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Enhancing Organisational Agility by Means of Agile Complexity Leadership

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ABSTRACT

Purpose – The purpose of this paper is to establish current knowledge regarding how organisational agility and competitive advantage could be enhanced when Small and Medium Enterprises (SMEs) adopt agile complexity leadership to fully exploit digital transformation.
Aims(s) – The primary aim of this paper is to understand the role of agile complexity leadership in improving organisational agility and competitive advantage in SMEs during digital transformation.
Secondary aims include: Identification of knowledge gaps in leadership attributes to foster organisational agility. Evaluation of research focus and methods used to date. Exploration of agile complexity leadership as a model for optimising performance in agile organisations.
Design/methodology/approach – A literature review was conducted using the Web of Science Database from 1992 to 2023 using the keywords complexity, complexity science, complexity leadership, agile, agile leadership. Initially, 62 journal articles were listed. Abstracts were reviewed to see if they are valuable and related to how agile complexity leadership enhances organisational agility, in effective digital transformation for SMEs—the final sample comprised 13 journal articles and four books.
Findings – Three major findings are identified: significant knowledge gaps remain regarding the leadership attributes required for optimisation of organisational agility because it is related to business sustainability instead of traditional short-term production objectives; the focus of research to date has been reliant on quantitative methods often employed with samples that are not statistically representative; the concept of complexity leadership has been relatively neglected as a potential effective leadership model to optimise performance in SMEs.
Limitations of the study – The study acknowledges limitations in its approach due to reliance on literature, which may have biases. Future research should include empirical studies to validate findings and expand understanding of agile complexity leadership in SMEs.
Originality/value – This paper provides novel insights into the intersection of organisational agility, and leadership regarding digital transformation within SMEs. It is valuable to scholars, business leaders, and practitioners interested in optimising performance through innovative leadership models in organisations.

KEY WORDS

complex adaptive system, agile complexity leadership, digital transformation

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1. INTRODUCTION

The purpose of this paper is to determine the state of current knowledge on how organisational agility, which is vital for sustained competitive advantage, can be enhanced by adopting agile complexity leadership within organisations, and in particular, to fully exploit the power of digitalisation in Small and Medium Enterprises (SMEs). Although the approach of different countries to digitalisation may differ, it is mainly in terms of different conditions (Štaffenová, Kucharčíková, 2021) and the use of AI tools (Afzal et al., 2023). However, what is essential for technological development regardless of the circumstances is the leadership style (see e.g. Kohnová et al., 2022).

In order to accomplish the objective of the paper, the concepts of agile organisation, leadership in agile organisations, Agile Leadership, Complex Adaptive Systems (CAS), and Complexity Leadership are critically appraised. Whilst agile and complexity leadership concepts are relatively novel, some recent academic research papers are integrated to demonstrate the gaps in knowledge that need to be diminished.

1.1 METHODOLOGY

A literature search was conducted using the Web of Science Database for the years 1992 to 2023 using the keywords; complexity, complexity science, complexity leadership, agile, agile leadership.

Initially, 62 journal articles were listed. The abstracts were read to determine whether the studies yielded insight into resolving how agile complexity leadership generally enhanced organisational agility and competitive advantage generally or specifically in effective digital transformation in SMEs. Following this analysis, 39 articles remained, which were subjected to a more in-depth appraisal of the significance of contributing to how organisational agility could be improved by the adoption of agile complexity leadership in SMEs undergoing digital transformation. The final sample is displayed in *Table 1.* The Review comprised 13 journal articles, and four books associated with well-established authors on complexity and organisational change were included in the Review.

Table 1: Sources Employed in Literature Review

Year of Publication	Authors	Topics	Search Keywords	Sector	Country
1992	Waldrop, M.	Complexity	Complexity	General	USA
1995	Gellman, I.	Complexity	Complexity	General	USA
1995	Stacey, R.	Complexity	Complexity	General	UK
2000	Stacey, R.	Complexity Science	Complexity Science	General	UK
2003	Sambamurthy, V., Bharadwaj, A., Grover, V.	Agile Organisation	Agile	General	USA
2007	Josephs, B., Joiner, S.	Agile Leadership	Agile Leadership	General	UK
2007	Uhl-Bien, M., Marion, R., McKelvey, B.	Complexity Leadership	Complexity Leadership		USA
2011	Stacey, R.	Complexity Science	Complexity Science	General	UK
2012	Kotter, J.	Leadership, Change	Change Leadership Agile	General	USA
2014	Laloux, F.	Agile Organisation	Agile Organisation	General	Brussels
2018	De Smet. A., Lurie, M., St George, A.	Agile Leadership	Agile Leadership	General	USA
2018	Uhl-Bien, M., Arena, M.	Complexity Leadership	Complexity Leadership	General	USA
2020	Fachrunnisa, O., Adhiatma, A., Lukman, N., Majid, M.	Agile Leadership	Agile Leadership	SME	USA
2020	Greinder, M., Blohm, I., Leicht, N.	Agile Organisation	Agile Organisation	General SLR	Slovenia
2020	Greineder, M., Leicht, N.	Agile Leadership	Agile Leadership	General	Slovenia
2022	Crnogaj, K., Tominc, P., Rožman, M.	Agile Leadership	Agile Leadership	General	Slovenia
In press	Plekhanov, D., Franke, H., Netland, T.	Digital Transformation	Digital Transformation	General SLR	UK

Source: Own Research.

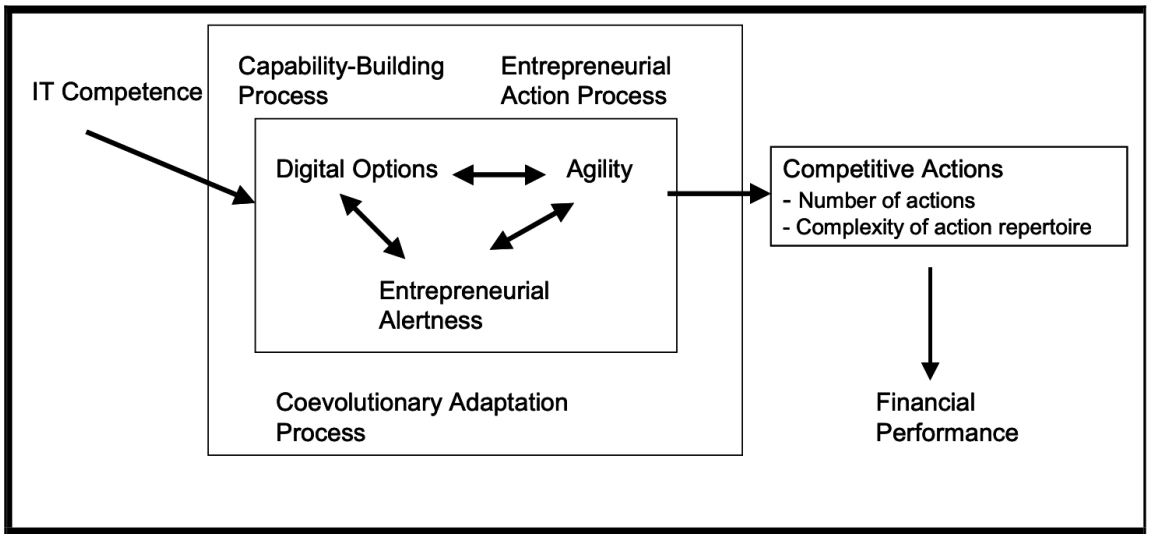
2. DISCUSSION

2.1 AGILE ORGANISATION

Agile organisations differ from traditional organisations because the future is considered unpredictable. Consequently, the well-established practice adopted by traditional organisations of planning future strategy by referring to past performance and predicting future changes in the external environment is not possible in agile organisations because the future is unknowable (Stacey 2000; Stacey 2011; De Smet et al. 2018).

An agile organisation is characterised as comprising three major agile components: strategy, entrepreneurship, and Information Technology (IT), which were identified by Sambamurthy et al. (2003) from the existing Management literature. Strategic management provided awareness regarding resources, processes, and capabilities; valuable studies on entrepreneurship focused on those processes linked to organisational agility that drive competitiveness; IT management research provided insights into how IT influences firm agility. Interestingly, for this paper, this approach appears to indicate that greater insight into the strategic role of IT is obtained by appraising the observable network of relationships that facilitate IT, impacting positively on organisational performance. The key outcomes of the research were that organisational investment in IT and IT competences shaped performance in several ways; enhanced agility; facilitated detection of digital options; increased entrepreneurial readiness and attentiveness to the changing environment; enabled more effective strategic processes, namely developing employee capabilities, encouraging innovation and coevolutionary adaptation. Coevolutionary adaptation refers to the continuous organisational learning process, including feedback processes, that enabled firms to learn by doing and to consequently develop a range of digital options and agility, which facilitated implementing a range of competitive actions. *Figure 1* provides a comprehensive depiction of the mentioned relationships between IT competence and firm performance.

Figure 1: The Nomological Network of Relationships Between IT Competence



Source: Sambamurthy et al. (2003 p. 239).

This research is useful because it identifies the importance of integrating the findings of several business management disciplines to be able to understand how agile organisations can optimise competitiveness.

The unique capabilities of agile organisations were also summarised by Greineder et al. (2020), with reference to the study by Sambamurthy et al. (2003) as strategic, functional, and operational. They were found to enable organisations to be sufficiently flexible to quickly adapt to the continuous fast changes

occurring in the current external environment. The newer research findings were determined by conducting a Systematic Literature Review (SLR) of 36 peer-reviewed studies from Information Science and Management and Organisational Science origins (Greineder et al. 2020). Initially, 23,029 studies were identified in the EBSCO Business Host, Science Direct and Scopus databases. However, no time scale was defined by the authors, so that all existing studies must be assumed as initially returned, and that qualitative research was ignored.

The typical defining features of agile organisations, according to Laloux (2014), were high power distribution, employee self-management, which generated strong employee motivation and energy, mutual trust, a shared focus on continuous improvement, fast decision-making making and fewer instances of ego dominating in the working dynamic. The roles of employees also change spontaneously to ensure that they continue to create organisational value. This definition is interesting because it infers that human competition factors may negatively affect the desired performance outcomes and that agile leadership must identify and manage such behaviours.

Agile organisations can be considered as organic entities that evolve and are able to continue to exist despite the unpredictable, constantly changing conditions; stability and instability conditions co-exist; for instance, organisational practices are well established but are constantly adapting to new market conditions typified by new regulations, customer feedback and emerging new technologies; unpredictability and ambiguity are implicit in their operations (De Smet et al. 2018). The requirement for customer focus in all aspects of the agile organisation's operations is an additional requirement for success, which is not stressed in the other studies in this section. The additional features of agile organisations highlighted in this study are open, inclusive, non-hierarchical, continually evolving without the traditional organisational restructurings typical of traditional hierarchical firms that often cause substantial financial, operational and performance impairment; uncertainty and ambiguity are managed with more imagination and creativity. These studies are valuable because they infer that traditional leadership models and approaches are required but that defining their characteristics is challenging and that multiple techniques will be necessary.

The rapid rate of change in the business environment in the 21st century, attributed to continual technological advancements, including those related to communication and transport infrastructure (Kotter 2012), has generated a need for companies to become agile, a term which refers to developing the capacity to both anticipate changes in the external environment and to quickly respond to them. Appropriate responses to such change, in which information rather than manufacturing excellence has become the means of competitive advantage (Kotter 2012), are particularly focused on managing complexity related to technical aspects of the business and to its stakeholders (Josephs and Joiner 2007).

The term agile has consequently become linked with organisational structure and process design and with leadership approaches (Josephs and Joiner 2007), but also with complexity science, which is associated with the new organisational environment and positions an appropriate leadership paradigm as a complex interactive influencing force that generates new organisational learning, innovation, and adaptability as essential to ongoing competitiveness (Uhl-Bien et al. 2007).

2.2 AGILE LEADERSHIP

The concept of agile leadership is ill-defined, implying that shaping a meaningful definition is further complicated by the changing nature of acceptable leadership approaches, which are a consequence of how social change impacts on workplace practices (Greineder and Leicht 2020).

Consequently, a range of agile leadership styles have been suggested; for instance, Greineder and Leicht (2020) conducted a SLR of published studies to critically appraise their relative strengths and weaknesses. Since they could find no agreement regarding how agile leadership should be unequivocally defined, their analysis was based on a working definition of agile leadership that considered it to comprise: a distinct style of thinking and stance to leadership; an association with leading agile teams; specific leadership practices and processes. The unique attributes and competencies of agile leaders operating in flat organisational structures were considered to facilitate the prompt responses required to effectively

manage fast changes identified in the external environment. The initial part of the analysis focused on identifying major differences in leadership attributes between traditional leadership models and those suggested in papers focusing on agile leadership; initial analysis identified four major agile leadership models associated with goal, role, process, and position, summarised in *Table 2*.

Table 2: Comparison of Traditional and Agile Leadership in Organisations

Levels	Traditional Leadership associated with hierarchical organisations	Leadership in agile organisations
Mindset/Attitude	Optimising performance by enhanced efficiency obtained by means of well-defined division of tasks between employees	Acceptance that external change in the environment is continuous
Leadership Role	Formal leader responsible for all major organisational decisions	Formal leader empowers the team, creates appropriate conditions to achieve shared goals and responsibilities
Organisation of Team	Distinct hierarchical positions are evident, roles are distributed between leader and followers but the overall responsibility of the formal leader is achieving goals	Organisation in self-organised teams, characterised by flat hierarchies and independent working practices, with emphasis on collaboration and shared responsibility
Management Practice	Adoption of the process view, sequences of different activities	Common vision, teamwork, collaboration, simple rules, open flow of information by means of models such as Scrum, Kanban or Lean Management

Adapted from: Greineder and Leicht (2020, p. 280)

Subsequently, the focus of the analysis was to identify agile leadership styles. The analysis identified 16 styles associated with agile leadership, which included complexity leadership, transformational leadership and digital leadership. Further analysis was based on three criteria followed by the counting the regularity of each criterion being published in highly regarded scientific databases. This procedure isolated the leadership styles considered closest to agile returning five styles; Servant, Transformational, Shared, Emergent and Visionary. The three criteria applied were that; agile was specifically mentioned in the study; the research was scientific in nature; the term agile was expressed in four peer reviewed scientific papers.

This analysis resulted in the conclusion that many gaps continued to exist: the lack of a well-defined concept relating to agile leadership; which of the known agile leadership styles is most appropriate to specific organisational contexts and in which specific conditions; variance in agile leadership style in terms of organisational culture, geographical location, and its development over time (Greineder and Leicht, 2020). Whilst these gaps alone justify further research, the additional limitations of this study include: no reference to the number, time scale or details of existing studies used for the analysis; scientific studies were the only ones selected for inclusion. Although the term scientific is not defined, it is inferred that they were all studies based on quantitative methods, meaning that the findings from an entire group of studies based on qualitative methods have been excluded.

2.3 COMPLEX ADAPTIVE SYSTEMS, COMPLEXITY SCIENCE, COMPLEXITY LEADERSHIP, AGILE COMPLEXITY LEADERSHIP

The concept and development of Complex Adaptive Systems, hereinafter CAS, are attributed to the Santa Fe Institute, whose members sought to create a collective theoretical model for complexity, which would facilitate more profound knowledge and understanding of spontaneous, self-organising entities (Waldrop 1992). Complexity is related to the interconnectivity between an organisation and its environment (Gell-Man 1995). CAS are holistically described by Stacey (2000) as comprising many agents that comply with a certain set of rules, which direct them to change their behaviour to align with that of other agents.

The concept of CAS is inherent in agile organisations, as described by Sambamurthy et al. (2003), namely in the context of the potential power of digital technologies to enhance competitiveness. The very recent systematic literature review of digital transformation was conducted by Plekhanov et al. (in press). Comprising analysis of 537 previous peer-reviewed studies demonstrated that digital ecosystems are an increasingly important example of CAS, since they comprise digital connectivity between multiple stakeholders, inferring that business organisations must develop leadership approaches, which are characterised by the leader as orchestrator and self-organisation practices, in order to generate appropriate incentives and strong relationships between the eco-system members (Plekhanov et al. in press). The Leader should model continuous improvement, remove barriers, motivate and support individuals, and create a team-focused environment (Crnogaj et al., 2021). This definition of leadership attributes that optimise innovation potential in organisations aligns with Stacey (2011). The key findings of Plekhanov et al.'s (in press) research were that organisations participating in a digital ecosystem must review their governance, organisational structures and production systems.

Consequently, the linear multistage production processes of traditional firms are no longer feasible for sustainable competitive advantage. They must be replaced with distributed, interconnected production methods in which many activities occur concurrently (Plekhanov et al. in press). These two studies tend to concur that new leadership approaches are vital for optimising CAS. However, they also reveal significant gaps in understanding what characteristics these leadership approaches comprise. Moreover, the inferences drawn from the current study may not be statistically significant due to the relatively small and unrepresentative sample.

When the concept of CAS is applied to organisations described as a network of people who mutually interact, Complexity Science is the discipline that attempts to understand better how these interactions occur and why they are characterised in a certain way. Therefore, in general, the key objective of complexity science is to better understand how complex non-linear systems, such as business organisations with wide-ranging interactions, function, and in particular, how ordered behaviour patterns emerge and develop into new well-ordered as conditions change (Stacey 2000). The inference is that the traditional concept of leadership is not appropriate to direct CAS in which innovation, adaptability and learning constantly emerge, but leadership must rather combine multiple facets whilst concurrently ensuring that operations are conducted in an ordered manner. Consequently, appropriate leadership must be agile and able to manage complexity, dynamic conditions, and relationships, and it is unlikely to be within the capabilities of a single person (Uhl-Bien et al. 2007). The findings of this study also indicate the need for a new leadership approach that could be called Agile Complexity Leadership. The concept of complexity leadership was developed by Stacey (1995; 2011), who suggested that it is characterised by all organisational employees being responsible for leadership, an approach that releases the formal leader from full responsibility in accomplishing outcomes. Consequently, complexity leadership instigates self-organisation within the firm, which generates higher levels of innovation; the formal leader merely orchestrates operations (Stacey, 2011). Interestingly, this description of leadership is employed by Plekhanov et al. (in press) in relation to agile organisations and suggests that agile complexity leadership is now an accepted concept within the field of complexity science and CAS.

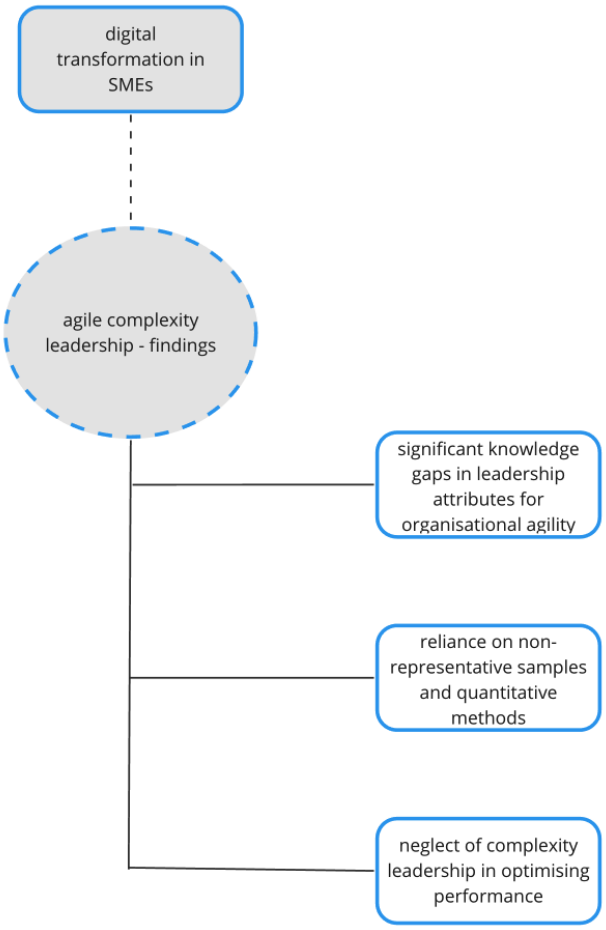
Recent research by Uhl-Bien et al. (2018) found that, although organisational adaptability to effectively manage CAS by creating an adaptive space was a critical factor, it remained poorly recognised by academics and practitioners. The fundamental issue for many firms was finding the balance between the requirement for production as the means to generate income and the requirement for innovation and business sustainability.

This difficulty for leadership to decide whether current production or innovation should predominate is also apparent from the findings of research conducted by Fachrunnisa et al. (2020), which aimed to test the role of agile leadership and strategic flexibility to facilitate digital transformation in small businesses. The quantitative survey completed by 519 small businesses located in Indonesia and Malaysia found that agile leadership was the critical success factor for assuring that digital transformation strategies were

implemented effectively. The importance of successfully implementing digital technologies generally was to enable small businesses to interact with consumers to gain feedback on their purchasing/product preferences, to generate new high-value products, and to obtain sustainable competitive advantage concurrently. The outcome was supported by the leadership adopting strategic flexibility. Although the sample in this research is not statistically representative, it is an important indicator that a crucial gap in current knowledge about the degree to which agile complexity leadership exists, which motivates and justifies further research.

To facilitate the comprehension of the results presented in the research paper, we kindly refer to Figure 2 below. *Figure 2*, presented below shows three major findings: significant knowledge gaps remain regarding the leadership attributes required for optimisation of organisational agility because it is related to business sustainability instead of traditional short-term production objectives; the focus of research to date has been reliant on quantitative methods often employed with samples that are not statistically representative; the concept of complexity leadership has been relatively neglected as a potential effective leadership model to optimise performance in complex adaptive systems such as agile organisations.

Figure 2: Identification of Problems and Knowledge Gaps



Source: Authors Work.

3 CONCLUSION

This overview of the existing knowledge relating to how organisational agility can be enhanced by means of agile complexity leadership demonstrates that substantial gaps continue to exist regarding the attributes leaders should ideally possess to optimise organisational agility. The concept of agility is complex because it is linked to organisational structure, process design, and leadership approaches that focus on business sustainability rather than short-term production output and with new ways of thinking and with traditionally unconventional practices and processes that are poorly characterised and understood.

The findings also reveals that the focus of the analysis of the published research studies to date has been based on those employing quantitative methods only, and conclusions have often been drawn from those with statistically unrepresentative samples. Any contribution from the findings of qualitative studies has not been considered valuable to enhancing knowledge, inferring that this is one possible opportunity to obtain human perspectives on the four concepts included in this review. Complexity leadership has also been considered as a less valuable concept when attempting to understand effective leadership in agile organisations, despite such organisations being examples of CAS.

Inclusion of a range of business management disciplines to better understand the concept of agile complexity leadership and its impact on innovation capability is mandatory to optimise the power of digitalisation in SMEs. The human factors that enhance or restrict innovation, such as ego and human competitiveness, are another interesting approach that seems to have had little attention in quantitative research and should be the object of further research.

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