



Exploring the characteristics of sustainable business practice in small and medium-sized enterprises: Experiences from the Australian manufacturing industry

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ABSTRACT

With small and medium-sized enterprises (SMEs) being responsible for a significant proportion of global pollution, there are increasing calls for this type of businesses to engage in 'sustainable business practice'. However it is still unclear what this term actually means in day to day operations. This study identifies key characteristics of sustainable business practice for SMEs through evaluating the experiences of senior decision makers from 13 companies engaged in lean and green practices in Queensland, Australia. Through a systematic literature review and an exploratory study, nine characteristics emanating from the three themes of environmental stewardship, process excellence, and sustainability oriented-culture were established. Furthermore, this study build on natural-resource-based view (NRBV) theory to present a 'Natural Resources Based View Plus' ('NRBV+') model that includes an additional strategy of 'regenerative development'. These findings can immediately assist SMEs to evaluate their practices, and in doing so, identify sustainability performance improvement opportunities. It is proposed that these findings also have implications for addressing the United Nations' Sustainable Development Goal of responsible consumption and production.

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1. Introduction

Pollution prevention strategies and sustainable business practice have historically focussed on large-scale enterprises (Kolk, 2016; Stubbs and Cocklin, 2008). But with small and medium-sized enterprises (SMEs) being responsible for about 70 per cent of global pollution, there are urgent calls for this sector to adopt sustainable business practice (Hillary, 2000; Revell et al., 2010). In Australia, where 97 per cent of all businesses are SMEs (Australian Bureau of Statistics, 2015), they have significant roles to play in implementing sustainable business practice (Kerr, 2006). Sustainable business practice is defined as "business behaviour that leads to a net overall increase in the different forms of capital associated with sustainable development" (Moser, 2001). How such enterprises should embed sustainable business practice into their core business

operations still remains a key challenge (Seidel et al., 2008), particularly because many SMEs believe that the practice of their firms does not significantly impact the natural and social environment (Oliveira Neto et al., 2017).

This key challenge of embedding sustainable business practice within the business operations of SMEs is often addressed in *ad hoc* ways, with limited attention paid to establishing what constitutes sustainable business practice. Attempts to provide a sustainable business approach have included using tools such as environmental management systems (Singh et al., 2015), life cycle assessment (Luthra et al., 2013), and lean thinking (Thanki et al., 2016). 'Lean thinking' or 'Lean manufacturing' tools have emerged as the preferred business approach to deliver better value for customers by removing non-value-adding activities (Womack and Jones, 2010) which later evolved to 'lean and green thinking' (Miller et al., 2010). A range of lean thinking tools have been shown the ability to improve operational and environmental performance (Verrier et al., 2016), but not necessarily achieve 'sustainable business practice'.

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It is still unclear what characterizes sustainable business practice in SMEs, or how lean and green practices could be strategically used to drive SMEs sustainable business practice (Fowler and Hope, 2007; Martínez León and Calvo-Amodio, 2017). This gap in knowledge demands more research on models and integrative theories for sustainable business management and practice (Schaltegger et al., 2016; Starik and Kanashiro, 2013). Therefore the main objective of this paper is to explore the characteristics of sustainable business practice in SMEs by focusing on a subset of companies who have been engaging in lean and green practices, considering key lessons learned to then influence future priorities. Building on previous research on characteristics for SMEs manufacturing processes to become economically sustainable (Thomas et al., 2012), this study contribute to understanding of sustainable business practice by establishing nine characteristics under the three themes of environmental stewardship, process excellence, and sustainability-oriented culture. While the Natural-Resource-Based View theory provided a robust lens for SMEs business practice the findings led to an addition of a fourth strategy of 'regenerative development' to foster resilience and enhance ecosystem health.

The following sections present an analysis of key literature, the methodology, findings, and discussion. It is proposed that further study of the manufacturing sector could uncover additional opportunities for pollution prevention, product stewardship, sustainable development and regenerative development.

2. Theoretical background

2.1. Incorporating sustainable business practice into SMEs' business operations

SMEs are faced with increasing institutional pressures to adopt sustainable business practice and reduce environmental pollution (Hillary, 2000; Melville, 2010). In light of this challenge, SMEs attempt to employ a variety of green tools to achieve sustainable business practice, such as environmental management systems (Singh et al., 2015), life cycle assessment (Luthra et al., 2013), design for environment (Agan et al., 2013), emissions reduction (Sangwan, 2011), use of natural resources (Ramayah et al., 2012), stakeholder engagement (Rodrigue et al., 2013) and lean thinking (Aguado et al., 2013). However, the success of establishing these green tools depends on the firm's size and other characteristics of the SME sector (Battisti and Perry, 2011).

2.2. Integrating lean and green practices to drive sustainable business practice in SMEs

Even though there is a considerable body of research on SMEs and sustainability, as indicated in above sections, relatively little research has focused on how lean and green practices could contribute to drive sustainable business practice in SMEs. A systematic review of the literature revealed that lean thinking has evolved into 'lean and green' thinking, as a promising coupled business approach to achieve integrated results in process efficiency and sustainable practice while promoting activities to "do more with less" (Caldera et al., 2017; Garetti and Taisch, 2012; Martínez León and Calvo-Amodio, 2017; Yang et al., 2011). The review protocol is detailed in Appendix A (Denyer and Tranfield, 2009). The findings of this systematic literature review will be discussed under the two themes of lean tools, and lean and green frameworks to achieve sustainable business practice.

A range of lean tools, such as 5S, Kaizen, 5 Why, PDCA, and A3 Reporting have shown improvements in SMEs' manufacturing operations by eliminating waste (González-García et al., 2014; White

and James, 2014). These tools aim to identify problem areas and remove non-value-adding activities. For example, 5S creates a clean environment in the workplace by using the steps of sort, set in order, shine, standardize and sustain (Piercy and Rich, 2015; Thanki et al., 2016; Verrier et al., 2016). Kaizen events (Upadhye et al., 2010) and the PDCA (Plan-do-check-act) cycle aim for continuous improvement (Vais et al., 2006). The tool, 5 why, is used for repetitive interrogation of a problem (Amani et al., 2015) and the A3 reporting method is used to investigate a problem and propose corrective actions written in a large paper supported by graphs (Rymaszewska, 2013). These lean tools can be combined with green tools to reduce waste and pollution throughout the value chain of product manufacturing (Martínez León and Calvo-Amodio, 2017).

A number of frameworks were developed to guide SMEs in selecting the most suitable combination of lean and green tools to achieve sustainable business practice. An integrated framework was developed by Thanki et al. (2016), as a source for SMEs to choose the most appropriate lean and green tools and evaluate their performance using targeted indicators. Another framework for lean and green tools was developed by Verrier et al. (2014), which guides SMEs in benchmarking best practices in their industrial consortium by placing their practices in a lean and green matrix. Scholars have developed a variety of lean and green models with a wide range of implications in areas of designing eco-innovation (Aguado et al., 2013), benchmarking performance (Piercy and Rich, 2015) and achieving sustainable development (Upadhye et al., 2010; Wu et al., 2015). Qualitative characteristics for achieving economic sustainability in SMEs using lean and agile strategies were found by Thomas et al. (2012).

As shown above, most studies have examined the relationship between lean and green practices, characteristics of sustainable manufacturing to achieve economic sustainability but with limited efforts to holistically frame analyses according to triple bottom line elements (Caldera et al., 2017; Martínez León and Calvo-Amodio, 2017). There has been limited discussion on what constitutes sustainable business practice apart from implications on economic sustainability (Thomas et al., 2012). This gap in knowledge motivated the study presented in this paper. The key characteristics of sustainable business practice in SMEs engaged in lean and green practices were investigated with a clear appreciation of the triple bottom line elements of sustainability. Out of the literature review emerge the research question of, "What are the emergent characteristics of sustainable business practice in SMEs".

A well-established theoretical framework of natural resource-based view was used as a lens to relate organizations' ability to develop capabilities and manage resources, to a number of characteristics of sustainable business practice.

2.3. Natural-resource-based view theory

This study utilizes the natural-resource-based view (NRBV) theory, as it offers a useful lens for evaluating SMEs sustainable business context (Aragón-Correa et al., 2008) and lean and green relationships (Galeazzo et al., 2014). NRBV theory is built upon the resource-based view, adding the constraints imposed on a firm by the natural environment. This theory states that competitive advantage will depend on the firm's ability to manage natural resources and develop capabilities to address the volatile environment. NRBV also indicates that firms with sustainable economic activities will soon have competitive advantage over the other firms (Hart, 1995). This theory of competitive advantage proposes three inter-connected strategies (i.e. strategic capabilities) of pollution prevention, product stewardship, and sustainable development. The driving forces, key resources and competitive advantage of these strategic capabilities are presented in Table 1, extracting text

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