

# **Focusing on strategic flexibility and resilience in times of uncertainty. Exploring Dynamic Capabilities and Lean Six Sigma to enable performance optimisation.**

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## **Abstract**

The uncertainty and challenges of the Covid19 pandemic has highlighted the reliance we have on optimised and functioning global supply chains. The global impact of the pandemic on organisations has focused attention on the need for supply chain management that enables effective adaptable and resilient strategies (Conerly, 2021, [www.dhl.com](http://www.dhl.com), 2020). Successful resilient strategies require the ability to adapt quickly to an uncertain and changing environment (Christopher and Peck, 2004, Tang and Tomlin, 2008). However, key to effective response is to ensure performance is not compromised and therefore the need to focus on rapid continuous improvement strategies to optimise processes (Singh and Singh, 2015). The paper seeks to provide an in-depth exploration and understanding of two approaches associated with continuous improvement: Dynamic Capabilities (DC) and Lean Six Sigma (LSS). We argue that effective integration of DC and LSS offers a potential competitive advantage to organisations due to the complementary features of the two concepts. However successful and effective integration can only be achieved if there is a detailed understanding of the similarities and differences of the two approaches. Detailed understanding of the two approaches enables identification of how to integrate the two approaches and utilise them

appropriately throughout the supply chain. Therefore, this paper aims to contribute to the theoretical understanding by examining the similarities and differences between the two concepts and exploring how this informs our understanding of creating a competitive advantage potential in a fast-changing environment.

It can be argued that the implementation of Lean Six Sigma (LSS) has never been more critical than in the current ripple effect of the COVID19 pandemic on uncertainty in our supply chains, both from the market and supply perspectives. Hence the vital need to focus on value adding activities and processes in an environment of huge uncertainty (Childerhouse and Towill, 2004). LSS has been depicted as a hybrid methodology that integrates two distinct management philosophies, Lean and Six Sigma (SS) (Sunder and Ganesh, 2020; Sunder et al., 2018; Juliani and de Oliveira, 2019). The latest study by Sunder and Ganesh, (2020) highlights that LSS integrates the rapidness of Lean and robustness of Six Sigma. Lean and Six Sigma are widely used as continuous improvement initiatives in order to increase productivity and reduce non-value-added activity within an operation, as well as to improve quality of products through eliminating variation in the process (Roth and Franchetti, 2010; Rajenthirakumar *et al.*, 2011; Knowles, 2011; Laureani and Antony, 2018; Juliani and de Oliveira, 2019; Sunder and Ganesh, 2020). Similarly, a recent study by Antony *et al.*, (2017) claim that organisations are using LSS not only as an efficient approach to quality improvement but also to improve delivery time, minimise waste and defects, and increase customer satisfaction. However, several studies claim that LSS needs to be integrated with strategic management tools to enable effective continuous improvement and performance improvements in a highly variable and arguably uncertain environment (Anand et al, 2009; Gutierrez et al, 2019).

Another fast growing branch of research within the field of continuous improvement since it was first introduced by Teece et al., (1997) is Dynamic Capability (DC). Similar to LSS, the strategic role of DCs towards performance improvement in a dynamic environment has been recognised and therefore highlighted the need to include it within strategic management research agendas (Daniel and Wilson, 2003; Lampel and Shamsie, 2003; Lenox and King, 2004; Salvato, 2009; Teece *et al.*, 1997; Zott, 2003).

DCs provide a systematic structure that offers business managers an approach that can enable effective performance in a dynamic and uncertain environment (Teece *et al.*, 1997; Eisenhardt and Martin, 2000; Dyer and Nobeoka, 2000; Zollo and Winter, 2002, Zahra *et al.*, 2006; Ambrosini and Bowman, 2009; Teece, 2019; Heaton *et al.*, 2020). Influential studies in the field, for example, Helfat *et al.*, (2007), Teece (2007; 2018; 2019), and Heaton et al., (2020) suggest that in order to survive and prosper under the pressures of an unpredictable environment, organisations must develop DCs to create, extend and modify their own resource base. Studies by Cepeda and Vera (2007), Helfat *et al.*, (2007) emphasised the strategic role of DCs, making explicit and direct links between DCs and performance improvement. The recent study by Teece (2019) claims that DCs enhance organisational responsiveness in the wake of an unpredictable environment. The strategic role of DCs towards improvement within a dynamic environment has catapulted this issue to the forefront of the research agendas of many strategic management scholars (Daniel and Wilson, 2003; Lampel and Shamsie, 2003; Lenox and King, 2004; Teece *et al.*, 1997; Brexník and Lahovnik, 2016; Teece, 2018; 2019; Collins and Anand, 2019; Sainsbury, 2020;).

This study aims to explore the differences and similarities between LSS and DCs as concepts that can create competitive advantage (CA) in a fast-changing environment. To achieve this aim, the systematic narrative review methodology has been employed. This methodology strives to 'comprehensively identify, appraise and synthesise all relevant studies on the given topic' (Petticrew and Roberts, 2006, p. 19) offering a sense of rigour and aiding interdisciplinary research by highlighting cross-disciplinary themes (Easterby-Smith *et al.*, 2015). This methodology has been widely used, becoming a fundamental scientific activity (Tranfield *et al.*, (2003) used to understand the state of knowledge in the field (Saunders *et al.*, 2012; Easterby-Smith *et al.*, 2015). In total 146 articles published between 2005-2020 were selected and analysed.

The research outcome has been the development of a comparison table that highlights the key components of both LSS and DC which clearly identifies the similarities and differences between the two approaches. This therefore enables an examination of the potential of utilising the two approaches to maximise opportunity for process improvement that capitalises on the benefits of each approach while minimising the pitfalls of each in certain environments. The research has shown that there is huge potential in combining the two approaches in an environment of high uncertainty within the supply chain, especially because DC works very well in areas of the system where there is high variability (and uncertainty) and LSS maximises efficiency in more stable facets of the process.

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