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Buffering strategies in the VUCA and BANI world

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Abstract

In an era characterised by volatility, uncertainty, complexity, and ambiguity (VUCA), further compounded by brittleness, anxiety, non-linearity, and incomprehensibility (BANI), it has become increasingly important to investigate how buffering strategies enable organisations to maintain resilience and sustainability. This study explores both traditional and emerging concepts of organisational buffers, with the aim of identifying their forms and assessing their role in contemporary management practice. Adopting a dual-method approach, the research combines conventional and AI-assisted literature analysis with qualitative interviews conducted with organisational leaders. AI tools were employed to detect both explicit and implicit buffering strategies in the academic literature, revealing a wide spectrum of structural, human resource, psychological, and strategic buffers. Complementing this, a pilot study based on semi-structured interviews offered practical insights into real-world buffering practices. The findings demonstrate that organisations actively deploy a variety of buffering mechanisms, including scenario planning, vertical integration, skill diversity, psychological safety, and experience-based leadership. The study advances resilience theory by laying the groundwork for a comprehensive and typologically expanded framework of buffering strategies applicable across diverse organisational contexts. It further underscores the crucial interplay between technological tools and human judgement in identifying adaptive strategies that foster long-term sustainability in turbulent environments.

Keywords VUCA, BANI, Buffer, Slack, Buffering strategy, Disruption, Resilience

1 Introduction

In today's world, organisations must navigate an unprecedented degree of uncertainty. Under increasingly challenging global conditions, they are required to compete with unpredictable rivals, develop new products without knowing whether a market for them will emerge, and increase sales among customers whose preferences shift constantly. At the same time, they must meet sustainability requirements, which often entail balancing conflicting objectives.

Maintaining organisational resilience—understood either as the capacity to adapt and function positively before, during, and after disruptions [1], or as the ability of an organisation to anticipate, prepare for, respond to, and adapt to incremental change and



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sudden disruptions in order to survive and prosper [2]—has therefore become one of the most pressing challenges facing modern organisations. Two influential frameworks, *VUCA* and *BANI*, have been proposed to capture the complexity of contemporary business environments. The acronym *VUCA* stands for *Volatility, Uncertainty, Complexity, and Ambiguity*, denoting the speed of change, lack of predictability, systemic interdependence, and informational overload. Originally coined by the U.S. Army War College in the late 1980s to describe the post-Cold War world, it has since been widely adopted in management and organisational theory to characterise the turbulence and unpredictability of global business. In organisational contexts, the *VUCA* framework serves to analyse challenges that traditional planning models cannot address and to support the development of adaptive leadership, strategic foresight, and resilience [3]. The *BANI* framework—*Brittle, Anxious, Nonlinear, and Incomprehensible*—was introduced by Cascio [4] to highlight the increasingly fragile and psychologically overwhelming character of modern crises, particularly in contrast to *VUCA*. *BANI* reflects the psychological and systemic pressures of the twenty-first century, including global pandemics, climate disruption, and algorithmic complexity, contexts in which human responses must extend beyond strategy to encompass emotional and cognitive resilience [4].

The challenges of modern business life in a *VUCA/BANI* world raise a fundamental question: how can organisations maintain resilience in such an uncertain and dynamic environment? What mechanisms can support this endeavour?

Buffers—also referred to as slacks or floats—have long been employed in management as a means of mitigating disruptions. The following traditional types of buffers are commonly recognised:

1. Time buffer – extra time added to or left in schedules to absorb potential delays.
2. Cost buffer – extra funds reserved to cover unexpected costs.
3. Resource buffer – additional labour or equipment kept on standby.
4. Inventory buffer (safety stock) – extra inventory kept to prevent stockouts.

The significance of buffers became evident in both manufacturing and project management, where Goldratt [5, 6, 6] introduced a novel interpretation and application of the concept. He emphasised their crucial role in responding to uncertainty, while also noting that managers frequently misuse buffers by applying them incorrectly, ultimately losing their effectiveness owing to the so-called *student's syndrome*. More than two decades later, his daughter, Goldratt-Ashlag [7], reaffirmed the importance of buffers in fostering organisational resilience. However, she stressed that their higher purpose lies in protecting stable flow, a perspective that may drive the continuous evolution of buffer definitions.

The Theory of Constraints (TOC) centres on identifying and addressing the most critical limiting factor—or constraint—that impedes an organisation's ability to achieve its objectives. According to TOC, every system possesses at least one constraint, and overall performance can only be improved by addressing that constraint rather than by optimising local efficiencies [8]. Once the constraint is identified, TOC prescribes a five-step process—identify, exploit, subordinate, elevate, and repeat—that underpins continuous improvement.

Buffers occupy a central role within TOC, serving to protect system throughput from variability and disruption. They are strategically positioned before the constraint (the

constraint buffer), before shipping (the *shipping buffer*), and, in some cases, ahead of assembly points (the *assembly buffer*). These buffers are not wasteful slack but intentional time or inventory cushions designed to ensure that the constraint operates without interruption, thereby maximising flow and system performance [9]. TOC's emphasis on throughput, systemic thinking, and buffer management makes it particularly effective in manufacturing contexts.

Recent literature suggests a potential causal relationship between buffers and organisational resilience ([10, 11]). Nevertheless, the role of buffers in fostering organisational resilience remains insufficiently examined, as evidenced by the findings of the literature review presented in Sect. 3.4.

These limited yet promising references to the potential role of buffers in maintaining resilience prompted the authors to investigate which buffering strategies are employed by business leaders and organisations to prepare for, respond to, and recover from disruptions in the *VUCA* and *BANI* world. In other words, the study seeks to identify buffers that, in the view of interviewed leaders, may exert a strong influence on resilience, with the intention of examining this influence more systematically in a future study with a considerably larger sample of respondents.

This objective should be understood within the broader aim of providing modern organisations with concrete recommendations on how to sustain resilience in today's environment. Accordingly, the research was guided by the following questions:

- RQ1: How do organisations sustain resilience in uncertain and dynamic environments?
- RQ2: Which tools and mechanisms support this endeavour?
- RQ3: What role do buffers play in enhancing resilience within modern organisations?

As the authors of this paper are exploring highly innovative definitions—concepts not yet formalised in the literature but potentially present in the minds and practices of entrepreneurs—it was considered appropriate to employ equally innovative research methods. The approach adopted combines two key elements:

- Extended literature review – alongside a traditional keyword-based search, the authors employed Artificial Intelligence (AI) tools capable of detecting patterns and connections that are not easily revealed through conventional searches but are closer to human perception and intuition—an aspect whose critical role in contemporary entrepreneurship has long been emphasised by numerous authors [4, 6]. A specialised AI tool was used to scan the literature for buffering strategies that may not be explicitly labelled as such but nonetheless share characteristics with the broader concept of buffers.
- Interviews with managers – in parallel, semi-structured interviews were conducted with managers to identify buffer-like practices that entrepreneurs may intuitively apply in practice, even if not consciously recognised as buffering strategies.

The conceptual framework of the study was developed as follows:

Step 1: A literature review was conducted using traditional string searches in major academic databases, focusing on the terms *buffer*, *resilience*, and their interrelationship.

Step 2: The identified literature was then analysed with the support of an AI tool to detect *explicit* uses of the term *buffer* or closely related terms such as *slack*.

Step 3: The identified literature was then analysed with the support of an AI tool to detect *implicit* uses of the term *buffer* or closely related terms such as *slack*.

Step 4: Drawing on the literature review, a questionnaire for practitioners was designed to explore which types of buffers or buffering strategies are, or might potentially be, useful in practice.

Step 4: The questionnaire was administered to a pilot group of 20 leaders from various organisations.

The pilot study results were analysed, producing a register of the buffering strategies currently in use, accompanied by descriptions of how interviewees perceive *VUCA* and *BANI* conditions within their organisations and how these strategies influence resilience. Finally, the next steps for future research were outlined.

Figure 1 presents the conceptual framework visually.

The structure of the paper reflects the research steps outlined above. Section 1 presents the research methods. Section 2 provides a literature review, identifying studies in which buffers or slacks are either explicitly mentioned or implicitly considered, as well as works addressing the relationship between buffers and organisational resilience. Section 3 describes the interviews and their results. Section 4 contains a discussion of the findings. The paper concludes with final remarks and directions for future research.

2 Research methods

Given the assumption that intuition plays an important role in addressing the challenges of *VUCA* and *BANI* environments, it follows that certain buffering strategies may appear in less conventional contexts, or without explicit reference to the keywords

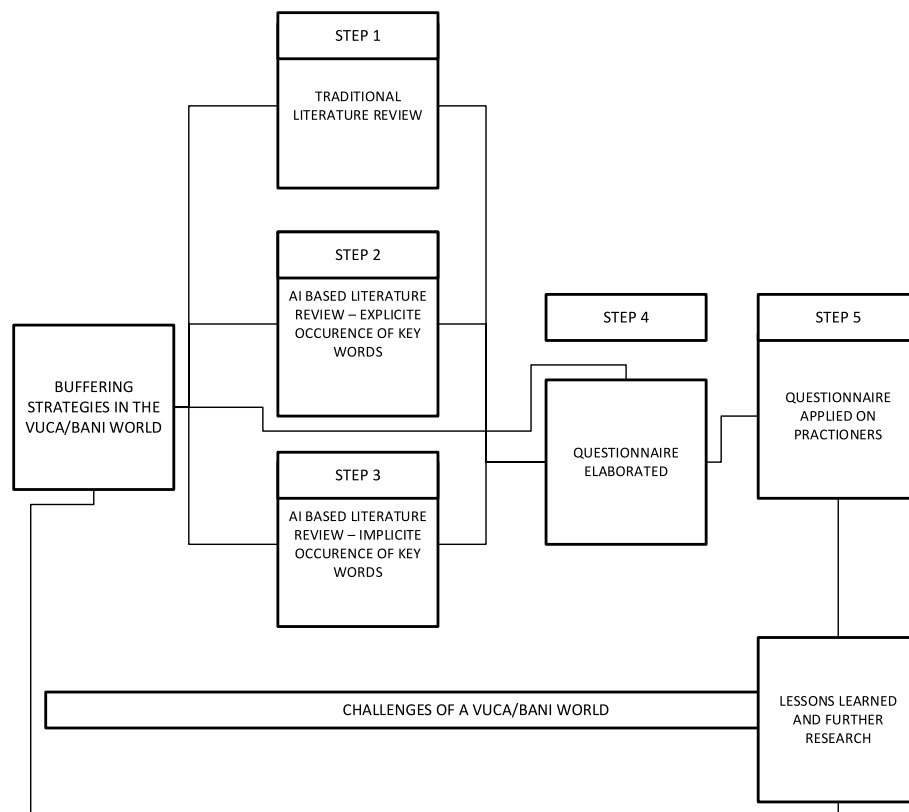


Fig. 1 The conceptual framework of the study

that researchers would typically expect (e.g. *buffer* or *slack*). For this reason, the authors chose to leverage recent technological advances with the potential to advance these considerations to a new level, while still retaining the use of traditional literature searches. Artificial Intelligence (AI), and in particular Large Language Models (LLMs), operate on semantic principles. They were therefore considered an appropriate tool to support the search for a broad spectrum of relevant publications.

Accordingly, both traditional and AI-supported literature reviews were undertaken. The traditional literature search focused on identifying the terms *buffer* and *slack* in connection with management practices in recent publications. For this purpose, the PRIMO VE search engine—available to registered users of the Wrocław University of Technology (Poland)—was employed. All relevant papers contributing new insights were included.

For the AI-supported literature search, the authors began by preparing a summary of the paper's subject and hypothesis. This text was further refined through interaction with a Large Language Model (Claude Sonnet 3.7, Anthropic) into a comprehensive prompt specifically designed for use with the AI research tool. The resulting prompt (Appendix 3) was then employed in the Elicit systematic review platform. Although Elicit enables the upload of additional papers, it was decided to rely exclusively on up to 500 relevant papers drawn from Elicit's database of over 125 million publications.

The AI-preselected papers were screened using the following criteria:

- Alternatives – does the paper propose measures that could be considered as alternatives to traditional buffers?
- Buffer focus – does the research address non-traditional organisational buffers (e.g. capacity, skills, authority, psychological safety) in addition to conventional ones?
- Evidence base – does the study provide evidence-based findings rather than relying solely on opinion or theoretical commentary?
- Implementation focus – does the research discuss the implementation process, the outcomes of buffer strategies, or both?
- Leadership context – does it consider leadership and the role of “soft” skills?
- Organisational context – does the study examine buffers specifically within organisational settings, as opposed to individual or purely technical system contexts?

A total of 500 papers selected by Elicit on the basis of the research prompt were evaluated and ranked according to predefined criteria. From this set, the top 99 papers were included in the review. Due to tool limitations, however, the AI-generated report was restricted (by Elicit itself) to the 40 most relevant items. Following a content analysis, the authors further narrowed this set to 24 papers deemed most relevant. This report was subsequently analysed by the authors and uploaded to Anthropic Claude (model Sonnet 3.7) for additional conversational analysis, which informed both the design of the interview protocol and the development of visual materials used in the research (see Fig. 2).

AI summarised the results from both the traditional and AI-based literature reviews categorising buffering strategies AI into four groups: structural, human resource, psychological, and strategic ones. Using this structure, an interview sheet was developed (Appendix 1) and piloted. Its primary purpose was to identify which buffers from the four categories are applied in practice. Additional questions were included to distinguish



Fig. 2 Buffer categories identified by AI (own elaboration)

between the personal buffers of managers and those implemented at the organisational level.

The survey sought to explore how organisational leaders experience and respond to environments characterised by *VUCA* and *BANI*, how they and their organisations build resilience, and which buffering strategies they currently employ or might consider adopting. The research was designed to identify fundamental buffering strategies with the potential to strengthen organisational resilience.

The study employed semi-structured qualitative interviews with organisational leaders, each lasting 45–60 min. The interviews were conducted via Microsoft Teams as one-to-one meetings, recorded, and subsequently analysed. Participants were recruited through convenience sampling, supplemented by elements of snowball sampling. One of the co-authors' LinkedIn (LI) connections were utilised, with a research invitation posted on LI to reach a potentially broad audience.

This simple sampling procedure was adopted on the basis of two assumptions: (a) all types of organisations are potentially vulnerable to the *VUCA* and *BANI* phenomena; and (b) a more systematic and extensive study will be conducted in the future, using the results of the present research as input and inspiration.

Despite multiple attempts and generally positive engagement with the LI post (e.g. comments, “likes”), no participants volunteered at this stage. This lack of response may be attributable to several factors: the target audience may have been too busy or overlooked the post; they may have been unaccustomed to participating in such initiatives; or they may not have perceived themselves as sufficiently experienced to qualify as respondents.

When it became evident that the original approach was ineffective, the authors initiated a direct outreach campaign by sending LinkedIn messages to selected leaders within their professional networks (one co-author has over 8,000 LI connections), as well as through direct contact channels outside LinkedIn. Although many invitations were ignored, this campaign generated more than 30 conversations. Several individuals declined to participate for various reasons, including limited experience with *VUCA/BANI* or project management, lack of time (some expressed willingness to complete a short survey but not to commit to a 30–60 min interview), discomfort with the

format (video recording and transcription), or a preference to receive the interview questions in advance. In one instance, a respondent accepted the invitation but failed to attend the meeting and provided no explanation.

Ultimately, 20 potential respondents agreed to participate under the following conditions: (i) the interview recordings would be accessible exclusively to the authors during the preparation of the paper and subsequently deleted; (ii) the interview transcripts would remain strictly confidential to the authors; and (iii) no information that could reveal the identity of the interviewees or their organisations would appear in the published paper.

Based on the interview transcripts, a content analysis was conducted to capture descriptions of *VUCA* and *BANI* characteristics affecting the interviewees' organisations, with particular attention to the buffering strategies adopted in response to these conditions.

3 Buffers in modern management and organisational resilience – literature review results

In this section, the authors present a literature review on the use of the notions *buffer* and its close relative *slack* in the academic literature, as well as on factors—some of them buffer-like—that influence organisational resilience. As outlined earlier, both explicit and implicit references to the concept of a buffer were examined, using a combination of traditional and AI-based approaches.

3.1 Explicit use of terms “buffer” and “slack”

Let us begin with definitions. The terms *slack* and *buffer* are sometimes distinguished in the literature. For example, some authors argue that “the term *slack* is not immediately associated with any type of resource, while the term *buffer* usually refers to inventory, time, or capacity” [12]. The limited nature of buffers is also frequently emphasised: they are expected to address only variability defined in advance [13]. In this paper, however, and in line with other contributions (e.g., [14]), the authors adopt a more abstract and inclusive definition of the buffer concept, not necessarily tied to specific resources. A buffer or slack is understood here as a mechanism or enabler that absorbs shocks, reduces vulnerability, or supports response and recovery in the face of disruptions [15]—a “cushion which allows an organisation to adapt successfully to internal pressures for adjustment or to external pressures for change in policy, as well as to initiate changes in strategy with respect to the external environment” [16].

Organisational buffering is described in detail in [14], as the “regulation and/or insulation of organisational processes, functions, entities, or individuals from the effects of environmental uncertainty or scarcity.” The same author notes that buffering may concern virtually all processes and functions at all organisational levels. It can be functional or dysfunctional, intentional or unintentional, and may vary in location, magnitude, and form.

The following types of buffer or slack have been identified in the literature:

- Location criterion – two categories are distinguished [17]: *internal buffers*, referring to surplus resources within the organisation, and *environmental buffers*, encompassing surplus or accessible resources available in the organisation's operating environment.

- Availability criterion – three forms are proposed [17]: *available buffers*, consisting of resources immediately ready for use (e.g. cash or stock reserves); *recoverable buffers*, referring to resources currently in use that can be reallocated or recovered (e.g. equipment or personnel engaged in low-priority activities); and *potential buffers*, representing the organisation's ability to generate additional resources in the future (e.g. through borrowing or investment).
- Nature of resources – another line of distinction [17] differentiates *hard buffers*, comprising tangible and measurable resources, from *soft buffers*, consisting of intangible or behavioural resources. Building on this criterion, further types have been suggested in [15]: the *redundancy/contingency buffer*, involving additional resources set aside to address unexpected events; the *experience buffer*, referring to accumulated organisational knowledge and expertise; and the *communication buffer*, denoting effective communication procedures that help regulate the impact of disruptions.

In [12], inventory disruptions are analysed, and the authors propose several buffer types: the *inventory buffer*, which ensures production continuity; the *safety buffer*, which mitigates demand or supply variability; and the *redundancy buffer*, which relies on redundancy strategies such as employing multiple suppliers. They further distinguish buffering approaches from bridging strategies, arguing that buffering relates to internal procedures, whereas bridging concerns external cooperation. In the present paper, however, bridging will also be treated as a buffering approach. In [12], a distinction is made between *buffer resources* and *buffer practices*. Buffer resources are tangible assets that can serve a buffering role, while buffer practices denote the activities required to deploy those resources. The same paper also introduces the notion of the *opportunistic buffer*—a resource that can function as a buffer, even if this is not its original purpose—and highlights *manufacturing flexibility* as a buffer proxy. In [18], two buffer types are identified: the *low-discretion buffer*, comprising resources that are tightly bound within the organisation and difficult to reallocate swiftly; and the *high-discretion buffer*, consisting of resources that can be readily reallocated to new opportunities.

In [14], the author differentiates between *core buffering*, referring to mechanisms linked to an organisation's core operations (manufacturing, marketing, purchasing, etc.), and *institutional buffering*, which involves decoupling managerial functions from core operations in order to meet institutional demands without disrupting core activities. The same paper also refers to *minimalist buffering*, which entails the use of a minimal number of buffers when they risk blurring responsibilities or increasing costs. Further distinctions include the *absorbed buffer*, consisting of resources already allocated but still flexible, and the *unabsorbed buffer*, composed of uncommitted resources. Finally, the authors differentiate between *decentralised buffering*, located at the team or unit level, and *interorganisational buffering*, where buffers are provided externally, for example through outsourcing or alliances.

3.2 Implicit buffering concepts identified by AI

In several papers, AI identified the use of buffering mechanisms even though the terms *buffer* and *slack* were not explicitly employed. A closer inspection of these papers confirmed that the notion of a buffer was indeed implicitly present, as illustrated below.

In [19], the AI tool identified *sensing buffer* and *response buffer*. The original paper referred instead to “sensing capabilities” and “response capabilities”, corresponding to human competencies and skills. The *sensing buffer* allows an organisation to “continually maintain awareness of external threats and opportunities”, while the *response buffer* enables it to assess the nature of changes and determine the most effective response. In [15], which addresses project management, the dimensions of project resilience are defined as proactivity, coping ability, flexibility, and persistence. These were recognised by AI as buffers, leading to the following categorisation: the *proactivity buffer*, an anticipatory capability that enables the project to influence its course; the *coping ability buffer*, defined as the capacity to handle stress caused by disruptions; the *flexibility buffer*, reflecting the ability to adjust in response to disruptions; and the *persistence buffer*, the capacity to continue the project despite significant obstacles.

In [20], *spare capacity* and *spare inventory* were interpreted by AI as *capacity buffer* and *inventory buffer*. In [21], which examines supply chain resilience, several forms of capacity were identified by AI as buffers: the *absorptive capacity buffer*, denoting the capability of the supply chain to absorb the effects of a disruption before it occurs; the *adaptive capacity buffer*, referring to the ability to adjust and overcome disruptions through non-standard operating practices; and the *restorative capacity buffer*, describing the ability to recover after a disruption has negatively affected the system, despite the presence of the other two buffers.

3.3 Literature review results – factors influencing organisational resilience

In several publications, organisational resilience is treated as a dependent variable—defined in multiple ways (two definitions were cited in the introduction; see, for example, [22] for a multidimensional definition)—while structural equation modelling (SEM) is applied to identify independent variables that positively (or negatively) influence it. Many of these independent variables are closely related to buffers in a broad sense. For instance, mindful organising has been shown to positively influence organisational resilience [23]. The authors of [24] demonstrate that leadership agility and organisational adaptability significantly enhance project resilience, which is strongly linked to organisational resilience. A study in the healthcare sector found that organisational agility significantly affects both crisis management and organisational resilience [25]. Similarly, [26] reports that work stress negatively impacts organisational resilience, whereas work engagement and employee resilience exert a positive influence. An empirical study of the world’s largest companies employed SEM to show that trust and sustainability significantly affect organisational resilience, conceptualised there as a multidimensional construct encompassing capital, strategic, cultural, relationship, and learning resilience [27]. SEM analysis in [28] indicated that flexibility, agility, and redundancy are strongly associated with organisational resilience. The findings of [1] suggest that resource slack is not directly related to operational resilience, but exerts its influence through certain mediating and moderating factors. Further studies also provide supporting evidence: [29] demonstrates that Corporate Social Responsibility (CSR) has a positive impact on organisational resilience; [30] and [31] show similar results for social HR practices; and [32] identifies a positive effect of employee-centred CSR. Finally, [33] confirms that flexibility, agility, and redundancy are strongly and significantly associated with organisational resilience.

It should be emphasised that the above-mentioned studies are typically region- or industry-specific, and each applies a different definition of resilience. No comprehensive study has yet been identified that qualitatively proves (or disproves) the associations between buffering strategies and resilience across all its dimensions. A definitive answer to the question of how buffers influence resilience is therefore still lacking.

3.4 Literature review results—summary

In response to a specific prompt (Appendix 3), AI summarised the literature review identifying four broad categories of strategies that may play a buffering role in organisations, namely:

1. Structural buffers
2. Human resource buffers
3. Psychological buffers
4. Strategic buffers

These categories provide a general systematisation of the buffers discussed above.

Structural buffers are strategies linked to the organisation of everyday operations. Examples include excess capacity [34], embedding redundancy and flexibility into organisational systems [35], employing redundancy [36], and adopting modular design [32].

Human resource buffers concern decisions relating to employees, their training, skills, work assignments, and authority. Examples include skill diversity [15]; cross-training, i.e. training employees to perform tasks beyond their primary roles, often across departments or functions [28]; authority distribution, understood as empowering others by delegating decision-making authority [15]; and empowered decision-making [37].

Psychological buffers comprise methods and practices aimed at strengthening the psychological wellbeing of organisational members. Examples include cultivating psychological safety [38], building trust networks [39], implementing mindfulness practices [23, 40], and applying stress management techniques [41].

Strategic buffers involve long-term decisions that shape organisational strategy. Examples include organisational slack, understood as resources exceeding those needed for regular operations (e.g., surplus personnel or discretionary financial expenditure) [42]; strategic planning [43]; scenario development [44]; and enhancing innovation capacity [45].

These findings are summarised in Fig. 2.

In Fig. 2, it is possible to identify dependent variables—either directly present or closely related—whose influence on organisational resilience was discussed in Sect. 3.3. As shown in that section, no definitive conclusions have yet been reached regarding the impact of the elements illustrated in Fig. 2 on organisational resilience.

The definitions identified in the literature, together with the framework presented in Fig. 2, completed by the notion of personal buffers (strategies employed by individuals in their individual decisions and actions, which are not necessarily identical to those formally adopted by the organisations they represent), were subsequently used in the design of the questionnaire (Appendix 1) administered during the interviews.

4 Interviews and their results

The research attracted senior leaders with extensive professional backgrounds: fourteen participants (70%) reported more than 20 years of professional experience, while the remaining six (30%) had between 10 and 20 years. This concentration of highly experienced professionals ensured access to mature perspectives on organisational buffering strategies, informed by exposure to multiple economic cycles and market disruptions.

Rather than a simple size-based categorisation, the analysis revealed nuanced organisational contexts spanning both current and previous roles. Some leaders had transitioned from large corporations to smaller organisations; others referred primarily to their immediate organisation, even when embedded in wider corporate groups. Eleven participants (55%) had mixed organisational experience across small (up to 49 employees), medium (50–250 employees), and large organisations (above 250 employees, in some cases exceeding 10,000 employees), thereby combining enterprise-scale knowledge with agile operational contexts. Six participants (30%) had worked consistently in large organisations, while three (15%) had experience primarily in small-to-medium environments. This distribution provided insights into how buffering strategies are adapted across different organisational scales and complexities. The sample also reflected strong industry diversity while aligning with contemporary business realities. The services sector accounted for 90% of participants, with Technology/IT alone comprising 50% (ten individuals), mirroring the current environment in which digital transformation intensifies organisational uncertainty.

To preserve anonymity, all transcripts were coded using the format “Respondent MX / FX,” where the initial letter denotes gender (M = male, F = female) and “X” represents a sequential number (1–20). The interviews were conducted in accordance with the protocol set out in Appendix 1.

The transcripts were analysed using semi open coding: any passages corresponding to one of the categories in Fig. 2, or to personal buffers, were assigned the relevant label. In addition, all references to *BANI/VUCA* conditions were coded accordingly. The results—presented in as much detail as possible while preserving anonymity—are included in Appendix 2. Only data directly relevant to the research objectives are reported there; additional material will be examined in future studies.

The findings are summarised below according to the framework introduced in Sect. 3.4 (Fig. 2), completed by personal buffering strategies.

The following buffering strategies were considered by respondents to contribute to building organisational resilience:

4.1 Structural buffers

Redundancy and Infrastructure Flexibility: Extra facilities, backup systems, and cloud-based documentation ensure that operations can continue if one part fails.

For M1, two similar production sites are maintained; if one encounters operational difficulties, the other can provide support or assume critical functions. In addition, when the team in one country is fully engaged or unavailable, tasks can be reallocated to teams in other countries to ensure continuity of operations. For F5, buffering strategies include the use of excess capacity, robust infrastructure, redundant systems, and modular design. For M10, each project is assigned at least one backup person familiar with its details. Furthermore, all relevant information and project documentation are

stored in the cloud, ensuring access for authorised personnel regardless of their location or role. For M12, operational capacity is distributed across multiple countries and locations, enabling one site to absorb part of the delivery load in the event of disruption at another. The organisation also maintains surplus physical infrastructure, such as unassigned workstations, which can be used to accommodate personnel relocated from regions affected by political instability.

Vertical Integration: By taking full control of logistics, production, and customer service, organisations reduce their reliance on external partners.

For M20, the organisation has, over the past five years, shifted from a subcontracting-heavy model to full vertical integration. Key operations—including customer support, production, logistics, and even component manufacturing—have been internalised, providing end-to-end control over the supply chain.

Scenario Planning and Crisis Protocols: Preparedness through defined scenarios, fallback procedures, and crisis response teams.

For M2, a dedicated 24/7 cybersecurity team was established to protect the organisation against recurring ransomware incidents. Cybersecurity operations are outsourced to a team located on another continent, ensuring continuous coverage and cost efficiency. Structured procedures have also been developed, including incident response playbooks and the acquisition of specialised cybersecurity tools. For F5, a wide range of procedures and scenarios is in place, regularly tested and verified to ensure preparedness for potential future events, regardless of their likelihood. For M12, the organisation has created a formal mechanism known as the Organisation Emergency Response Team (OERT), designed to provide rapid responses to crises and disruptions. The OERT safeguards employee safety and wellbeing through predefined protocols such as accommodation support, evacuation planning, and other emergency measures. For M13, predefined scenarios are employed in both project-based work and routine operations. In system implementation projects, contingency procedures are established to address potential failures or deviations from expected outcomes.

For M19, the respondent reported using scenario development as a key buffering strategy.

Financial Buffers: Holding strong cash reserves gives breathing room during economic shocks.

For M6, earnings are retained within the company rather than distributed as dividends. The organisation has also shifted from a monthly to a quarterly financial cycle to enhance cash flow management. When clients encounter difficulties and consider cancelling contracts, flexible solutions such as suspensions or temporary service reductions are offered. For M8, a deliberate financial buffer is maintained to mitigate the impact of economic shocks. For M12, the organisation seeks to preserve a strong cash position and operates with minimal reliance on credit.

Digitization and Automation: Shifting to automated and digital systems makes organisations less dependent on individuals and more resilient.

For F14, digitalisation serves as a buffering strategy, involving a shift from human-based to system-based operations through the widespread adoption of remote work technologies and automation.

4.2 Human resource buffers

Cross-Training and Skill Diversity: staff are trained across roles, enabling flexibility during absences or surges.

For M2 and M10, cross-training initiatives are implemented to maintain operational continuity during staff absences caused by holidays or sick leave. M8 promotes skill diversity and cross-training more broadly: rather than cultivating narrowly specialised experts confined to a single domain, the organisation encourages employees to develop competencies across multiple areas, thereby fostering more versatile professionals. For F17, when an employee expresses interest in acquiring knowledge beyond the organisation's current focus, this initiative is supported on the assumption that project opportunities in the new area will soon arise.

Balanced Talent Strategy: Combining experienced professionals (crisis-savvy) with younger, adaptive staff to balance wisdom and innovation.

For M20, a talent strategy is employed that balances two complementary profiles: experienced professionals with backgrounds in crisis management, and younger, adaptive employees with innovative mindsets.

Horizontal Mobility: Encouraging people to move across departments to boost collaboration and uncover hidden skills.

For M20, horizontal talent mobility is applied by encouraging employees to rotate across departments.

Mentorship and Knowledge Sharing: Senior staff mentors junior employees to build continuity and strengthen capability.

For M7, senior employees actively mentor and collaborate with junior staff, aiming not only to provide immediate support but also to facilitate knowledge transfer and professional development. For M8, senior employees similarly assist younger colleagues while taking an active role in mentoring and educating them, with the objective of supporting their long-term growth.

Decentralized Authority: Empowering employees to make decisions helps speed up crisis responses and improve ownership.

F5 and M10 report employing distributed authority and empowered decision-making. For M19, the organisational structure has been flattened to enable more effective communication with the team.

4.3 Psychological buffers

Psychological Safety and Trust: Open, trusting cultures where people feel safe to speak up and collaborate without fear.

For F5, crisis situations may trigger shock leading to symptoms of PTSD or emotional paralysis, which can prevent individuals from following established procedures. She considers psychological buffers to be the most underdeveloped yet most desired within the organisation, particularly in the areas of psychological safety, trust networks, mindfulness practices, and stress management. For M8, psychological safety is a priority, with efforts directed towards fostering an environment in which employees feel secure and valued, even under heavy workloads and tight deadlines. Despite external pressures, the organisation consciously avoids placing excessive demands on staff, recognising the human limitations of its workforce. For M12, emphasis is placed on creating opportunities for dialogue, ensuring that individuals feel seen, heard, and valued. For F17, open

and honest communication with the team is central. She engages with employees about their feelings in specific situations—such as stress, anger, or uncertainty—and ensures that those unwilling to confide directly in a manager always have the option of speaking with a mentor or coach.

Well-being and Support Mechanisms: Stress-relief initiatives (e.g., seminars, festivals, team-building) help manage mental strain.

For M2, seminars are organised on how to work effectively and prepare for stressful situations. For M6, a culture of well-defined behavioural standards has been developed. Nine core rules covering communication, fairness, interpersonal relations, and customer interactions are discussed individually with each new hire. For remote teams, weekly virtual meetings are held—often without business agendas—to foster emotional support and reduce stress. In addition, quarterly in-person meetings are organised despite the associated financial costs, and once a year the company closes for three days to attend a summer music festival together. For M8, emphasis is placed on building teams composed of individuals who share common values. When difficulties arise, members are prepared to make temporary sacrifices—such as devoting additional time to a project or accepting reduced financial returns—on the conviction that overcoming such challenges will ultimately strengthen both the team and the organisation. For M11, opportunities for dialogue are prioritised to ensure that individuals feel seen, heard, and valued. For F17, periods of employee downtime are consciously managed. When no client projects are underway, staff are temporarily allocated to internal initiatives. These smaller, non-client projects not only help retain talent within the company but also contribute to operational improvements, thus providing stability and added value during transitional periods.

Leadership as Emotional Shield: Leaders take responsibility for absorbing uncertainty and providing clarity and direction to their teams.

For M3, leadership involves absorbing as much external uncertainty as possible and preventing its transmission to the team. This is achieved by maintaining a consistent and structured approach to work, avoiding frequent shifts in priorities, and acting as a protective barrier to shield team members from the destabilising effects of ambiguity and change. For M11, support is provided to specialists by ensuring they have the necessary resources and, where possible, sufficient time to concentrate on their core tasks. His aim is to minimise interference, thereby enabling specialists to perform their work effectively. For M12, emphasis is placed on the importance of a decisive and communicative leader who articulates a coherent course of action.

Mission-Driven Motivation: Staying anchored in a clear sense of purpose (e.g., improving public health) provides motivation and direction.

For M13, the emphasis is placed not solely on formal responsibilities but on understanding the broader purpose of the work. In the healthcare context, for example, the fundamental mission extends beyond service provision to encompass the improvement of people's health.

4.4 Strategic buffers

Scenario planning and strategic foresight: long-term planning cycles and “what-if” analysis supported proactive adaptation.

For M1, as part of a global corporation, frame agreements are maintained for steel deliveries worldwide. Scenario development is employed to synchronise supplies across Europe. For M2, an annual roadmap is prepared covering all cybersecurity-related products and processes, which is presented to senior management. Based on this roadmap, a comprehensive cyber strategy is formulated, often accompanied by recommendations for organisational restructuring. For F5, long-term planning is approached with caution. She warns against overreliance on past trends, arguing that extrapolating them may lead to fundamentally incorrect conclusions. For M13, predefined scenarios are used in both project-based and routine operations, covering situations such as increased resource demands, cost overruns, or lack of engagement from key stakeholders with competing priorities. For M15, short-term operational realities are balanced with long-term strategic planning. This includes maintaining a robust sales pipeline for the next two to three years while simultaneously forecasting the potential impact of AI on the efficiency and value proposition of their offerings. For M19, scenario development and strategic planning are reported as key practices.

Diversification: Spreading risk by diversifying clients, services, and locations.

For M6, the organisation primarily relies on inbound marketing and maintains a cautious approach to outbound efforts. However, during challenging periods, additional budget is allocated to outbound marketing to support business stability. For F14, a diversified approach is applied to both supplier and client bases, minimising dependence on any single entity or geographic market. For F17, a buffer has been introduced to mitigate growing uncertainty in project acquisition. Depending on the anticipated end date of a current project, preparations for the next assignment begin well in advance, involving engagement with sales teams and early planning to ensure a smooth transition.

Data-Driven Decisions: Relying on real-time metrics and analytics to guide agile responses.

For M9, decision-making has shifted towards a data-driven approach, moving away from perception-based judgements. Emphasis is placed on the systematic collection and analysis of data relating to people, performance, productivity, and efficiency. For M12, importance is attached to maintaining a disciplined focus on factual information and simplification. Decisions are grounded in data, such as quantitative metrics and verifiable facts. For M20, significant investment has been made in developing a comprehensive, data-driven ecosystem to enhance efficiency and resilience. This includes the implementation of integrated ERP systems, proprietary operational software, and centralised customer service tools.

Innovation and AI Readiness: Aligning services with technological trends, such as the rise of AI, to stay relevant.

For M7, the company has shifted from supplying individual personnel to IT customers towards delivering integrated teams. These teams provide not only workforce capacity—which can be partially substituted by AI—but also strategic support, consultation, and knowledge sharing. For M15, attention is given to forecasting the potential impact of AI on the organisation's operations.

Cultural Change: Investing in coaching and mindset shifts to prepare employees for a dynamic future.

This buffer was reported, with the above words, by M20.

4.5 Personal buffers

Confidence from Experience: Long exposure to crises helps leaders stay calm and decisive under pressure.

For F5, an experienced manager, flexibility has increased rather than diminished with age. Having lived through several “black swan” events, she reports a reduced fear of unpredictable disruptions. For F17, the greatest source of strength is the conviction that no problem is unsolvable. From the outset of her career, she has worked on projects characterised by change, uncertainty, and unexpected challenges. For her, instability is the norm, and her experience has equipped her to handle it with confidence.

Simplifying Complexity: Translating chaos into clarity helps teams understand priorities and act quickly.

For M3, leadership involves acting as a protective barrier to shield team members from the destabilising effects of ambiguity and change. For M12, efforts are directed towards simplifying messaging and frameworks across the organisation in order to promote collective understanding. For M16, emphasis is placed on ensuring clarity and accuracy in understanding the organisational context. This includes access to expertise, tools, and data that enable clear analysis of the company’s financial status, as well as surrounding oneself with individuals capable of interpreting complex financial information quickly and accurately.

Open Communication: Transparent, direct conversations builds trust—even when messages are difficult.

For M16, transparent communication of difficult news is considered essential, alongside full utilisation of available communication tools. While formal methods such as PowerPoint presentations can be useful, he finds it often more effective to engage directly with individuals, using language and terms that resonate with their specific context. For F17, open and honest communication with the team is central. She discusses with employees how they feel in concrete situations—whether stress, anger, or uncertainty—and ensures that such conversations are part of everyday practice. For M19, trust and transparency are emphasised, including the open acknowledgement of organisational vulnerabilities.

Mission-Driven Motivation: Staying anchored in a clear sense of purpose (e.g., improving public health) provided motivation and direction.

This buffer was reported by M13, with the above words.

5 Discussion

This study was guided by three research questions: RQ1: How do organisations sustain resilience in uncertain and dynamic environments? RQ2: Which tools and mechanisms support this endeavour? RQ3: What role do buffers play in enhancing resilience within modern organisations? The findings provide clear answers to these questions by underscoring the centrality of buffering strategies in organisational resilience. Four interrelated categories of buffers—structural, human resource, psychological, and strategic—were identified by AI as a summary of literature review. Together, these categories illustrate the mechanisms through which resilience is maintained, the tools and practices that enable it, and the distinct functions that buffers perform in shaping organisational responses to disruption.

Structural buffers demonstrate how continuity is secured through redundancy, infrastructure flexibility, and financial reserves, directly addressing RQ1. Tools such as vertical integration, scenario planning, crisis protocols, and digital automation further respond to RQ2 by reducing reliance on external actors and minimising the impact of human variability. Collectively, these findings address RQ3 by showing that structural buffers enhance stability and accelerate organisational responses to disruption.

Human resource buffers demonstrate how adaptability is sustained through cross-training, skill diversity, and mentorship, thereby addressing RQ1. Strategies such as balanced talent composition, horizontal mobility, and decentralised authority provide concrete tools (RQ2) that strengthen collaboration, autonomy, and knowledge continuity. In relation to RQ3, these buffers highlight the role of people-centred practices in enabling organisational resilience.

Psychological buffers emphasise the cultural and emotional dimensions of resilience. Practices that foster psychological safety, trust, and wellbeing help organisations to maintain stability under pressure (RQ1). These practices also function as tools (RQ2) that protect individuals and teams during crises. Importantly, leaders themselves act as emotional buffers, clarifying and stabilising organisational responses. In doing so, they address RQ3 by illustrating how psychological factors actively sustain resilience.

Strategic buffers capture the long-term dimension of resilience by showing how organisations anticipate and adapt to change. Tools such as foresight, scenario planning, and data-driven decision-making (RQ2) enable anticipation and agility (RQ1). Complementary practices—including diversification, innovation readiness, and cultural transformation—address RQ3 by demonstrating how strategic buffers support adaptation in evolving markets and technologies.

Taken together, these findings demonstrate that resilience is not rooted in any single mechanism but emerges from the interplay of structural, human, psychological, and strategic buffers. This integrated typology directly addresses the three research questions: it clarifies how resilience is maintained (RQ1), what tools support it (RQ2), and the distinct roles that buffers play in enabling organisations to withstand and adapt to disruption (RQ3).

At the same time, managers frequently employ personal buffering strategies that do not always align with those implemented at the organisational level. A consistent pattern was observed across cases: leaders often rely on more advanced buffering mechanisms—frequently of a psychological nature—whereas organisations tend to depend on more traditional, established forms of buffering.

Several further observations emerged from the analysis. First, the role of leaders in navigating VUCA/BANI environments proved decisive; depending on their attitude and management style, they may function either as buffers that shield their teams from uncertainty or, conversely, as disruptors who amplify it. Second, technology, particularly AI, was described ambivalently by respondents, positioned both as a source of volatility and complexity and as a potential ally in mitigating these very challenges. Third, the relationship between leadership, organisational culture, and risk management came to the fore: risk identification and mitigation procedures alone were found to be insufficient when confronted with entrenched cultural dynamics or the influence of a disruptive leader. Fourth, generational differences were frequently noted. Leaders often attributed resilience to age and experience, yet their views on younger generations were

ambivalent: while some criticised a perceived lack of commitment, they also recognised the flexibility and technological awareness that younger employees contribute.

It is worth reiterating that buffers and resilience are intrinsically linked: buffers constitute the mechanisms through which resilience is operationalised. Resilience—understood as the capacity of an organisation or leader to absorb shocks, adapt to disruptions, and maintain continuity—depends on the presence of buffers that create “slack” against volatility. Structural buffers (e.g. redundancy, slack resources, contingency planning) provide stability by absorbing variability, while human and psychological buffers (e.g. trust, emotional regulation, leadership shielding) enhance adaptability and recovery. In this sense, buffers are not resilience itself but rather the enablers of resilient outcomes. The absence of adequate buffering mechanisms exposes systems to brittleness, whereas well-designed buffers transform uncertainty into manageable variability. Resilience therefore emerges as the systemic effect of layering and orchestrating different forms of buffers across organisational, strategic, and human domains.

It is instructive to consider these results in the context of *TOC* and the *VUCA/BANI* frameworks. In line with *TOC*, buffers—whether structural, human, psychological, or strategic—serve as purposeful mechanisms to absorb variability and protect the flow of operations. In *VUCA* environments, characterised by volatility and complexity, structural and strategic buffers (e.g. redundancy, scenario planning) provide system-level resilience by stabilising operations and enabling foresight. In *BANI* contexts, marked by brittleness and anxiety, human and psychological buffers (e.g. mentorship, trust, leaders’ emotional shielding) address fragility and the emotional strain of rapid change. Taken together, these layered buffering strategies represent adaptive capacities that preserve continuity, flexibility, and clarity amid disruption, reflecting *TOC*’s principle of protecting flow and managing constraints under uncertainty.

The integration of AI-supported literature review with empirical interview data reveals both strong convergence and important divergence between theoretical propositions and practical implementation, offering several contributions to buffer theory. The four-category framework (structural, human resource, psychological, strategic) identified through literature analysis was largely confirmed by practitioners, who readily recognised these buffer types in their organisations. However, the presented findings reveal how abstract theoretical concepts become operationalised in practice. For instance, while the literature discusses “redundancy” as a structural buffer [35, 36], practitioners described specific mechanisms such as vertical integration, geographically distributed capacity, and backup personnel systems. Similarly, the literature’s emphasis on “skill diversity” [15, 28] manifested in practice as concrete initiatives including cross-training programs, balanced generational talent strategies, and horizontal mobility schemes. This operationalisation reveals that effective buffering requires translating theoretical principles into context-specific organisational mechanisms—a dimension underexplored in existing literature.

A significant theory–practice divergence emerged regarding psychological buffers. While the literature emphasises psychological safety, mindfulness practices, and trust networks as critical resilience mechanisms [23, 38, 39, 41], the empirical findings reveal substantial implementation resistance. Multiple respondents dismissed formal psychological buffer programs as “luxuries”, “overused excuses” for performance shortfalls, or initiatives that are “cut first” during financial pressure. This resistance persists despite

some leaders recognising their value. Notably, practitioners who rejected formal psychological buffering often substituted informal, leader-enacted mechanisms—particularly "leadership as emotional shield"—where leaders personally absorb uncertainty to protect their teams. This finding suggests that psychological buffering may operate through informal, leadership-dependent pathways when formal programs face institutional or economic barriers, extending current theory by revealing the contingent and contested nature of psychological buffer implementation.

The study identified a distinction not prominent in existing literature: the divergence between personal buffering strategies employed by individual leaders and formal organisational-level buffers. Leaders frequently relied on experience-based confidence, cognitive simplification techniques, and mission-driven motivation—personal buffers that enabled them to navigate VUCA/BANI conditions even when organisational systems lacked corresponding formal mechanisms. This finding reveals multi-level buffer dynamics: organisational resilience may depend not only on institutional buffers but also on the personal buffering capacity of key leaders. The interaction between these levels—and the potential fragility when resilience depends heavily on individual rather than systemic buffers—warrants further theoretical and empirical attention.

The main result of this study is a collection of buffers (buffering strategies) that are potentially positively linked—whether directly, indirectly through mediators, or conditionally in the presence of moderators—with organisational resilience. Respondents identified these strategies as measures they believed to be helpful in sustaining the resilience of their organisations. Future research will seek to identify additional potential buffers and, as a subsequent step, to establish mathematically verified relationships between buffering strategies and organisational resilience in its various definitions and dimensions. Potential mediators (e.g. selected HR practices) and moderators (such as industry context and leadership style) will also be explored.

With regard to practical applications, this paper offers managers a set of buffering strategies reported as useful by at least one peer in enhancing organisational resilience. Managers may wish to experiment with these strategies in practice, while remaining mindful that their effectiveness may vary across contexts. As an initial exploratory study, the research does not yet provide strong evidence of the efficiency of the identified approaches. It may, however, serve as a valuable source of ideas for managers seeking to address the challenges of the VUCA and BANI world and to strengthen organisational resilience.

6 Conclusions

This study set out to uncover buffering strategies and related dimensions that enhance organisational resilience in contemporary and future turbulent environments, often described by the acronyms VUCA and BANI. Twenty participants shared their perceptions of the VUCA/BANI environment and revealed the buffering strategies they employ to navigate it. Overall, respondents characterised the VUCA and BANI levels as high. Across diverse industries and organisational sizes, they reported multi-layered buffering strategies combining structural redundancy, human adaptability, emotional resilience, and strategic foresight. Personal attributes—such as experience, communication skills, and a mission-driven mindset—were also identified as factors that reinforce organisational buffers.

This research should, however, be interpreted in the context of certain methodological limitations:

- AI-based tools – Although their use was justified and aligned with the research design, AI-based tools may introduce retrieval bias by prioritising certain types of publications or omitting relevant studies. They may also overlook complex and nuanced relationships that human reviewers might detect.
- Sample size and distribution – As a pilot, exploratory study, the sample size was intentionally limited. Without systematic access to a broad pool of potential interviewees, the researchers relied on their own professional networks to recruit experienced leaders. This approach may have reduced sample diversity in terms of geography and industry: 65% of participants were based in Poland, only 10% represented manufacturing, while services accounted for the remaining 90%, with half of the total sample employed in the Technology/IT sector. Gender imbalance was also evident, with only three female leaders (15%) among the 20 participants.
- Interpretational bias – The authors' own perspectives may have significantly influenced the conclusions. Input from a larger pool of experts would therefore be required to validate and refine the findings.

Further research is needed to examine buffering strategies in a wider context, involving a larger pool of interviewees representing a broader spectrum of industries, organisational types, and countries, and to link these explicitly to organisational resilience through qualitative, SEM-based studies. A global survey is planned to complement the interviews, with the aim of developing concrete recommendations for managers on how to maintain resilience in VUCA and BANI environments.

In addition, several issues raised during the interviews require closer examination: cases of disruptive events and methods for addressing them; interdependencies between different buffering strategies, particularly from a systems-thinking perspective; and the consequences of buffering needs for leadership, including the limitations and feasibility of buffering strategies across industries and contexts.

While this study has certain limitations, it opens important avenues for future research on building organisational resilience. In today's volatile and complex business landscape, risk and uncertainty play a pivotal role. By providing empirical insights into strategies for strengthening resilience and robustness in organisational leadership, this research contributes to a timely and necessary discourse on equipping organisations with specific and effective tools to cope with the challenges of the modern VUCA/BANI world.

Appendix 1: Interview protocol

Introduction script

"Thank you for participating in this research interview. I'm [Your Name], a researcher exploring how organizations and their leaders navigate VUCA environments – those characterized by Volatility, Uncertainty, Complexity, and Ambiguity – and build resilience beyond traditional approaches.

This conversation will take about 30–60 min. I'm interested in your personal experiences and perspectives as a leader, not just your organization's official policies. There are no right or wrong answers. Our goal is to understand the real-world approaches

that help organizations become more antifragile – not just surviving disruption but potentially growing stronger through it.

Do you have any questions before we begin?"

No	Questions	Instructions, follow up strategy and / or visual support:
<i>Introduction & statistics</i>		
0	Organization size	< 10 employees 10–49 employees 50–249 employees > = 250 employees
0	Industry	as respondent classifies it, in case it is not clear, clarify if this corporate / NGO / Administration
0	Professional experience	< 5 years 5–10 years 10–20 years > 20 years
0	Would you characterize your area of responsibility as...	more operations-focused, project-focused, hybrid / mixed
1	In your own words, how would you describe the level of volatility, uncertainty, complexity, and ambiguity in your business environment?	Follow up: Which of these factors impacts your work most significantly?
2	Can you tell me about a recent situation where you faced significant uncertainty or disruption? How did you respond, and what helped you navigate through it?	After first two questions, researcher should be able to determine if respondent has the understanding of mentioned VUCA components and if he/she acknowledges them in his daily work as a leader If this is not clear, below follow up questions and / or visual aids could be used to confirm that If this cannot be confirmed, it is expected the interview to conclude as the respondent most probably does not meet target expectations What do you see as the most critical risks or challenges that your organization faces in today's environment? How do you identify the key constraints or bottlenecks in your operations or projects? In your experience, what capabilities or resources have been most valuable in helping you or your organization absorb shocks or adapt to unexpected changes?

Organizational Buffer Types in VUCA Environments

Key Definitions

- VUCA:** Volatility, Uncertainty, Complexity, and Ambiguity – characteristics of modern business environments
- BANI:** Brittle, Anxious, Nonlinear, and Incomprehensible – an extension of VUCA describing more extreme conditions
- Buffer:** Any approach, resource, or capability that helps an organization absorb shocks, adapt to changes, or thrive amid disruption
- Antifragility:** The property of a system that allows it to not just withstand stressors but actually improve and grow stronger from them
- Resilience:** The ability to recover quickly from difficulties and return to a stable state

Personal leadership approaches to building resilience

No	Questions	Instructions, follow up strategy and / or visual support:
3	As a leader, have you developed any personal strategies or approaches for managing uncertainty that might differ from your organization's standard processes?	Follow up questions to be used if applicable: • How do you personally build “reserves” or capabilities that help you and your team respond to unexpected challenges? • When planning initiatives or operations, do you consciously build in elements that will help absorb shocks or create flexibility? If so, what approaches do you use?
<i>Organization-level buffer strategies</i>		
4	How would you describe your organization's formal approach to building resilience or preparing for uncertainty?	Depending on the depth of the response, researcher may explain: In this research we are interested in any strategy that may increase organisational resilience Any approaches, resources, or capabilities that help your organization absorb shocks, adapt to changes, or even thrive amid disruption. Whether they're formally recognized as buffers or not, we will refer them as buffering strategies
5	Beyond traditional time and budget contingencies, what other types of “buffers” or resilience strategies does your organization employ?	After the respondent completes his response, researcher shall present below slide with a comment: We have searched papers to identify strategies that may play buffering role in organisations. I would like to show you an overview to check if some of them may also be used in your organisation Do you recognise them? Would you agree they play the buffering role in your organisation? The image displays four slides arranged in a 2x2 grid, each detailing a different type of organizational buffer. The top-left slide, titled 'Structural Buffers', describes resources and mechanisms for operational flexibility, listing examples like excess capacity and flexible infrastructure, and benefits like quick response to demand fluctuations. The top-right slide, 'Human Resource Buffers', focuses on people-centered capabilities for adaptability, listing examples like skill diversity and cross-training, and benefits like enhanced problem-solving. The bottom-left slide, 'Psychological Buffers', covers mental and emotional resources for resilience, listing examples like psychological safety and trust networks, and benefits like increased creativity. The bottom-right slide, 'Strategic Buffers', highlights long-term positioning elements for adaptation, listing examples like organizational slack and strategic planning, and benefits like long-term adaptability and improved risk management.
6	Have you observed any important interdependencies between different buffer strategies in your organization?	For example, do certain approaches complement or conflict with each other? Could you share an example of how increasing one type of buffer (like team authority) might affect another aspect of the organization (like procedural adherence)? What role does time—whether response time, lead time, or time-to-market—play in your industry? How does this influence your approach to building resilience? How do you balance the pressure for efficiency and optimization against the need for resilience and adaptability?

No	Questions	Instructions, follow up strategy and / or visual support:
7	Have you found that your approach to building resilience has evolved over time? What prompted these changes?	This is expected to be personal experience of the respondent, researcher may decide to refer it somehow to previous discussion leave it without further follow up questions
<i>Closing questions</i>		
8	If you were advising another leader in your industry about building organizational resilience, what three key practices would you recommend?	No follow up required
9	Looking ahead, do you see any emerging approaches or innovations that might transform how organizations build resilience in VUCA environments?	No follow up required
10	Is there anything else about your experience with uncertainty, buffers, or resilience strategies that we haven't covered that you think would be valuable to share?	No follow up required

Interview closing script

“Thank you so much for sharing your insights and experiences. Your perspectives will be incredibly valuable in understanding how leaders and organizations actually build resilience in practice, beyond theoretical models. Once our research is complete, I'd be happy to share a summary of the findings with you. Do you have any questions before we conclude?”

Table 1 Summary of the interview results

Case	Industry	No. employees	VUCA/BANI Level	Main drivers	Buffering strategies
M1	Steel manufacturing	50–249	Low	Market diversity, personnel fluctuations	Redundant sites; international team coordination; global sourcing agreements; knowledge sharing
M2	FMCG (Cybersecurity area)	> 10000	High	Evolving threats, social engineering	24/7 operations; playbooks & tools; prevention focus; annual roadmap; vendor agreements; cross-training; stress seminars
M3	Telecom/IT	< 10	Medium	Internal shifts, stakeholder demands	Feedback loops; leadership shielding; perspective-taking in communication
M4	Office real estate	200	High	Hybrid work trends, demand volatility	Environmental scanning; space transformation; brand cultivation; perception management
F5	Transportation	> 10,000	Extremely high	Geopolitics, piracy, route instability	Experience; observational agility; scenario planning; distributed authority; psychological support gaps
M6	MarTech	10–49	Medium	Platform dependency, market insecurity	Pivot options; financial cycle change; sales expansion; retention strategy; team cohesion practices
M7	Consulting	10–49	Medium	Specialization narrowness, communication breakdowns	Small deliverables; internal mentoring; integrated team offering
M8	IT	10–49	High	AI-driven disruption	Financial reserves; team-based delivery; junior staff mentoring; skill diversity; shared values; psychological safety
M9	IT services (India)	> 250	Medium	Regional instability, regulatory risk	Proactive communication; data-driven decisions; stable region focus; niche development; scenario planning; employee wellness
M10	IT services	~ 150	High	Rapid tech/client change, talent shortages	Contingency plans; worst-case forecasting; backup personnel; cloud documentation; knowledge sharing; empowerment; trust culture
M11	Transport authority	50–249 (> 10 in department)	High	Complex regulatory environment	Collaborative problem-solving; specialist autonomy; lost surplus capacity; dialogue; documentation; incremental change; task focus
M12	IT	> 250	High	Geopolitical instability; ownership change; sector-wide transformation	Strong leadership; clear communication; data-driven simplification; client portfolio balance; cash reserves; emergency team; site redundancy; diverse leadership; employee dialogue
M13	Healthcare	> 250	High	Demographic shifts; industrial expansion; evolving healthcare demand	Contingency plans; adaptive leadership; scenario planning; purpose-driven work; competency mapping; use of consultants; prioritization
F14	Business consulting (Finance, M&A)	NA	High	Global market exposure; investor caution; transaction delays	Client/supplier diversification; low debt; digitization; AI-assisted databases; phased project approach; diversified services; legal/accounting advisors

Table 1 (continued)

Case	Industry	No. employees	VUCA/BANI Level	Main drivers	Buffering strategies
M15	IT services	> 10,000 (> 250 in department)	High	Macroeconomic instability; geo-political risks; AI-driven disruption	Strategic planning; workforce skill review; layered risk management
M16	Energy & Utilities	50–250 & > 250	High	Cross-cultural collaboration; communication ambiguity	Competency assessment; financial clarity; team cohesion; upper management dialogue; transparent communication
F17	IT	50–200	High	IT sector down-sizing; offshoring; employment volatility	Project planning buffer; internal projects for downtime; service diversification; mindset of resilience; emotional dialogue; skill diversity; flat structure; market scanning
M18	IT Services	50–250 (30–50 managed)	High	Budget constraints; rising complexity; talent shortages	User engagement; team motivation; resource buffers; cross-functional collaboration; quarterly reviews; team-focused incentives
M19	Real estate development	None	High	General uncertainty in project-based work	Structured info flow; flat structure; skill diversity; scenario planning
M20	Transportation & Logistics	> 250	Medium	Inflation; supply chain risk; long-term contract exposure	Balanced talent strategy; mature management; vertical integration; ERP & operational software; people coaching; horizontal mobility

Own elaboration

Appendix 2: Interviews results

See Table 1

Detailed interview results are presented in the following:

M1—Industry: Manufacturing of steel structures, 50–249 employees.

VUCA/BANI level: Not highly significant. The primary influence arises from the number of markets involved (over 20 in total), each with distinct technical and commercial requirements. Observed disturbances are mainly linked to fluctuations in personnel.

Buffering strategies:

1. Two similar production sites are maintained; if one encounters operational difficulties, the other can provide support or assume critical functions.
2. When the team in one country is fully engaged or unavailable, tasks are reallocated to teams in other countries to ensure continuity of operations.
3. As part of a global corporation, frame agreements for steel deliveries are in place worldwide. Scenario development is used to synchronise supplies across Europe.
4. Knowledge-sharing practices are implemented with teams across the world.

M2—Industry: Fast moving consumer good production and selling; over 10 000 employees around the world; responsibility area of the respondent: cybersecurity (threat monitoring and response);

VUCA/BANI level: High. The cybersecurity landscape is characterised by pronounced volatility, with constant changes in attackers, threat groups, and their employed techniques and strategies. These involve not only technical methods but also social engineering tactics.

Buffering strategies:

1. A dedicated 24/7 cybersecurity team has been established to safeguard the organisation against recurring ransomware incidents. Operations are outsourced to a team based in India to ensure continuous coverage and cost efficiency.
2. Structured procedures have been developed, including incident response playbooks and the acquisition of cybersecurity tools such as endpoint protection, remediation software, and monitoring solutions.
3. Emphasis is placed not only on the detection of attacks but above all on prevention, for example through software reconfiguration.
4. An annual roadmap is prepared outlining all cybersecurity-related products and processes, which is presented to senior management. On this basis, a comprehensive cyber strategy is proposed, often accompanied by recommendations for organisational restructuring, including budget allocations, team expansions, resource planning, and the acquisition of new tools.
5. Agreements with external vendors, including incident response retainers, are in place to guarantee on-demand support capabilities when required.
6. Cross-training initiatives are implemented to maintain operational continuity during staff absences due to holidays or sick leave.
7. Seminars are organised on how to work effectively and prepare for stressful situations.

M3—Industry: Telecommunication, IT, less than 10 employees in the immediate team, part of bigger organisation. The interviewee represents the middle management level.

VUCA/BANI level: Medium, influenced by both internal factors—such as shifting priorities of top management—and external factors, including stakeholder expectations and legal or regulatory requirements.

Buffering strategies:

1. Establishment of a structured feedback loop within the team.
2. As a leader, the interviewee seeks to absorb as much external uncertainty as possible and prevent its transmission to the team. This is achieved by maintaining a consistent and structured approach to work, avoiding frequent shifts in priorities, and acting as a protective barrier against the destabilising effects of ambiguity and change.
3. In formulating responses to top management, the buffering strategy involves the cognitive process of perspective-taking. Messages are prepared by anticipating the mental states, expectations, and informational needs of the intended audience, ensuring that the response is tailored to align with the listener's perspective.

M4 -Industry: Office development, office management, asset management in office business, 200 employees;

VUCA/BANI level: High. Predicting annual sales outcomes is particularly challenging due to volatility. A significant contributing factor is the ongoing shift towards hybrid and remote work models, a trend accelerated by the pandemic.

Buffering strategies:

1. In disruptive situations, the primary challenge lies in accurately assessing prevailing conditions. A precise and unbiased perception of the environment often reveals the appropriate course of action. Market disruptions are viewed as analogous to warfare, where losses are possible, yet innovation and profit may also emerge. This approach involves extensive reading of diverse sources and engaging in frequent discussions with a broad range of individuals. Such comprehensive information gathering enables recognition and understanding of the situation.
2. The core strategy is to transform leased spaces into exceptionally attractive environments unmatched in the market. This includes introducing new, high-quality services, both paid and complimentary. The focus extends beyond incremental improvement of existing spaces to the creation of entirely new, strategically important project components. This ongoing transformation is driven by the regular introduction of new ideas, challenges, or tasks to other directors during Board of Directors meetings or private discussions.
3. Continuous cultivation of the organisation's brand image within the minds of clients.
4. The most crucial buffer is the "opinion buffer": the recognition that perceptions of business reality are rarely absolute truths, but rather a combination of imagination, beliefs, and factual data.

F5—Industry: international transportation; over 10 000 employees; the respondent has over 20 years of professional experience;

VUCA/BANI level: Extremely high. The transportation industry operates in an exceptionally volatile environment, particularly within the broader European market, which includes connections to the Middle East and Far East. Political factors—both domestic and international—exert significant influence. Daily uncertainty is heightened by ongoing geopolitical tensions, such as conflicts between Israel and Iran, which threaten established routes through countries such as Iran and Turkey. Maritime transport beyond Oman is also exposed to serious risks from piracy, while alternative routes around Africa are considerably more expensive.

Buffering strategies:

1. *Personal:* Relies on age and extensive professional experience. Contrary to common perceptions of ageing managers, she emphasises having become increasingly flexible over the years. Having witnessed several "black swan" events, she reports a reduced fear of unpredictable disruptions.
2. *Personal:* Stays open and alert, making minimal assumptions and closely observing other market and political players. She warns against overreliance on past trends, arguing that extrapolation may lead to fundamentally flawed conclusions. This approach contrasts with her organisation's prevailing infrastructure-focused culture, which traditionally emphasises long-term planning.
3. *Organisational:* Maintains extensive infrastructure and a wide range of procedures and scenarios, which are regularly tested and verified for potential future events

regardless of their likelihood. Operational resilience depends largely on the ability to react, regroup, and adapt modes of operation. Excess capacity, robust infrastructure, redundant systems, and modular designs are employed.

4. Distributed authority, empowered decision-making, and skill diversity are applied.
5. *Psychological*: In crisis situations, individuals may experience shock leading to symptoms of PTSD or emotional paralysis, preventing adherence to established procedures. She identifies psychological buffers as the most underdeveloped within the organisation, particularly in terms of psychological safety, trust networks, mindfulness practices, and stress management.

M6—Industry: MarTech, 10–49 employees;

VUCA/BANI level: Medium. The primary risks and challenges arise from dependence on partnerships with social media platforms. Given the company's small size, the termination of such partnerships poses significant risks, as the business model is built on external infrastructure. There is also concern that these platforms could replicate their services, thereby undermining their competitive position. In addition, some customers have terminated cooperation due to broader market insecurity.

Buffering strategies:

1. Development of a *Plan B* to pivot towards internal communication platforms if required.
2. Primary reliance on inbound marketing, combined with a cautious approach to outbound activities. During challenging periods, however, additional budget is allocated to outbound marketing to support business stability.
3. A shift from a monthly to a quarterly financial cycle to improve cash flow management. When clients face difficulties and consider cancelling contracts, flexible solutions—such as suspensions or temporary service reductions, even if not stipulated in original agreements—are offered.
4. Strengthening of marketing and sales functions through increased budgets and expansion of personnel in both departments.
5. Adoption of a conservative marketing strategy, avoiding aggressive expansion into multiple markets simultaneously. Earnings are retained within the company rather than distributed as dividends, thereby maintaining a financial buffer.
6. Promotion of team stability by using longer recruitment and assessment processes to ensure careful selection and onboarding of suitable candidates.
7. Establishment of a culture with clearly defined behavioural standards. Nine core rules covering communication, fairness, interpersonal relations, and customer interactions are introduced and discussed individually with each new hire.
8. For remote teams, regular weekly virtual meetings are held—often without business agendas—to provide emotional support and reduce stress. Quarterly in-person meetings are also organised despite the financial costs, and once a year the company closes for three days to attend a summer music festival together.

M7—Industry: Business consulting and management services, less than 50 employees.

VUCA/BANI level: Challenges related to work quality have emerged. Compared to previous generations, current employees are perceived as more narrowly focused,

often selecting tasks aligned with their specialisation while neglecting broader responsibilities. This behaviour contributes to internal inefficiencies and organisational volatility. Younger employees are seen as processing information differently, prioritising flexibility over security, and often engaging with tasks at a more superficial level. Many organisational problems stem from poor communication and misaligned interpretations, as teams frequently lack deep engagement with shared goals. Despite formal structures, collaboration tends to be fragmented, with individuals completing isolated tasks rather than functioning as cohesive teams.

Buffering strategies:

1. Structuring projects into smaller, tangible deliverables to ensure measurable progress at each stage. Given the possibility that clients may change their minds or halt initiatives mid-process, delivering incremental results enhances project resilience and sustains stakeholder engagement despite shifting priorities.
2. Investment in existing personnel by fostering the development of high-potential specialists, even those with limited experience. Senior employees actively mentor and collaborate with junior staff, aiming not only to provide support but also to facilitate knowledge transfer and professional growth.
3. Externally, the company has shifted from offering individual personnel to delivering integrated teams that provide not only workforce capacity—which can be partially substituted by AI—but also strategic support, consultation, and knowledge sharing. This approach strengthens the value proposition for clients and promotes long-term cooperation.

M8—Industry: IT, 10–49 employees.

VUCA/BANI level: High. The advent of the AI revolution has significantly transformed both the industry and the operational model within which the organisation functions. Tasks previously performed exclusively by human professionals are now, at least in part, undertaken by artificial intelligence tools.

Buffering strategies:

1. Maintaining sufficient financial reserves to ensure operational continuity during adverse periods. Rather than allocating all earnings immediately, the organisation deliberately sets aside a financial buffer to mitigate the impact of economic shocks.
2. Transitioning from merely supplying individual personnel to delivering cohesive teams that provide not only technical capacity but also added value through strategic support, consultancy, knowledge sharing, and other collaborative benefits.
3. Prioritising the development of high-potential specialists, including relatively young or less experienced professionals. The organisation facilitates their growth by ensuring access to internal knowledge and encouraging close collaboration between senior and junior staff. Senior employees not only support younger colleagues but also actively mentor and educate them, with the aim of fostering long-term professional development.
4. Promoting skill diversity and cross-training. Rather than cultivating narrowly specialised experts confined to a single domain, the organisation encourages individuals to broaden their competencies, thereby developing more versatile and well-rounded professionals.

5. Building teams composed of individuals who share common values. When challenges arise, team members are prepared to accept temporary sacrifices—such as investing additional time in a project or tolerating reduced financial returns—under the conviction that overcoming difficulties ultimately strengthens both the team and the organisation.
6. Fostering psychological safety by creating an environment in which employees feel secure and valued, even under conditions of high workload and tight deadlines. Despite external pressures, the organisation consciously avoids imposing excessive demands, recognising the human limitations of its workforce.

M9—Industry: IT services, over 250 employees, location: India, operating across multiple continents;

VUCA/BANI level: Medium. Given that the organisation operates across multiple continents, the degree of volatility varies by region. A significant level of uncertainty persists, primarily due to global instability. Operational complexity is not perceived as a major concern. However, certain external factors—such as national economic conditions and potential regulatory changes, particularly those relating to job protection policies—are recognised as potential sources of additional challenges.

Buffering strategies:

1. Proactive and consistent communication with both customers and team members, extending to all levels of staff, including junior employees, and encompassing topics beyond immediate task-related issues.
2. Transition towards data-driven decision-making, moving away from perception-based judgements. This involves systematic collection and analysis of data on people, performance, productivity, and efficiency.
3. Gradual reorientation of contracts towards more politically stable regions.
4. Development of niche capabilities that provide distinctive value.
5. Regular scenario planning to evaluate business viability over an 18–24 month horizon.
6. Building new capabilities to enhance long-term adaptability and sustain competitiveness.
7. Fostering employee wellbeing through a culture of psychological safety and trust networks.

M10—Industry: IT services delivered to other customers, around 150 employees.

VUCA/BANI level: High. Both client expectations and the broader technological landscape are subject to continuous and rapid change. Consequently, the types and volume of services demanded by clients fluctuate constantly. This situation also affects the availability of qualified experts in the labour market.

Buffering strategies:

1. Consistently maintaining contingency plans, including plans B and C.
2. Forecasting worst-case scenarios and preparing for unexpected setbacks, in line with Murphy's Law.
3. Ensuring that each project has at least one designated backup person who is fully familiar with its details.

4. Storing all relevant information and project documentation in the cloud, thereby ensuring access for authorised personnel irrespective of their location or role.
5. Promoting knowledge transfer and knowledge-sharing practices across the organisation.
6. Empowered decision-making.
7. Fostering a culture of trust, support, and open, transparent communication.

M11—Industry: transport authority, 50 – 249 employees, over 10 in the department led by the interviewee;

VUCA/BANI level: High. The organisation operates under considerable complexity due to the need to comply with multiple regulatory frameworks, including national law, EU legislation, and international bodies such as maritime and aviation safety organisations, alongside strict legal constraints. As a state institution, it previously functioned with surplus capacity and was overstaffed. However, this buffer has been eroded over time as a result of systematic budget reductions. The organisation now lacks a flexible infrastructure.

Buffering strategies:

1. *Personal:* Collaborative problem-solving, drawing on the experience of working with competent colleagues.
2. *Organisational:* Supporting specialists by ensuring they have the necessary resources and, where possible, adequate time to focus on their core tasks. Management seeks to minimise interference, enabling specialists to perform effectively.
3. Providing opportunities to discuss ideas and navigate the complex legal environment collaboratively in order to reach informed decisions.
4. Systematic documentation of processes and decisions.
5. Incremental improvements—small adjustments to methods or internal guidelines designed to enhance efficiency and facilitate work. These modifications are tactical rather than strategic in nature.
6. Prioritising task completion while striving to minimise unfinished work.

M12—Industry: IT, over 250 employees;

VUCA/BANI level: High. At the macro level, the current global geopolitical context is highly complex and unstable. At the meso level, the organisation is undergoing a significant internal transformation following a recent change in ownership. At the micro level, the organisation is characterised by dynamic internal processes and an adaptive working culture that continuously adjusts to both internal and external pressures. The organisation operates in the IT services and products sector, which is currently undergoing unprecedented transformation.

Buffering strategies:

1. The presence of a decisive and communicative leader—regardless of gender—who articulates a coherent course of action.
2. Clear and concise communication.
3. A disciplined focus on factual information and simplification. Decision-making is grounded in quantitative metrics and verifiable facts, while messaging and frameworks are simplified to facilitate collective understanding across the organisation.

4. A balanced client portfolio composed of multiple substantial customers distributed across different regions.
5. Maintaining a strong cash position and operating with minimal reliance on credit.
6. Establishment of a formal mechanism known as the Organisation Emergency Response Team (OERT), designed to respond rapidly to crises and disruptions. The OERT safeguards employee safety and well-being through predefined protocols, including accommodation support, evacuation planning, and other emergency measures.
7. Redundancy: operational capacity distributed across multiple countries and locations, enabling one site to absorb part of the delivery load in the event of disruption at another. In addition, surplus physical infrastructure (e.g., unassigned workstations) is maintained to accommodate personnel relocated from affected areas.
8. An internationally diverse management team composed of individuals with wide-ranging professional backgrounds and experiences.
9. Creating opportunities for dialogue, ensuring that individuals feel seen, heard, and valued.

M13—Industry: Healthcare, over 250 employees;

VUCA/BANI level: High. From one perspective, the organisation's VUCA level may be considered low with regard to ambiguity and clarity of purpose, as its mission is well defined: providing healthcare services to citizens in the region. However, volatility is very high due to the rapidly changing external environment. Demographic shifts—particularly accelerated population ageing—are especially pronounced in this part of the country. In addition, several large-scale industrial projects have recently been developed in the region, leading to the arrival of thousands of temporary workers who, although not permanent residents, require access to healthcare services. This influx represents a significant and ongoing shift in healthcare demand, introducing a new, long-term challenge. Thus, while the organisation's strategic direction remains clear, it operates within an environment characterised by considerable and sustained change.

Buffering strategies:

1. In new system implementation projects, system testing and contingency procedures are established to address potential failures or deviations from expected outcomes. For example, staff are trained to revert to manual, paper-based processes if necessary, and emergency routines are regularly practised to ensure readiness.
2. In new system implementation projects, leadership and governance are reinforced during the transition. A dedicated leadership structure, distinct from the standard chain of command, is created. This team convenes multiple times per day to monitor developments and make timely decisions as issues arise.
3. Recognition that not all eventualities can be anticipated, requiring an adaptive leadership model capable of responding rapidly and effectively at the appropriate organisational level.
4. Use of predefined scenarios, applied both in project-based work and routine operations (e.g., increased resource demands, cost overruns, or disengagement of key stakeholders with competing priorities).
5. Emphasis on a purpose-driven approach over a strictly task-based one. Rather than focusing solely on formal responsibilities, the organisation prioritises understanding

the broader purpose of the work. In healthcare, for instance, the fundamental mission extends beyond service provision to improving people's health; in manufacturing, the goal may extend beyond production to sustaining a viable business model through profitability.

6. Adoption of a systemic approach to competency management. This involves continuously mapping existing competencies, identifying critical skills, and assessing redundancy or contingency capacity. It requires not only knowing what competencies exist, but also where they are located, how many individuals possess them, and whether distribution is sufficient to ensure resilience.
7. Engagement of external consultants to provide flexibility in scaling the workforce in response to shifting demands. While this approach has drawbacks, it allows more rapid adaptation than would be possible with permanent staff. To mitigate dependency, diversification of consulting relationships is maintained, with contingency plans in place to identify alternative providers and ensure critical capabilities are not tied to a single external source.
8. Prioritisation during high-impact or urgent events, enabling the organisation to make deliberate decisions on which activities can be temporarily deprioritised to concentrate resources on the emerging issue.

F14—Industry: business consultancy (finance, M&A—Merge and Acquisitions), working with organisations of various sizes;

VUCA/BANI level: High. Poland, as a semi-emerging market, has proven particularly sensitive to global financial crises (e.g., 2000–2001, 2007–2009). Experience with IPOs and public market projects demonstrates that both the capital market and private sector in Poland are highly exposed to international fluctuations. Global economic or political turbulence often triggers investor withdrawals, affecting not only public markets but also private equity and M&A activity, particularly in cross-border transactions involving Eastern European markets. Industry trends further indicate that transaction processes, including M&A and IPOs, have become increasingly prolonged, reflecting growing investor caution towards both direct and portfolio investments.

Buffering strategies:

1. *In organisations she collaborates with:* adopting a diversified approach to both supplier and client bases, thereby minimising dependence on any single entity or geographic market.
2. *In organisations she collaborates with:* maintaining a more cautious attitude towards raising debt.
3. *In organisations she collaborates with:* implementing digitalisation initiatives, shifting from human-based to system-based operations, including the widespread adoption of remote work technologies and automation.
4. *In her own work:* using databases that provide real-time, sector-specific data, supported by AI tools, to ensure accurate and up-to-date company valuations.
5. *In her own work:* applying a phased approach—beginning with smaller, low-commitment tasks such as company valuation, before progressing to broader initiatives like identifying potential investors.
6. *In her own work:* maintaining a diversified service portfolio, enabling shifts between business lines in response to changing market conditions.

7. *In her own work*: engaging professional advisors in legal and accounting matters to ensure compliance and informed decision-making.

M15—Industry: IT services, over 10 000 employees worldwide, the organization managed by the interviewee: above 250 people;

VUCA/BANI level: High. Owing to substantial investment in the development of internal skills and capabilities, the immediate organisational environment is relatively stable. However, macroeconomic disruptions—such as geopolitical conflicts, wars, or large-scale economic instability—pose significant challenges. These disruptions periodically affect operations, necessitating abrupt adjustments in workforce planning, recruitment strategies, vendor selection, and technological priorities. For example, changes may be triggered by the country of origin of a technology provider, escalating costs, or shifting regulatory and geopolitical constraints. The growing prominence of artificial intelligence also constitutes an important source of disruption. The organisation faces increasing pressure from sales, pre-sales, and key stakeholders to demonstrate cost savings and productivity gains, driven by the widespread belief that AI guarantees “super-efficiency.” The gap between such expectations and technical reality presents a strategic challenge, as their predominantly non-AI service model must adapt to remain competitive in an AI-driven market.

Buffering strategies:

1. Balancing short-term operational realities with long-term strategic planning. This includes maintaining a robust sales pipeline for the next 2–3 years while also forecasting the potential impact of AI on efficiency and the value proposition of their offerings.
2. Reconsidering required skill sets, staffing levels, and training priorities to adapt to evolving demands.
3. Strengthening risk management through multi-layered monitoring mechanisms operating on daily, monthly, and annual cycles. Risk-related processes are reviewed across multiple organisational levels, with procedures tailored to the specific scope and function of each level. This cascading structure ensures that different teams employ processes of varying granularity and cadence.

M16—Industry: energy and utilities, processing of municipalities’ waste; two organisations, 50–250 and above 250 employees, respectively.

VUCA/BANI level: High. Ambiguity remains a significant issue, particularly in the context of increasing international collaboration. Professionals frequently interact across cultural, linguistic, and disciplinary boundaries, amplifying the importance of clear communication and a shared understanding of key concepts. This challenge is evident not only in cross-border cooperation but also within individual organisations.

Buffering strategies:

1. Prompt assessment of individual and collective competencies, strengths, and limitations within the team. Where capability gaps are identified, corrective measures are implemented without delay.
2. Ensuring clarity and accuracy in understanding the organisational context by securing access to expertise, tools, and data that enable clear analysis of the company’s financial

status. This includes surrounding oneself with individuals capable of interpreting complex financial data quickly and accurately.

3. Fostering team spirit not only within the immediate team but across the wider organisation. This is achieved through open communication, transparency about challenges, and efforts to maintain cohesion among geographically dispersed units.
4. Building strong support structures and maintaining dialogue with upper management.
5. Communicating difficult news transparently while making full use of available communication tools. Although formal methods such as PowerPoint presentations can be helpful, direct engagement using language and terms tailored to the audience's specific context is often more effective. Such direct and honest communication typically yields immediate benefits by reducing misunderstandings.

F17—Industry: IT, 50–200 employees, location in Poland.

VUCA/BANI level: High. The Polish IT sector has undergone significant change in recent years. Once characterised by strong demand, attractive wages, and rapid employment opportunities, the industry is now marked by increasing volatility and uncertainty due to downsizing, offshoring, and reduced hiring needs. These shifts have disrupted the labour market, making job transitions more difficult and lowering salary levels.

Buffering strategies:

1. Introduction of a buffer to address uncertainty in project acquisition. Depending on the expected end date of a current project, preparations for the next assignment begin well in advance through engagement with sales teams and early planning to ensure a smooth transition.
2. Management of employee downtime, or “bench” periods. When no client project is in progress, staff are temporarily allocated to internal initiatives. These non-client projects not only retain talent within the company but also contribute to operational improvements, providing both stability and added value during transitional periods.
3. Enhancement of organisational adaptability through portfolio diversification. By expanding the range of technologies and services offered, the company broadens its client base and creates new business opportunities.
4. *Personal:* Confidence derived from knowing that organisational planning processes are in place.
5. *Personal:* A belief that no problem is unsolvable. From the beginning of her career, she has worked on projects involving change, uncertainty, and unexpected challenges. For her, instability is normal, and her experience has prepared her to handle it with confidence.
6. Open and honest communication with the team. She discusses with employees how they feel in specific situations—whether stress, anger, or uncertainty. While not all are comfortable sharing directly with a manager, she ensures the availability of alternative channels such as mentors or coaches.
7. Promotion of skill diversity. For example, when an employee expressed interest in learning something outside the company's current focus, support was provided, and soon project opportunities in that area emerged.
8. Flattening of organisational structures to reduce hierarchy and enhance responsiveness.

9. Active market scanning and strategic decision-making regarding the organisation's future direction.

M18—Industry: IT services, 50–250 employees in the organisation, 30–50 under direct supervision of the interviewee;

VUCA/BANI level: High. Budget constraints limit investment in operational improvements across people, processes, and technology. At the same time, rising complexity and cost pressures create a “sandwich” effect: optimisation is hindered while operational challenges intensify. This situation particularly affects the people dimension, which is foundational in IT services. Employee dissatisfaction increases the risk of attrition, thereby amplifying volatility and uncertainty. Moreover, talent shortages in emerging technologies—especially cloud—exacerbate the problem. Although cloud solutions are widely promoted, in practice access to skilled professionals remains limited.

Buffering strategies:

1. Engaging with business users to understand their needs and identify gaps between those needs and current service delivery. These identified gaps serve as a strategic guide for defining subsequent actions and prioritising improvements.
2. Motivating the team to pursue more optimised ways of working and to deliver the best outcomes despite limited capacity.
3. Allocating additional resource buffers within ongoing transformation initiatives. These reserves are leveraged to address urgent, high-priority deliverables.
4. Promoting cross-functional collaboration and internal knowledge sharing within the team, enabling rapid response to critical, low-effort tasks.
5. Conducting quarterly team reviews to assess strategic direction, evaluate past performance, project upcoming work, and analyse available capacity and constraints. This process facilitates the formulation of an informed short-term strategy for the next one to two quarters and ensures alignment of team efforts.
6. Implementing a highly focused reward and team-building strategy to sustain motivation and cohesion.

M19—Industry: real estate development, no employees, earlier in several different organisations including large ones.

VUCA/BANI level: high;

Buffering strategies:

1. Establishing a structured information flow by defining clear responsibilities for data reporting, thereby ensuring timely and accurate insights into financial movements.
2. Flattening organisational structures to enhance communication with the team, supported by trust, transparency, and the open acknowledgement of vulnerabilities.
3. Promoting skill diversity and distributing authority to enable more flexible and responsive decision-making.
4. Applying scenario development and strategic planning to anticipate and prepare for potential disruptions.

According to the interviewee, most buffers proposed in the literature are regarded as a luxury in today's context and can seldom be afforded in practice.

M20—Industry: transportation, public transport, logistics, over 250 employees;

Medium. The organisation operates under a specific B2G2B2C model, with approximately 80% of revenues derived from long-term (5–7 year) contracts with municipalities. These contracts provide revenue stability and reduce short-term volatility. However, their extended duration exposes the company to significant external uncertainties, including inflation, supply chain disruptions, and fluctuating input costs, which make long-term cost forecasting particularly challenging.

Buffering strategies:

1. Implementing a talent strategy that balances two complementary profiles: experienced professionals with crisis backgrounds and younger, adaptive talent with innovative mindsets.
2. Adopting a more mature management approach that deliberately balances creativity with strategic caution. This involves fostering innovative thinking and rapid adaptability while simultaneously emphasising thoughtful decision-making and risk assessment.
3. Pursuing vertical integration. Over the past five years, the organisation has shifted from a subcontracting-heavy model to full vertical integration. Previously reliant on external partners for core functions such as asset relocation, customer service, and component supply, it faced operational vulnerabilities including subcontractor insolvency and service instability. By internalising key operations—customer support, production, logistics, and even component manufacturing—the company has regained end-to-end control over its supply chain.
4. Investing in the development of a comprehensive, data-driven ecosystem to enhance efficiency and resilience. This includes the implementation of integrated ERP systems, proprietary operational software, and centralised customer service tools.
5. Investing in coaching, training, and initiatives designed to reshape employee mindsets.
6. Promoting horizontal talent mobility by encouraging employees to rotate across departments.

Appendix 3: prompt used for elicit systematic literature review

RESEARCH CONTEXT/BACKGROUND: Buffers in Sustainable Business Strategies – its roles, types, and biases. When we consider protecting operations or projects from VUCA, we often consider buffers to be a good tool for that purpose. Traditionally we would look towards time or money (budget) buffers, but current highly competitive and fast changing world does not always give enough space for them. What's the point of designing new project within the contingency time and budget (theoretically project succeeded) if meantime our competition managed to introduce faster and better solution ("winner takes all" and market failure)? Literature (for example Goldratt with Critical Chain and Rajan Suri with QRM) also points to the fact that those buffers are often applied in the wrong way and instead helping, lead to wastes and problems. What if there were other dimensions of operations / projects that could be used as more robust anti-fragile buffers ? Just looking into my own experience and some reading I would point few that seem to be aligned with common sense, but corporate world has some challenge to accept them (corporate measures fit better to deterministic world, but not necessarily to volatile and random): Capacity / utilisation – TOC says only bottlenecks should be

utilised maximally, the rest sometimes remain idle; in QRM we should plan for 75–80% of capacity while for many corporate organisations still efficiency means running operations / projects all the time 100% leaving no space for picks or process “hiccups” coming from volatility. For decision makers it is a conflict between known increased cost of additional capacity vs. only potential risk of losses if VUCA strikes. But it could be mitigated if proper diversification (of tasks & priorities) was introduced. Local car mechanic cannot impact fluctuations in number of customers coming to his workshop, but he can keep increased capacity to make money when there is a pick and arrange lower priority activities that could fill low demand moments (he is buying broken car, working on it in low days and sells it when this is done). Skills + Authority (+ Leadership) = > we could probably give many examples when “black swan” type event caused extensive regulation of certain area of (corporate) life. This shall work in systems of moderate complexity where this is a matter of increasing number of “If ... then ...” rules but may not work in complex situations where possible scenarios and their best responses are too complex to anticipate and codify. In IT world I observe that for example between “standard” IT operations (infrastructure, operational systems etc.) where very structured methodology like ITIL seems to work well) and ERP systems where complex business processes and dependencies make it difficult to fit into pure ITIL. Based on many years of experience I can say in such cases best buffer is high performing team that has skills and attitude going over average demand (therefore potentially redundant for most of time) but also empowered to take decisions not codified specifically in any “if ... then ...” rule. This is kind of dual buffer – the more skilful the team is the more authority & manoeuvre area should they have. “Overqualified” people without authority will go away or stop caring; underqualified with high authority would bring chaos and risks. In this context leadership is very important factor. I put it based on my experience, but David Marquet describes it well in his book “Turn the ship around” saying that delegation without skills leads to chaos. I would consider this as a starting point that could go towards: Research – interview with leaders to verify their perception but also identify other “dimensions” that could play a role of an antifragility buffer Literature research to identify other “dimensions” that could play a role of an antifragility buffer In both cases I would consider also to search for potential biases that may impact buffer usability. CORE RESEARCH QUESTION: What is the role of organizational buffers beyond traditional time and budget contingencies in building sustainable and antifragile systems in VUCA environments? KEY SEARCH PARAMETERS: 1. BUFFER DIMENSIONS: * Non-traditional buffers (capacity, utilization, skills diversity, authority distribution, leadership) * Organizational slack as a strategic buffer concept * Antifragile buffers in VUCA environments * Buffer interdependencies and trade-offs 2. THEORETICAL FRAMEWORKS: * Theory of Constraints (TOC) and buffer management * Quick Response Manufacturing (QRM) approaches to capacity * Antifragility principles (Taleb) * Complexity theory and buffer strategies * Systems thinking approach to buffers 3. INTERDISCIPLINARY PERSPECTIVES: * Strategic management view of organizational slack * Leadership approaches to buffer management * Project management risk frameworks incorporating buffer concepts * Psychological aspects of buffer utilization * Engineering resilience concepts applied to management 4. SPECIFIC RELATIONSHIPS TO EXPLORE: * Correlation between skill levels and optimal authority distribution * Impact of capacity buffers on organizational performance in volatile environments * Relationship between leadership styles and effective buffer utilization * Effects

of different buffer types on organizational antifragility * Trade-offs between efficiency and resilience in buffer design 5. PRACTICAL APPLICATIONS: * Project management methodologies incorporating advanced buffer concepts * Decision-making frameworks for buffer allocation * Leadership practices that optimize buffer utilization * Organizational design supporting strategic buffer implementation * Performance measurement systems that account for strategic buffers SUPPLEMENTARY CONSIDERATIONS: * Cognitive biases influencing buffer decisions and utilization * Cultural and organizational factors affecting buffer implementation * Empirical studies measuring the effectiveness of different buffer types * Case studies of organizations successfully implementing non-traditional buffers * Recent developments in buffer theory (last 5 years).

Author contribution

Ł.T.: concept development, conducting interviews, literature review, preparing the figures, discussion and conclusion development; D. K.: literature review, analysis of interview transcripts, results section, discussion and conclusion development, appendices, text editing; T.V. F.: concept development, discussion and conclusion development, appendices.

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Data availability

The datasets generated and analysed during the current study are not publicly available due to arrangements with the respondents, but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The protocol was approved by the Committee for Research Ethics of Wrocław University of Science and Technology in accordance with the Regulations of the Committee for Research Ethics of Wrocław University of Science and Technology. All participants expressed in writing their informed consent to participate in the interviews. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

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