

ISSN 1840-4855

e-ISSN 2233-0046

Original scientific article

<http://dx.doi.org/10.70102/afts.2026.1836.854>

SUSTAINABLE LEADERSHIP ENHANCING ORGANIZATIONAL RESILIENCE THROUGH EMERGING TECHNOLOGIES IN VUCA ENVIRONMENTS

Dr.S. Saranya^{1*}, Dr.S. Benneet², Dr.S.G. Yogesh³, Dr.G. Kalpana⁴,
Dr.R. Thiyagarajan⁵

^{1*}Assistant Professor, Department of Management Studies, SRM TRP Engineering College, Trichy, Tamil Nadu, India. e-mail: saranya.s@trp.srmtrichy.edu.in,
orcid: <https://orcid.org/0000-0002-9443-0639>

²Assistant Professor, Department of Management Studies, SRM TRP Engineering College, Trichy, Tamil Nadu, India. e-mail: benneet.s@trp.srmtrichy.edu.in,
orcid: <https://orcid.org/0000-0002-3513-3060>

³Assistant Professor, Department of Management Studies, SRM TRP Engineering College, Trichy, Tamil Nadu, India. e-mail: yogesh.sg@trp.srmtrichy.edu.in,
orcid: <https://orcid.org/0000-0003-2501-265X>

⁴Assistant Professor, Department of Management Studies, SRM TRP Engineering College, Trichy, Tamil Nadu, India. e-mail: kalpana.g@trp.srmtrichy.edu.in,
orcid: <https://orcid.org/0009-0007-1813-5981>

⁵Head of the Department & Assistant Professor, Department of Management Studies, SRMTRP Engineering College, Trichy, Tamil Nadu, India.
e-mail: thiyagarajan.r@trp.srmtrichy.edu.in,
orcid: <https://orcid.org/0000-0003-3187-1741>

Received: June 09, 2026; Revised: July 20, 2026; Accepted: August 27, 2026; Published: September 29, 2026

SUMMARY

The growing complexity and unpredictability of environments characterized by Volatility, Uncertainty, Complexity, and Ambiguity (VUCA) made organizations realize the necessity of improving their resilience through the implementation of sustainable leadership practices and technologies. Although these areas have been studied independently, there is very little research examining the connection between sustainable leadership, technologies, and organization resilience. The research employs the Systematic Integrative Literature Review (SILR) methodology. The literature review was carried out using PRISMA guidelines in order to establish a protocol for conducting a search. As a result, 250 documents were located, among which 40 duplicates were excluded. The resulting 210 documents underwent title and abstract analysis, then 180 articles were chosen for the full-text analysis, and finally, 124 studies proceeded to the next stage of the selection process. The methodology of the 106 empirical studies was assessed based on the Mixed Methods Appraisal Tool (MMAT 2018), where 65% (69 studies) were considered high quality and 35% (37 studies) had moderate quality. Additionally, it is important to note that 68% of the reviewed works were published between 2021 and 2026, showing that there is growing interest in technology-enabled organizational resilience. It was surprising to see the thematic synthesis found four major research directions: sustainable leadership competencies at the top place with 31% of documents, organizational resilience and sustainability achievements with 27%, emerging

technologies with 23%, and VUCA environment characteristics with 19%. Based on the obtained findings, it is possible to conclude that sustainable leadership and emerging technologies play complementary organizational capabilities, with the role of technology in mediation between leadership and resilience being still under-researched. The proposed model includes all the aspects discussed and will serve as a basis for further empirical researches.

Key words: *sustainable leadership, organizational resilience, emerging technologies, VUCA environment, systematic integrative literature review, PRISMA, thematic synthesis.*

INTRODUCTION

The present-day firms function in less probably confusing, indeterminate, complicated, and unclear (VUCA) environments which have greatly changed the way of making strategic decisions, ensuring operational stability, and achieving long-term competitiveness of organizations [1]. Due to rapid technological changes, growing geopolitical instability, and changing expectations of the stakeholders, leadership styles must ensure the ability to adapt, ethical governance, and continuity of the organization in the circumstances of extreme unpredictability [2]. A large amount of literature has dealt with leadership readiness, authenticity, and agility as tools for responding to VUCA contexts, covering diverse topics such as the expectations of generation Z representatives at workplaces and remote work arrangements [3] [4]. At the same time, collective leadership models as the right frameworks for dealing with uncertainty have been discussed in other lines of research, which, however, point out that readiness frameworks for effective management remains not properly connected to resilience results [5] [11].

Sustainable leadership has come to be recognized as a separate category drawing attention to long-term value creation, stakeholder participation, and flexibility while empirical results have linked sustainability practices to resilient small and medium enterprises [16]. Systematic reviews of leadership agility also emphasize the persistent conceptual fragmentation in VUCA leadership literature [13]. At the same time, technological breakthroughs especially Industry 4.0 and Industry 5.0 have been identified as a facilitator of sustainable and resilient operation in manufacturing environments while blockchain technology has been found to help operations to be resilient in times of uncertainty in finance [17] [19].

Even with these developments, existing research still treats leadership agility, sustainable leadership, and technology use as three separate and unrelated inquiries rather than interconnected. According to available research, it is confirmed that leadership agility is essential for adaptive capacity and the use of technologies contributes to operational flexibility, but at the same time, there is no consistent understanding of how sustainable leadership helps achieve resilience via technology in the environment of VUCA organizations. This inconsistency constitutes a significant theoretical and practical gap in view of rising role of organizations in digital transformation.

This paper aims to fill this gap by providing a solid understanding of the relationship between sustainable leadership, technology, and resilience in organizations in the context of VUCA.

Research Objectives

1. To synthesize existing literature on sustainable leadership practices and their role in strengthening organizational resilience within VUCA environments.
2. To examine how emerging technologies function as mediating mechanisms between sustainable leadership and organizational resilience.
3. To develop an integrated conceptual framework linking sustainable leadership, technology adoption, and resilience outcomes.
4. To identify theoretical and practical implications for leadership practice in technology-enabled VUCA settings.

Key Contributions

- This research thoroughly reviews the evidence collected from 124 different studies to explore how sustainable leadership is related to emerging technologies and the resilience of organizations in a chaotic and unpredictable situation.
- The role of emerging technologies has been highlighted in this study because it plays an important role in transforming the practices of sustainable leadership into outcomes of resilience.
- This paper establishes a theoretical framework based on Dynamic Capabilities Theory, Stakeholder Theory, and Organizational Resilience Theory to understand resilience that has been achieved because of the use of technology.
- The paper provides important insights into trends in research in this area and gaps that exist in theoretical knowledge as well as practical implications that can be helpful for conducting empirical research in this area.

The rest of this paper is structured as follows. In section 2, the relevant literature on sustainable leadership, organizational resilience, new technologies, and VUCA environments is reviewed by highlighting the gaps in research. Methodology used for the systematic integrative literature review is given in section 3. The findings of the review are presented in section 4. Theoretical and practical implications of the current study are discussed in section 5. Lastly, section 6 sets forth the conclusions of the paper, summarizes the findings of the research, mention its limitations, and presents possible directions for future research.

LITERATURE REVIEW

Leadership in VUCA Environments

The VUCA concept of volatility, uncertainty, complexity, and ambiguity is now regarded as the core explanation for organizational leadership challenges [15]. Studies on effective leadership under VUCA suggest that it includes taking charge, being grounded in ethics, and making decisions based on values. A leadership competence framework created for VUCA contexts is also applied to higher education, which allows for the identification of discrepancies between leadership education and unpredictable working conditions [7]. According to responsible leadership theories, VUCA conditions represent a situation where leaders must provide accountability to stakeholders and arrive at proactive decisions, instead of relying solely on traditional authority [8]. Internal cognitive discussions imply that effective leadership can be achieved through situational awareness and learning [9].

Studies that correlate VUCA leadership with intercultural competencies suggest that cross-cultural adaptability is an important leadership quality that deserves further attention in globally-distributed organizations [10]. Strategic leadership models stress the importance of leadership approaches that are flexible and adaptable to changes [12]. Bibliometric studies of leadership agility show that this field of research has developed rapidly in the past ten years, while its coverage is far from being even across industries and geographical areas [14]. VUCA-based strategic leadership frameworks assert that volatility and ambiguity call for different types of management rather than a single leadership style [15].

Sustainable Leadership and Organizational Resilience

On top of the common VUCA findings in leadership research, another field looks at sustainable leadership as a factor in long-term organizational performance. This field links sustainable leadership practices with ethical governance, stakeholder engagement, and strategic foresight, allowing organizations affected by crisis situations to achieve resilience [16]. Other research indicates that organizational capacities that relate resilience and sustainability require a common focus on continuity crisis management, adaptive capacity, and confidence of various stakeholders [20]. In general, the literature recognizes sustainable leadership as a feedback mechanism that enables organizations to absorb shocks and recover effectively.

Emerging Technologies and Resilience-Building

An independent line of study that is becoming more closely linked with other fields is that looking at how digital and other new technologies are altering organizational resilience. Industry 4.0 and Industry 5.0 systems are being portrayed as tools of operational flexibility, capability forecasting and human-centred production models that serve the objectives of sustainability and resilience [17] [18]. The research dedicated to blockchain technologies indicates that the distributed ledgers can help increase transparency and risk management in those industries that have a high level of uncertainty, banking being one of them [19].

Integration Gaps and Theoretical Positioning

All of the research concludes three different points: the VUCA environment needs a kind of leadership that is both adaptive and ethical; sustainable leadership provides resilient governance based on stakeholder principles; and innovative technologies help improve operational and predictive capabilities. However, only limited studies link these three elements in a theoretical framework, and none of them investigate the question of how sustainable leadership serves as a prerequisite for technology-enabled resilience specifically in enterprises operating under VUCA conditions. This gap is taken as the theoretical basis for the conceptual framework developed in the current study.

Research Novelty and Contribution

Unlike previous studies, this review paper discusses the concept of sustainable leadership, organizational resilience, emerging technologies, or VUCA environments as isolated fields of research. Previous reviews were concerned either with leadership competencies in VUCA environments, organizational resilience and sustainability, or resilience through technology such as Industry 4.0/5.0 and blockchain without discussing the relationship between sustainable leadership and resilience through technology enablement.

The originality of this research is defined by its four main contributions. To begin with, it connects scattered pieces of evidence extracted from 124 selectively chosen studies into one systematized conceptual framework based on Dynamic Capabilities Theory, Stakeholder Theory, and Organizational Resilience Theory. Next, it points out the role that emerging technologies play as mediators in linking sustainable leadership to organizational resilience, which remains insufficiently studied in previous reviews. Also, it combines recent evidence to illustrate the trend toward leadership capabilities' convergence with digital transformation for enhancing organizational resilience in VUCA environment. In conclusion, this research exposes present shortcomings in this field and provides a robust theoretical framework for validation via empirical testing and application of findings.

According to the literature, studies in the area of sustainable leadership, organizational resilience, emerging technologies and VUCA have been conducted as separate research fields. However, not much research has been performed to study how these areas connect to and interact with each other, especially the effect of emerging technologies in connecting sustainable leadership with organizational resilience. In addition, the existing literature does not have a common theoretical framework that addresses the described relationships in the context of VUCA. Hence, it is essential to conduct systematic synthesis of the current literature and create the integrated conceptual framework for these researches in future and in context of organization practices.

METHODOLOGY

Research Design

The present study utilizes the Systematic Integrative Literature Review (SILR) methodology in studying the connections between sustainable leadership, innovative technologies, and organizational resilience in VUCA context. Unlike conventional literature reviews, SILR has a clear methodology that allows examining published literature from a variety of fields for the purpose of developing an integrated

theoretical framework, instead of a superficial summary.

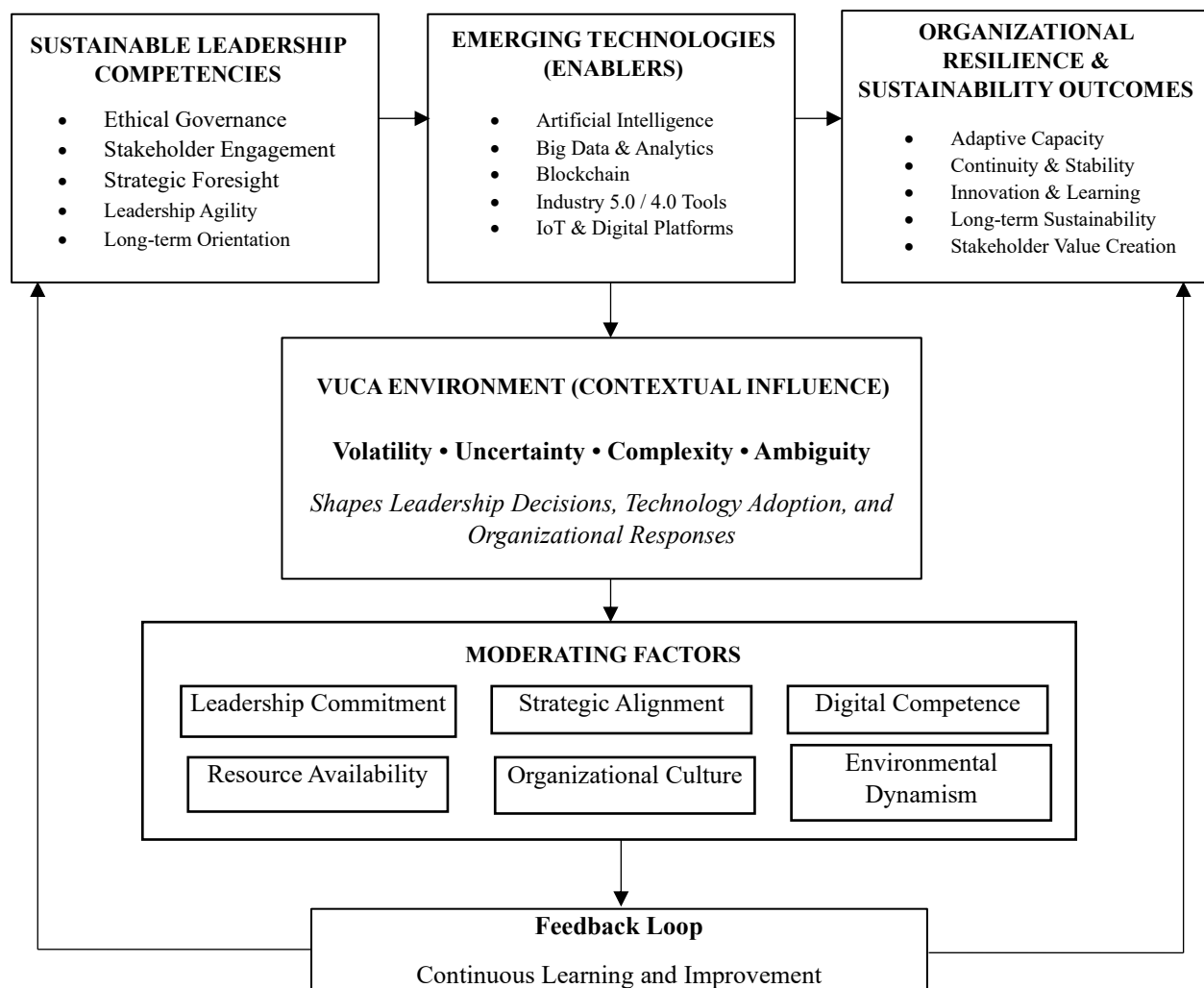


Figure 1. Integrated conceptual framework for sustainable leadership, emerging technologies, and organizational resilience in VUCA environments

The proposed conceptual framework is shown in figure 1. It indicates how sustainable leadership, new technologies, organizational breadth, and stakeholder's value are interconnected in VUCA environments. The function of sustainable leadership in the implementation of technologies, enhancing organizational resilience, and creating stakeholder value is provided together with contextual and moderating relationships that influence these relationships in terms of the organization's continuous learning and adaptation.

Literature Search Strategy

A literature review was performed on six databases Scopus (n = 85), Web of Science (n = 62), ScienceDirect (n = 45), SpringerLink (n = 28), IEEE Xplore (n = 20), and Google Scholar (n = 10) covering the time between 2011 and 2026, favouring more recent theoretical and empirical development but maintaining some relevant classic concepts. A systematic Boolean method that fuses main concepts was used and includes combinations between words "sustainable leadership", "organizational resilience", "VUCA", "Emerging Technologies", "Artificial Intelligence", "Blockchain", "Industry 5.0", and "ESG Governance" has been applied. Also, backward and forward citation tracking has been used to minimize the omission of bias. The selection criteria included peer-reviewed articles from scientific journals, conference proceedings, book chapters, and organizational reports, published in English and dealing with the issues of sustainable leadership, resilience, digital transformation or challenges related to VUCA. All duplicate documents, editorials, and opinion pieces, documents in a

foreign language or unavailable in their whole text, and non-relevant documents have been excluded from consideration. The initial search strings across the six databases yielded a combined pool of records that, prior to deduplication, was cross-referenced to establish a unique initial screening set of 250 records.

Screening and Selection (PRISMA-Based)

The study selection process adhered to the PRISMA guidelines and went through four stages. Identification: out of the 250 identified records, 40 duplicates were eliminated, resulting in a total of 210 records for screening as shown in figure 2. Screening: after screening the title and abstract, 30 records were excluded because they are not relevant thematically, which resulted in a total of 180 records for full text review. Eligibility: there were 56 records excluded because of research limitations, lack of theoretical meaning, or unavailable full text. Inclusion: out of the remaining records, 124 records were kept for review. Each of the steps of the study was assessed separately by two reviewers, who were evaluated as per the Cohen's Kappa ($\kappa = 0.82$) and discrepancies were handled through discussions.

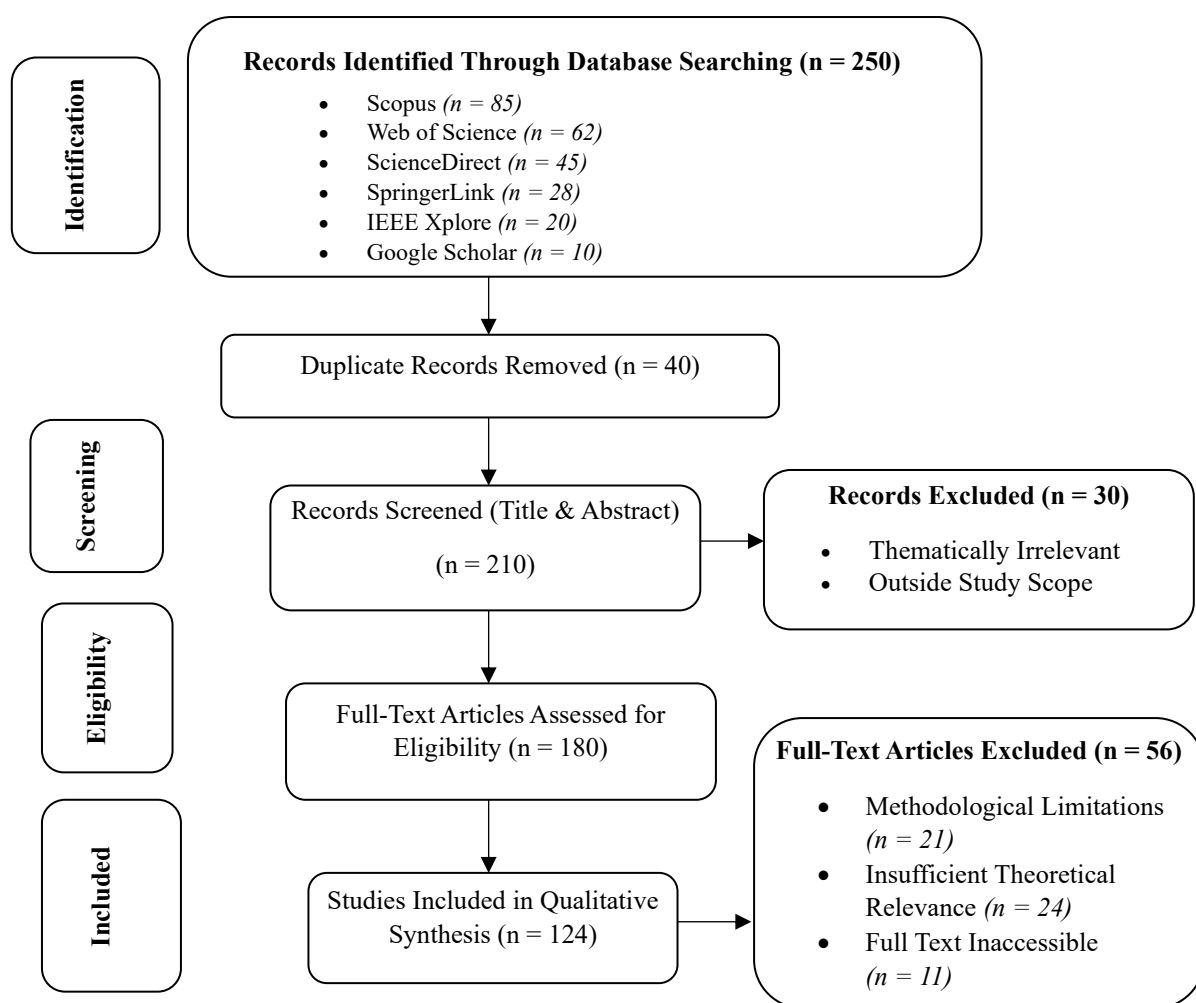


Figure 2. PRISMA 2020 flow diagram of the study selection process

Data Extraction and Coding Procedure

A structured extraction framework documented authorship, year of publication, source of publication, methodology, theory, technology, aspects of leadership, and results for every paper classified into four categories: sustainable leadership competencies; emerging technologies; outcomes related to sustainability/resilience of the organization; and VUCA qualities of the environment. The coding was done in three stages with the use of a common codebook: open coding resulted in preliminary names for concepts and relations; axial coding formed groups based on four categories and their connections; and

selective coding merged the categories forming the main relation of leadership-resilience-technology in the conceptual framework. Two coders worked independently coding 20% of the sample for the verification of coding, eliminating discrepancies before coding the full sample.

Quality Assessment

After going through the PRISMA procedure of screening and eligibility, the review of the final collection of 124 studies was conducted. The Mixed Methods Appraisal Tool (MMAT 2018) was only applied to the empirical studies, which are a total of 106 studies of qualitative, or quantitative descriptive, or quantitative non-randomized, or mixed-methods type. The rest of the 18 conceptual or theoretical studies were not subjected to MMAT, as this tool is meant for empirical studies only. These conceptual/theoretical studies were still included in this review, due to their importance in the formulation of the conceptual framework and thematic synthesis being done. The evaluation of the empirical studies was performed in the following sequence. Firstly, each empirical study was classified according to the research approach it adopts. Secondly, after the classification, it was assessed with the help of five MMAT criteria for that particular type of research, which are: the relevant and clear research question, warrant of the study design, adequacy of data collection, adequacy of data analysis, and consistency between findings and conclusions. The reviewers made use of "Yes," "No," and "Cannot Tell" choice for their rating of studies, and in case of disagreement, they would communicate with each other to resolve it. The MMAT assessment was used to evaluate and report the methodological quality of the empirical studies rather than as an additional exclusion criterion.

Conceptual Framework and Data Synthesis

Table 1. Research objectives, variables, explanation, methodology, and relevant literature

S. No.	Research Objective	Variables	Explanation	Methodology	Relevant Literature
1	To synthesize existing literature on sustainable leadership practices and their role in strengthening organizational resilience within VUCA environments.	IV: Sustainable Leadership; DV: Organizational Resilience	Consolidates fragmented findings on how ethical governance, stakeholder engagement, and strategic foresight strengthen resilience capacity.	Thematic synthesis of peer-reviewed literature (SILR)	[16][20]
2	To examine how emerging technologies function as mediating mechanisms between sustainable leadership and organizational resilience.	Mediator: Emerging Technologies (AI, Blockchain, Industry 5.0); IV: Sustainable Leadership; DV: Organizational Resilience	Evaluates how technology adoption translates leadership capability into measurable resilience outcomes.	Cross-study thematic comparison and coding of technology-resilience linkages	[17] [18] [19]
3	To develop an integrated conceptual framework linking sustainable leadership, technology adoption, and resilience outcomes.	IV: Sustainable Leadership; Mediator: Technology Adoption; DV: Organizational Resilience	Integrates leadership, technology, and resilience streams treated independently in prior work into a single explanatory model.	Conceptual integration grounded in Dynamic Capabilities, Stakeholder, and Resilience Theory	[13] [15]
4	To identify theoretical and practical implications for leadership practice in technology-enabled VUCA settings.	Moderator: VUCA Environmental Intensity; DV: Leadership Practice Implications	Translates synthesized findings into guidance for leaders operating under volatility, uncertainty, complexity, and ambiguity.	Interpretive analysis of thematic findings against VUCA leadership literature	[1][11]

Note: IV = Independent Variable; DV = Dependent Variable. Sustainable leadership is treated as the IV, emerging technologies (artificial intelligence, blockchain, Industry 5.0) as the mediating variable,

VUCA environmental intensity as the moderating variable, and organizational resilience as the DV throughout the conceptual framework.

The framework shown in figure 1 is based on the Dynamic Capabilities Theory, Stakeholder Theory, and Organizational Resilience Theory, all of which explain the processes by which organizations reorganize their resources during uncertain times, and how governance geared towards sustainability creates stakeholder value. The framework also explains the role of adaptive capacity in the recovery and sustainability of organizations. Based on the 124 studies used in this review, the framework suggests that sustainable leadership is the driving force for organizational resilience, with emerging technologies playing an intermediary role in the process, and VUCA environmental intensity influencing its strength. The studies were thematically synthesized rather than statistically and classified according to four domains to allow comparing the themes and their findings in search for common relationships among leadership capability, technology enablement, and resilience outcomes that made it possible to construct the framework under review.

Table 1 shows how the objectives of the research align with the key variables, and methodologies as well as the supporting literature. The independent, mediation, moderation, and dependent variables used in the conceptual framework are given and the systematic review of the literature is utilized to support the general analytic structure of all the research.

RESULTS

Quality Assessment Results

The evaluation of the methodological quality of the 106 empirical studies included was done using the Mixed Methods Appraisal Tool (MMAT 2018) after the PRISMA process of screening and achieving eligibility. The conceptual studies that remained 18 in number were not passed through MMAT because the instrument is meant for empirical studies. Among 106 empirical studies, 69 (65%) fulfilled all five MMAT criteria and were therefore designated as 'high quality' studies while 37 (35%) fulfilled three to four criteria and were thus designated as 'moderate quality' studies. Furthermore, no other studies were eliminated during this process of evaluation of quality as MMAT was only used for evaluating methodological quality of the included studies and not for screening purposes again. The findings suggested that the empirical evidence accumulated in this study is based on works with sufficient methodological quality.

Table 2. MMAT quality assessment summary (N = 106)

Study Design	Studies Appraised	High	Moderate
Qualitative	46	30	16
Quantitative Descriptive	28	19	9
Quantitative non-randomized	18	11	7
Mixed Methods	14	9	5
Total	106	69 (65%)	37 (35%)

According to table 2, 69 of the 106 studies, which represent 65% of the total, passed all the five criteria, suggesting that the empirical evidence used in this synthesis is of high quality.

Distribution of Reviewed Literature

Figure 3 indicates how 124 included studies relate to their date of publication and how widely review benefits from researches in recent years. 68% of the studies fall into the timeframe of 2021-2026 thus justifying the recency requirements mentioned in the review.

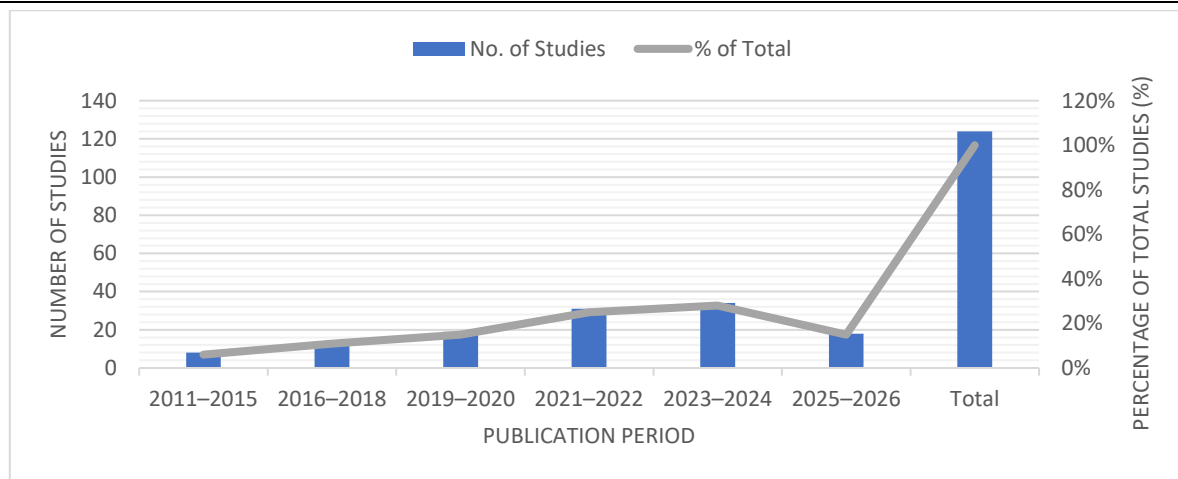


Figure 3. Temporal distribution of publications included in the review (N = 124)

Table 3 provides complementary information as it shows how the same 124 studies are distributed according to the four thematic domains developed during data extraction (Section 3.4), hence presenting the significance of literature related to sustainable leadership, resilience, technology, and VUCA in the prepared review.

Table 3. Thematic domain distribution (N = 124)

Thematic Domain	No. of Studies	% of Total
Sustainable Leadership Competencies	38	31%
Organizational Resilience & Sustainability Outcomes	33	27%
Emerging Technologies	29	23%
VUCA Environmental Characteristics	24	19%
Total	124	100%

Note: Each of the 124 studies was classified into its primary dominant thematic domain based on the main focus of its research findings to ensure a clear mutually exclusive distribution totalling 100%.

The area of sustainable leadership has been the most widely discussed by experts; in comparison, advances in technology and research on VUCA concepts have been less developed. Therefore, the unevenness of academic literature should be mentioned explicitly in Discussion rather than simply passing over it.

Thematic Evidence Matrix

Table 4. Thematic synthesis of reviewed literature

Theme	Analytical Pattern Across Studies	Supporting Studies
Sustainable leadership as a resilience driver	Ethical governance, stakeholder engagement, and strategic foresight consistently emerge as the three behaviours most strongly associated with adaptive capacity and sustainability, in particular in resource-constrained organizations.	[9] [16] [20]
Leadership agility and readiness under VUCA conditions	Agility and readiness are considered as prerequisites for resilience, but they are identified as crucial parts of the process rather than being linked to practical outcomes.	[11][13][14]
Digital competence as an emerging leadership requirement	In subsequent research, the discourse has shifted to digital competence emerging as a unique attribute of leadership rather than a facet of general adaptability, an opinion that was absent in previous VUCA studies.	[4][5][7]
Emerging technology as an operational enabler	The research relating to Industry 4.0/5.0 and blockchain stresses the importance of transparency, forecasting capabilities and flexibility in operations as key elements of the influence of technology on sustainability.	[17][18][19]
Technology as a mediator between leadership and resilience	The weakest-supported relationship in the series: leadership-resilience and technology-resilience links have extensive individual standing, but not many research works examine technology adoption as an explicit mediator; thus, this is precisely where the innovation fills the gap.	[6] [12] [19]

Table 4 gives information on the theme analysis of the reviewed publications by showing the prevalent themes, modes of analysis, and the relevant papers. The results indicate that the sustainable leadership and emerging technologies work together to improve the resilience of an organization while revealing the mediating role of technology as a not fully explored topic that needs further analysis.

Synthesis Summary

The review of literature shows that the significance of sustainable leadership, emerging technologies, and organizational resilience is increasingly appreciated as interrelated capabilities of organizations instead of diverging scientific areas. The evaluation of the quality of the studies shows that the methodological requirements for inclusion into this synthesis were met. It is evident that sustainable leadership is still in the centre of investigation, whereas the role of emerging technologies in mediating the relationship between leadership and resilience is poorly studied. The review of literature shows that in this context emerging technologies systematically improve the organizations' flexibility, transparency, and adaptability in case they are linked to sustainable-oriented leadership. Thus, the framework proposed is proved to be a valid one, and technology-driven sustainable leadership is revealed as a way to improve resilience of organizations operating in VUCA environments.

DISCUSSION

Interpretation of Findings

The research indicates that sustainable leadership is the main capacity within organizations that supports being resilient in turbulent conditions. The ethical governance, stakeholder engagement, strategic foresight, and agility of leaders are regarded to be the key features of leadership which influence adaptive capacity and sustainability of organizations [9] [16] [20]. Unlike earlier studies concentrating on leadership styles alone, recent research has shifted to studying both leadership competencies and digital transformation processes and their contribution to resilience of organizations [13][17][18].

The review indicates that the role of technologies has changed from that of the instruments of operation support to that of the main sources of organizations' resilience. Technologies like artificial intelligence (AI), blockchain, Industry 4.0/5.0 and digital analytics help the organizations to gain the resilience by increasing the predictive power, agility, and transparency of decision-making [17][18][19]. At the same time the evidences determine the fact that the technology implementation needs the involvement of leaders and their understanding of the relevance of technology to companies' goals [2][4][19].

One important revelation that has emerged from the mix is that not enough studies on the part of technology being the mediator between sustainable leadership and organizational resilience have been conducted. Although the links between leadership and resilience and between technology and resilience have been examined separately, there haven't been many studies that analysed how this technology makes the transition from sustainable leadership to resilience outcomes. This is the main gap found in the literature review that acts as a basis for the formation of the conceptual framework proposed in the paper [16][17][19].

Theoretical Implications

In analysing the subject matter, the research employs theories drawn from the areas of sustainable leadership, new technologies and organizational resilience within one conceptual framework. Rather than treating each area separately, the proposed framework illustrates how resilience arises from the interaction among the areas represented in the VUCA environment. As such, theoretical foundations used in this case add to the existing knowledge of leadership adaptation and technology capability and resilience.

Practical Implications

The findings present the vital significance of fostering sustainable leadership capabilities as part of

digital transformation processes. In this regard, developing leaders should reflect in the educational programs the topics like ethical governance, relations with stakeholders, strategic insights, etc. Moreover, investing in artificial intelligence (AI), blockchain, Industry 4.0/5.0 technologies, and data analytics should be made alongside long-term sustainability goals, rather than operational efficiency only. The combination of these approaches should improve organizations' flexibility, decision-making quality, and stability.

Limitations

This study has certain limitations. First, the study brings together existing knowledge from earlier research but does not carry out any empirical validation of the proposed framework. Second, literature in languages other than English may have been left out as only peer-reviewed papers published in English were included in the study. Third, the differences in the methodology used in the reviewed studies limited the extent to which a quantitative synthesis of the data or a meta-analysis could be performed.

Suggestions and Future Research

Research in the future should validate the suggested conceptual framework with the method of empirical research employing the quantitative, longitudinal, or mixed-method research design. Future research must continue exploring the influence of artificial intelligence, blockchain technology, and other high technologies on the relationship between sustainability leaders and their ability to increase the resilience of their organizations. Cross-industrial research that compares various industries, sizes of companies, and geographic regions would also add to the comprehension about technology-induced sustainability. In the future, the standardized model that would be able to measure both sustainability leadership and technology capabilities and the resilience of an organization should be developed.

CONCLUSION

The present research article conducted a Systematic Integrative Literature Review (SILR) to analyze the relationship between sustainable leadership, recent technology, and organizational resilience in environments described as Volatile, Uncertain, Complex, and Ambiguous (VUCA). A PRISMA-congruent review protocol identified 250 articles collected from 6 online databases. After removing 40 duplicate records, 210 studies were reviewed whereby 180 full-text papers were reviewed for inclusion. Quality assessment for methodological research was conducted using MMAT-2018 criteria for 106 empirical papers included in this literature review. In addition, 18 conceptual/theoretical papers were chosen for the conceptual synthesis. According to the results of the analysis, 65% of the studies were of high quality, and 35% were classified as moderate quality thereby ensuring the strong evidence base for the systematic review. Moreover, 68% of all the reviewed studies were published between 2021 and 2026 indicating the developing interest of scholars in technology-based organizational resilience. The thematic synthesis identified four main areas of research: sustainable leadership skills (31%), organizational resilience and sustainability results (27%), new technologies (23%), and VUCA environment features (19%). The findings show that sustainable leadership and new technologies are complementary capabilities that contribute towards improving adaptability, operational flexibility, and sustainability. The review also identified a gap in the research related to the mediating role of new technologies in transforming sustainable leadership practices into resilience results, which guided the development of the proposed conceptual framework.

The contribution of the research lies in the integration of scattered studies into a new framework that combines theoretical and practical value for organizations functioning in uncertain and changing environments. On the practical side, this framework can also help organizations' leaders to match their leadership practices with technology adoption strategies in order to enhance resilience and provide lasting value to stakeholders. Future investigation is supposed to validate the framework in different industrial sectors and countries, study the mediating and moderating mechanisms, and analyze such new technologies as AI (artificial intelligence), digital twins, and Industry 5.0 in a way as to promote technology-enabled sustainable leadership research.

Acknowledgement

I am Dr. S. Saranya and I want to express my deep sense of gratitude to the Indian Council of Social Science Research (ICSSR) for sponsoring and selecting me for the Post Doctoral Fellowship. The support from ICSSR under the Government of India has been very helpful in completing my research.

Author Contributions

Dr. S. Saranya: Conceptualization, Methodology, Literature Review, Data Curation, Analysis, Visualization, Writing – Original Draft Preparation, Writing – Reviewing and Editing, Validation. Dr. K. Chandrasekar: Supervision.

Funding

This research was funded by the Indian Council of Social Science Research (ICSSR), under the Post-Doctoral Fellowship Grant, File No. 3-146/2024-25/PDF/GEN.

Ethical Approval

The study conducted is a systematic review based only on the existing literature that is publicly available. It does not incorporate any human or animal subjects, collection of primary data or experimental intervention. Thus, ethical approval is not needed.

Competing Interest

The authors declare no competing financial, institutional, or personal interests that could have influenced the content or conclusions of this paper.

Data Availability

The research entirely relies on secondary data that was collected from academic resources that have undergone peer review. No primary data was received or analysed. Other necessary material or references can be provided on reasonable request by the author.

AI Usage Disclosure

The authors affirm that generative AI tools (such as ChatGPT, Gemini, Claude) were not involved in any way in the preparation of the core content of this manuscript. Only commons spelling, grammar, and layout tools available in Microsoft Word were utilized. All sorts of analytical, conceptual, and critical writing are original and were produced by the researchers.

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