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Corporate Strategy and Excellence: Advancing Project Resilience into Sustainable Management

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ABSTRACT

Purpose of the paper

This paper aims to highlight the significance of integrating project resilience into sustainable management practices to promote organisational agility, adaptability, and long-term viability. In the context of today's complex and volatile global environment, organisations had been under increasing pressure to respond to both immediate disruptions and long-term sustainability challenges. Project resilience, the ability of projects to anticipate, absorb, adapt to, and recover from adverse events, emerged as a vital capability in this setting. However, the findings show that, despite its widespread discussion within risk management and project delivery domains, its integration into broader corporate strategy remains fragmented. This research further explored the strategic embedding of project resilience within corporate management frameworks to support sustainable outcomes and organisational excellence.

Main findings

The research critically analysed the literature and examined the relationship between sustainable management and project resilience within the context of corporate strategy and organisational excellence. It identified synergies between the two concepts and discussed how organisations had leveraged resilience strategies not only to enhance their sustainability initiatives but also to reinforce strategic agility and long-term competitiveness. The analysis further explored how leadership commitment, a resilience oriented organisational culture, and active stakeholder engagement contributed to embedding resilience into strategic management practices. Together, these perspectives converge on a simple yet powerful insight: **resilient organisations are not those that avoid tension, but those that harness it constructively.** Rather than seeking equilibrium, they build agility into their foundations through culture, leadership, routines, and structures, allowing them to pivot quickly while staying anchored in their purpose. By synthesising the findings, this article provides actionable insights and strategic recommendations for practitioners and researchers aiming to align resilience thinking with corporate excellence and sustainable performance. However, several limitations were acknowledged. The exclusive reliance on secondary data may not have fully captured current real-world practices. Additionally, the emphasis on post-2018 literature may have excluded foundational studies, and the predominance of cross-sectional research limited the ability to observe long-term trends or establish causal relationships.

Type of paper

This study adopted a systematic literature review approach, drawing from over 39 peer-reviewed articles, industry reports, and relevant case studies published between 2018 and 2025. The review focused on key thematic areas such as resilience theory, strategic management, sustainability, and organisational behaviour. It highlighted best practices and empirical evidence demonstrating the value of integrating resilience principles into sustainable management, particularly within corporate strategy and organisational excellence.

Keywords

Systematic Literature Review; Project Resilience, Sustainable management, Strategic management, Organisational resilience, Corporate strategy, and Organisational excellence.

1. INTRODUCTION

In an era marked by escalating complexity, uncertainty, and technological disruption, organisations are increasingly required to build adaptive capacities that ensure continuity, performance, and strategic relevance. The concept of **project resilience** (RQ1) has emerged as a vital construct in this context, offering a framework for understanding how projects can anticipate, absorb, and adapt to shocks and stressors. Project resilience extends beyond traditional risk management by emphasizing flexibility, learning, and recovery, making it particularly relevant in dynamic project environments.

Closely linked to resilience is the imperative for **sustainable management** (RQ2), which encompasses long-term value creation through environmentally responsible, socially equitable, and economically viable practices. Integrating resilience into sustainable management frameworks enables organisations to navigate systemic challenges while maintaining progress toward sustainability goals. This dual focus ensures that projects are not only protected against disruption but are also aligned with broader development imperatives and stakeholder expectations.

With the advent of **Industry 4.0** (RQ3), digital transformation has become both a source of opportunity and disruption. Technologies such as the Internet of Things (IoT), artificial intelligence (AI), and automation are reshaping project processes, supply chains, and stakeholder interactions. Understanding how resilience principles apply in this technologically advanced landscape is essential for successful implementation. Project resilience acts as an enabler, supporting adaptability and strategic alignment amidst digital innovation.

Finally, resilience must be embedded within **corporate strategic management and organisational behaviour** (RQ4) to drive enduring excellence. This includes fostering a resilient culture, encouraging adaptive leadership, and integrating resilience thinking into planning and decision-making processes. By doing so, organisations can enhance agility, sustain competitive advantage, and foster a proactive orientation toward change.

Together, these four themes provide a holistic lens through which to explore the multifaceted role of resilience in contemporary organisational and project practice.

Research Gap

Despite the growing body of literature on resilience, sustainability, and digital transformation, several gaps remain in our understanding of how these domains intersect within the context of organisational project management.

First, while **project resilience** has been increasingly recognised as critical for navigating uncertainty, much of the existing research remains fragmented, focusing predominantly on reactive risk management rather than the proactive and systemic capabilities that define resilience. There is limited empirical and conceptual clarity regarding how resilience is operationalised across different project phases and sectors, particularly in dynamic or high-risk environments.

Second, although **sustainable management** frameworks emphasise long-term value creation and environmental and social accountability, the role of resilience in reinforcing or enabling sustainability remains underexplored. Few studies have examined how resilience principles can be structurally embedded into sustainability strategies to enhance organisational responsiveness and continuity under pressure.

Third, the integration of **Industry 4.0 technologies** into project environments has received significant attention; however, the literature lacks a comprehensive analysis of how resilience facilitates the adoption and implementation of such technologies. Most research isolates technological capabilities without considering the organisational resilience required to support successful and sustained digital transformation.

Finally, the relationship between **project resilience and corporate strategic management, organisational behaviour, and excellence** is still emerging in academic dialogue. There is a need to understand how resilience influences leadership practices, decision-making processes, and organisational culture to support long-term competitiveness and performance. Current research tends to overlook the systemic integration of resilience at the strategic and behavioural levels within organisations.

Therefore, this paper addresses these critical gaps by synthesising existing knowledge across these domains through a systematic literature review. It aims to offer an integrative understanding of how project resilience intersects with sustainability, digital innovation, and strategic management, providing insights for both researchers and practitioners.

To guide this synthesis and ensure comprehensive coverage of the relevant themes, the literature review was structured around four research questions (RQs), each aligned with a distinct thematic focus:

RQ1 – Theme 1: Project Resilience

What are the key dimensions of project resilience, and how have they evolved in recent literature to support effective project delivery in dynamic environments?

This theme explores the conceptual foundations and evolving characteristics of project resilience, focusing on its role in enhancing adaptability, continuity, and responsiveness under uncertainty.

RQ2 – Theme 2: Sustainable Management

How does the integration of project resilience principles enhance the effectiveness of sustainable management practices within organisations?

The review investigates how resilience can be embedded into sustainability strategies to strengthen organisational capacity for long-term viability, resource efficiency, and stakeholder engagement.

RQ3 – Theme 3: Project Resilience and Industry 4.0 Implementation

What role does project resilience play in Industry 4.0's successful implementation?

This theme examines the intersection between resilience and digital transformation, evaluating how advanced technologies, such as automation, IoT, and AI, interact with resilient project structures to support Industry 4.0 readiness and implementation.

RQ4 – Theme 4: Corporate Strategic Management, Organisational Behaviour, and Excellence

How can embedding resilience into corporate strategic management and organisational behaviour drive long-term competitiveness and organisational excellence?

The final theme addresses the strategic and behavioural dimensions of resilience, highlighting its integration into leadership, culture, and corporate planning as a lever for sustained organisational performance and excellence.

The systematic approach ensured the inclusion of literature that is both academically rigorous and practically relevant, enabling a comprehensive synthesis of insights across disciplines and sectors.

Aim

This study aimed to critically examine the evolving concept of project resilience and its strategic integration across four key domains: effective project delivery, sustainable management, Industry 4.0 implementation, and corporate strategic management. Through a systematic literature review, the research explored how resilience contributes to organisational adaptability, long-term competitiveness, and excellence in complex and dynamic environments.

2. METHODOLOGY

This study employed a systematic review of secondary data sourced from scholarly literature, including peer-reviewed journals, academic books, and conference proceedings. The search strategy was designed to identify relevant publications addressing themes of sustainable management and project resilience within organisational contexts. The selection process emphasised rigor and relevance, ensuring the inclusion of high-quality, thematically aligned sources. This methodological approach follows the same procedure outlined in Spanovic and Cano (2024), ensuring consistency and comparability with previous research.

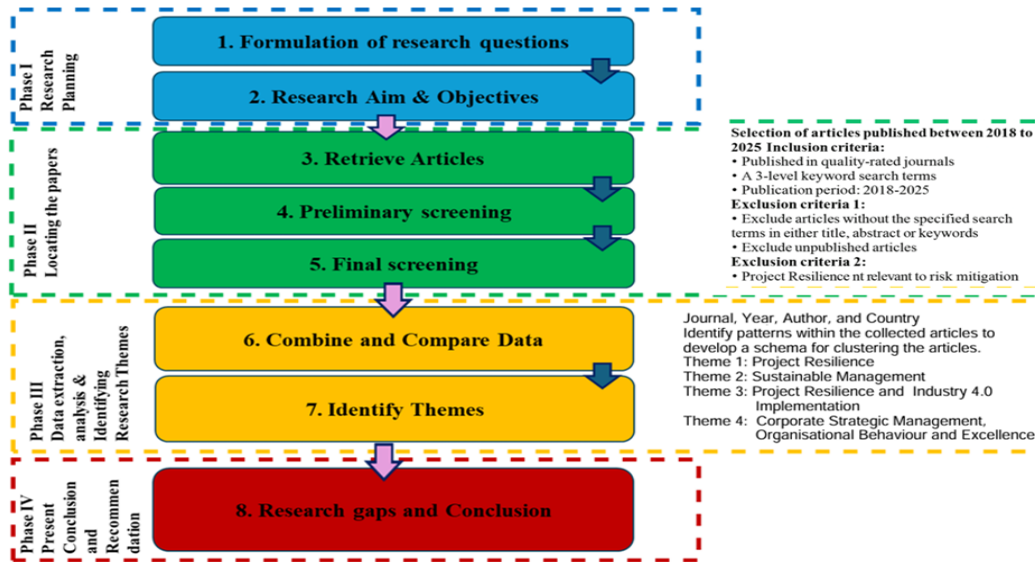


Figure 1. The methodological framework of the review (Adopted, Spanovic and Cano, 2024)

This study adopted a systematic literature review methodology to examine the evolving discourse on project resilience and its intersection with sustainable management and technological transformation. The review drew on secondary data from peer-reviewed journals, academic books, and conference proceedings, aiming to identify theoretical developments, empirical insights, and best practices relevant to resilience in organisational and project contexts.

Inclusion and Exclusion Criteria

Predefined conditions were established to determine the eligibility for the study, focusing on inclusion and exclusion criteria. The inclusion criteria outlined specific characteristics, including publication year, language, and subject relevance, to ensure that the research remained focused, pertinent, and of high quality. The exclusion criteria specified factors that disqualify certain studies, facilitating a systematic analysis of the most pertinent, recent, and peer-reviewed literature, thereby assisting in the formulation of valid conclusions and recommendations pertinent to project management (McKenzie et al. 2019).

Table 1. Inclusion and Exclusion Criteria

No.	Criteria	Inclusion Criteria	Exclusion Criteria
1	Publication Date	Articles published from 2015 onwards.	Articles before 2015 are eliminated to emphasise the latest achievements
2	Quality	Peer-reviewed research journals and articles, Published dissertations, Conference papers	Non-peer-reviewed articles, Unpublished, Opinions
3	Language	Publications must be in English.	Studies published in languages other than English are excluded.
4	Relevance/Publication sectors	Business, Construction, Supply Chain, Information Technology, Environment, Social, Entrepreneurship, Production, and Services	Medical and health sectors, fashion and others that don't contribute to the relevant topic
5	Empirical Evidence	Empirical and Conceptual Studies	General articles in newspapers, working papers in magazines
6	Accessibility	Articles accessed Full-text	Articles that couldn't be accessed in Full text

Preliminary screening

Full-Text Review, Every article was meticulously examined to assess its contribution, depth of discussion, methodological rigor, and empirical evidence.

Quality Assessment, Articles were evaluated for the clarity of their objectives, the strength of their theoretical foundations, the rigour of their analyses, and the significance and implications of their findings.

Study Design, The systematic literature review employed a cross-sectional time horizon, examining data gathered at a specific moment in time. This was appropriate for integrating established knowledge and combining various research outcomes.

Focus and Scope, The review focused on studies published from 2015 onwards to encompass the latest developments and insights, showcasing current trends and innovations in project resilience, sustainable management, project resilience and industry 4.0 implementation and corporate strategic management, organisational behaviour, and excellence.

Secondary Study Strategy

The secondary study strategy utilised pre-existing data, thereby circumventing the lengthy process of gathering primary data. This approach integrated insights from project management, organisational behaviour, and sustainability, enabling a thorough and current examination of both established theories and recent research advancements.

Final screening

The data screening process was carefully structured to identify and retain the most relevant and high-quality articles from the original set of 851. The abstracts were reviewed in greater depth to evaluate their relevance to the core themes. Following a thorough and systematic screening process, 39 articles were identified as meeting all inclusion criteria, forming a foundation for a comprehensive and insightful systematic literature review.

Although the study provided meaningful contributions, certain limitations were acknowledged. Relying solely on secondary data may not have reflected current real-world practices. The focus on post-2018 literature might have overlooked important earlier work, and the use of cross-sectional studies limited the understanding of long-term trends or causal relationships.

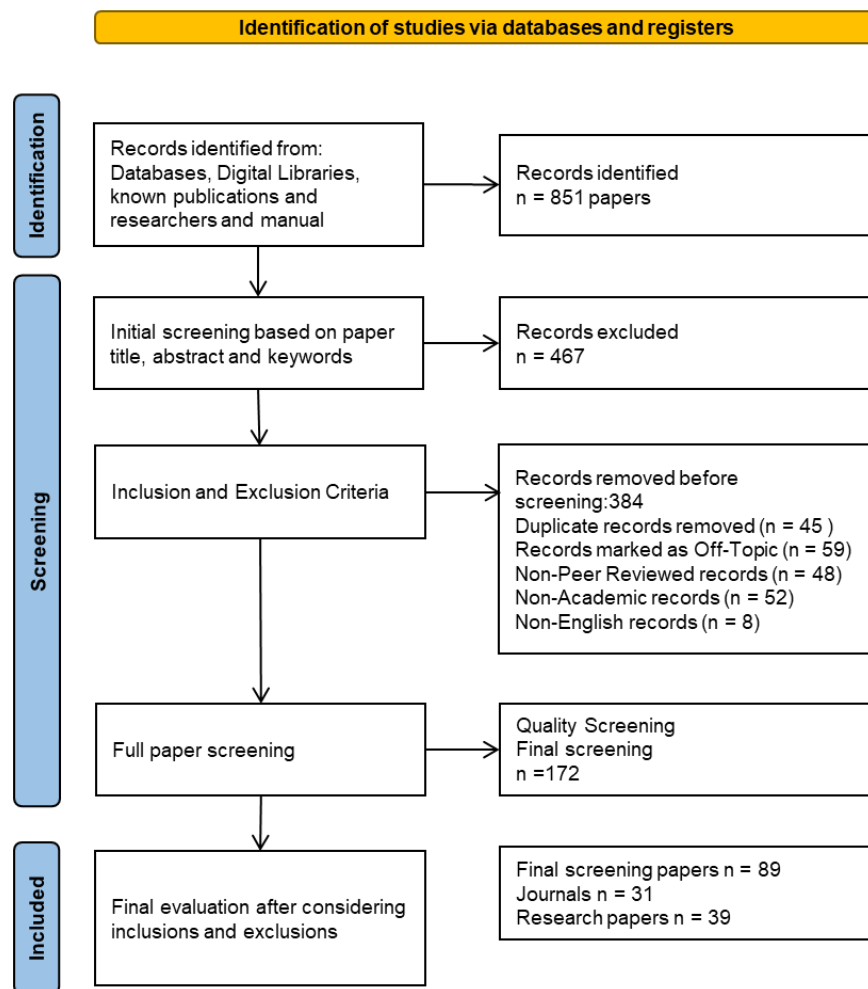


Figure 2. Selection Process for final paper – Prisma chart

Table 2. Selected sources for Project Resilience

Theme I - Project Resilience				
	Year	Author	Title	Journal
1	2019	Aven, T.	The Call for a Shift from Risk to Resilience: What Does it Mean?	Risk Analysis
2	2019	Rahi, K.	Project Resilience: A Conceptual Framework	International Journal of Information Systems and Project Management
3	2020	Ivanov, D.	Predicting the Impacts of Epidemic Outbreaks on Global Supply Chains: A Simulation-Based Analysis	International Journal of Production Research
4	2020	Naderpajouh, N., Matinheikki, J., Keeys, K. and Aldrich, P. D	Resilience and Projects: An Interdisciplinary Crossroad	Project Leadership and Society
5	2021	Spieske, A. and Birkel, H. (2021)	Improving supply chain resilience through industry 4.0: A systematic literature review under the impressions of the COVID-19 pandemic	Computers and Industrial Engineering
6	2022	Zarghami, S.A. and Zwikaël, O.	Measuring Project Resilience – Learning from the Past to Enhance Decision Making in the Face of Disruption	Decision Support Systems
7	2022	Nachbagauer, A.	‘RESILIENT PROJECT MANAGEMENT	Journal of Modern Project Management
8	2022	Fey, S. and Kock, A	Meeting Challenges with Resilience - How innovation Projects Deal with Adversity	International Journal of Project Management
9	2022	Benjamin, O. and Foye, O.	Inclusion, Organizational Resilience, and Sustainable Development in Nigeria: The Role of Digital Innovations	Multidisciplinary Digital Publishing Institute
10	2023	Bernat, B., Qualharini, G., Castro, E. and Barcaui, A.	Sustainability in Project Management and Project Success with Virtual Teams: A Quantitative Analysis Considering Stakeholder Engagement and Knowledge Management	Sustainability Journal
11	2023	Naderpajouh, N., Matinheikki, J., Keeys, L., Aldrich, D. and Linkov, I.	Resilience Science: Theoretical and Methodological Directions from the Juncture of Resilience and Projects	International Journal of Project Management
12	2023	Ram, J.	Investigating Staff Capabilities to Make Projects Resilient: A Systematic Literature Review and Future Directions	International Journal of Production Economics
13	2023	He, Z., Huang, H., Choi, H. and Bilgihan, A.	Building organizational resilience with digital transformation	Journal of Service Management

14	2023	Codara, L. and Sgobbi, F.	Resilience, complexity and digital transformation: three case studies in the valves industry	Journal of Manufacturing Technology Management
15	2024	Hilu, K.A. and Hiyassat, M.A.	Qualitative Assessment of Resilience in Construction Projects	International Journal of Construction Management
16	2024	Pettersen, S. and Grøtan, T.O.	Exploring the grounds for cyber resilience in the hyper-connected oil and gas industry	Safety Science Journal
17	2024	Bentahar, O and Belhadi, A	Integrating Project Management and Supply Chain Management for Resilient and Sustainable Operations in VUCA world	Supply Chain Forum
18	2024	Park, A. S	Understanding Resilience in Sustainable Development: Rallying call or Siren Song?	Journal of Sustainable Development

Table 3. Selected sources for Sustainable Management

Theme II - Sustainable Management				
	Year	Author	Title	Journal
1	2018	Sellberg, M.M. Ryan, R., Borgström, S., Norström, V. A., and Peterson, D. G	From resilience thinking to Resilience Planning: Lessons from practice	Journal of Environmental Management
2	2018	Sanchez, B. and Haas, C	Capital project planning for a circular economy	Construction Management and Economics
3	2018	Meyerowitz, D., Lew, C. and Svensson, G.	Scenario-planning in strategic decision-making: requirements, benefits, and inhibitors	Foresight Journal
4	2019	Diemer, A	Six key drivers for sustainable development	International Journal of Environmental Sciences & Natural Resources
5	2020	Naderpajouh, N., Matinheikki, J., Keeys, K. and Aldrich, P. D	Resilience and projects: An interdisciplinary crossroad	Project Leadership and Society
6	2020	Murtagh, N., Scott, L. and Fan, J.	Sustainable and resilient construction: Current status and future challenge	Journal of Cleaner Production
7	2020	Zanotti, L., Ma, Z., Johnson, L. J., and Johnson, R. D	Sustainability, resilience, adaptation, and transformation	Journal of Ecology and Society

8	2020	Grunkemeyer, W and Moss, M	Key Concepts in Sustainable Development	International Journal of Management, Business, and Administration
9	2021	Shahi, S., Patryk Wozniczka, P., Rausch, C., and Trudeau, I.	A computational methodology for generating modular design options for building extensions	Automation in in Construction Journal
10	2021	Sossa, Ríos, T. A. V., López, G. A. C., and Piedrahita, P. C. J.	Foresight by scenarios—a literature review	International Journal of Foresight and Innovation Policy
11	2022	Nachbagauer, A.	Resilient Project Management	Journal of Modern Project Management
12	2024	Jiang, W., Zhao., Cai, C., and Chang, K.	Study on Resilience Evaluation for Construction Management of Major Railway Projects	Building Journal

Table 4. Selected sources for Project Resilience and Industry 4.0 Implementation

Theme III - Project Resilience and Industry 4.0 Implementation				
	Year	Author	Title	Journal
1	2020	Ghobakhloo, M.	Industry 4.0, digitization, and opportunities for sustainability	Journal of Cleaner Production
2	2021	Kouhizadeh, M., Saberi, S. and Sarkis, J.	Blockchain technology and the sustainable supply chain: Theoretically exploring adoption barriers	International Journal of Production Economics
3	2021	Pavez, I., Gomez, H., Laule, L. and Gonzalez, V. A.	Project team resilience: The effect of group potency and interpersonal trust	International Journal of Project Management
4	2021	Spieske, A. and Birkel, H.	Improving supply chain resilience through industry 4.0: A systematic literature review under the impressions of the COVID-19 pandemic	Computers and Industrial Engineering
5	2022	Benjamin, O., and Foye, O..	Inclusion, Organizational Resilience, and Sustainable Development in Nigeria: The Role of Digital Innovations	Multidisciplinary Digital Publishing Institute
6	2022	Nachbagauer, A.	‘RESILIENT PROJECT MANAGEMENT	Journal of Modern Project Management
7	2023	Codara, L. and Sgobbi, F.	Resilience, complexity, and digital transformation: three case studies in the valves industry	Journal of Manufacturing Technology Management
8	2023	He, Z., Huiling, H., Hyeyoon, C. and Anil, B.	Building organizational resilience with digital transformation	Journal of Service Management
9	2023	Piperca, S. and Floricel, S.	Understanding project resilience: Designed, cultivated, or emergent?	Journal of Project Management
10	2024	Pettersen, S. and Grøtan, T.O.	Exploring the grounds for cyber resilience in the hyper-connected oil and gas industry	Safety Science Journal

Table 5. Selected sources for Corporate Strategic Management, Organisational Resilience, and Excellence

Theme IV - Corporate Strategic Management, Organisational Resilience, and Excellence				
	Year	Author	Title	Journal
1	2018	Darkow, I.	Plan to resist and containing-crisis approaches to organisational resilience	Journal of Risk Research
2	2019	Niemimaa, M., Järveläinen, J., Heikkilä, M. and Heikkilä, J.	Business continuity of business models: evaluating the resilience of business models for contingencies	International Journal of Information Management
3	2020	Hughes, P., Morgan, R.E., Hodgkinson, I.R., Kouropalatis, Y. and Lindgreen, A.	A diagnostic tool to determine a strategic improvisation Readiness Index Score (IRIS) to survive, adapt, and thrive in a crisis	Industrial Marketing Management
4	2021	Pavez, I., Gomez, H., Laule, L. and Gonzalez, V. A.	Project team resilience: The effect of group potency and interpersonal trust	International Journal of Project Management
5	2022	Colberg, T.	Strategic resilience: a systematic review of leading literature	Journal of Business Management
6	2023	Codara, L. and Sgobbi, F.	Resilience, complexity and digital transformation: three case studies in the valves industry	Journal of Manufacturing Technology Management
7	2023	He, Z. Huiling H Hyeyoon, C. Anil, B.	Building organizational resilience with digital transformation	Journal of Service Management,
8	2024	Hendri Khuan	Building Organizational Resilience in the Era of Uncertainty: Strategies and Best Practices	Management Studies and Business Journal (PRODUCTIVITY)
9	2024	Pettersen, S. and Grøtan, T.O.	Exploring the grounds for cyber resilience in the hyper-connected oil and gas industry	Safety Science Journal
10	2024	Tekletsion, B.F., Gomes, J.F.D.S. and Tefera, B.	Organisational resilience as paradox management: a systematic review of the literature	Journal of Contingencies and Crisis Management



Figure 3. Yearly Article Distribution by Theme

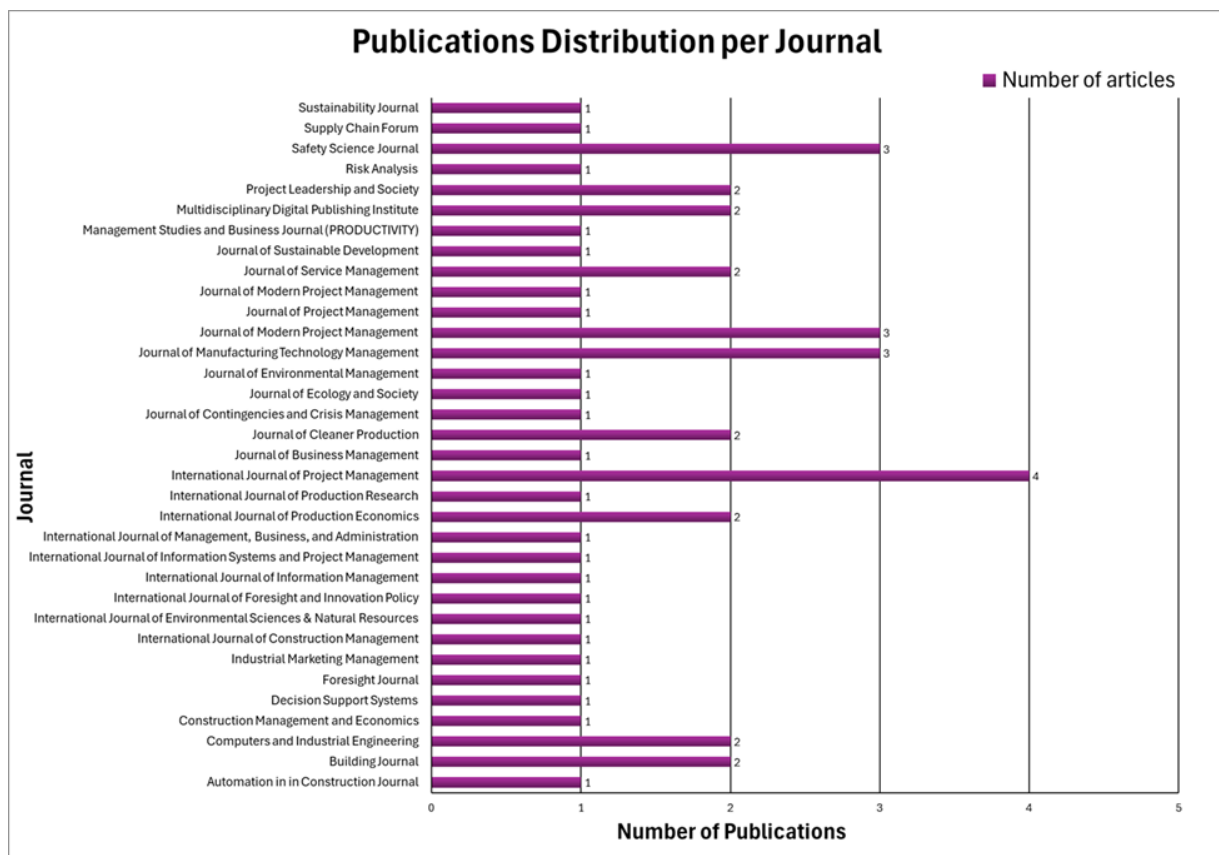


Figure 4. Journal Distributions

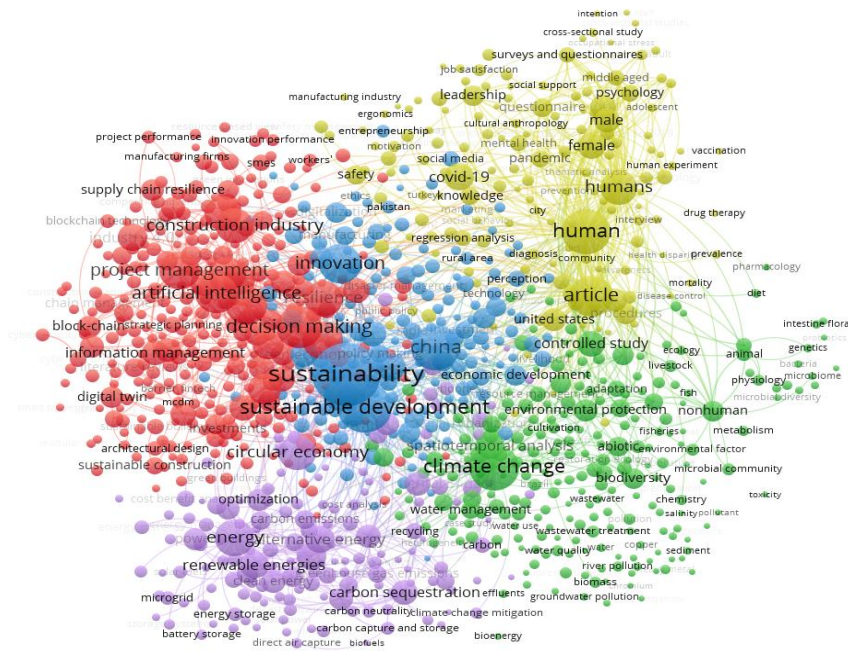


Figure 5. Keyword Co-occurrence Network of Literature on Project Resilience and Sustainable Management (Source: Scopus, Visualized with VOSviewer)

Bibliometric Analysis Results

These conceptual insights are supported by the findings of the bibliometric analysis, which further illuminate the multidisciplinary and evolving nature of resilience research. The keyword co-occurrence map generated through VOSviewer identified five major thematic clusters that represent distinct yet interconnected domains within the literature.

The **red cluster**, centred on technological innovation and project resilience, underscores the growing scholarly emphasis on digital transformation in enhancing resilience across industrial sectors. Key terms such as project management, decision-making, construction industry, and artificial intelligence signal a trend toward technologically driven resilience strategies.

The **blue cluster** forms the conceptual and policy-oriented core of the discourse, highlighting sustainability, sustainable development, and governance frameworks that align resilience with strategic planning and long-term impact.

The **yellow cluster** shifts focus to the human and organisational dimensions of resilience, with keywords such as leadership, psychology, job satisfaction, and motivation. This reflects increasing recognition of the behavioural foundations necessary for resilient systems, aligning with arguments made in recent literature that stress the importance of organisational culture and leadership in resilience-building efforts.

The **green cluster**, rooted in environmental concerns, integrates topics such as climate change, biodiversity, and ecological adaptation, broadening the resilience discourse to include natural systems and planetary boundaries.

Finally, the **purple cluster** addresses infrastructural and energy resilience through themes such as renewable energy, carbon emissions, and energy storage, underlining the role of resilience in supporting low-carbon transitions and sustainable infrastructure.

Together, these clusters illustrate the fragmented nature of current intellectual efforts. In particular, the relatively weak connections between strategic management and behavioural themes point to an underexplored nexus that this study seeks to address. By proposing an integrated framework that unites these domains, this research contributes to a more comprehensive understanding of resilience as both a cross-cutting and unifying concept in contemporary project environments, bridging sustainability, digital transformation, organisational behaviour, and strategic excellence.

3. SYSTEMATIC LITERATURE REVIEW (SLR)

In today's complex and rapidly evolving environments, project resilience has become a critical factor for ensuring effective delivery and long-term organisational success. This systematic literature review explores four key themes: the evolving dimensions of project resilience in dynamic contexts; the integration of resilience into sustainable management practices; the role of resilience in supporting Industry 4.0 implementation; and its strategic value within corporate management and organisational behaviour. By examining these interconnected themes, the review offers a perspective on resilience as a multidimensional enabler of adaptability, innovation, and sustainable performance.

3.1. Theme I - Project Resilience

In a time marked by increasing volatility, uncertainty, complexity, and ambiguity, the necessity to integrate resilience into project environments has become more critical than ever. A systematic review by Tekletsion et al. (2024) highlights that organisational resilience involves the ability to foresee, react to, and recuperate from disruptions while maintaining or potentially improving essential functionality. It is essential to understand that resilience is not a fixed quality; rather, it is a dynamic and paradoxical process. Organisations must constantly navigate the balance between competing demands, including stability and flexibility, exploration and exploitation, as well as short-term and long-term priorities. This dual approach facilitates ongoing adaptation while maintaining strategic coherence (Tekletsion et al., 2024).

The initiative focused on resilience, positioned at the crossroads of business strategy and sustainable management, has transitioned from abstract theories into quantifiable strategic assets. Zarghami and Zwikaël (2022) pioneered the quantification of resilience by extracting indicators from historical disruption data, effectively connecting reflective learning to decision support. Their study illustrated how resilience metrics can guide resource allocation and risk mitigation, turning resilience from a theoretical concept into a functional management instrument. Expanding on this, Aven (2019) redefined resilience as a dynamic capability that goes beyond traditional risk avoidance. Rather than focussing solely on avoiding negative outcomes, resilient organisations foster adaptability and learning, enabling them to flourish in the face of uncertainty.

To implement these insights, Rahi (2019) proposed a project lifecycle framework that incorporates anticipation, coping, and adaptation into each stage of project execution. Rahi's simulation studies revealed that projects incorporating resilience mechanisms like scenario planning at the initiation stage, improvisational teams during execution, and structured after-action reviews at closure show a markedly enhanced capacity to uphold critical objectives in the face of disruptions. In addition to this, Ivanov (2020) presented empirical evidence from disruptions in supply chains caused by epidemics, demonstrating that the integration of early detection systems with well-timed interventions can significantly minimise both downtime and financial losses. The results highlight the critical need for real-time monitoring and flexible decision-making processes within project environments.

Recent methodological advancements have enhanced a comprehension of resilience within an interdisciplinary context. Naderpajouh et al. (2020) explored the intersection of resilience science and project management, emphasising the importance of cross-sector collaboration to create more holistic models of adaptive capacity. The subsequent work (Naderpajouh et al., 2023) introduced thorough evaluation techniques such as network analysis for mapping interdependencies and resilience maturity models for benchmarking organisational agility that empower practitioners to systematically assess and improve resilience. Ram (2023) highlighted the importance of focused training and cultural change, pinpointing essential competencies, leadership acumen, emotional intelligence, and change-management skills as crucial for fostering resilient performance. In the built environment sector, Hilu and Hiyassat (2024) qualitatively outlined resilience dimensions preparation, absorption, recovery, adaptation emphasizing how project teams and governance structures can be adjusted to maintain operational continuity during extreme stress.

In the context of sustainability, resilience plays a crucial role in harmonising economic, social, and environmental objectives. Falsarone (2022) articulates project resilience as the ability to foresee, prepare for, react to, and recuperate from disruptions while promoting sustainability goals. In contrast to conventional risk management that emphasises avoidance, resilience acknowledges uncertainty and centres on the ability to adapt. Cook and Wirén (2024) illustrate that initiatives structured around resilience principles like modular resource allocation, adaptable stakeholder engagement, and contingency funding are capable of achieving long-term sustainability goals despite challenges posed by climate events, supply shocks, or market fluctuations. Technological advancements, such as predictive analytics, real-time monitoring systems, digital twins, and blockchain, enhance resilience by improving situational awareness, automating standard responses, and maintaining data integrity across the project lifecycle.

The transformation of work environments through digital and virtual means has brought forth a range of opportunities and challenges related to resilience. Blak Bernat et al. (2023) demonstrate that digital collaboration platforms and adaptive communication protocols enhance resilience in geographically dispersed teams, a vital finding derived from the experiences of the COVID-19 pandemic. He et al. (2023) defines resilience as a two-tiered capability that includes Individual Contribution (IC) which encompasses employee creativity, initiative, and improvisation and Systematic Control (SC) which refers to organised processes for overseeing and addressing vulnerabilities. Digital tools enhance both aspects by promoting innovation via collaborative ideation platforms and providing oversight through integrated dashboards and automated alerts. In cyber-physical sectors like oil and gas, Pettersen and Grøtan (2024) introduce a “Resilience ABC” framework (A) system design robustness, (B) structured risk management, and (C) emergent adaptation highlighting the importance of integrating technical and human components to ensure operational continuity.

Project management methodologies have been adapted to enhance resilience. Bentahar and Belhadi (2024) emphasise the ways in which Agile, Lean, and Hybrid methodologies facilitate iterative planning, foster continuous feedback loops, and ensure stakeholder alignment, effectively achieving a balance between flexibility and governance. Nachbagauer (2022) notes that high-performing teams frequently combine centralised leadership with decentralised decision-making authority, creating a hybrid governance model that ensures strategic coherence while enabling swift responses to emerging challenges. Fey and Kock

(2022) present the idea of Innovation Resilience Behaviour, which encompasses a collection of practices such as a focus on failure, attentiveness to operations, and respect for expertise that promote a culture of learning aimed at ongoing enhancement and innovative responses in times of crisis.

Studies specific to various industries support the increasing importance of resilience in different sectors. Spieske and Birkel (2021) illustrate the impact of Industry 4.0 technologies such as artificial intelligence, the Internet of Things, blockchain, and predictive analytics on manufacturing by highlighting their role in reducing response latency and facilitating prescriptive decision-making during disruptions. Codara and Sgobbi (2023) demonstrate that organisations that align their internal resilience configuration whether centralised control or participatory governance with their complexity management strategy tend to achieve more successful outcomes in digital transformation. In the fields of healthcare, logistics, and agriculture, case studies like Nigeria's GeroCare platform an Artificial Intelligence (AI)-driven telehealth system illustrate the potential of digital infrastructure to maintain service delivery in times of public health crises (Benjamin & Foye, 2022).

Considering these advancements, unresolved conceptual and practical gaps continue to persist. Park (2024) concerns that resilience may turn into a "floating signifier" a vague buzzword, if clarity in concepts and rigour in methodology are not upheld. In the absence of standardised definitions and metrics, resilience initiatives risk becoming mere rhetorical devices instead of authentic catalysts for adaptability. Furthermore, the dynamics across ecosystems, specifically how clients, suppliers, regulators, and communities come together to collaboratively foster resilience are still not thoroughly examined. Sector-specific threats, including cyber-attacks in the energy sector and infrastructure fragility in developing economies, require customised resilience strategies that existing studies have not yet comprehensively explored. Moreover, the ethical aspects of resilience require thorough examination; practices focused on resilience should be cautious not to perpetuate unequal power structures or overlook stakeholder equity while claiming to promote stability (Park, 2024).

The literature makes it clear that project resilience is not an inherent characteristic nor a secondary issue. It is, instead, a complex and adaptable skill that necessitates a comprehensive strategy, including a dedication to culture, exemplification of leadership, fostering psychological safety, maintaining strategic adaptability, and investing in technology. For practitioners, incorporating resilience into project governance requires the integration of reflective learning loops, scenario-based planning, dynamic risk registers, and cross-functional training programs. It is essential for leaders to foster a culture that embraces experimentation, views failure as a chance for growth, and enables teams to make swift adjustments. For researchers, forthcoming enquiries should focus on enhancing resilience theory through the creation of cohesive conceptual frameworks, promoting comparative studies across sectors and cultures, and exploring the relationship between resilience and related strategic goals such as innovation capacity, stakeholder equity, and environmental stewardship.

In summary, enhancing project resilience within the context of sustainable management and corporate excellence requires an acceptance of its complex and evolving characteristics. Through the integration of anticipation, coping, and adaptive learning throughout the project lifecycle, along with the alignment of technological, methodological, and human aspects, organisations can convert disruptions into strategic

opportunities. Project resilience emerges not just as a protective strategy against challenges but as a fundamental catalyst for long-term value generation, competitive edge, and sustainable success.

3.2 Theme II - Sustainable Management

Sustainable management has emerged as a focal paradigm in modern project execution, driven by the increasing complexity of environmental, social, and economic challenges. At the intersection of these challenges lies the need for resilience, an adaptive capacity essential for the long-term viability and effectiveness of projects. This literature review critically examines the integration of sustainability and resilience in project management, focusing on theoretical underpinnings, methodological approaches, empirical findings, and critical perspectives. Through this synthesis, the review aims to contribute to a deeper understanding of how project managers can operationalise sustainability through resilient practices.

At the core of sustainable management theory is the concept of sustainable development, which was popularised by the Brundtland Commission in 1987 (Dahl, 2024). This concept emphasises development that meets the needs of the present without compromising the ability of future generations to meet their own needs (Diemer, 2019). In the realm of project management, this translates into practices that consider environmental, social, and economic impacts, a tripartite model often referred to as the Triple Bottom Line (TBL). Further elaboration on this concept is seen in the Sustainable Development Goals (SDGs) established by the United Nations in 2015. The SDGs provide a broad framework of 17 interlinked goals that cover a range of sustainability issues, from environmental sustainability to economic growth and social inclusion. Project managers can align projects with specific SDGs to ensure that their outcomes contribute to broader global agendas (Grunkemeyer and Moss, 2020).

In contrast to the more established field of sustainability, resilience theories often focus on systems' abilities to withstand and adapt to change (Zanotti et al., 2020). Resilience Engineering, for instance, emerged from the field of systems safety and emphasizes the ability of systems to function under varying conditions of stress and disturbance. In project management, this means designing projects that are not just robust against known risks but are also adaptable in the face of unforeseen changes. Adaptive Management is another key theoretical model in resilience. It is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs. This iterative learning-based approach is particularly suited to project management, where conditions can change unpredictably, and flexibility is essential for success (Linkov and Trump, 2019).

Integrating sustainability and resilience has led to the emergence of hybrid frameworks like the Resilient Sustainability Framework (Sanchez and Haas, 2018). This approach blends ecological resilience with sustainable development by prioritising essential service continuity and non-depletion of key resources (Kerzner, 2022). Another notable framework is Sustainable Resilience, which encourages scenario planning and foresight to embed flexibility in the design phase (Sossa et al., 2021).

Practical tools such as the Sustainability Project Management Model (SPMM) and the Resilience Matrix have gained traction among practitioners. SPMM integrates sustainability indicators into all phases of the project lifecycle (Meyerowitz, Lew, and Svensson, 2018), while the Resilience Matrix helps identify vulnerabilities across physical, cognitive, informational, and social domains (Jiang et al., 2024b). These

instruments facilitate both sustainability tracking and resilience planning, reinforcing each concept's relevance to effective project outcomes.

The intersection of resilience and sustainability in project management is crucial for fostering robust, adaptable, and enduring systems capable of facing the multifaceted challenges of the 21st century. This integration ensures that projects are not only designed to meet present needs without compromising future resources but are also equipped to adapt and thrive in an uncertain and dynamic environment (Fathi, 2022).

Resilience in project management primarily enhances the ability of projects to withstand and recover from adverse events, such as economic downturns, natural disasters, or technological disruptions. This capacity for resilience is vital for maintaining project stability and continuity under stress. For instance, resilient practices can lead to risk reduction by incorporating risk assessment and management strategies that identify potential threats and develop appropriate responses. This proactive approach ensures that projects are not derailed by unexpected setbacks, thereby safeguarding investments and outcomes. Moreover, adaptability, another cornerstone of resilience, enables projects to respond to changes in their environment or requirements. This flexibility can be particularly advantageous in long-term projects where project scopes and goals may evolve. Adaptive project management allows for iterative revisions and refinements, ensuring that the project remains relevant and aligned with current needs and conditions. For example, in construction projects, adaptive management might involve the use of modular and scalable designs that can be adjusted or expanded in response to changing use patterns or population growth (Shahi et al., 2021).

The long-term impacts of incorporating resilience into project management are profound, particularly in the context of sustainability. By fostering systems that can adapt to changes, resilience contributes to sustainability in several keyways. Firstly, resilient practices promote the efficient use of resources by enabling systems to recover and readapt existing resources without the need for substantial external inputs. This not only reduces waste but also minimises the environmental impact associated with resource extraction and consumption. Furthermore, resilience enhances the durability of project outcomes, ensuring that they continue to deliver benefits over an extended period. This durability is essential for sustainable development, which seeks to create long-lasting value and benefits. Resilience also plays a critical role in fostering social and economic stability. By ensuring that projects can continue to function and meet their objectives in the face of disruptions, resilience contributes to the stability of communities and economies. This stability is crucial for sustainable development, which relies on steady economic growth and social cohesion. Resilient projects thus help to build a foundation for sustainable development by creating robust systems that support consistent progress and development (Murtagh, Scott and Fan, 2020).

The integration of resilience into sustainable project management is facilitated by a variety of methodologies and tools that bridge these concepts. Strategic planning, risk management, and adaptive management are among the key approaches used to enhance resilience in projects. These approaches involve thorough planning, continuous monitoring, and the flexibility to adjust as project conditions change. By incorporating these practices, project managers can ensure that projects are not only sustainable in their goals and outcomes but are also resilient to the inevitable changes and challenges they will face. Furthermore, the focus on resilience in project management is increasingly supported by technological advancements and innovations. Information technologies, for example, can provide real-

time data that aids in monitoring project performance and environmental conditions, allowing for rapid adjustments.

Therefore, resilience is a critical component of sustainable project management. By enhancing risk reduction, adaptability, and long-term sustainability, resilient practices ensure that projects are capable of withstanding and thriving in the face of challenges. The integration of resilience into sustainability efforts not only enhances the immediate effectiveness and reliability of projects but also contributes to the broader goal of creating sustainable systems that can endure and prosper over time (Sellberg et al., 2018). This holistic approach to project management is essential for addressing the complex and interconnected challenges of today's world, ensuring that our projects and systems are robust, adaptable, and sustainable (Nachbagauer, 2022). Sustainable management has emerged as a pivotal paradigm in modern project execution, driven by the increasing complexity of environmental, social, and economic challenges. At the intersection of these challenges lies the need for resilience, an adaptive capacity essential for the long-term viability and effectiveness of projects. This literature review critically examines the integration of sustainability and resilience in project management, focusing on theoretical underpinnings, methodological approaches, empirical findings, and critical perspectives. Through this synthesis, the review aims to contribute to a deeper understanding of how project managers can operationalise sustainability through resilient practices.

3.3. Theme III - Project Resilience and Industry 4.0 Implementation

The Fourth Industrial Revolution, commonly referred to as Industry 4.0, has become a transformative force across project environments, redefining not only the tools and techniques used but also the resilience strategies required for successful implementation. By integrating technologies such as artificial intelligence, the Internet of Things, blockchain, and automation into core processes, organisations can achieve unprecedented efficiencies, connectivity, and predictive capacity (Kouhizadeh, Saberi and Sarkis, 2021). However, these advancements come with heightened complexity, volatility, and risk. In such contexts, project resilience emerges not as a luxury but as a necessity, an indispensable capacity for sustaining value delivery amidst ongoing disruption.

Industry 4.0 introduces layered challenges to project management. Projects are now deeply embedded in cyber-physical systems, making them susceptible to both digital and operational disruptions. The literature strongly indicates that while these technologies can enhance transparency and control, they also create interdependencies and vulnerabilities that must be actively managed. The article by (Spieske and Birkel, 2021) demonstrates how IoT and blockchain can simultaneously strengthen and complicate supply chains. While these tools enhance visibility, traceability, and stakeholder trust, they also necessitate robust integration protocols and effective risk mitigation strategies. Without a resilience framework in place, organisations are likely to falter when unexpected disruptions occur, such as cyberattacks, supplier failure, or market volatility.

Project resilience in the context of digital transformation should be understood as both a strategic enabler and an adaptive mechanism. It encompasses designed resilience, through pre-emptive system robustness and redundancy, and cultivated resilience, which is embedded in the behaviours, culture, and reflexes of project teams. (Piperca and Floricel, 2023) distinguishes between designed, cultivated, and emergent

resilience and emphasises that sustainable resilience requires attention across all three. Particularly in digital projects, cultivated resilience, manifested in human adaptability, trust, and team cohesion, often determines whether a project can continue functioning effectively during periods of stress.

Numerous studies underscore that successful digital transformation beliefs in group competence and trust are strong predictors of adaptive performance in high-risk projects. These findings elevate the discussion beyond tools and systems, urging project leaders to invest in team dynamics, psychological safety, and cross-functional trust as part of their resilience strategy.

Evaluation and measurement of project resilience remain nascent but critical. While most organisations track efficiency metrics such as on-time delivery and budget variance, they often overlook resilience indicators such as time to recovery, scenario responsiveness, and stakeholder confidence. (Spieske and Birkel, 2021) suggests integrating resilience metrics into existing dashboards to allow real-time monitoring of adaptive capacity. Metrics such as change absorption rate, team decision latency, and digital system redundancy offer deeper insight into the resilience profile of ongoing projects. Without such indicators, resilience remains a vague ambition rather than a trackable project deliverable.

In developing contexts, infrastructure constraints and capability gaps add another layer of complexity. (Ghobakhloo, 2020) warns that digital inequality can undermine resilience if not addressed through deliberate, inclusive policy. Projects often succeed not because they employ the most advanced technologies, but because they are designed to align with local infrastructural realities—using mobile rather than desktop interfaces, or solar-powered devices in areas with unreliable electricity. These findings align with the growing body of literature advocating for hybrid innovation models that combine high-tech capabilities with context-sensitive, grassroots delivery mechanisms (Foster & Heeks, 2013).

Finally, several studies stress that resilience in Industry 4.0 projects must be supported by enabling ecosystems and governance structures. National digital strategies, standards for data governance, and workforce development programs all shape how resilient a project can be. Blockchain-based supply chain solutions offer enhanced transparency and speed, but only within regulatory environments that support digital contracting, dispute resolution, and interoperability (Kouhizadeh, Saberi and Sarkis, 2021) Thus, resilience must be understood as both an internal project attribute and an external systemic condition.

In sum, the literature reveals that project resilience is not merely a by-product of Industry 4.0 implementation, but a foundational enabler of its success. Whether viewed through the lens of behavioural adaptation, digital infrastructure, organisational learning, or cross-sector integration, resilience emerges as the determinant of whether digital transformation yields durable, inclusive, and strategically aligned outcomes. The most successful Industry 4.0 projects are not those with the most advanced technologies, but those with the most resilient systems, designed for flexibility, driven by trust, and grounded in continuous learning. As digital environments grow more turbulent, the ability of project teams to adapt, respond, and recover will be the ultimate benchmark of success.

3.4. Theme IV - Corporate Strategic Management, Organisational Behaviour, and Excellence

Modern organisations operate in volatile, uncertain, complex, and ambiguous (VUCA) environments where abrupt crises can jeopardise their viability. Recent research identifies organisational resilience as a key meta-capability enabling firms to anticipate, withstand, and emerge stronger from disruption (Tekletsion et al., 2024). Building on a systematic review, Tekletsion et al. (2004) integrate four complementary perspectives: paradox theory, contingency-based crisis management, dynamic capabilities, and strategic improvisation to propose a holistic framework for cultivating resilience throughout the crisis life cycle.

They reconceptualise resilience as a dynamic process unfolding across three temporal phases: anticipation, coping, and recovery. Each phase demands the simultaneous orchestration of seemingly contradictory logics (e.g., stability versus flexibility, exploration versus exploitation). Resilient organisations adopt a ‘both/and’ mindset, continuously balancing these tensions to progress toward a “new normal” that surpasses pre-crisis performance. Central to this capability are dynamic routines that enable firms to reconfigure resources, learn and unlearn, and improvise when existing plans become obsolete (Teece, 2007).

The unified resilience framework proposed by Tekletsion et al. (2004) offers significant theoretical and practical benefits. It addresses fragmented definitions by providing a coherent understanding of resilience across pre-crisis, during-crisis, and post-crisis phases, while integrating competing organisational demands to enhance crisis navigation and dynamic decision-making. The framework advances scholarship by aligning with organisational complexity and ambiguity, bridging gaps, and facilitating exploration of emergent concepts such as paradox management. Practically, it translates resilience into actionable strategies, supporting leadership development and improving organisational preparedness, response, and recovery. Emphasising resilience as an ongoing process of learning, unlearning, and transformation, the framework encourages organisations not only to recover but also to leverage crises for innovation and sustainable growth. Its focus on contextual adaptability ensures that strategies are tailored to specific settings, thereby enhancing their relevance and effectiveness. Incorporating paradox thinking equips organisations to manage interrelated tensions simultaneously, fostering creativity and enabling dynamic equilibrium. In sum, the framework enhances conceptual clarity, theoretical robustness, and practical utility, empowering organisations to navigate crises effectively while promoting long-term innovation and growth.

Darkow (2018) complements the paradox view by distinguishing three clusters of practices: the Plan to Resist approach (risk assessment and robust preparation), the Containing Crisis approach (real-time monitoring, frontline empowerment and bricolage) and a recovery focus that stresses adaptive renewal. Darkow’s two dominating paradigms of resilience are:

Plan to Resist Approach: This paradigm focuses on strengthening an organisation's resistance to potential threats through improved risk assessment and planning capacities. It assumes that better foresight can mitigate risks and prevent crises (Alvesson & Sandberg, 2011).

Containing Crisis Approach: This paradigm emphasises the ability of organisations to detect and contain threats promptly, acknowledging uncertainty as an inherent part of operations. It focuses on organisational practices that help manage unexpected situations and maintain core functions during adversity

He advocates an integral, capability-based posture in which firms develop redundant resources, social capital, and flexible governance before crises; harness divergent perspectives and improvisational routines during crises; and treat recovery as an evolutionary, innovation-oriented journey. The emphasis on embracing uncertainty links directly to paradox theory: resilience is strengthened when organisations integrate, rather than trade off, preventive robustness and adaptive agility across all phases of disruption.

Numerous studies underscore that the successful digital transformation hinges on the organisation's internal resilience profile. In *Building Organisational Resilience with Digital Transformation* by (He et al., 2023), the authors assess the impact of transformation management intensity (TMI) on two core dimensions: individual contribution and systematic control. The research shows that organisations with high TMI, which includes leadership support, employee engagement, and agile project governance, are more resilient to digital stressors. This dual-pronged approach enhances the project's capacity to absorb complexity, recover quickly, and even evolve under pressure. The implication is clear: it is not just the technological tools that matter, but the systems and people wrapped around them.

Comparative case studies in the manufacturing sector further validate these findings. In the article by Codara and Sgobbi, (2023), three companies Alpha, Beta, and Gamma, were examined in terms of how they approached Industry 4.0 adoption. Company Alpha pursued a centralised, control-heavy model aimed at efficiency and risk reduction, while Gamma embraced a participatory, learning-oriented strategy. The results were stark: Gamma achieved broader transformation outcomes, exhibited stronger learning loops, and was more adaptable during crises. This supports the view that resilience is not simply a reactive feature but a strategic orientation that shapes the very pathway of digital implementation.

This argument is also reflected in case studies from the Global South. (Benjamin & Foye, 2022), in their article on digital inclusion and organizational resilience in Nigeria, present real-world examples where Industry 4.0 technologies were successfully deployed in high-risk, low-resource environments. Services like Hello Tractor, GeroCare, and Kobo360 used mobile applications, GPS tracking, and cloud systems to solve problems in agriculture, healthcare, and logistics. These digital platforms enabled continuity during the COVID-19 pandemic, not through technological superiority alone, but through alignment with local needs, adaptive governance, and inclusive business models. Their study makes a critical distinction between instantaneous resilience, the ability to cope with a disruption and dynamic resilience, which is about evolving stronger post-disruption. In volatile digital landscapes, the latter becomes increasingly relevant.

Cyber-resilience is another key component of Industry 4.0 project success. As projects become more dependent on real-time data and interconnected systems, the potential for cyber threats increases dramatically. (Pettersen and Grøtan, 2024) introduces a conceptual framework known as "Resilience ABC," which distinguishes between Theory A (physical robustness), Theory B (risk-based management), and Theory C (adaptive capacity). Many organisations, the study argues, remain anchored in the first two levels, investing in infrastructure and compliance without developing the adaptive reflexes necessary to

respond to novel, unpredictable cyber threats. The strategic agility gap highlighted in this study reinforces the argument that resilience must be dynamic, human-centred, and embedded into daily project practices.

However, the literature consistently warns that technology alone cannot build resilience. Behavioural and cultural dimensions are equally vital. In *Resilient Project Management* by (Nachbagauer, 2022), resilience is presented as a team-level phenomenon, enabled by emotionally stable leadership, mutual support, and structured learning. Teams that reflect, recalibrate, and collaborate under pressure are more likely to navigate digital complexities successfully. Similarly, (Pavez et al., 2021) finds that share

Figure 1 presents Darkow’s capability-based model of organisational resilience, which delineates the enactment of specific capabilities across three distinct crisis phases: pre-crisis, response, and recovery. Integrating the Plan to Resist and Containing Crisis approaches, the model emphasises risk assessment and mitigation during the pre-crisis phase, agile detection and containment during the response phase, and proactive rebuilding and adaptation in the recovery phase. This framework reconceptualises resilience as a dynamic, processual capability that transcends the traditional notion of merely “bouncing back,” instead advocating for achieving a transformative “new normal.” By highlighting the interdependence of preparation, response, and recovery, the model underscores the necessity of a holistic and balanced approach to resilience, offering a comprehensive lens that prioritises adaptability and proactive management throughout the crisis lifecycle.

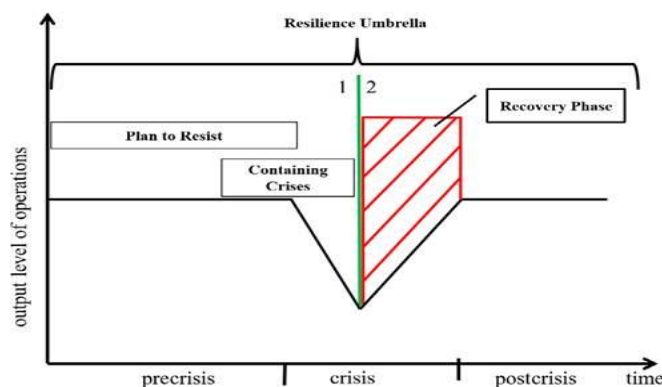


Figure 6. - An integral, capability-based understanding of organisational resilience. (Source: Darkow 2018)

Extending this logic, Colberg (2022) identifies six interlocking components of strategic resilience: dynamic sensing and seizing capabilities, ambidexterity, learning orientation, proactive risk management, human-factor adaptability, and business-model continuity. Ambidexterity captures the paradoxical need for organisations to use existing strengths to maintain operational resilience, while also pursuing new opportunities for strategic renewal (Niemi et al., 2019). Effective leadership and a supportive culture serve as the social foundations that turn these capabilities into adaptive, practical actions. Leadership is the essential element that combines these elements into a coherent resilience system. Colberg (2022) demonstrates that resilient leaders cultivate cognitive openness, encourage risk-taking, and allocate resources with thoughtful slack to sustain their improvisation capacity. They also institutionalise proactive risk governance, empower employees to surface weak signals, and champion continuous experimentation, practices that collectively turn paradox into productive tension rather than debilitating conflict.

Hughes et al. (2020) translate the abstract notion of improvisational capacity into a pragmatic diagnostic, the Improvisation Readiness Index Score (IRIS). Grounded in a 10C framework, IRIS assesses five strategic imperatives (Resource Fluidity, Strategic Leadership, Strategic Posture, Organisational Resilience and Innovative Proclivity), each expressed through two core components.

The 10C Strategic Imperative Framework is designed to assess an organisation's readiness for strategic improvisation during crises. It consists of five strategic imperatives, each comprising two "Cs," which collectively enable effective crisis management:

Resource Fluidity:

Capital: Accessibility and redeployment of strategic resources.

Capability: Agile and flexible decision-making practices.

Strategic Leadership:

Cognition: Decision-making approach, balancing evidence-based reasoning and intuition.

Confidence: Belief in the ability to act decisively under uncertainty.

Strategic Posture:

Clarity: Clear strategic intent guiding actions.

Coordination: Effective input and collaboration in decision-making.

Organisational Resilience:

Climate: A workplace environment that fosters decisiveness and unconventional responses.

Collaboration: Cross-functional teamwork and conflict resolution.

Innovative Proclivity:

Creativity: Experimentation and embracing new solutions. 2

Customer Centricity: Prioritising customer needs in strategic decisions.

Hughes's et al. (2020), the Improvisation Readiness Index Score (IRIS) is a diagnostic tool directly linked to the 10C Strategic Imperative Framework, measuring an organisation's strategic improvisation readiness during crises. IRIS assesses performance across five key imperatives—Resource Fluidity, Strategic Leadership, Strategic Posture, Organisational Resilience, and Innovative Proclivity, each evaluated through two related "Cs" on a 5-point scale. Scores from these components combine into sub-scores per imperative, yielding a total score between 50 and 250, which is then normalised to a 0–1 scale. This normalised score categorises organisations into three readiness stages: Survive, Adapt, or Thrive. By highlighting strengths and weaknesses within the 10C framework, IRIS enables organisations to prioritise strategic improvements, effectively operationalising the framework to benchmark and enhance their ability to respond flexibly and innovatively in crises.

These imperatives collectively help organisations survive, adapt, and thrive during crises by enabling rapid decision-making, resource redeployment, strategic flexibility, and innovative responses.

Scores above '**Thrive**' indicate that resource redeployment, decisive governance and customer-centric creativity are sufficiently advanced to enable real-time strategic improvisation; lower scores **Adapt** or '**Survive**' reveal capability gaps that may impede timely crisis response. Hughes et al. recommend a three-step cycle - diagnose, act, and close capability gaps - to embed improvisation readiness as a continuous improvement routine.

Across these streams, a coherent narrative emerges, resilience is achieved not by choosing either robustness or adaptability but by integrating them through deliberate paradox management. Dynamic capabilities provide the mechanism, contingency frameworks specify stage-appropriate practices, leadership activates the human and cultural levers, and IRIS supplies an actionable dashboard for monitoring progress. Managers should therefore:

Map key paradoxes (e.g. central control vs. local autonomy) and design structures that enable simultaneous pursuit.

Invest in redundant yet reconfigurable resources to support both preventive and improvisational strategies.

Embed learning loops that institutionalise post-crisis reflection and strategic renewal.

Use IRIS periodically to benchmark improvisation readiness and prioritise capability development.

Additionally, Hendri (2024) identified key predictors of organisational resilience that offer further granularity to this framework. These include:

Resilient Leadership: Leaders are central in embedding resilience by cultivating a culture of agility, facilitating continuous learning, enhancing adaptability, and promoting team-level psychological strength and cohesion.

Human Capital Management Strategies: Investing in individual capabilities through training, coaching, and professional development enhances overall organisational resilience by strengthening the foundational competencies of the workforce.

Capacity to Anticipate, Adapt, and Recover: Organisations must be equipped to foresee disruptions, adjust operations to changing contexts, and re-establish stability, or even attain a more advantageous state, after disruption.

Proactive Resilience Strategies: These involve ambidextrous capabilities that allow organisations to balance operational efficiency with exploratory agility, enabling prompt and effective responses to unexpected challenges.

Cost Optimisation Techniques: A multi-layered approach that integrates resilience-building with risk management enables firms to balance fiscal efficiency with preparedness, enhancing their ability to absorb shocks.

Together, these predictors reinforce the notion that resilience is multi-dimensional, requiring both structural mechanisms and behavioural competencies to help organisations navigate uncertainty, mitigate risks, and flourish amidst adversity.

In conclusion, Organisational resilience is best understood as an ongoing, paradox-laden journey in which firms anticipate, absorb and transcend disruption by dynamically integrating competing demands. It is neither a singular capability nor a fixed end state, but a strategic process that unfolds over time through the interplay of preparedness, adaptability and renewal.

By synthesising insights from Darkow (2018), Hughes et al. (2020), Colberg (2022), Hendri (2024), and Tekletsion et al. (2024), this chapter advances a holistic, capability-based roadmap for resilience. Paradox

theory emphasises the importance of embracing and navigating contradictions rather than attempting to resolve them. Contingency-based crisis management stresses stage-specific responses that evolve across the crisis lifecycle. Dynamic capabilities underpin the mechanisms by which organisations reconfigure, learn and innovate. Strategic improvisation, assessed through tools like IRIS, translates these capacities into real-time, actionable responses. Hendri (2024) further contributes by identifying key predictors, such as resilient leadership, proactive strategies, and human capital development that reinforce resilience as a multi-level construct integrating structural, behavioural, and strategic dimensions.

Together, these perspectives converge on a simple yet powerful insight: resilient organisations are not those that avoid tension, but those that harness it constructively. Rather than seeking equilibrium, they build agility into their foundations through culture, leadership, routines, and structures, allowing them to pivot quickly while staying anchored in their purpose.

This synthesis provides researchers with an integrative framework to guide future studies on the antecedents, processes, and outcomes of resilience, while offering practitioners a pragmatic agenda: to embed dynamic capabilities, balance strategic paradoxes, and institutionalise improvisational readiness as a core organisational competency. By doing so, organisations can transform adversity into advantage and emerge from disruption not merely intact but strategically strengthened. However, the literature review revealed a notable gap: the absence of a valid and comprehensive diagnostic tool specifically designed to assess the resilience level of projects. This highlights the need for developing a systematic diagnostic instrument capable of effectively evaluating project resilience.

Extending the resilience discourse, Niemimaa et al. (2019) introduce the concept of Strategic Business Continuity Management (SBCM), which repositions traditional Business Continuity (BC) as a strategic endeavour closely aligned with business model innovation. In contrast to conventional BC practices focused solely on operational recovery, SBCM encompasses both value preservation, ensuring the continuity of critical resources and processes that sustain the current business model and value creation, which involves the proactive evaluation and redesign of business models to mitigate emerging environmental contingencies, particularly those driven by technological advancements.

Key dimensions of this approach include the recognition of business model vulnerability, where disruptive technologies such as the Internet of Things, big data, and the sharing economy threaten traditional value creation mechanisms and revenue streams. In response to these strategic BC risks, organisations must adopt a forward-looking posture that evaluates competitive threats from new business models and continuously adapts their own.

The SBCM framework is composed of two interdependent pillars:

Value Preservation: Focuses on maintaining the stability of existing resources and operational processes essential to the current business model.

Value Creation: Entails defining the business model, identifying external uncertainties, assessing potential impacts, designing necessary modifications, and executing adaptive transformations.

The authors conclude that resilience should extend beyond operational safeguards to encompass strategic adaptability, advocating for interdisciplinary collaboration between business continuity experts and business model scholars. By integrating business model resilience into BC practices, organisations can transform continuity planning into a strategic capability that promotes long-term sustainability and innovation.

This reconceptualisation of BC as a dual process of preserving and reinventing value enhances organisational agility and responsiveness in a technology-driven environment, where volatility, uncertainty, complexity, and ambiguity increasingly define operating contexts. It represents a shift from a traditional, operationally focused notion of business continuity, concerned primarily with maintaining essential functions during disruption, towards a more strategic understanding that integrates adaptation, learning, and transformation (Herbane, 2019; Burnard & Bhamra, 2011). By embedding renewal and innovation into continuity planning, organisations can develop dynamic capabilities that allow them not only to recover from shocks but also to evolve and strengthen their competitive position (Duchek, 2020; Linnenluecke, 2017). Consequently, business continuity becomes an enabler of long-term resilience, fostering proactive anticipation and the strategic reconfiguration of resources in response to technological and environmental change (Williams et al., 2017; Hillmann & Guenther, 2021).

4. CONCLUSIONS and RECOMMENDATIONS

4.1. Conclusions

Project resilience represents a complex and evolving capability that is essential for enhancing corporate strategy and promoting sustainable management. Resilience is not merely a response to challenges; it serves as a strategic facilitator grounded in the management of paradoxes, harmonising stability with adaptability and immediate responsiveness with enduring sustainability. With the backing of dynamic capabilities, digital transformation, and adaptive team cultures, resilient projects are better equipped to anticipate disruptions, adjust during crises, and innovate in recovery. Furthermore, the combination of resilience with sustainability goals establishes it not merely as a reaction to instability but as a route to enduring competitive edge and organisational superiority. As organisations face more intricate and unpredictable landscapes, integrating resilience into project governance, capability development, and strategic planning is crucial for managing disruptions while ensuring sustained value delivery.

Building on this foundation, sustainable management emerges as a complementary and reinforcing framework for resilience. It focuses on balancing environmental, social, and economic goals to ensure long-term project success. This review highlights that integrating resilience into project practices strengthens sustainability by promoting adaptability, efficient resource use, and proactive risk management. Resilient projects can withstand disruptions while maintaining performance, stakeholder engagement, and alignment with sustainability principles such as the Triple Bottom Line. Organisational culture plays a key role, requiring flexibility, innovation, and long-term thinking. Despite challenges like high initial costs and resistance to change, embedding resilience enables projects not only to survive but to thrive, positioning sustainable management as essential in today's complex project environments.

In parallel, the advancement of Industry 4.0 introduces both unprecedented opportunities and significant challenges, reinforcing the strategic relevance of project resilience. While digital technologies such as AI, IoT, and blockchain offer advanced capabilities, their integration introduces complexity and volatility that traditional project management cannot always absorb. Resilient projects, as the literature shows, are those that combine robust digital systems with adaptive leadership, inclusive governance, and strong team dynamics. This analysis highlights that resilience is not merely reactive, it is a proactive, strategic capability that shapes how organisations respond to disruption and evolve through change. Case studies from both developed and developing contexts reinforce that technology alone does not guarantee success; it must be supported by behavioural, structural, and cultural enablers. Accordingly, embedding resilience into project planning, evaluation, and capability development is becoming increasingly critical. As Industry 4.0 becomes the new norm, the resilience of project environments will increasingly determine the sustainability and impact of digital transformation.

Extending from the project level to the broader organisational context, organisational resilience is best understood not as a singular capability or a fixed end state, but as an ongoing, paradox-laden journey in which firms anticipate, absorb, and transcend disruption through the dynamic integration of competing demands. This article advances a holistic, capability-based roadmap for resilience, positioning it as a strategic process that unfolds over time through preparedness, adaptability, and renewal. Paradox theory underscores the importance of embracing and navigating contradictions rather than seeking to eliminate them, while contingency-based crisis management highlights the necessity of stage-specific responses that evolve throughout the crisis lifecycle. Dynamic capabilities provide the foundation for organisational reconfiguration, learning, and innovation, which are translated into real-time, actionable responses through strategic improvisation tools such as IRIS. Key predictors, including resilient leadership, proactive strategies, and human capital development, reinforce resilience as a multi-level construct that integrates structural, behavioural, and strategic dimensions.

Crucially, resilience must extend beyond operational safeguards to encompass strategic adaptability and value creation. This reconceptualization calls for interdisciplinary collaboration between business continuity experts and business model scholars, enabling continuity planning to evolve into a strategic capability that supports long-term sustainability and innovation. Ultimately, resilience emerges as a dual process, preserving core value while simultaneously reinventing it, enhancing organisational agility and responsiveness in an increasingly volatile, technology-driven environment.

The evolving concept of project resilience has emerged as a multidimensional capability that supports effective project delivery in increasingly dynamic and uncertain environments (RQ1). Recent literature highlights key dimensions such as adaptability, preparedness, strategic improvisation, and dynamic capabilities, framing resilience not merely as a reactive response, but as a proactive, embedded process. Resilient projects are characterised by their ability to anticipate disruptions, absorb shocks, and innovate during recovery, harmonising short-term responsiveness with long-term sustainability. When aligned with sustainable management practices (RQ2), resilience enhances organisational capacity by promoting efficient resource use, proactive risk management, and stakeholder engagement. Embedding resilience into sustainability strategies strengthens adaptability and enables projects to deliver lasting value across environmental, social, and economic dimensions. Furthermore, project resilience plays a crucial role in

the successful implementation of Industry 4.0 (RQ3), where the integration of advanced digital technologies such as AI, IoT, and automation introduces new levels of complexity and uncertainty. Resilient project structures, supported by adaptive leadership, inclusive governance, and behavioural enablers, are better positioned to harness these technologies and sustain performance amid digital transformation. Beyond the project level, embedding resilience into corporate strategic management and organisational behaviour (RQ4) reinforces long-term competitiveness and excellence. Resilience becomes a strategic capability when it is institutionalised through leadership development, continuous learning, and interdisciplinary collaboration, transforming business continuity from an operational safeguard into a core driver of agility, innovation, and organisational renewal. Collectively, these insights position project resilience as both a foundational and integrative concept that underpins effective project execution, sustainable growth, digital readiness, and strategic excellence in contemporary organisational contexts.

4.2. Recommendations

To enhance sustainable management, project managers should adopt adaptive risk management frameworks, leverage predictive technologies, and foster inclusive stakeholder engagement. These approaches enable projects to remain agile in the face of uncertainty while maintaining alignment with long-term environmental, social, and economic objectives. Organisations should institutionalise resilience training and implement policies that incentivise sustainable and resilient practices, embedding these principles into everyday operations. Public-private partnerships and the development of sector-wide standards are also critical for translating high-level sustainability ambitions into actionable practices that are both scalable and context-sensitive.

Building on these operational measures, researchers have a vital role to play in advancing resilience-informed sustainability. Future studies should focus on empirical validation of resilience strategies, the development of integrated metrics that link resilience with sustainability outcomes, and the tailoring of frameworks to sector-specific needs. In addition, knowledge-sharing platforms that bridge the gap between academia and industry are essential for ensuring that theoretical advancements are effectively translated into practical tools and decision-making processes. This collaborative approach facilitates mutual learning and accelerates the integration of resilience into project and organisational strategies.

To operationalise the holistic understanding of organisational resilience presented in this article, it is further recommended that organisations adopt a unified resilience strategy that combines dynamic capabilities, strategic improvisation, and business model innovation. Investment in leadership development and human capital is crucial, particularly in cultivating the ability to navigate paradoxes, foster adaptability, and promote continuous learning at all organisational levels. Business continuity (BC) functions should evolve beyond traditional risk mitigation to play a more strategic role, working in close alignment with innovation and strategic planning units.

Moreover, practical tools such as the IRIS framework should be embedded into crisis planning and response mechanisms, enabling real-time decision-making and effective improvisation. Regular resilience assessments should be integrated into organisational review cycles to ensure ongoing alignment with changing external conditions, while interdisciplinary training and scenario-based simulations can build cross-functional preparedness and agility.

By adopting this multi-level, capability-based approach, organisations can transcend reactive continuity planning and build the strategic adaptability necessary for long-term sustainability and competitive advantage. Ultimately, these combined recommendations—spanning project-level practices, organisational strategies, and collaborative research efforts—position resilience not only as a means of surviving disruption but as a core enabler of sustainable success in an increasingly complex and dynamic environment.

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