argues that ‘at the institutional level there are a variety of mechanisms propelling stories forward: choice, accident, functionality, institutionalization, historicism, force and so on.’ (Abbott 2001b). While some events are the result of rational actions, others may be irrational, happen by chance or be the result of tradition or various forms of social influence. Figure 4 traces the impact of the formation of the strategic alliance between JHE and SEI, showing how a number of processes eventuated influencing the internationalisation path of JHE.

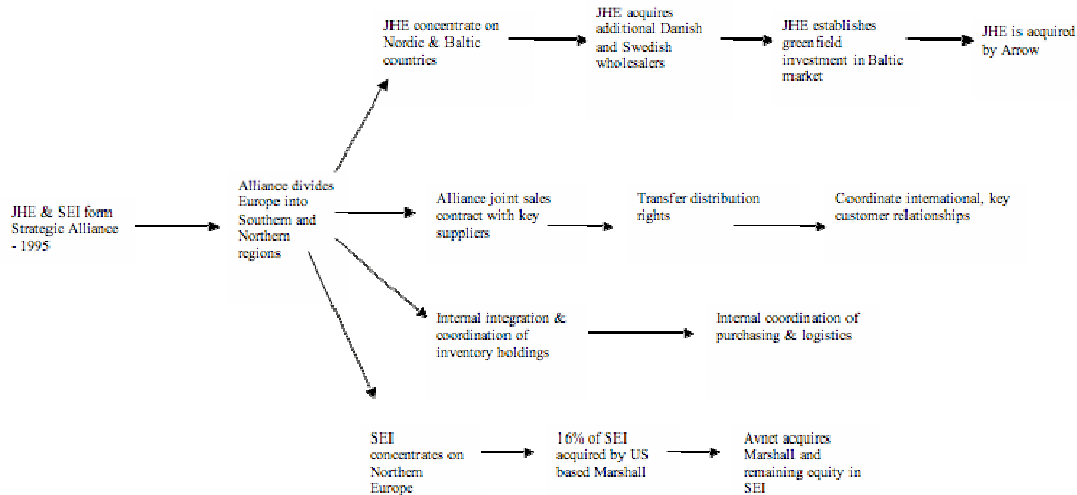


Figure 4 Divergent and Parallel Explanation

Micro Explanations. Narratives may be expressed at different levels of abstraction. Progressive uncovering of detail allows for different levels of abstraction in a process of colligation, while maintaining the essentials of the narrative. Narratives are compared by looking for sufficiently similar patterns, or enchainment of events, across similar levels of abstraction, in which case generalization is possible. Abell expresses this as ‘homomorphism’ – combining abstraction and generalization rules such that we can determine if at some level a series of narratives can be regarded as identical (Abell 1993; Abell 1987).

In seeking to explain the course of events, a lack of evidence may hide connections between relevant events and therefore hide changes of direction or conceal key turning points. However gaps in narratives may be bridged by looking to further micro-analysis in a quest for ever finer detail and identification of the intentional, or otherwise, actions of a purposeful actor. Knowing which micro events are related may be achieved by identifying correlations between earlier and subsequent events for which evidence exists but they still require narrative explanation. For example, while it is possible to explain JHE’s decision to expand into other Nordic markets at a macro level in terms of the strategic decisions of electronic component wholesalers, Figure 5 demonstrates how key micro-events drive these surface events and more fully explain the outcome.

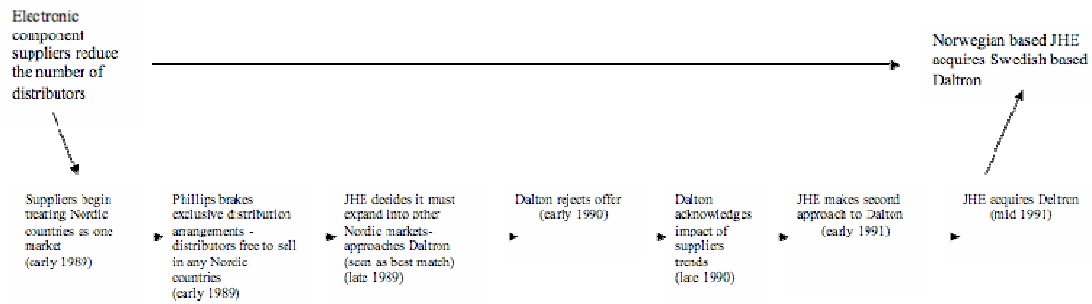


Figure 5 Micro Explanation

Parallel Explanations. The pursuit of micro explanations often leads to parallel sequences of events. For instance it may be necessary to explain the actions and events that relate to a number of actors or objects, taking place over the same time frame in order to explain an outcome event. Each parallel sequence may continue to play out independently but explaining them collectively is crucial to explaining an aggregate outcome. Conversely, some sequences may eventually converge on a single event, parallel sequences become convergent and the actions and sequences of events of separate actors therefore become concurrent causes of a single event (Roberts 1996). Figure 4 illustrates the parallel process that resulted from JHE and SEI's strategic alliance and the process of adapting their operations in order to better manage key customer and supplier relationships.

Cumulative Explanation involves causal processes that permanently alter the structure of the state of the explanandum (Stinchcombe 1968). Here the researcher maps the cumulative changes in the structure of the state which is to be explained as a result of actions and reactions – the events that have played out. Such structures involve any one or more of the dimensions described above. As noted, agents and structures are mutually constitutive, as structures resulting from past actions shape subsequent action but are themselves reproduced or changed by these actions (Roberts 1996). We may map the events leading to the development and evolution of structure. These may be the accumulation of a critical mass or the triggering of tipping points in which existing structures are broken down and new structures created. Events occur subject to many structures or institutional rules governing behaviour in the sense of North (1993). The researcher must decide which of these structures are central to explaining the outcome of interest. For example in the case, moves by the large component

wholesalers in the early 1990's to centralize their marketing and consolidate national markets into three large regional markets, Europe, America and Asia, provided the initial impulse for changes within the distributor network that lead eventually to this market being dominated by a few large global firms.

Feedback Effects. Events can trigger feedback mechanisms that reinforce or undermine the recurrence of particular outcomes and patterns into the future. Feedback is positive when change in one direction sets in motion reinforcing processes that produce change in that same direction; negative when change triggers processes that counteract the initial change and return the system to something like its original position. Positive feedback therefore generates change and growth while negative feedback produces patterns of stability (Sterman 2000; Stinchcombe 1968). Positive and negative feedback can operate independently, for instance across different geographical areas, departments, teams, groups etc. In other instances feedbacks interact with positive feedback operating for a period of time only to be replaced by negative feedback, or the reverse, as the state of the system changes. Events in one period may influence what will happen in another era, sometimes after considerable amount of time as for example happens in some of the evolutionary game theory models of emergence of cooperation (Axelrod 1984). Once JHE and SEI entered into a strategic alliance they set about removing market overlaps and coordinating the handling of key customer relationships. This required the transfer of distribution rights, centralization and internal coordination of purchasing, inventory holding and logistics. This adapting of the relationship entrenched JHE and SEI's position, leaving JHE to concentrate on the Nordic and Baltic markets and SEI to concentrate on northern Europe.

Path-dependence concerns the way earlier events, sometimes even small events, can have large longer-term effects. While many alternatives evolutionary paths may be possible at earlier stages, the path may become 'locked-in' even if it becomes inefficient or disadvantageous. Once a particular path has been followed, changing or reversing it may be very difficult and as a result crucial prior events rather than more general competitive forces may be at work in shaping how history plays out. Hence explanations in terms of the characteristics of the people or firms involved or current environment may be misplaced and misleading. The locking-in of particular

trajectories accounts for organisational inertia and shows how the dynamics triggered by an event or process at one point in time reproduce themselves even in the absence of the original event or process. The order of events can make a fundamental difference to outcomes (Pierson and Skocpol 2002).

IN the case, once JHE had entered into a strategic alliance with SEI and divided the European market between them, they were set on a path of development that left them vulnerable once SEI was acquired by the US based Avnet group. The JHE – SEI alliance was broken and JHE acquired by Arrow, the major global competitor of Avnet. How this prior history of links affected subsequent outcomes is a subject for future research.

4. Theory Development

Having worked through the labyrinth of connected and parallel events leading to the outcome to be explained the researcher has a wealth of causes to contemplate. These would be bewildering in their scope and variety were it not that mechanisms repeat one another again and again, some more than others. Any researcher seeking to explain the same outcome will therefore conclude that the same mechanisms at play have shaped events and account for the eventual outcome because they have appeared in particular ways and with particular frequency. It is this that draws the researcher to them in explaining the outcome and developing theory (Roberts 1996).

Theory development takes place through a building block approach with new cases identifying mechanisms and sub-types. Each case contributes to the cumulative refinement of contingent conditions under which particular causal mechanisms occur and contributes to a more comprehensive theory or explanation. They may also develop concatenated theories by dividing causal processes up into sequential stages or by focusing on particular episodes. Though their scope is limited, they address the important problem or puzzle that is encompassed in the research objectives. Its generalizations are contingent and narrower than those of a covering law. However the building blocks developed for particular mechanisms are self sufficient, their validity and usefulness does not depend on regularity or generalisation to other mechanisms (Bennett and George 2005; Ragin 1992). Generalisation does not have to be universal to have wide applicability, we can acknowledge tendencies and patterns

and mechanisms that don't have to work for them to be present, they retain their causal power irrespective of whether they are triggered or not (Sayer 2000)

Conclusion

There are a myriad of potential application for NSM. The research referred to here focuses on organizational and market evolution as firms internationalise. In other research we focus on the evolution of a firm over time as it commits more of its resources and actions to internet based systems and on the way interfirm relationships and networks develop and evolve. In each case, comparisons can be made with similar processes in other firms and markets to see how starting conditions, history and contextual issues shape the patterns of evolution. This will allow us to identify potential attractors that firms, markets and relations gravitate to and what types of conditions, processes and events are relevant in affecting which attractor is more likely to emerge. Any type of evolutionary or dynamic process can be studied in similar ways such as innovation, diffusion, competitive and entrepreneurial processes as well as the research processes itself.

Such research can inform the development of dynamic models of relevant underlying processes, using techniques such as agent based models (e.g. Koesrindartoto and Tesfatsion 2005). These models in turn permit us to explore alternative evolutionary paths that could arise. Lastly, the results of NSM can guide future empirical studies of the more traditional VM type, so that they can include measures of key events, conditions and sequences. In this way the causal mechanisms identified inform the empirical research rather than the empirical results leading to "just-so" accounts of why particular frequencies and correlation structures arise.

In sum NSM offers new windows into business life that complement and extend the variable-focused and variance based methods now dominant in many fields. NSM is a type of positivistic process analysis that we can use to advance our understanding of the dynamics and evolution of social and business life in ways that correspond the actual life lived by managers and policy makers. This will help sensitise managers to the often strange and counterintuitive world of complex systems behaviour of which they are a part. It will help them to understand more about the processes at work, the potential roles they can and cannot play in the process. Further, it comes close to the way managers learn from each other and share stories of how they confronted

particular issues over time, but enables these stories to be more carefully and systematically mapped, analysed and compared. But we should caution you that NSM methods are still work in progress; the methodology requires further refinement that will come from learning by doing and by opening the methods to public scrutiny and replication through the publication and dissemination of this type of research.

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