Special Track: IMP 2019 Sustainability in the networked economy

Processes of change in environmental activity patterns

Abstract

Prior research has warned that contemplating environmental issues only at the organisational or dyadic levels can lead to unfavourable overall environmental outcomes. There have been calls for more network level research focusing on sustainability issues. The purpose of this paper is twofold. First, the paper aims to develop an understanding of the processes leading to changes in organisations' environmental management practices and the subsequent environmental activity patterns. Environmental management practices refer to activities employed by management with the aim of reducing the organisation's own and/or other organisations' impact on the environment (such as on water, soil, air and biodiversity). The second and related objective is to enhance understanding of how activities and events build processes.

To explore these objectives empirically, a multiple embedded network case study was undertaken in the Western Australia pork and dairy industries using data from 34 in-depth interviews and a documentary review. The theoretical foundation employed is the business network approach developed by the Industrial Marketing and Purchasing (IMP) Group. Fourteen process types were identified occurring in series and parallel over time resulting in the 'clean and green' industry reputations. A key process was decades of enacting and enforcing environmental legislation, which provided a slow, but steady, momentum.

The paper contributes to prior network dynamics studies by focusing on changes in the activity dimension, whereas many extant studies investigate changes in network structure, such as changes in network position and changes in actors included in the network. The paper theoretically and empirically clarifies the relationships between events, activities, processes and sub-processes in processual research. Finally, the paper provides a categorisation system for processes of change in environmental management practices.

Network dynamics, Environmental sustainability, business networks, network process analysis

1. Introduction

Prior research has warned that contemplating environmental issues only at the organisational or dyadic levels can lead to unfavourable overall environmental outcomes (Öberg et al., 2012). There have been calls for more network level research focusing on sustainability issues (Meqdadi et al., 2017). The purpose of the paper is twofold. First, the paper aims to develop an understanding of the processes leading to changes in organisations' environmental management practices and the subsequent environmental activity patterns. Environmental management practices refer to activities employed by management with the aim of reducing the organisation's own and/or other organisations' impact on the environment (such as on water, soil, air and biodiversity). The second and related objective is to enhance understanding of how activities and events build processes.

To explore these objectives empirically, a multiple embedded network case study was undertaken in the Western Australia pork and dairy industries using data from 34 in-depth interviews and a documentary review. The theoretical foundation employed is the business network approach developed by the Industrial Marketing and Purchasing (IMP) Group (Håkansson, 1982; Håkansson and Snehota, 1995). Other streams of literature relevant to environmental change processes are included in the study, such as Green supply chain management (SCM) (Srivastava, 2007). Legislative processes are expected based on literature suggesting that many organisations only engage in mandatory environmental practices (Paulraj, 2009).

The paper contributes to prior network dynamics studies by focusing on changes in the activity dimension, whereas many extant studies investigate changes in network structure, such as changes in network position (Chou and Zolkiewski, 2012) and changes in actors included in the network (Havila and Salmi, 2000). The paper theoretically and empirically clarifies the relationships between events, activities, processes and sub-processes in processual research. Finally, the paper provides a categorisation system for processes of change in environmental management practices.

The remaining sections are laid out as follows. Section 2 provides a review of relevant literature and section 3 outlines the methodology employed. Section 4 presents the results followed by a discussion in section 5 and concluding remarks in section 6.

2. Literature review and initial conceptual development

2.1 Network dynamics

This paper follows a processual approach to understanding network dynamics, that is, changes in networks (Chou and Zolkiewski, 2012; Halinen et al., 2013). The definitions of 'process' highlight the importance of events and activities as building blocks of processes. Pettigrew (1997: 338) defined a process as "a sequence of individual and collective events, actions, and activities unfolding over time in context." Similarly, Van de Ven (1992:169 in Pettigrew 1997) found that the term 'process' is used in the literature to denote "a sequence of events that describes how things change over time."

Events have been defined as "temporally specific outcomes of performed acts by the actors" (Hedaa and Törnroos, 2008: 324) or as human and non-human (e.g. hurricane) action or a mixture of both over time and space, where an event describes what happened, with a beginning and an end (Makkonen et al., 2012). From these definitions it is observed that events themselves are the result of activities.

The literature offers numerous categorisations of events, for example Elo et al. (2010) distinguished 'normal' and 'critical' events. Chou and Zolskiewski (2012) used the term 'milestone' events, reflecting that the criticality of the event depends on its context and actor perceptions, which are affected by the time and space dimensions. Milestone events may be enabling and assist or inhibit a process or activity. Some researchers segregate relevant and irrelevant events for the process under study (Halinen et al., 2013; Elo et al., 2010), noting that such a distinction often only emerges as the holistic picture of the processes and the contextual factors fall into place post the event occurring. This is the distinction used in the current study where events are identified as relevant, based on the holistic analysis of the processes and context.

Network dynamics has been considered in terms of the process of propagation or transmission of dyadic changes in the network (Håkansson and Snehota, 1995), where exogenous and endogenous factors (Håkansson and Snehota, 1995), triggers (Hertz, 1999) or critical events (Havila and Salmi, 2000) arise to which actors adapt/react thereby initiating changes in their relationships (Håkansson and Snehota, 1995). These changes within a dyad may be transmitted further in the network if counterparts to the actors in the initial relationship react to these changes. This process may repeat itself multiple times with connected organisations, thus transmitting the change to extensive parts of the network and may result in unpredictable 'network effects' (Håkansson and Snehota, 1995). Similarly, Easton and Lundgren (1992) explain network changes arising initially at the dyadic level where actors may reflect, absorb, adapt, transmit or transform a change instigated by the other actor in a relationship. The actor's response as well as further actors' responses will then affect the extent of resultant network changes. Researchers have highlighted that processes do not operate in isolation (Halinen et al., 2012); processes giving rise to network change have been found to occur in parallel and/or series. Halinen *et al*. (2012) contend that a variety of processes may evolve in parallel and several micro-level processes may create upper level processes and vice versa.

2.2 Conceptual development

Based on prior literature, the following assumptions are used in the processual analysis in this study, clarifying the relationships between activities, events and processes.

1. The smallest unit of analysis in processual analysis is an activity (which may be human or non-human (hurricane or computer)), where activities are made up of smaller activities (Håkansson and Snehota, 1995).
2. All activities (individual or multiple) lead to outcomes. An outcome is a result. Actors' perspectives of an outcome may vary (Lind, 2015).
3. An event is a description of an outcome or multiple outcomes from an activity or activities.
4. A relevant event is a researcher imposed description of an outcome or multiple outcomes prescribed according to research objectives across time and context.
5. A process is a description of a flow of events over time (in parallel or series) related to a perceived or possibly changing outcome. Actors' perspectives of an outcome may vary (Lind, 2015).
6. A relevant process is a researcher imposed description around relevant events that helps understand how change occurs within time and context according to research objectives.
7. A researcher imposed process may reach an outcome within a set time and context while the processes may be ongoing.

Figure 1 provides a graphical representation of a relevant event (depicted by the circle), which is a description of an outcome or multiple outcomes (O2-O5) from an activity or activities (A2, A3, A5) included in the circle. The researcher imposes the circle over the time period of interest (time 2 (T2) to time 3 (T3)) and the activities and outcomes deemed relevant according to the research objectives. The researcher interprets activities (A1, A6, A7) and outcomes (O1, O6, O7) as irrelevant to the research objective.

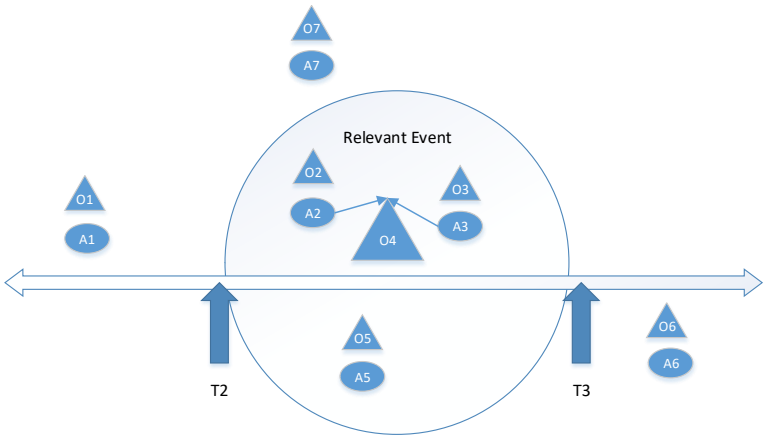

Figure 1: Relevant event

Figure 2 shows a graphical representation of a relevant process, reflected by the rectangular box, encapsulating the relevant events (circles denoted "E" within the rectangle). The researcher seeks to understand the change occurring between time 4 (T4) and time 5 (T5) and hence describes the relevant events forming part of the process. Note that the process and events may be ongoing before T4 or after T5; the researcher imposes the boundary on the time and context included in the analysis.

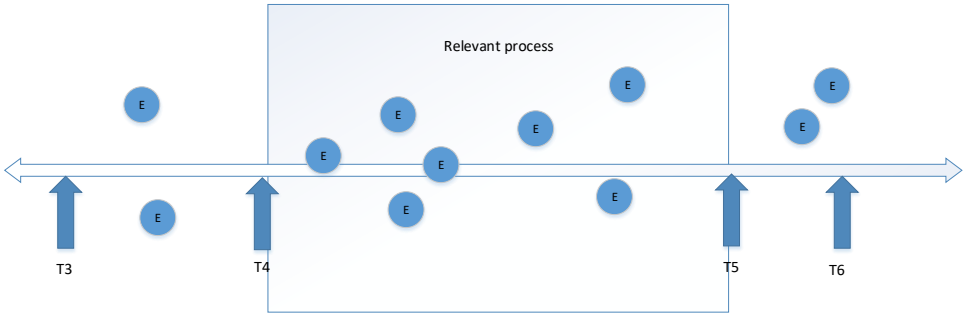

Figure 2: Relevant process

3. Methodology

A multiple embedded network case study was undertaken in the WA agrifood sector, focusing on the pork and dairy industries. Data were collected through 34 in-depth interviews and a documentary review. Interviews were sought from pork and dairy supply chain members; government departments playing a role in environmental practices through legislation as well as joint government-industry projects; industry representative organisations; and support organisations.

Thematic analysis was used to code the interviews and documents following themes and definitions of relevant events and processes in the initial conceptual development as well as

themes emerging from the data. Narrative sequence analysis (Buttriss and Wilkinson, 2004; Buttriss and Wilkinson, 2006) was used to organise the sequences of relevant events and processes leading to changes in environmental practices over time. Both a bottom-up (from events to processes) and top-down (recognition of processes at process level, which could be decomposed into events) was used to identify potentially relevant events and relevant processes.

4. Results

Fourteen change process types were identified, illustrated in both industries. Table 1 shows the process types with examples of related sub-processes (summaries of related events are not presented). The processes were organised into three categories: 1) Legislative processes, 2) Economic sustainability processes and 3) Public interest processes, based on perceived drivers underlying the processes following a double sense-making process (Halinen et al., 2013) of interview and documentary data.

Table 1: Change processes for environmental practices in the WA pork and dairy industries

Processes type	Examples of sub-processes relating to pork, dairy or both industries
P1: Legislative processes	
P1.1: Enacting and enforcing environmental legislation, regulations and reporting requirements	-Enacting and enforcement of the WA Environmental Protection Act of 1986. (both) -The regulator (DER) issuing and enforcing the licences required for the piggery, abattoir and rendering plant of OrgA. (pork)
P2: Economic sustainability processes	
P2.1: Change through pursuit of cost savings and productivity benefits	-Farmers implementing environmental activities because they are sound business practices i.e. increases productivity or reduces costs. (both)
P2.2: Change through organisations choosing to pursue green marketing	-OrgN pursuing high quality and environmentally friendly dairy products targeting a niche market. (dairy) -Large supermarkets marketing themselves as environmentally friendly in their sustainability reports and websites. (both)
P2.3: Developing and implementing voluntary agreements and reporting requirements	-OrgG and OrgH implementing ISO 14001. -Large supermarkets being assured and rated according to GRI 3 series.(both)
P2.4: Change through government assistance	-OrgA implementing a new low heat system at its rendering plant, utilising an Australian Government grant. (pork)
P2.5: Forming and implementing joint government-industry projects concerning environmental issues	-Farming for the Future project (2005-2008). (both) -Development and implementation of the 'WA Environmental Management Guidelines for Animal Based Industries – Piggeries' of 1989. (pork)
P2.6: Change through imitation	-Large supermarkets imitating each other's environmental practices to avoid giving the other company a "point of difference."(both) -OrgN imitating a Swedish company's eco-packaging and their continuous improvement approach to sustainability. (dairy)
P2.7: Green supply chain management	-Coles and Woolworths assisting suppliers in foreign countries to adhere to Ethical sourcing policies and green purchasing criteria. (both)
P2.8: Change through movement of staff between organisations and countries	-Tesco directors moving to Coles supermarket and bringing environmental practice experience from the UK. (both) -Staff moving to other companies and recommending the use of recycling company OrgI.(pork)

Processes type	Examples of sub-processes relating to pork, dairy or both industries
P2.9: Change through intermediary interactions	-Farm consultants advising farmers to take part in government environmental projects or to implement additional environmental practices. (both)
P3: Public interest processes	
P3.1: Change due to international influence, international agreements and global committees	-Global interest in the environment (such as UN conferences on the environment) which influences Australia to take part in global initiatives concerning environmental issues such as climate change. (both)
P3.2: Change through actors wanting to 'do the right thing'	-OrgA implementing environmental practices because the shareholders want to 'do the right thing.' (pork) -OrgN pursuing green practices because it is the 'right thing to do.' (dairy)
P3.3: Consumer awareness campaigns	-The education of consumers through government programmes such as the Australian Landcare programme. (both)
P3.4: Change through consumers demanding environmental practices	-Consumers contacting OrgD and enquiring about environmental practices (pork)

Legislative process (P1.1) was the dominant process type with interviewees suggesting that many environmental practices would not be implemented if they were not legislated and enforced, since they do not provide a (short-term) economic benefit, highlighting the necessity of government intervention in relation to these environmental practices. In addition to the legislative processes, a number of processes identified appeared to be driven by an underlying pursuit of economic sustainability, in relation to environmental practices which did yield (short-term) economic benefits. Since *economic* sustainability is a concern for many companies in the pork and dairy industries, government incentives, funding and taxes can alter the costs and benefits of environmental practices and encourage the adoption of environmental practices (see P2.4). Joint government-industry projects (P2.5) created awareness of environmental best practice among organisations (e.g. farmers and retailers) in both industries and involved various combinations of industry representative organisations, individual companies, local governments, state government departments and Australian Government departments in both cases. Processes P2.2, 2.3, 2.6, 2.8 and 2.9 appeared less effective and widespread. A surprising finding was the lack of green SCM (P2.7) by the powerful supermarkets, especially in relation to Australian suppliers of branded products.

A number of processes appeared to be driven, not by legislation or direct economic motive, but by a concern for public interest; although the indirect economic driver appeared to be related to all public interest processes except P3.2. The public interest processes were less effective and could be regarded as reinforcing rather than key change processes.

5. Discussion

The predominance of the legislative process (P1.1) concurs with prior literature emphasising that many organisations only engage in mandatory environmental practices (Paulraj, 2009). This finding corresponds with Hall's (2000) contention that environmental legislation is key to organisations adopting intra-organisation and supply chain environmental practices. The important role played by government in legislating and enforcing legislation (P1.1), assisting organisations (P2.4, P2.5) through joint government-industry projects and grants, as well as influencing through the process of international agreements (P3.1) was expected, as many environmental practices relate to public goods with associated market failure, free rider,

negative externalities and 'tragedy of the commons' problems (Chander et al., 2007; Kotchen, 2012; Rogers, 2003).

The processes with underlying economic drivers (P2) were expected from political economy theory that suggests an underlying economic motive in organisations' environmental and social decisions (Cooper and Sherer, 1984). The low level of green SCM (P2.7) with Australian suppliers of branded goods was unexpected, but can be understood from the perspective that the supermarkets can rely on the effective legislative processes (P1) in Australia, thus enabling them to reduce their green SCM with Australian suppliers, illustrating the influence between processes. The supportive role of public interest processes (P3) was expected, based on the dominance of economic drivers in environmental and social decisions.

The study highlighted that in process research it may be useful to describe a process in terms of sub-processes (as in Table 1), rather than in terms of events (section 2.2)). The level of analysis depends on the granularity of the data and the research objective. Thus three further assumptions may be added to section 2.2, namely:

8. A process is a description of a flow of sub-processes over time (in parallel or series) related to a perceived or possibly changing outcome. Actors' perspectives of an outcome may vary (Lind, 2015).
9. A relevant process is a researcher imposed description around relevant sub-processes that helps understand how change occurs within time and context according to research objectives.
10. The level at which relevant processes are identified and analysed (event or process level) depends on the research objective as well as the granularity of the data.

The above description of process in terms of sub-processes resonates with Halinen et al's (2012) conceptualisation of micro-level and upper level processes.

6. Conclusion

The study provides empirical data from two network case studies illustrating the identification and analysis of processes involved with change in environmental practices. A categorisation of fourteen process types and underlying drivers are provided. The study contributes to extant network dynamics literature by clarifying the relationships between activities, events, processes and sub-processes. Contributions are made to processual studies of network dynamics by focusing on changes in activity patterns (rather than changes in structure) and on environmental sustainability. Limitations of the study include that international actors in the case studies were not interviewed, such as foreign suppliers. This would have added further insights into international change processes. Further, the case study results may not apply to other industries and other countries. Areas for further research include the exploration of change processes for other types of practices, such as animal welfare and social practices.

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