Enhancement of the Evolutionary Change Theory - A Determination of who and what matters through a study of New Zealand Electricity Industry

Hafsa Ahmed

Faculty of Commerce Lincoln University, Christchurch, New Zealand

Email: Hafsa.Ahmed@lincolnuni.ac.nz

Dr. Michaela Balzarova

Faculty of Commerce Lincoln University, Christchurch, New Zealand

Email: Michaela.Balzarova@lincoln.ac.nz

Dr. David A. Cohen

Faculty of Commerce Lincoln University, Christchurch, New Zealand

Email: David.Cohen@lincoln.ac.nz
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ABSTRACT
Alterations to social, economic, and political conditions demand that organisations change to survive under new settings. Organisational change is widely viewed as evolutionary, due to the notion of ordered change. The Evolutionary Change Theory (ECT) proposed by Van de Ven and Poole (1995) represents a mechanism of organisational change. Critiques provide a basis for examining impacts of internal/external influences on the ECT and the role of adaptation. An enhanced model of the ECT is proposed after reviewing criticisms of the Van de Ven and Poole model. Consequently, we appraise the enhanced ECT by examining changes in the New Zealand electricity industry over the past four decades by utilising a process research approach.

Keywords: change process, evolving, organisational change, theories of change, transition

‘I assert that continued growth is essential to the rational and empirical character of scientific knowledge; that if science ceases to grow it must lose that character.’
(Popper, 1989: 215)

ORGANISATIONAL CHANGE

As commentary on the growth of science, Popper’s statement must surely apply to the widest range of enquiry, both theoretical and applied. We think Popper’s view is relevant to organisational theory, as organisational theorists utilise varying paradigms to explain organisational phenomenon such as organisational change. The interaction of divergent perspectives assists in a broader yet stronger understanding of organisational change, hence overcoming the limits imposed by a single perspective (Van de Ven & Poole, 1988; Poole & Van de Ven, 1989; Van de Ven & Poole, 1995). This approach of interaction and integration has been utilised by many organisational researchers to borrow theories from other fields/sciences to explain organisational change. One example of this sort of borrowing is the metaphorical recognition of organisations as open systems similar to organisms in the field of biology (Morgan, 1996). Through this, attention was focused on organisations as if living systems. These were composed of related elements, dynamic in behaviour, holding the potential for growth and renewal (Morgan, 1996; Lewis, Passmore, & Cantore, 2008). Furthermore, the argument was formed that organisations constantly adapt, changing by responding to their environments, depending on the wider environment for the satisfaction of their needs (Thompson, 1967; Morgan, 1996; Lewis et al. 2008). However, organisational ecologists argued it was rare for organisations to deliberately adapt,
by emphasising the dominant influence of competition and the Darwinian notion of natural selection (Hannan & Freeman, 1977; Davis, 2005).

Both perspectives - adaptation and natural selection - offer a range of theories with different outlooks on organisational change (Aldrich & Ruef, 2006). While the adaptation view deems organisations as flexible by being responsive to exogenous conditions and changing, natural selection implies that organisations are relatively inflexible, resisting change, considering it difficult and hazardous (Hannan & Freeman, 1977, 1984; Amburgey, Kelly, & Barnett, 1993). The two perspectives offer independent assessments of the role of the organisation in its environment by differing on how they see the impetus for change. However, the natural selection perspective fails to acknowledge that organisations and their environments coexist and are involved in a pattern of co-creation (Morgan, 1996).

Organisational change is a vital theme in the realm of studies examining an organisation and its environment. Organisational change is now widely associated with the notion of evolution – following a path to achieve greater fitness with the environment (March, 1994). Thus, organisational change becomes an observable phenomenon captured by the process of evolution, as borrowed from biology. Arguments by critics, highlighted in the literature review section, provide us with a premise to appraise the ECT and the basis for an enhanced ECT.

The New Zealand electricity is an appropriate research setting to evaluate the enhanced ECT. This industry has undergone major changes over the past four decades and the fact that electricity reform is still very much an agenda in New Zealand confirms research on this industry has immense relevance. The research method section provides details of how the change process in the industry was examined using a process research method. The preliminary findings indicate how much of the data analysed conformed to the enhanced ECT. We also highlight implications of the enhanced ECT along with directions for future research.
THE EVOLUTIONARY CHANGE THEORY

The ECT was proposed by Van de Ven and Poole (1995) and is depicted in Figure 1. It consists of a repetitive sequence of variation, selection, and retention, with the cycle generated by competition for scarce resources between multiple entities inhabiting a population. Van de Ven and Poole (1995: 518) explain the three stages as follows:

Variations, the creations of novel forms of organisations are often viewed to emerge by blind or random chance; they just happen. Selection of organisation occurs principally through the competition for scarce resources, and the environment selects entities that best fit the resource base of an environmental niche. Retention involves forces (including inertia and persistence) that perpetuate to maintain certain organisational forms.

Critiques of the ECT

The ECT represents an important mechanism that appears to describe organisational change. Though other approaches over the past five decades have attempted to explain organisational change, we acknowledge that the ECT in its present form addresses environmental competition between entities occupying a population. However, the ECT is simply Darwin’s natural selection process (variation, selection, and retention) taken from biology and applied to organisations. As such, it has attracted much criticism from organisational thinkers. We highlight some of the arguments put forward by critics of the natural selection process as applied to organisational change.

Lack of importance given to decision making by organisational actors

The organisation is deemed powerless and weak in the ECT (Aldrich & Pfeffer, 1976). The ECT in its present form also gives limited thought towards the ability of organisations to influence the environment. Therefore, the natural selection process of variation, selection, and retention has been criticised for its determinism while denying managerial intentionality and free will (Bourgeois, 1984; Astley & Van de Ven, 1983; Lewin, Weigelt, & Emery, 2004; Aldrich & Ruef, 2006).

Generalisation of Variation-Selection-Retention process

Hannan and Freeman (1977) put forward the idea of structural inertia and propose this inertia as a cause for lack of adaptive change (Betton & Dess, 1985). Therefore, the ability of the organisation to
adapt is rendered futile by the current ECT. However, Hannan and Freeman (1977) also admit that larger organisations have unclear boundaries that make them poor candidates for change brought about by simple natural selection (Freeman & Hannan, 1983). Therefore, the ECT cannot be generalized to all organisations. It is also important to emphasise that the source of variation is argued as being random or blind (Van de Ven & Poole, 1995; Poole, Van de Ven, Dooley, & Holmes, 2000; Poole & Van de Ven, 2004). However, what remains undetermined is what happens if these variations are planned (Aldrich & Pfeffer, 1976) and what triggers these variations.

The critiques highlighted above bring into question the mechanism of natural selection as a device for explaining organisation change. Rather than discard the theory, we argue that the representation of ECT by Van de Ven & Poole (1995), whilst valuable, is oversimplified and hence incomplete.

**AN ENHANCED EVOLUTIONARY CHANGE THEORY**

The preceding discussion indicates to us that the ECT as currently conceptualized may not provide a sufficiently strong theoretical basis for our work. What is required is a theory which accommodates adaptation and the role of willful actors, both within and outside organizations. It is also vital to specify the triggers which begin the process of change. By utilising the process of variation, selection and retention as a meta-theory we can integrate ideas from other theories or approaches to develop a more comprehensive ECT (Aldrich and Ruef, 2006). We acknowledge this suggestion and progress towards offering an enhanced ECT by amalgamating views from different organisational theories. Our proposal of the enhanced ECT focuses on the following areas (a) various external environmental influences, (b) dissatisfaction as a precursor to variation, (c) impact of various stakeholders, and (d) adaptation as another stage in the ECT.

**External Environmental Influences**

As organisations are embedded within the realm of society (Hannan & Freeman, 1989), they are affected by various external influences – social, political, economic, legal, technological, and resource changes (Harrison & John, 1996; Schaltegger, Burritt, & Petersen, 2003; Feldman, 2004). We argue that these external influences create the relevant environment for organisational change, hence acting as triggers for organisational change.
Dissatisfaction – Precursor to Variation

We borrow the concept of ‘dissatisfaction’ from Van de Ven and Poole’s (1995) teleological theory of change and argue it is a precursor to the process of variation. Dissatisfaction arises due to the inability of an organisation to survive changing environmental conditions or its failure to meet desired goals. This concept has long been utilised in research on decision making and strategic planning (March & Simon, 1958; Mintzberg, Raisinghani, Theoret, 1976, Chakravarthy & Lorange, 1991), wherein change occurs as organisations have concerns with current performance/plans.

Impact of various stakeholders

It is hard to imagine organisational change without intervention by groups of individuals who have interests in activities of the business, the stakeholders (Schaltegger et al. 2003). Freeman (1984: 46) defined stakeholders as ‘any group or individual who can affect or is affected by the achievement of the organisation's objectives’. Recent definitions further classify these into one or more of various groups. Perhaps the most fundamental distinction is based on organisational boundary – internal versus external. Internal stakeholders are within the organisation and managers have direct supervisory control over them, whereas external stakeholders are those external to the organisation and outside supervisory control (Harrison & John, 1996). Stakeholders are can also be classified on the basis of importance to the organisation’s activities – primary and secondary. Primary stakeholders are those who are important for the continued growth of an organisation, whereas secondary stakeholders are those who are not engaged in transactions with the organisations but have the ability to influence primary stakeholder relationships (Freeman, Harrison, & Wicks, 2008; Clarkson, 1995; Wheeler & Sillanpaa, 1997). The existence and potential contribution of these groups to a business’ activities mandates the need to incorporate how various stakeholders can influence the individual stages of the ECT. Furthermore, we argue that an overlap exists between internal/external and primary/secondary stakeholders; this is detailed more explicitly in Table 1.

The role of Adaptation

Adaptation is often associated with organisational change; however, Lewin et al. (2004) argue that adaptation and natural selection (variation, selection, and retention) represent different levels of
change. Lewin et al. (2004) argue that adaptation is better explained at an individual organisation level, whereas natural selection is better explained by a population of organisations; however, we take exception to this view. We turn to biology, where adaptation is defined as ‘1) the action or process of adapting, fitting, or suiting one thing to another... 2) the process of modifying a thing so as to suit new conditions (Rose & Lauder, 1996: 42). We argue that adaptation is an important stage in the ECT, as it is likely that a population of organisations will adapt, for example, in the case of regulatory changes which influence a particular population.

Figure 2 represents an enhanced ECT, incorporating the aforementioned elements. We argue that this model takes us a step closer towards developing a more comprehensive organisational change theory. In order to empirically test this enhanced ECT, we selected the New Zealand electricity industry. This is justified on the basis of the wave of change in the New Zealand electricity industry during the mid-1980s (Bertram, 2006). The industry continuously evolved through the past four decades; hence it provides the ideal research setting. The following section provides an outline of the New Zealand electricity industry.

[INSERT FIGURE 2 ABOUT HERE]

NEW ZEALAND ELECTRICITY INDUSTRY

With an estimated current population is 4,405,200 (Statistics New Zealand 2012) and electricity consumption of approximately 40,000 gigawatt hours (GWh) per annum (Electricity Authority 2011), demand for electricity is forecasted to rise 1.5 per cent per year due to economic growth and increasing population size. Ministry of Economic Development figures suggest that New Zealanders spend $6 billion a year on electricity, which is comprised of residential, commercial, industrial, agricultural, forestry and fishing consumers. Figure 3 provides an estimate of sector-wise electricity consumption in New Zealand. Consumers purchase electricity from 18 retail brands, which is then supplied to consumers by 29 distribution companies (Electricity Authority). However, prior to the reforms of 1984, electricity was provided through two types of electricity supply authorities (ESAs): Municipal Electricity Departments and Electric Power Boards (Bertram & Twaddle, 2005).

[INSERT FIGURE 3 ABOUT HERE]
Reforms were initiated by the newly elected Labour party government in 1984, which was faced with a severe economic crisis due to rising public debt, a foreign exchange crisis, and an inflation rate of 15 per cent (Scott, 1996). The reform objectives primarily involved moves to increase profitability of state-owned entities through revenue maximisation, which was achieved through corporatisation (Bertram, 2006). The succeeding National party government in 1990 extended its predecessors plans (Wilson, 1997) by separating transmission and generation. Thereafter, generation assets owned by one state-owned enterprise (Electricity Corporation of New Zealand) were split into four big competing enterprises – Contact Energy, Meridian Energy, Mighty River Power and Genesis (Bertram, 2006). Figure 4 provides the structure of the industry, post reforms.

[INSERT FIGURE 4 ABOUT HERE]

Since the mid-1980s, the industry has also had other significant events contributing to changes. Table 2 summarises these changes in the New Zealand electricity industry by highlighting critical events. In order to examine the change process in the New Zealand electricity industry from mid-1980s until end of 2011, we considered process research to be an appropriate method.

[INSERT TABLE 2 ABOUT HERE]

RESEARCH METHOD

For organisational change research to be theoretically sound and practically useful, it needs to explore the context, content, and process of change over time (Pettigrew, 1990; Van de Ven, 2007). Process research is an appropriate method to examine forces influencing change in this context (Poole et al. 2000; Van de Ven, 2007). Process research is useful as it provides an understanding of how entities adapt, change, and evolve over time (Van de Ven, 2007; Hernes & Weik, 2007). Although many argue that process research is a recently developed approach, its roots can be traced back to Greek and Roman philosophers (Hernes & Weik, 2007). The literature outlines different definitions of the term ‘process’; however we focus on one definition which is especially relevant to our research – process as a narrative describing how things develop/change by temporally examining the sequence of events (Mohr, 1982; Van de Ven, 1992; Poole et al. 2000;). Figure 5 provides a detailed explanation of our research method. We highlight here the important aspects of the process research method utilised to examine the enhanced ECT.
Data Collection

The process research method is grounded on the methodical investigation of a series of events (Poole et al. 2000), and consists of identifying linkages amongst and between ‘what happened and who did what when – that is, events, activities, and choices ordered over time’ (Langley, 1999: 692). Poole et al. (2000) argue that time is an important element in any process research; therefore, the researcher needs to collect longitudinal data by either observing change in real time or by relying on historical, archival data. For this research we are relying primarily on archival data relating to the New Zealand electricity industry, beginning with 1984 through to the end of 2011. Data was collected from five different newspapers, journal articles relating to the New Zealand electricity industry, OECD proceedings, IMF reports and papers published by various Government agencies such as the Treasury, Commerce Commission, Crown Ownership Monitoring Unit and Electricity Commission/Electricity Authority. The data collected was then organised sequentially into what is referred to as ‘incidents’ (Abbott, 1984; Poole et al. 2000). A total of 331 incidents were identified as relevant to the industry and this investigation.

Data Analysis

Each incident is an indicator or qualitative summary of what has happened, as publically reported. The next step is the identification of theoretical meaningful ‘events’ from this incident data (Poole et al., 2000; Van de Ven, 2007). We identified the following as event categories for our research: (1) Dissatisfaction, (2) Variation, (3) Selection, (4) Retention, and (5) Adaptation. Before coding data it was important to highlight how the events would be mapped (Poole et al., 2000). This research utilised a deductive approach. Hence, a set of theoretical constructs were derived from the literature review by which to categorise events (Poole et al., 2000). Coding rules were developed for classifying the incident data into the relevant theoretical constructs as noted above, in order to achieve reliability and validity (Van de Ven & Ferry, 1980; Poole et al. 2000). Coding was performed by the three researchers, who evaluated a random sample of 20% of the incidents. Inter-rater reliability (IRR) of 90 per cent was initially achieved for the coding exercise. The researchers resolved differences in categorisation through discussion and mutual consensus, following Van de Ven & Garud (1994).
second pass with another 20% sample yielded an IRR of 99%, demonstrating consistency and comparing favourably to studies which have used IRR (Balzarova & Castka, 2008; Van de Ven & Garud, 1994).

**FINDINGS AND DISCUSSION**

Preliminary findings from the data analysis reveal conformity with the various stages put forward in the enhanced ECT. Change progressed through the following stages – dissatisfaction, variation, selection and retention/adaptation. The external environmental influences which acted as triggers for change were also identified. In addition, the analysis identified the various stakeholders who were influencing the change process at different stages.

**External Environmental Influences and Dissatisfaction**

Following Pettigrew, Woodman, & Cameron (2001), we note that identifying stimuli that provoke change is important for determining the context for change. Social, economic, political, technological, or resource stimuli appeared quite able to provoke transformation in operations for the industry. As an example of a change trigger, we quote Evans and Meade (2005: 134) about the economic circumstances which provoked reform in the New Zealand electricity industry:

> In the decade to June 1984 net public debt rose from 5% of GDP to 32%, annual inflation was in double digits except for the last part of this period, and the unemployment rate had risen from 0.2% to 4.9%.

Dissatisfaction appears to be an inherent source of variation that occurs frequently. In case of the New Zealand electricity industry, there are significant examples of dissatisfaction. We can illustrate how dissatisfaction with negative performance acted as a major source of change by quoting Scott (1996: 11):

> Unsatisfactory experiences in the control and management of government-owned businesses were, however, the first issue where major references to institutional economics and the modern theory of finance were emphasised. A paper by two Treasury officials, Cameron and Duignan (1984), set out a new framework for thinking about institutional structures for creating improved performance by government-owned commercial activities.
Adaptation

We have also documented adaptation as a stage in the change process. Adaptation was defined as planned changes or the creation of specialised units/strategies: Analysis revealed the creation of numerous specialised units designed to deal with special circumstances confronting the industry. As examples, we note the Electricity Task Force created in 1987 to advise the government on the structure and regulatory environment of the electricity industry (Evans & Meade, 2005), the Transpower Establishment Board created to oversee the establishment of a separate state-owned enterprise, and the Wholesale Electricity Market Study Group, which was sponsored by the industry (Evans & Meade, 2005). All three were created in response to changes in the industry’s operating environments. Several additional entities were created to deal with a variety of challenges faced by the industry.

Stakeholders

With regards to stakeholders, we have identified the different groups having an ability to influence change in the New Zealand electricity industry. A list of the more prominent stakeholders appears in Table 3. Some groups, however, have more potency than others. The Government of New Zealand has been regarded as an omnipotent stakeholder in the industry, as it influences all stages in the change process. However, other stakeholder groups outside of government have also played large roles in demanding change. Further, whilst the Government is the owner of the state-owned enterprises that generate majority of publically available electricity and is therefore a primary-internal stakeholder, when it acts as a body devising regulations/legislation impacting the New Zealand electricity industry, it also acts as if a secondary-external stakeholder.

The conformity of data with the enhanced ECT highlights that important aspects were neglected from the ECT originally proposed by Van de Ven and Poole (1995). For future research, it will be advantageous to determine how internal environmental influences can impact the enhanced ECT by examining a change process in real time. In addition, identifying which stakeholders can impact the different stages of the enhanced ECT will lead to better understanding of organisational change.
CONCLUSIONS

The ECT proposed by Van de Ven and Poole (1995) provided a conventional explanation of organisational change through the process of natural selection (variation, selection, and retention). We concur with March’s (1994) argument that the term ‘evolution’ is used in a narrow sense in the organisational change literature, and have thus proposed augmentations to the basic structure of the ECT. This reflects Pettigrew et al.’s (2001) argument that context must also be considered, and highlights the need to examine the relevant environments in order to more thoroughly understand organisational change. The primacy of the electricity industry in daily life is such that the external environments frequently stimulate change. In recognition of this, we have emphasised the external environments in our research. The arguments presented above challenge the ECT in its present form, revealing it as oversimplified.

To counter this limitation, we have presented an augmented version of the ECT. Utilising this model, we have identified dissatisfaction as a necessary precursor to variation. We have also highlighted that social, political, economic, and technological forces, along with constraints on resources, might act as triggers for dissatisfaction. We used the example of economic conditions to illustrate how this might lead to change in this essential industry. Adaptation was also identified as another critical stage in a deliberate change process. The model thereby also proposes that organisational change is likely to depend upon deliberate effort in order to adapt. This suggests that groups outside the organisation might be instrumental in making change occur. Thus beyond the other environmental influences, the model recognises that stakeholders are not invisible during the change process, and are thus a necessary component of the enhanced ECT. We document this by identifying different stakeholder groups that have influenced change in the electricity industry. As Einstein rightly said ‘there could be no fairer destiny for any theory than that it should point the way to a more comprehensive theory’ (Popper, 1989: 32), we believe the enhanced ECT achieves this purpose.
REFERENCES


Figure 1: The Evolutionary Change Theory proposed by Van de Ven & Poole (1995)

![Diagram showing the Evolutionary Change Theory](image)

Figure 2: An Enhanced Evolutionary Change Theory

![Diagram showing an enhanced Evolutionary Change Theory](image)

Figure 3: New Zealand Electricity Consumption by Sector (GWh)

![Pie chart showing electricity consumption by sector](image)
Figure 4: Structure of New Zealand Electricity Industry post-reform

ELECTRICITY AUTHORITY
An independent Crown entity established for regulating the New Zealand electricity market.

GENERATION 15-16kV
TRANSMISSION 110-220kV
DISTRIBUTION 11.5k, or 6.6kV
RETAILING
CONSUMERS 230 volts

5 Major Generators
- Contact Energy
- Trustpower
- Meridian Energy
- Mighty River Power

1 National Grid Owner & Operator
- Transpower

29 Distribution Companies
18 Retail Brands

Consumers
1.7 million
- Residential, 165,000
- Commercial, 70,000
- Agriculture, forestry & fishing, 40,000 Industrial

Direct Supply
6 Large Industrial Users

Figure 5: Research Method

Mode of Inquiry
Deductive

Data Collection
Unit of Analysis New Zealand Electricity Industry
- Observation Method: Historical data from newspapers, journals, company reports.
- Sample size: 331 Incidents collected between Feb 1984 – Dec 2011

Data Measurement and Analysis

Process Concepts
Dissatisfaction, Variation, Selection, Retention and Adaptation

Incidents and Events
Coding rules developed to identify which incident are indicators of what events.

Tabulating and Organising Data
Microsoft Excel and NVIVO

Testing an enhanced process theory
Narrative which explains generative mechanisms of observed events,
<table>
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<tr>
<th>WHAT ARE THEY?</th>
<th>PRIMARY</th>
<th>SECONDARY</th>
</tr>
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</table>
| EXTERNAL       | 1 - Outside the organisational boundary & manager do not have supervisory control.  
2 – Vital to continued growth and survival of business. Without the support of any of these groups the business is unable to continue operation. | 1 - Outside the organisational boundary & manager do not have supervisory control.  
2 – Groups that can affect an organisation’s primary relationships but are not engaged in transactions with the organisation. Also they are not essential for its survival. |
| INTERNAL       | 1 – Within the organisational boundary & over whom managers have direct supervisory control.  
2 – Vital to continued growth and survival of business. Without the support of any of these groups the business is unable to continue operation. | 1 – Within the organisational boundary & over whom managers have direct supervisory control.  
2 – Groups that can affect an organisation’s primary relationships but are not engaged in transactions with the organisation. Also they are not essential for its survival. |
## Table 2: Critical Events of the New Zealand Electricity Industry

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| EXTERNAL     | - People of NZ/Consumers  
|              | - Local Community Groups  
|              | - New Zealand Stock Exchange  
|              | - Jade Software Corporation Limited  | - Cabinet Policy Committee  
|              |                                   | - Consumer NZ  
|              |                                   | - Ministry of Environment  
|              |                                   | - Electricity Gas and Complaints Commission  
|              |                                   | - Ministry of Consumer Affairs  
|              |                                   | - Unions  
|              |                                   | - Media  
|              |                                   | - Activists/Action Groups  
|              |                                   | - Competitors  
|              |                                   | - Wholesale Electricity Market Development Group  
|              |                                   | - Electricity Task Force  
|              |                                   | - Task Force  
|              |                                   | - Ministerial Co-ordinating Committee  
|              |                                   | - Electricity Market Company  
|              |                                   | - Energy Efficiency & Conservation Authority  
|              |                                   | - Wholesale Electricity Market Study Group  
|              |                                   | - Audit Office NZ  
|              |                                   | - Commerce Commission  
|              |                                   | - The Treasury  
|              |                                   | - Crown  
|              |                                   | - Electricity Authority  
|              |                                   | - The Opposition  |
| INTERNAL     | - Ministry of Economic Development  
|              | - Ministry of Energy  
|              | - Electricity Corporation of New Zealand  
|              | - Ministry of Commerce  
|              | - Management  
|              | - Employees  | - Advisory Board – Electricity Division  
|              |                                   | - Transpower Establishment Board  
|              |                                   | - The Government  |