Evaluating Project Scope in Unstable Environments: Adaptive Frameworks for Uncertainty and Change[1]

Prof. Dr. M.F. HARAKE

MESOS Business School (France)
GBSB Global Business School (Malta)
CEREGE Research Laboratory – University of Poitiers (France)

Abstract

Project scope evaluation is a critical pillar of project management, yet traditional, plan-driven models struggle to remain effective in environments characterized by volatility, uncertainty, complexity, and ambiguity (VUCA). This paper critiques the limitations of conventional scope evaluation approaches in such unstable contexts and explores the potential of adaptive methodologies, such as Agile, hybrid frameworks, and scenario planning to fill this gap. Drawing from an extensive literature review, the study proposes a conceptual framework designed to guide scope evaluation in dynamic environments. The framework is grounded in four core principles: adaptability, stakeholder integration, iterative evaluation, and risk sensitivity. It introduces four interrelated components: Dynamic Scope Baseline, Risk-Informed Scope Matrix, Iterative Evaluation Loops, and Adaptive Stakeholder Engagement Mechanism that collectively offer a structured yet flexible approach to managing scope under conditions of continuous change. This integrative model repositions project scope as a dynamic, navigational tool rather than a fixed contractual element. It is particularly relevant to sectors such as humanitarian response, digital innovation, and transitional policy implementation where stakeholder needs, resources, and external conditions are prone to rapid evolution. While the framework advances the theoretical discourse on adaptive scope management, its conceptual nature and lack of empirical validation highlight opportunities for future research. Suggested directions include pilot testing across various sectors, developing dynamic evaluation metrics, and leveraging digital tools such as AI-driven risk modeling and stakeholder sentiment analysis. The study ultimately advocates for a paradigm shift in scope evaluation, one that emphasizes responsiveness, strategic alignment, and contextual sensitivity in the face of growing environmental instability

Key Words: Adaptive Project Management, Scope Evaluation, VUCA Environments, Stakeholder Engagement, Risk-based Planning, Dynamic Project Scope.

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1. Introduction

1.1. Background

Project scope is a foundational component of effective project management, encompassing the precise delineation of deliverables, boundaries, roles, responsibilities, and stakeholder expectations. A clearly articulated scope not only establishes a shared understanding among project stakeholders but also serves as a critical reference point for planning, resource allocation, and performance evaluation. According to the Project Management Institute (PMI, 2021), a well-defined scope provides a baseline against which project progress and outcomes can be measured, enabling control mechanisms to be applied systematically throughout the project lifecycle. In relatively stable environments characterized by predictable conditions and minimal external disruptions, scope evaluation can be approached methodically using predictive models and structured methodologies. These models allow project managers to anticipate risks, monitor milestones, and make data-driven decisions to ensure alignment with project objectives (Kerzner, 2017).

However, the utility of this structured approach diminishes significantly in unstable or dynamic environments, where projects are frequently exposed to high levels of complexity, uncertainty, and volatility. In such contexts, initial scope definitions and assumptions may quickly become obsolete as new information emerges, and external conditions evolve. As Kutsch and Hall (2016) highlight, traditional scope management practices often struggle to accommodate the fluidity and ambiguity inherent in these settings, necessitating a more adaptive, flexible, and iterative approach to scope evaluation and control.

Table 01. Adapting Project Scope Management to Environmental Stability: A Dual Approach

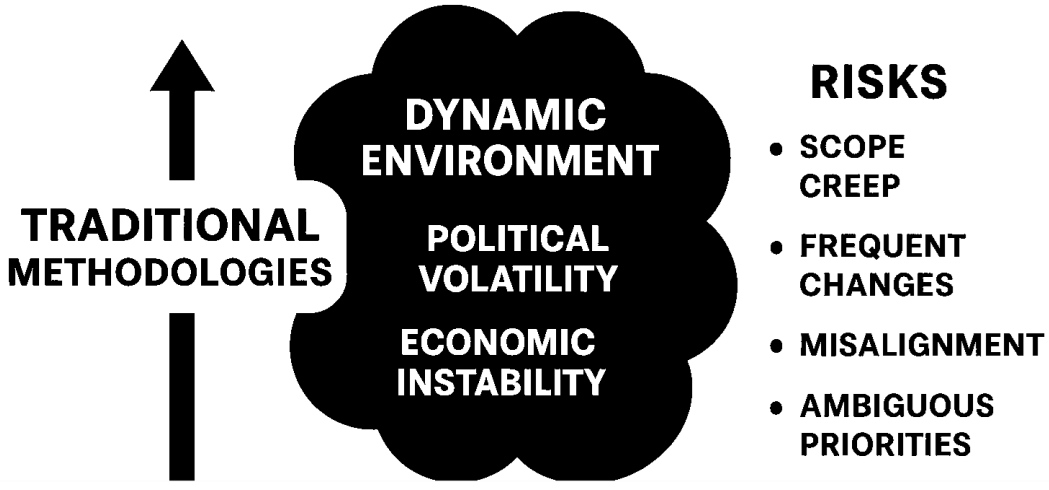
Stable Environments (Predictive Approach)	Dynamic Environments (Adaptive Approach)
Fixed scope definition	Evolving scope
Structured planning	Iterative planning
Risk anticipation via models	Continuous risk reassessment
Clear milestones	Flexible checkpoints
Linear progress tracking	Feedback-driven adjustment
Controlled change management	Responsive change integration

1.2. Problem Statement

Traditional scope evaluation methodologies, grounded in linear and predictive planning models, often prove inadequate in environments characterized by political volatility, economic instability, or rapid technological disruption. These complex and dynamic contexts introduce a range of unpredictable variables such as abrupt regulatory changes, frequent stakeholder turnover, and unforeseen supply chain disruptions that challenge the assumptions underpinning conventional project management approaches (Cicmil et *al*., 2006). In such environments, the rigidity of predefined scopes becomes a liability rather than a strength, as project teams are frequently required to respond to evolving conditions with limited foresight.

Consequently, projects may experience frequent changes in requirements, misalignment between stakeholder expectations and project deliverables, and ambiguous prioritization of objectives. These factors contribute to common project risks such as scope creep, inefficient allocation of resources, diminished stakeholder confidence, and, in extreme cases, total project failure (Olechowski et *al.*, 2016). The tools and techniques offered by traditional planning frameworks designed for stability and predictability are ill-equipped to accommodate this degree of variability. This creates a persistent gap between theoretical models and practical realities, underscoring the need for more flexible, adaptive scope management strategies that can respond dynamically to emergent challenges.

Figure 01. Limitations of Traditional Scope Evaluation

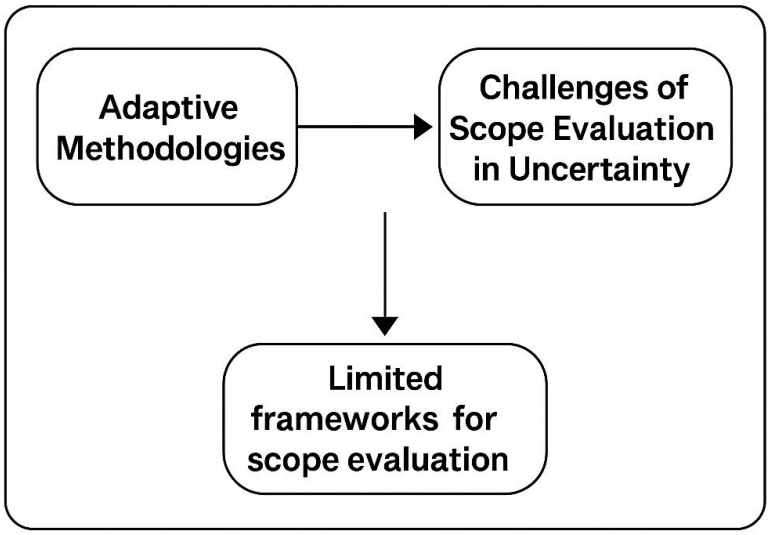


1.3. Research Gap

While adaptive methodologies such as Agile, hybrid project management models, and rolling-wave planning provide greater flexibility in navigating uncertainty, they often fall short in offering concrete frameworks for scope evaluation in turbulent environments. These approaches are primarily designed to enhance responsiveness through iterative development, continuous feedback, and incremental delivery. As such, much of the existing literature focuses on process

agility, emphasizing flexibility in task execution, stakeholder engagement, and delivery cycles, while offering limited guidance on how the core elements of project scope should be redefined, assessed, and controlled under conditions of volatility and change (Highsmith, 2009; Conforto et *al*., 2014). Specifically, there remains insufficient theoretical development around the mechanisms by which project boundaries, deliverable trade-offs, and prioritization schemes can be dynamically evaluated when foundational assumptions no longer hold.

Figure 02. Adaptive Methodologies and the Challenges of Scope Evaluation in Uncertainty



This gap presents a critical challenge for both researchers and practitioners: ***in the absence of stable environmental conditions, how can scope be systematically assessed without reverting to ad hoc decision-making or reactive planning?*** Without a robust framework for scope evaluation that aligns with the principles of adaptive project management, teams risk either over-correcting in response to change or inadequately responding to emergent threats, ultimately compromising project outcomes. Addressing this deficiency requires extending existing methodologies to explicitly incorporate dynamic scope management practices that are resilient to unpredictability and capable of supporting strategic coherence in the face of continuous flux.

1.4. Research Aim and Questions

This paper aims to undertake a theoretical and analytical exploration of project scope evaluation within unstable and dynamic environments. It critically examines the inherent limitations of traditional, plan-driven scope evaluation methodologies, particularly in contexts characterized by volatility, uncertainty, complexity, and ambiguity (VUCA). In doing so, the study also evaluates the extent to which adaptive and flexible project management frameworks, such as Agile, hybrid models, and iterative planning techniques can compensate for these limitations and offer viable alternatives for managing scope under fluid conditions.

The inquiry is guided by three central research questions:

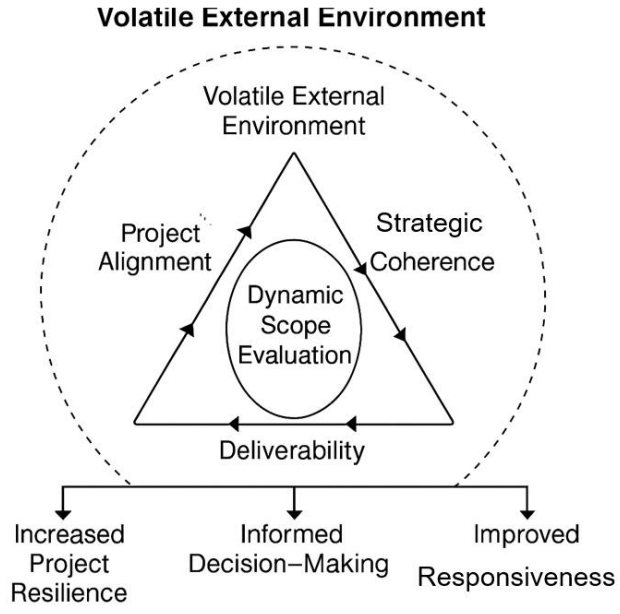
- *What are the fundamental challenges associated with evaluating project scope in politically, economically, or technologically unstable environments?*
- *In what ways do adaptive project management frameworks address the shortcomings of traditional scope evaluation approaches in such contexts?*
- *What conceptual model can be developed to support systematic and responsive scope evaluation in volatile and uncertain project settings?*

By addressing these questions, the paper seeks to contribute to both scholarly understanding and practical advancement in the field of project management, particularly in relation to scope control and strategic alignment in complex, rapidly evolving environments.

1.5. Significance of the Study

By addressing a relatively underexplored dimension within project management theory, this study contributes to a deeper understanding of how project alignment, deliverability, and strategic coherence can be maintained amidst fluid and unpredictable external conditions. Through its theoretical and conceptual insights, the research advances current discourse on project resilience by highlighting the critical, yet often overlooked, role of dynamic scope evaluation. The findings are expected to offer practical value for project managers and organizational leaders tasked with navigating uncertainty, as well as for scholars aiming to extend the theoretical foundations of adaptive project management. Ultimately, this study aspires to inform both research and practice by offering actionable perspectives on decision-making, scope governance, and responsiveness in volatile environments.

Figure 03. Dynamic Scope Evaluation Framework for Enhancing Project Resilience in Volatile Environments



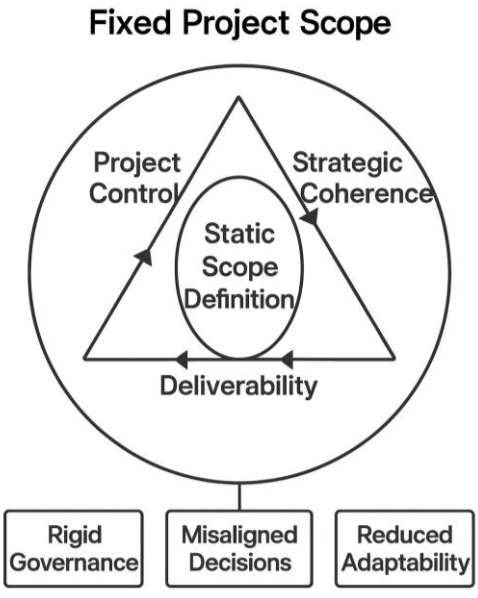
2. Theoretical Foundations

2.1. Defining Project Scope

Project scope refers to the comprehensive set of deliverables, objectives, and features that a project is expected to achieve within predefined constraints of time, cost, and resources (PMI, 2021). It defines the boundaries of the project by specifying what is included and equally, what is excluded in the scope of work. As such, it serves as the foundation for project planning, execution, monitoring, and evaluation. Traditionally, scope is formalized using structured tools such as the Work Breakdown Structure (WBS), scope statements, and requirements traceability matrices, which help decompose and organize project work into manageable components (Kerzner, 2017). These instruments are grounded in the assumption of a relatively stable and predictable external environment, where detailed upfront planning and systematic control are both feasible and effective throughout the project lifecycle.

While a fixed scope can facilitate clear performance measurement and control, its rigidity becomes problematic in dynamic contexts where environmental changes are frequent, unforeseen, and often unavoidable. In such situations, the assumptions underlying initial scope definitions may quickly become outdated or irrelevant, creating a misalignment between the project's original design and the evolving needs of stakeholders or external conditions (Zwikael & Globerson, 2006). This dissonance can hinder timely decision-making, reduce the effectiveness of project governance, and compromise overall project success. Consequently, there is a growing recognition of the need for more flexible and adaptive approaches to scope management that can respond effectively to uncertainty and change.

Figure 04. Limitations of Fixed Project Scope in Dynamic Environments



2.2. Understanding Environmental Instability

Environmental instability in project settings is often conceptualized through the VUCA framework, an acronym denoting volatility, uncertainty, complexity, and ambiguity, which captures the multidimensional challenges that can arise in turbulent contexts (Bennett & Lemoine, 2014). Such instability may be triggered by a variety of external forces, including political conflict, regulatory shifts, technological disruption, economic fluctuations, market volatility, or natural disasters. Within these environments, project teams are frequently required to make decisions with incomplete or rapidly evolving information, cope with frequent operational interruptions, and navigate unpredictable resource availability and stakeholder dynamics (Kutsch & Hall, 2016).

The VUCA model offers a valuable lens for analyzing how these forms of instability impact project management processes, particularly in relation to scope evaluation and control. Each component of the framework introduces distinct challenges: volatility refers to the rate and magnitude of change, often demanding rapid adaptation; uncertainty involves a lack of predictability, making it difficult to anticipate future events; complexity denotes the proliferation of interdependent variables, which complicates analysis and coordination; and ambiguity reflects the absence of clarity regarding causality or meaning, leading to interpretive challenges in decision-making (Bennett & Lemoine, 2014). These conditions undermine the assumptions of stability and linear progression that underpin traditional project management methodologies, rendering conventional scope evaluation techniques insufficient and often counterproductive. In such environments, static scope definitions can constrain adaptability and increase the likelihood of misalignment between project objectives and external realities.

Table 02. VUCA Dimensions and Their Impact on Project Scope Evaluation

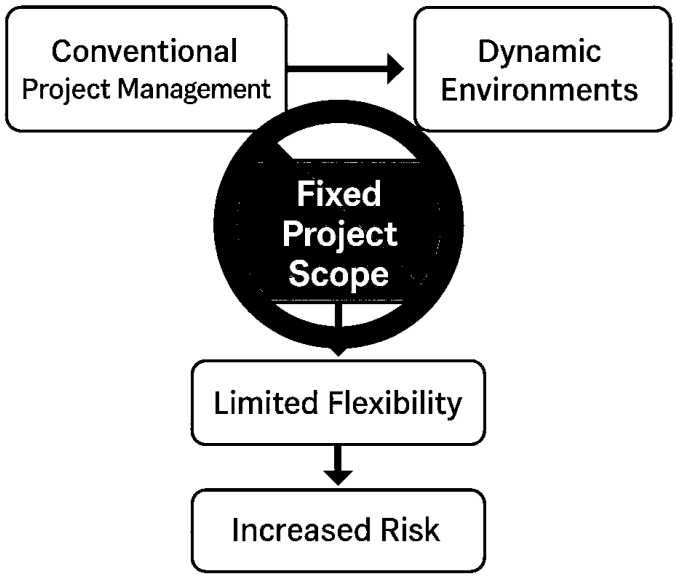
VUCA Dimension	Definition	Source of Instability	Implications for Scope Evaluation
Volatility	Rate and magnitude of change	Market volatility, regulatory shifts, political unrest	Requires rapid adaptation; static scopes quickly become outdated.
Uncertainty	Lack of predictability about future events	Technological disruption, incomplete information	Hinders accurate forecasting; reduces the effectiveness of fixed scope planning.
Complexity	Multiple interconnected variables	Global supply chains, diverse stakeholders, layered regulations	Makes it difficult to trace impacts and dependencies; complicates scope control.
Ambiguity	Lack of clarity about meaning or causality	Novel situations, evolving standards, unclear stakeholder demands	Leads to misinterpretation of objectives; undermines precise scope definition.

2.3. Traditional Project Management Approaches

Conventional project management approaches, such as the Waterfall model and the PMBOK® (Project Management Body of Knowledge) framework, are predominantly grounded in deterministic assumptions. These methodologies emphasize sequential, phase-based planning in which the project scope is clearly defined, documented, and effectively ''frozen'' at an early stage in the project lifecycle (PMI, 2021). This linear and prescriptive orientation facilitates control, standardization, and predictability, features that are advantageous in stable environments where requirements are unlikely to change. Within this paradigm, changes to project scope are typically framed as deviations or disruptions to be controlled, minimized, or formally processed through structured change control procedures (Kerzner, 2017).

However, such rigidity becomes a significant limitation in dynamic and high-risk environments, where the pace of external change may render early scope definitions obsolete before project completion. In these contexts, an inflexible adherence to initial plans can result in the delivery of outputs that no longer align with stakeholder needs or organizational priorities (Cicmil et al., 2006). The tendency of traditional models to treat scope changes as exceptional rather than expected contributes to reduced responsiveness, slower adaptation, and diminished project value. Furthermore, these models often underestimate or insufficiently integrate the influence of environmental factors, such as regulatory volatility, market dynamics, or stakeholder fluidity, on the ongoing relevance and feasibility of the defined scope. This oversight highlights a critical gap in conventional project management thinking and underscores the need for more adaptive, context-sensitive approaches to scope evaluation and control.

Figure 05. Limitations of Fixed Project Scope in Dynamic Environments



2.4. Emergence of Adaptive Project Management

In response to the limitations inherent in traditional project management models, adaptive frameworks such as Agile, Scrum, and various hybrid approaches have gained increasing prominence, particularly in environments marked by high levels of uncertainty and change. These methodologies prioritize flexibility, iterative development cycles, and continuous stakeholder engagement over rigid, sequential planning (Highsmith, 2009). A central tenet of these approaches is the principle of progressive elaboration, whereby project scope is not fully defined at the outset but is instead incrementally refined as new information emerges and stakeholder needs evolve (Conforto et *al.*, 2014).

Agile methodologies are particularly well-suited for unstable environments because they are designed to accommodate and even welcome change as an integral part of the project lifecycle. Practices such as sprint planning, backlog grooming, sprint reviews, and frequent feedback loops allow project teams to reassess and adjust the project scope on an ongoing basis. This dynamic reassessment fosters a higher degree of alignment between deliverables and stakeholder expectations, even as external conditions evolve.

However, while Agile frameworks offer enhanced responsiveness and adaptability, they may fall short in domains that require formal rigor, extensive documentation, or strict compliance, such as highly regulated industries or large-scale infrastructure projects (Fernandez & Fernandez, 2008). In such contexts, the absence of structured mechanisms for evaluating scope boundaries can introduce ambiguity and risk. This shortcoming has led to the growing adoption of hybrid models, which seek to integrate the flexibility and iterative learning of Agile methodologies with the governance, documentation, and control mechanisms of traditional approaches. By combining the strengths of both paradigms, hybrid models aim to provide a balanced approach to scope management, one that is both adaptive and accountable.

Table 03. Comparative Scope Management Approaches Across Project Methodologies

Dimension	Traditional (Waterfall/PMBOK)	Agile (Scrum/XP/etc.)	Hybrid
Scope Definition	Fixed early, detailed	Evolving, progressive	Initially defined, then iteratively refined
Flexibility	Low	High	Moderate–High
Change Management	Formal change control	Integrated into cycles	Mixed (formal + adaptive)
Stakeholder Engagement	Periodic (milestones)	Continuous (each sprint)	Regular (blended)
Best Fit Environment	Stable, predictive	Dynamic, fast-paced	Complex, mixed regulation
Key Risk	Obsolescence of scope	Scope ambiguity	Integration complexity

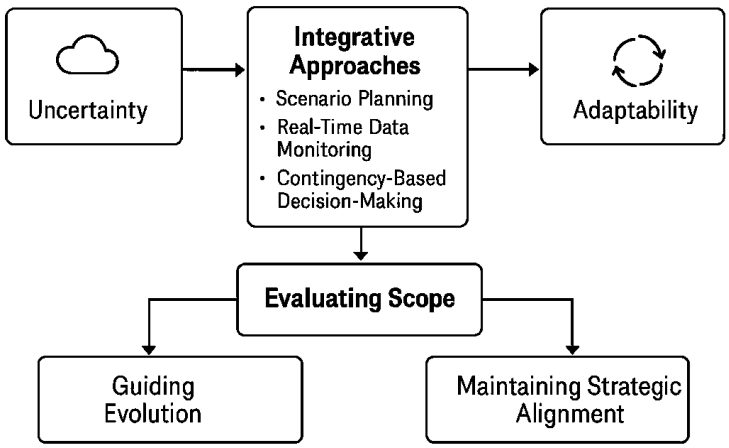
2.5. Toward a conceptual Reframing of Scope Evaluation

Given the limitations of both purely predictive and purely adaptive project management models, a growing body of scholarship has begun to advocate for integrative frameworks specifically designed to address the complexities of scope evaluation in unstable and volatile environments (Martinsuo & Hoverfält, 2018). These emerging models move beyond the binary of rigidity versus flexibility by incorporating elements such as scenario planning, real-time data monitoring, and contingency-based decision-making. A central premise of these frameworks is the recognition of uncertainty not merely as a disruptive factor to be mitigated, but as an inherent and actionable parameter within the planning process.

Rather than relying solely on post hoc adjustments to scope, these integrative approaches aim to embed adaptability into the very architecture of scope evaluation. This involves designing project structures, governance mechanisms, and feedback systems that anticipate change and facilitate informed re-scoping throughout the project lifecycle. In doing so, the emphasis shifts from controlling scope, as in traditional models to guiding its evolution in a manner that maintains strategic alignment with dynamic environmental conditions and evolving stakeholder expectations.

Such a reframing represents a significant theoretical and practical shift in project management thinking. It calls for new models of scope governance that are iterative, context-aware, and capable of balancing responsiveness with accountability. As environmental instability becomes an increasingly common feature of contemporary project landscapes, the development and application of such integrative frameworks become not only relevant but essential.

Figure 06. Toward a Conceptual Reframing of Scope Evaluation



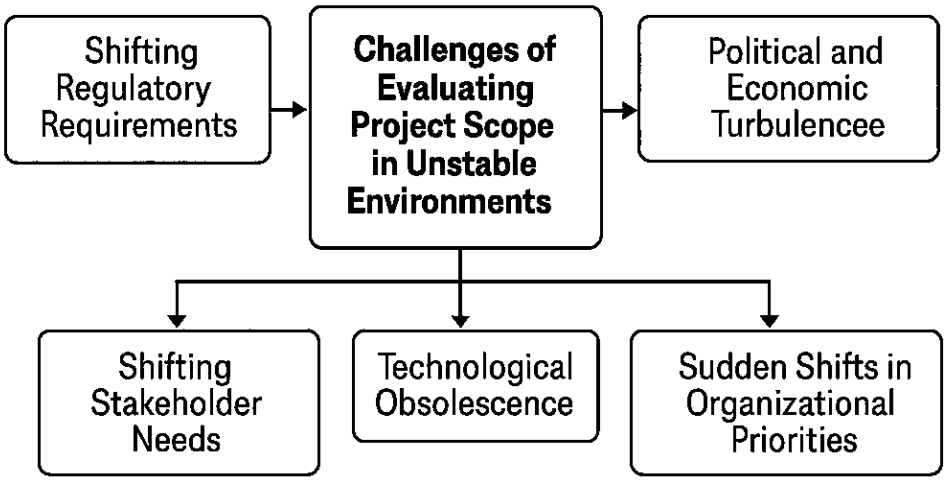
3. Challenges of Scope Evaluation in Unstable Environments

3.1. Outline

Evaluating project scope in unstable environments presents a multifaceted set of challenges arising from both internal dynamics and external sources of unpredictability. Unlike projects situated in stable and controlled contexts, where assumptions about resources, stakeholder expectations, and timelines tend to remain relatively consistent, projects operating in volatile environments must contend with ongoing disruptions that compromise the reliability of initial planning parameters. These disruptions often manifest as shifts in regulatory requirements, political or economic turbulence, technological obsolescence, or sudden changes in stakeholder needs and organizational priorities.

Under such conditions, traditional mechanisms for scope evaluation grounded in fixed baselines and linear progress tracking struggle to maintain relevance and efficacy. This section aims to identify and critically examine the core challenges that undermine effective scope evaluation in unstable environments. These include but are not limited to: the erosion of early-stage assumptions, the misalignment of stakeholder interests over time, fluctuating resource constraints, and the limitations of existing scope management tools in detecting and adapting to change. By unpacking these challenges, this analysis sets the foundation for proposing more adaptive, resilient approaches to scope evaluation that align with the realities of contemporary project environments.

Figure 07. Challenges of Evaluating Project Scope in Unstable Environments



3.2. Unpredictable Stakeholder Needs and Priorities

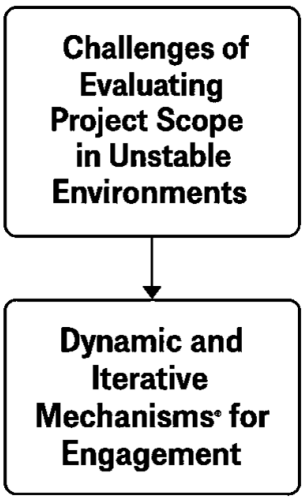
One of the most critical challenges in evaluating project scope within unstable environments is the fluid and evolving nature of stakeholder expectations. In volatile contexts, stakeholders including sponsors, end-users, regulators, and strategic partners—frequently adjust their

priorities in response to emerging information, shifting external conditions, or unforeseen organizational pressures (Bourne, 2009). These changes may be proactive and strategic for example, a deliberate reorientation of project objectives in response to political or economic shifts or reactive, such as adjustments made in response to a crisis, regulatory intervention, or market disruption.

Traditional scope management frameworks typically rest on the assumption that stakeholder requirements can be clearly elicited and documented during the initiation phase of the project. These requirements are then formalized through tools such as requirement matrices and scope statements, forming the basis for subsequent planning and evaluation. However, in unstable environments, stakeholders themselves may lack the clarity or foresight needed to articulate stable and comprehensive requirements at the outset. Furthermore, their expectations are likely to evolve sometimes significantly throughout the project lifecycle, as new risks, opportunities, and constraints emerge (Turner & Cochrane, 1993).

This ongoing fluidity creates a moving target for project teams, making it increasingly difficult to establish a fixed baseline against which scope can be consistently evaluated. As a result, project managers must navigate an inherently uncertain landscape in which stakeholder alignment is transient, and scope definitions are subject to continuous negotiation and revision. Addressing this challenge requires more dynamic and iterative mechanisms for stakeholder engagement and scope validation, capable of accommodating evolving priorities without sacrificing coherence or strategic focus.

Figure 08. Shifting Stakeholder Expectations in Unstable Environments



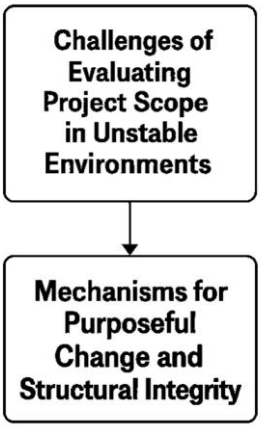
3.3. Scope Creep Versus Necessary Adaptation

Scope creep, commonly defined as the uncontrolled expansion of project scope without proportional adjustments to schedule, budget, or resource allocation remains a well-documented and widely recognized risk in project management literature (Kerzner, 2017). However, in unstable and rapidly changing environments, the distinction between detrimental scope creep and strategic scope adaptation becomes increasingly blurred. In such contexts, modifications to project scope are not inherently problematic; rather, they may constitute essential responses to emergent external conditions, evolving stakeholder needs, or newly identified risks and opportunities (Lehtonen & Martinsuo, 2008).

The core challenge lies in evaluating whether these scope changes contribute to the project's continued relevance, alignment with strategic goals, and overall value creation, or whether they reflect disorganized planning, unclear objectives, and reactive management practices. In high-uncertainty settings, overly rigid scope control mechanisms can hinder the project's capacity to adapt in a timely manner, potentially rendering its outputs obsolete or misaligned with stakeholder expectations. Conversely, excessive flexibility without sufficient governance can lead to fragmented execution, resource inefficiencies, and diminished project coherence (Cicmil et *al.*, 2006).

Therefore, scope evaluation in such contexts requires a more sophisticated and context-sensitive approach, one that goes beyond binary judgments of change as ''good'' or ''bad''. Project managers must navigate the tension between adaptability and discipline, employing mechanisms that allow for purposeful change while safeguarding the project's structural integrity and intended value. This necessitates continuous reassessment of scope changes through criteria that consider strategic alignment, impact on objectives, resource feasibility, and stakeholder consensus.

Figure 09. Balancing Adaptability and Governance in Governance in Scope Evaluation



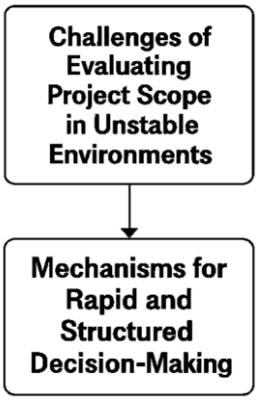
3.4. Time and Resource Constraints

Projects operating in unstable environments frequently contend with compressed timelines, constrained resources, and significant logistical challenges that inhibit the feasibility of detailed planning and structured scope evaluation (Kutsch & Hall, 2016). Situations such as natural disasters, humanitarian emergencies, or politically driven initiatives often demand rapid project initiation and accelerated execution, leaving little room for comprehensive upfront scoping or iterative re-scoping processes. Under such conditions, traditional project management tools, such as baseline scope documents, work breakdown structures, and earned value management metrics may become impractical or insufficient due to the absence of stable reference points and reliable data.

The urgency inherent in these contexts also limits the capacity for real-time analysis, comprehensive impact assessments, and formal decision-making processes. Project teams, facing immediate operational pressures, may be forced to implement short-term fixes or ad hoc solutions without fully understanding their implications for the broader scope or long-term strategic objectives. This reactive approach can result in scope fragmentation, reduced coherence across project components, and eventual misalignment with stakeholder expectations or organizational goals (Martinsuo & Hoverfält, 2018).

Furthermore, these constraints extend beyond technical execution to affect the overall governance of the project. When time and information are scarce, accountability structures may weaken, and the ability to make informed, transparent, and strategically aligned scope decisions becomes compromised. In such scenarios, scope evaluation is not simply a matter of methodological rigor but a question of institutional capacity and contextual adaptability. Addressing these challenges requires frameworks that support rapid yet structured decision-making, flexible prioritization, and real-time learning, all while maintaining a clear connection to overarching project goals.

Figure 10. Constraints of Scope Evaluation Amid Urgency and Logistical Challenges



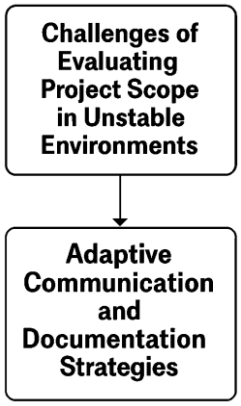
3.5. Communication and Documentation Breakdown

Effective scope evaluation relies fundamentally on clear, consistent communication and comprehensive documentation to ensure shared understanding, traceability of decisions, and alignment among project stakeholders. However, in unstable environments, frequent disruptions, such as high staff turnover, infrastructural breakdowns, organizational restructuring, or cross-cultural communication barriers, can severely compromise these foundational elements (Binder, 2007). Such disruptions often result in fragmented information flows, conflicting interpretations of scope, undocumented changes, and diverging stakeholder expectations.

In these contexts, the conventional reliance on formal documentation as a central mechanism for scope management may prove both impractical and insufficient. Project teams may encounter difficulties in maintaining accurate and up-to-date scope statements, ensuring version control, or linking changes back to their original rationale. The fast pace and high uncertainty of such environments often outstrip the capacity of teams to manage documentation rigorously. Moreover, when changes occur frequently and with little warning, documentation may be perceived as an administrative burden rather than a value-adding activity, leading to what Pollack (2007) refers to as documentation fatigue, a condition in which stakeholders disengage from formal record-keeping processes due to diminishing returns.

These communication and documentation challenges undermine the reliability and effectiveness of scope evaluation mechanisms. Without a clear and shared understanding of scope—and without the ability to systematically capture and communicate scope changes, projects risk falling into misalignment, both internally among team members and externally with key stakeholders. This highlights the need for adaptive communication strategies and lightweight, real-time documentation practices that can function effectively in high-disruption contexts while preserving the integrity of scope-related decisions.

Figure 11. Disruptions Affecting Communication and Documentation Integrity



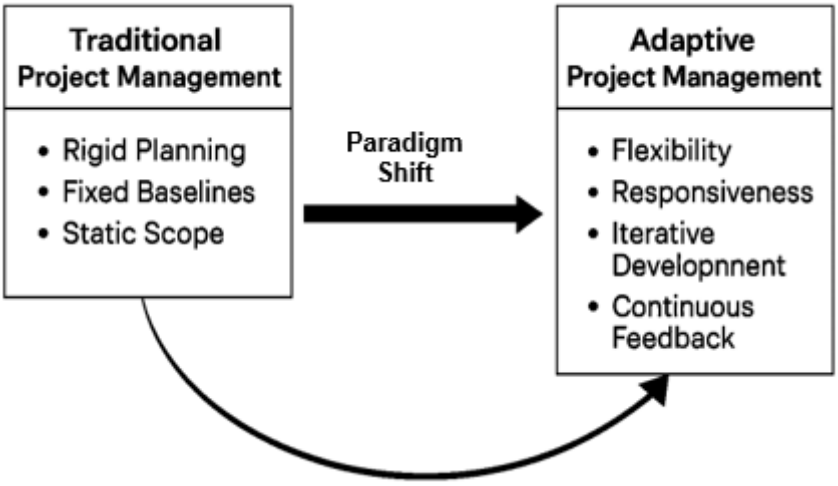
4. Analytical Review of Adaptive Frameworks

4.1. Overview

The inadequacies of traditional project management models in managing scope evaluation under conditions of instability have prompted a paradigm shift toward more adaptive approaches. These contemporary frameworks emphasize flexibility, responsiveness, and iterative development, positioning themselves in contrast to the rigid planning, fixed baselines, and static scope definitions characteristic of conventional methodologies. Rather than attempting to eliminate uncertainty, adaptive models seek to work with it, leveraging continuous stakeholder feedback, incremental delivery, and real-time learning to refine project direction and scope over time.

This section critically examines the principal adaptive project management frameworks, such as Agile, Scrum, Lean, and hybrid models—with particular attention to their applicability and limitations in evaluating project scope within volatile, uncertain, complex, and ambiguous (VUCA) environments. The goal is to assess the extent to which these frameworks offer robust mechanisms for managing scope evolution, maintaining alignment with stakeholder expectations, and preserving project value in the face of rapid change. Through this analysis, the paper aims to identify best practices, theoretical gaps, and areas where further development is needed to strengthen scope evaluation in adaptive project environments.

Figure 12. Adaptive Approaches to Scope Evaluation



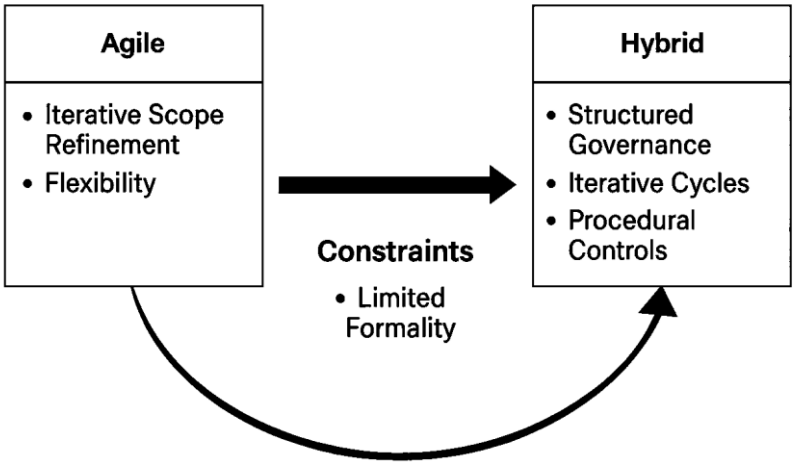
4.2. Agile and Hybrid Methodologies

Agile methodologies originated in the software development sector as a direct response to the limitations of linear, plan-driven approaches, and have since been adopted across a range of industries characterized by high levels of change and uncertainty (Highsmith, 2009). Central to Agile philosophy is the prioritization of iterative development, continuous stakeholder collaboration, and responsiveness to evolving requirements. Rather than attempting to define and freeze detailed scope at the outset, Agile frameworks, such as Scrum and Kanban, utilize mechanisms like product backlogs, sprint cycles, and regular retrospectives to enable the incremental delivery of value. This iterative structure facilitates ongoing refinement of project scope, allowing teams to incorporate feedback and respond to emergent needs in near real-time.

Agile's strength in unstable environments lies in its inherent flexibility. Scope is deliberately kept fluid and is reassessed at the end of each iteration through stakeholder engagement, thus ensuring that deliverables remain relevant and aligned with shifting priorities. However, despite these advantages, Agile methodologies may face limitations when applied to large-scale, highly complex, or heavily regulated projects. In such contexts, some degree of upfront planning, formal documentation, and procedural oversight remains essential to satisfy legal, organizational, or contractual requirements.

To address these constraints, hybrid project management approaches have emerged—integrating Agile principles within the structured governance frameworks of traditional models such as PMBOK® or PRINCE2. These hybrid models aim to balance adaptability with control, allowing for iterative scope refinement and rapid decision-making at the execution level, while preserving the reporting discipline, risk management processes, and quality assurance mechanisms demanded by oversight bodies (Serrador & Pinto, 2015; Conforto et *al*., 2014). As such, hybrid frameworks offer a pragmatic solution for projects that operate in unstable environments but must still comply with institutional or sector-specific requirements.

Figure 13. Agile and Hybrid Approaches to Scope Evaluation



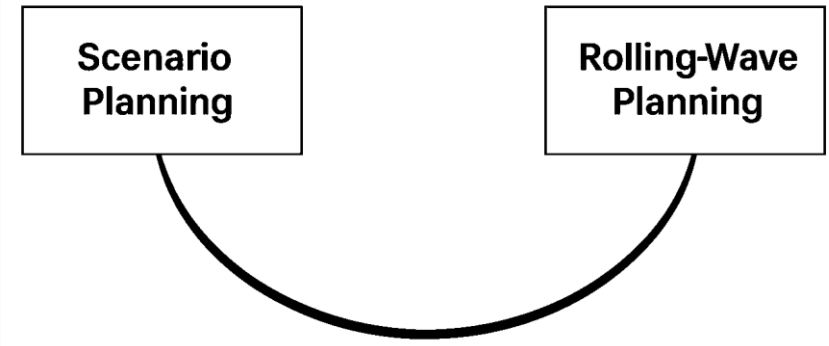
4.3. Scenario Planning and Rolling-Wave Planning

Scenario planning is a strategic foresight technique designed to anticipate and prepare for a range of plausible future conditions. When applied within the domain of project management, it serves as a valuable tool for managing uncertainty by enabling scope planners to outline flexible pathways that account for varying environmental outcomes (Chermack, 2011). This approach facilitates the differentiation between core scope components, those deemed essential and relatively stable across scenarios, and peripheral elements, which may be activated or modified depending on how external conditions unfold. By embedding contingency thinking into the early stages of scope definition, scenario planning helps to insulate projects from the destabilizing effects of rapid or unexpected change.

Complementing scenario planning is the technique of rolling-wave planning, as advocated by the Project Management Institute (PMI, 2021). Rolling-wave planning allows for the progressive elaboration of scope, where immediate tasks are planned in detail while future tasks are outlined at a higher level and refined as additional information becomes available. This method is particularly valuable in projects characterized by high initial uncertainty that is expected to diminish over time. Rather than forcing premature decisions based on incomplete data, rolling-wave planning supports incremental commitment and adaptive decision-making, enabling teams to remain responsive while still progressing toward long-term goals.

Together, scenario planning and rolling-wave planning offer a coherent framework for managing evolving scope boundaries without compromising overarching strategic intent. They provide structured yet flexible mechanisms for incorporating new insights, shifting stakeholder needs, and external disruptions into the project's trajectory. However, the effectiveness of these techniques hinges on the team's capacity to recognize weak signals, monitor environmental trends, and revise assumptions in a timely and disciplined manner (Turner & Müller, 2003). Without such capabilities, even well-designed adaptive planning processes risk devolving into reactive management, undermining both project coherence and value delivery.

Figure 14. Adaptive Planning Techniques for Evolving Project Scopes



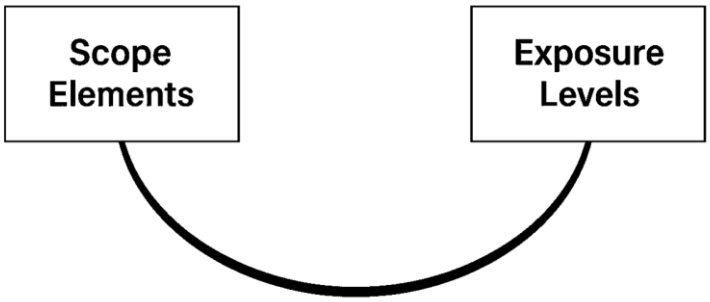
4.4. Risk-Based Scope Evaluation

Risk-based approaches to project scope management emphasize the integration of risk analysis into the scope definition, prioritization, and evaluation process. Unlike traditional models that treat scope and risk as separate domains, this approach seeks to align scope decisions with identified uncertainties, dependencies, and exposure levels (Kendrick, 2015). In this framework, scope elements are not only ranked by strategic importance or stakeholder demand but also by their associated levels of risk, such as technical uncertainty, resource volatility, or external dependencies. This enables project teams to plan more robustly by making scope decisions that reflect both value and vulnerability.

For example, scope components characterized by high uncertainty and low strategic value may be deliberately excluded, delayed, or assigned lower priority in order to conserve resources and reduce exposure. Conversely, high-value components with manageable risk profiles are given precedence, ensuring that project outcomes remain resilient even when disruptions occur. This form of risk-informed prioritization is particularly valuable in unstable environments, where trade-offs are inevitable and resource constraints frequently shift. Moreover, the integration of continuous risk monitoring enables early detection of emerging threats, prompting timely reassessment of scope and minimizing the likelihood of unmanaged scope creep or misalignment.

Risk-based scope evaluation aligns closely with the principles of enterprise risk management (ERM) and contributes to the development of more adaptive and resilient project strategies. It shifts the focus from reactive scope adjustments to proactive planning, enhancing both strategic alignment and operational flexibility. However, the successful implementation of such an approach requires a mature organizational risk culture, supported by analytical capabilities, data availability, and decision-making frameworks that allow teams to assess, quantify, and act on risks effectively (Hillson & Simon, 2012). In organizations lacking these enablers, the potential benefits of risk-based scope management may be difficult to fully realize, underscoring the need for capacity building alongside methodological innovation.

Figure 15. Risk-Based Scope Prioritization in Volatile Environments



4.5. Stakeholder Engagement and Feedback Loops

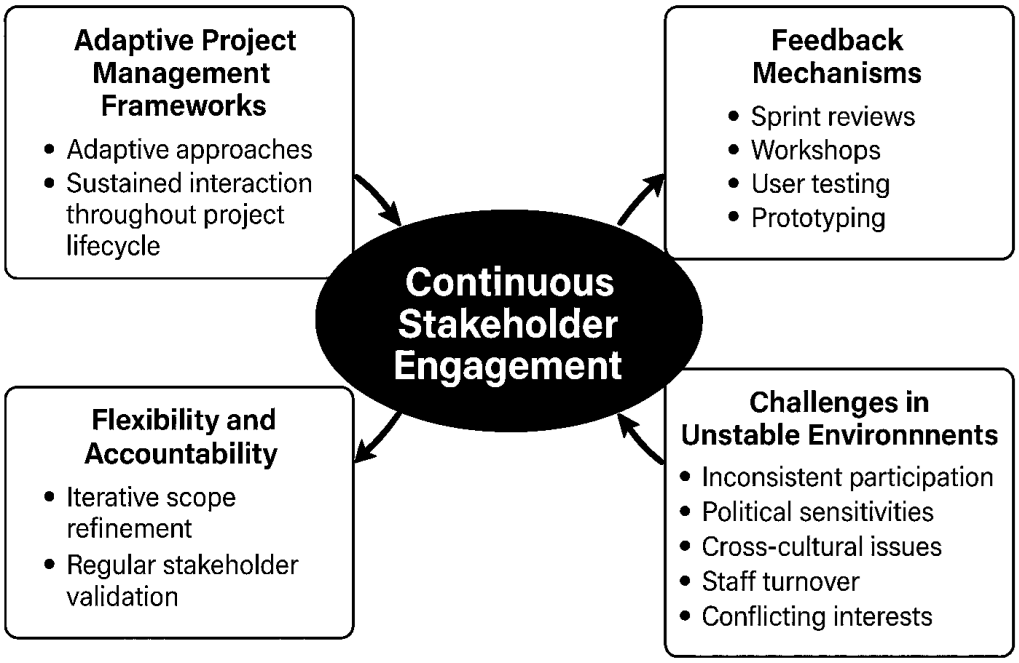
Adaptive project management frameworks place a strong emphasis on continuous stakeholder engagement as a central mechanism for scope control and evaluation. In contrast to traditional models where stakeholder input is often confined to the planning and closure phases, adaptive approaches advocate for sustained interaction throughout the entire project lifecycle (Bourne, 2009). This continuous engagement reflects the recognition that stakeholder needs, priorities, and expectations are likely to evolve, particularly in volatile or uncertain environments.

Mechanisms such as sprint reviews, collaborative workshops, user testing, and iterative prototyping establish feedback loops that ensure scope remains responsive to emerging stakeholder insights. These feedback processes serve dual purposes: they help maintain alignment between deliverables and real-time needs, while also enabling the early detection of scope misalignments and the implementation of timely corrective actions. In doing so, adaptive engagement supports both flexibility by allowing iterative scope refinement—and accountability, through regular stakeholder validation and input.

However, the implementation of continuous stakeholder engagement in unstable environments presents notable challenges. Inconsistent participation, political sensitivities, cross-cultural communication barriers, staff turnover, and conflicting interests can all hinder the quality and reliability of stakeholder input (Binder, 2007). These disruptions may lead to fragmented communication, delayed feedback, or misinterpretation of evolving requirements, thereby undermining the effectiveness of adaptive scope evaluation.

To mitigate these risks, adaptive frameworks must be complemented by robust, context-sensitive stakeholder communication strategies. This includes tailoring engagement methods to local cultural norms, establishing clear roles and expectations, using multilingual and multimodal communication tools, and building trust through transparency and responsiveness. Ultimately, the success of continuous stakeholder engagement as a scope management strategy depends not only on process design but also on the relational and communicative capacity of the project team within its specific environmental context.

Figure 16. Continuous Stakeholder Engagement in Adaptive Project Management

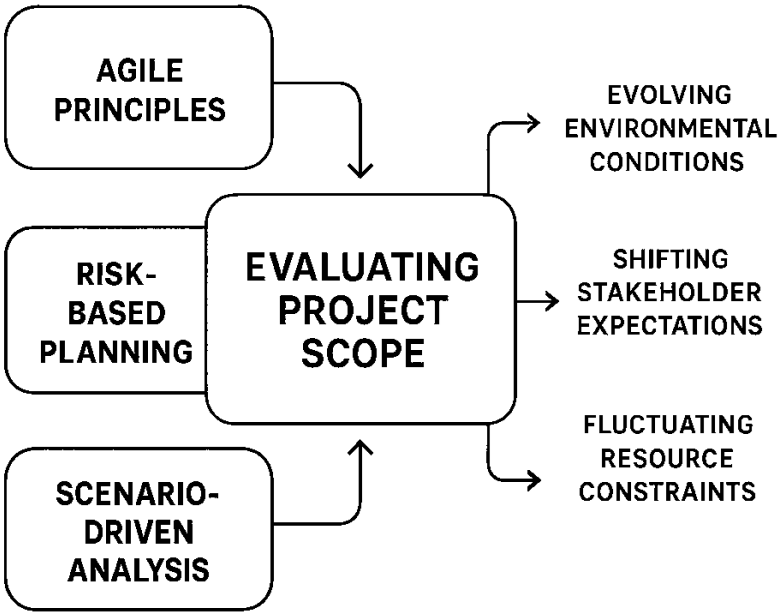


5. Proposed Conceptual Framework

5.1. Outline

Considering the challenges and adaptive strategies discussed in the preceding sections, this paper proposes a conceptual framework for evaluating project scope in unstable environments. The framework is intended to address the limitations of both traditional and purely adaptive models by integrating principles from Agile methodologies, risk-based planning, and scenario-driven analysis. It seeks to balance the need for structural clarity with the imperative for responsiveness in dynamic and uncertain contexts. By providing a flexible yet systematic approach, the framework aims to support project teams in maintaining continuous alignment between project scope, evolving environmental conditions, shifting stakeholder expectations, and fluctuating resource constraints. Ultimately, it serves as a practical and theoretical tool for enhancing scope governance and decision-making in complex, high-uncertainty project settings.

Figure 17. Conceptual Framework for Evaluating Project Scope in Unstable Environments



5.2. Core Principles of the Framework

The proposed conceptual framework is underpinned by four interrelated principles: adaptability, stakeholder integration, iterative evaluation, and risk sensitivity. These principles emerge from a critical synthesis of existing project management literature and are specifically tailored to address the complex challenges of scope evaluation in volatile and uncertain environments (Highsmith, 2009; Bennett & Lemoine, 2014; Kendrick, 2015). Collectively, they provide a foundation for scope governance that is both flexible and resilient.

1. **Adaptability** refers to the capacity of the project scope to evolve in response to dynamic environmental conditions without compromising the overarching strategic objectives. It encourages flexibility in scope design and execution, enabling teams to revise priorities and deliverables as new information emerges.
2. **Stakeholder integration** highlights the importance of ongoing, structured engagement with stakeholders throughout the project lifecycle. By maintaining open communication channels and incorporating feedback continuously, project teams can ensure that scope adjustments reflect current stakeholder expectations and emerging needs.
3. **Iterative evaluation** involves the systematic reassessment of scope boundaries at regular intervals through formal mechanisms such as sprint reviews, stage gates, or feedback loops. This principle supports timely course correction and helps prevent misalignment between scope, objectives, and external conditions.
4. **Risk sensitivity** embeds risk analysis directly into scope management decisions. Rather than treating risk as a peripheral consideration, this principle ensures that uncertainty is

systematically assessed, quantified where possible, and factored into scope prioritization, trade-offs, and contingency planning.

These four principles serve not only as conceptual anchors for the framework but also as practical design criteria for developing scope evaluation processes that are responsive, accountable, and strategically coherent in the face of ongoing change.

Table 04. Core Principles for Scope Evaluation in Unstable Project Environments

Principle	Definition	Purpose	Mechanism/Tools
Adaptability	Capacity to adjust project scope in response to changing conditions without losing strategic direction	Enables flexibility and relevance in dynamic environments	Dynamic scope design, real-time reprioritization
Stakeholder Integration	Continuous, structured engagement with stakeholders throughout the project lifecycle	Aligns scope with current stakeholder needs and expectations	Feedback loops, stakeholder mapping, regular check-ins
Iterative Evaluation	Ongoing reassessment of scope at regular intervals using formal processes	Maintains alignment with goals and external changes; enables course correction	Sprint reviews, stage gates, retrospectives
Risk Sensitivity	Embedding risk analysis in all scope decisions; proactive risk identification and response	Informs scope trade-offs and contingency planning based on uncertainty	Risk matrices, scenario planning, impact/probability scoring

5.3. Framework Components

The proposed framework comprises four interrelated components, each aligned with a phase in the project lifecycle (initiation, planning, execution, and monitoring) but intentionally designed for recursive and non-linear application. These components operationalize the framework's core principles (adaptability, stakeholder integration, iterative evaluation, and risk sensitivity) and provide a practical structure for navigating scope evaluation in unstable environments.

5.3.1. Dynamic Scope Baseline

Rather than relying on a traditional fixed scope statement, the framework introduces the concept of a Dynamic Scope Baseline, which is designed to evolve through periodic

reassessment. This baseline functions as a living document, capturing both core (non-negotiable) and adaptive (negotiable or emergent) elements of scope. Core elements represent foundational deliverables that are essential to the project's strategic objectives, while adaptive elements are intentionally flexible and subject to modification as conditions evolve.

The dynamic baseline is reviewed and updated at each iteration, stage gate, or major decision point in the project lifecycle. Updates are informed by stakeholder feedback, risk reassessments, performance data, and shifts in the external environment (Turner & Cochrane, 1993; PMI, 2021). This approach enables project teams to maintain a structured yet flexible reference point for scope management, ensuring responsiveness without sacrificing alignment or control. By explicitly accommodating change within the scope definition process, the dynamic baseline enhances transparency, traceability, and adaptability in complex project settings.

5.3.2. Risk-Informed Scope Matrix

The Risk-Informed Scope Matrix is a strategic tool that supports scope evaluation by categorizing scope elements along two key dimensions: strategic value and environmental uncertainty. Strategic value reflects the importance of a scope element in achieving project or organizational objectives, while environmental uncertainty refers to the degree of volatility, unpredictability, or complexity associated with delivering that element under current conditions (Kendrick, 2015; Hillson & Simon, 2012).

By mapping scope components within this two-dimensional space, the matrix enables project teams to make informed, proactive decisions about scope adjustments. For instance:

- High-value, low-uncertainty items may be prioritized and safeguarded.
- High-value, high-uncertainty items may require contingency planning or phased delivery.
- Low-value, high-uncertainty items may be candidates for deferral or removal.
- Low-value, low-uncertainty items may be deprioritized or simplified.

This structured approach supports rational trade-offs under conditions of constraint and change. It shifts scope decision-making from reactive accommodation to strategic adaptation, reinforcing alignment between evolving project realities and long-term goals. Moreover, the matrix can be revisited iteratively as new information emerges, reinforcing the framework's commitment to dynamic and context-aware scope evaluation.

5.3.3. Iterative Evaluation Loops

The framework institutionalizes Iterative Evaluation Loops-recurring checkpoints where the project scope is systematically reviewed and recalibrated considering current environmental conditions, stakeholder inputs, and emerging risks. These loops draw conceptual parallels to Agile sprint reviews and PRINCE2 stage gates but are expanded to incorporate scenario analysis and risk-based insights as integral components of the evaluation process (Chermack, 2011; Serrador & Pinto, 2015).

Each evaluation loop serves as a structured opportunity to reassess the alignment between the evolving project context and the existing scope baseline. This includes examining scope performance, validating stakeholder relevance, and applying new risk or scenario data to guide necessary adjustments. By embedding these loops throughout the project lifecycle, rather than restricting evaluation to pre-defined milestones, teams can maintain a high degree of responsiveness without compromising strategic coherence.

The frequency, scope, and format of these loops are intentionally adaptable, allowing customization based on project type, environmental volatility, and organizational capacity. In highly dynamic settings, shorter cycles with more frequent reviews may be necessary, while more stable projects may benefit from broader, less frequent assessments. In all cases, the aim is to institutionalize reflective practice and evidence-based scope management, thereby enhancing adaptability, accountability, and resilience.

5.3.4. Adaptive Stakeholder Engagement Mechanism

Recognizing the fluidity of stakeholder interests in dynamic and unstable environments, the framework incorporates an Adaptive Stakeholder Engagement Mechanism to ensure continuous alignment between evolving expectations and project scope. Unlike static stakeholder management plans, this mechanism is designed for flexibility, responsiveness, and contextual sensitivity (Binder, 2007; Bourne, 2009).

Key features of this mechanism include:

- **Regular stakeholder re-mapping**, which involves periodically reassessing stakeholder influence, interests, and priorities in light of environmental or organizational changes.
- **Transparent communication of scope decisions**, ensuring that rationale, trade-offs, and impacts are clearly conveyed to all relevant parties, thereby fostering trust and shared understanding.
- **Conflict resolution protocols** to address misalignments early and constructively, using structured dialogue, facilitated negotiation, or escalation pathways where necessary.

Effective engagement within this framework is frequent**,** multidirectional, and context-sensitive, allowing for both formal feedback loops and informal exchanges that can capture emerging concerns and insights. This dynamic engagement model is essential not only for responsive scope evaluation, but also for sustaining stakeholder buy-in and legitimacy throughout the project lifecycle. By embedding stakeholder integration into the fabric of scope governance, the framework supports more inclusive, resilient, and adaptive project outcomes.

Table 05. Principles and Framework Components for Scope Evaluation in Unstable Environments

Core Principle	Framework Component	Lifecycle Phase(s)	Function	Key Mechanisms/Tools
Adaptability	**Dynamic Scope Baseline**	Initiation, Planning, Execution, Monitoring	Enables evolving scope without losing strategic focus	Living scope document with core/adaptive elements; updated via stage gates, feedback, and risk data
Risk Sensitivity	**Risk-Informed Scope Matrix**	Planning, Execution, Monitoring	Integrates risk into scope prioritization and trade-offs	2×2 matrix mapping value vs. uncertainty; supports deferral, simplification, or contingency strategies
Iterative Evaluation	**Iterative Evaluation Loops**	Execution, Monitoring	Facilitates ongoing scope alignment via regular reassessment	Sprint reviews, stage gates, scenario analysis, risk-informed retrospectives
Stakeholder Integration	**Adaptive Stakeholder Engagement Mechanism**	All Phases	Maintains continuous alignment between scope and stakeholder expectations	Stakeholder remapping, transparent change communication, structured conflict resolution mechanisms

5.4. Application Scenarios

The proposed framework is particularly well-suited for projects operating in high-uncertainty sectors, where traditional scope management approaches often prove inadequate. Its emphasis on adaptability, iterative reassessment, and stakeholder integration makes it applicable across a range of dynamic contexts, including:

- **Humanitarian aid and disaster response**, where initial conditions can shift dramatically due to evolving crisis dynamics, access constraints, and emergent stakeholder needs. In such settings, fixed scope definitions are often unfeasible, and the ability to adapt quickly is critical to mission success.
- **Digital innovation and technology startups**, where user expectations, market conditions, and technical feasibility can change rapidly. Projects in these sectors benefit from a framework that supports continuous iteration and prioritization without compromising alignment with overarching goals.

- **Policy implementation in transitional governments**, where fluctuating political pressures, regulatory uncertainty, and administrative volatility challenge conventional planning and scope control. The framework's capacity to integrate stakeholder input and reassess scope under shifting constraints is particularly valuable in such contexts.

In each of these domains, the framework reconceptualizes scope not as a static contractual boundary, but as a navigational tool, one that enables project teams to respond constructively to complexity, uncertainty, and change while preserving strategic intent. This flexible, principle-driven approach enhances project resilience and increases the likelihood of delivering value in unpredictable environments.

Table 06. Applicability of the Adaptive Scope Evaluation Framework in High-Uncertainty Sectors

Sector/Context	Challenges	Framework Contributions	Key Benefiting Principles
Humanitarian Aid & Disaster Response	Rapidly evolving crises, unpredictable access, emergent needs	Enables real-time scope adjustments and flexible delivery through dynamic baselining and stakeholder feedback	Adaptability, Stakeholder Integration
Digital Innovation & Tech Startups	Fast-changing market/user demands, uncertain technical feasibility	Supports continuous iteration, reprioritization, and scope recalibration without losing strategic focus	Iterative Evaluation, Adaptability
Policy Implementation in Transitional Governments	Regulatory and political volatility, inconsistent administrative capacity	Encourages responsive planning, frequent reassessment, and broad stakeholder engagement	Stakeholder Integration, Risk Sensitivity

5.5. Theoretical Contributions, Limitations and Future Work

This framework contributes to project management theory by reconceptualizing scope evaluation as a dynamic and context-sensitive process, rather than a static, one-time exercise. It challenges the deterministic assumptions embedded in traditional models and aligns with contemporary calls for more flexible, adaptive methodologies that reflect the realities of complex and uncertain environments (Cicmil et *al*., 2006; Martinsuo & Hoverfält, 2018). By integrating principles from Agile, risk-based, and scenario-driven approaches, the framework offers a structured yet flexible foundation for navigating scope-related decisions in volatile settings.

Importantly, the framework advances the theoretical discourse by positioning scope not as a boundary to be controlled, but as a navigational tool that evolves in response to environmental cues, stakeholder inputs, and strategic priorities. This perspective enhances the resilience and relevance of project management practices in sectors where change is constant and predictability is limited.

However, the current formulation remains conceptual and has yet to be tested in empirical settings. To strengthen its practical relevance and theoretical robustness, future research should focus on piloting the framework in specific sectors, such as humanitarian operations, digital innovation, or policy implementation in transitional states. Empirical studies could assess the usability of the framework, validate its individual components, and refine its applicability across a range of organizational and environmental contexts. Mixed-method approaches combining case studies, surveys, and action research may offer valuable insights into how the framework performs under real-world conditions and what modifications may be necessary for broader adoption.

Table 07. Theoretical Contributions and Research Implications of the Adaptive Scope Evaluation Framework

Dimension	Description	Key References/Notes
Conceptual Shift	Reframes scope from a static, one-time boundary to a dynamic, evolving navigational tool	Aligns with complexity-informed PM perspectives
Theoretical Contribution	Integrates Agile, risk-based, and scenario-driven principles into a coherent, adaptive framework for scope evaluation	Offers a structured yet flexible alternative to deterministic PM models
Practical Relevance	Provides tools and processes that enhance scope governance in high-uncertainty contexts (e.g. humanitarian, tech, policy sectors)	Enhances resilience, responsiveness, and alignment under volatile conditions
Limitations / Current Status	Conceptual only; has not been empirically tested	Requires validation through field studies, real-world piloting
Future Research Directions	Empirical testing in sector-specific contexts; evaluation of framework usability, impact, and adaptability	Suggested methods: case studies, surveys, action research; focus on component-level validation and refinement

6. Conclusion and Recommendations

Project scope evaluation is a foundational element of effective project management, serving as the basis for planning, execution, and performance monitoring. However, its traditional treatment within static and predictive frameworks has been shown to fall short when applied to unstable environments characterized by volatility, uncertainty, complexity, and ambiguity. This paper has critically examined the limitations of conventional models in such contexts, reviewed emerging adaptive methodologies, and proposed a conceptual framework that integrates adaptability, stakeholder integration, iterative evaluation, and risk sensitivity.

This concluding section synthesizes the key insights derived from the analysis, offers practical recommendations for project practitioners operating in dynamic environments, acknowledges the framework's current limitations, and outlines avenues for future research. In doing so, it reinforces the need for a paradigm shift in how project scope is understood and managed, moving from rigid control to responsive navigation in complex project landscapes.

Table 08. Toward Adaptive Scope Evaluation in Unstable Environments

Conclusion Dimension	Key Points
Core Insight	Traditional scope models are inadequate in volatile environments; adaptive, principle-based frameworks offer better alignment.
Framework Contribution	Introduces a dynamic, flexible model centered on adaptability, stakeholder integration, iterative evaluation, and risk sensitivity.
Practical Recommendations	Project teams should shift from control-oriented scope management to context-aware, feedback-driven, and risk-informed practices.
Current Limitations	The framework remains conceptual; real-world applicability, usability, and impact have not yet been empirically validated.
Future Research	Pilot studies in sectors like humanitarian aid, tech innovation, and transitional policy; use of mixed methods for validation and refinement.
Paradigm Shift Emphasis	Calls for reimagining scope not as a boundary but as a navigational tool adaptable to uncertainty and complexity.

6.1. Summary of Key Insights

The literature review and analytical assessment conducted throughout this study yield several interrelated conclusions that collectively underscore the need for a more adaptive and context-aware approach to project scope evaluation:

1. **Traditional scope evaluation models** rooted in linear planning and fixed assumptions, are ill-suited to unstable environments where timelines, budgets, stakeholder expectations, and resource availability are frequently disrupted (Kutsch & Hall, 2016; Kerzner, 2017). These models lack the flexibility and responsiveness required to maintain relevance in volatile project contexts.
2. **Adaptive frameworks** including Agile, hybrid methodologies, and scenario-based planning, offer greater flexibility and iterative responsiveness. However, their effectiveness is contingent on integration with robust risk management practices and continuous, multidirectional stakeholder engagement (Highsmith, 2009; Conforto et *al.*, 2014). Without these complementary components, adaptive methods risk becoming fragmented or reactive.
3. The **proposed conceptual framework** addresses this gap by emphasizing four interdependent principles: adaptability, stakeholder integration, iterative scope evaluation, and risk sensitivity. This framework offers a more realistic, scalable, and context-sensitive approach to managing project scope under conditions of uncertainty and change.

By reconceptualizing scope as a flexible yet strategically anchored construct, the framework reframes scope evaluation as a continuous, learning-oriented process rather than a discrete, front-loaded activity. This shift enables project teams to sustain alignment with evolving external conditions and stakeholder priorities while preserving project coherence and value delivery.

Table 09. Rethinking Project Scope Evaluation for Unstable Environments

Conclusion Theme	Key Insight	Implication
Limitations of Traditional Models	Linear, fixed-scope models fail in volatile environments with shifting timelines, budgets, and expectations	Necessitates a departure from rigidity toward dynamic, real-time scope adaptation
Value and Limits of Adaptive Approaches	Agile and scenario-based methods offer flexibility but require risk integration and continuous stakeholder engagement to be effective	Adaptive methods must be supported by structured risk and stakeholder mechanisms to avoid reactivity
Framework Contribution	The proposed framework combines adaptability, stakeholder integration, iterative evaluation, and risk sensitivity into a coherent, practical model	Provides a scalable, context-sensitive model for real-time scope governance in uncertain settings

Paradigm Shift in Scope Thinking	Scope is reframed as a navigational, learning-driven construct rather than a static artifact	Supports ongoing alignment with evolving priorities while preserving strategic coherence and value

6.2. Practical Recommendations

Based on the insights derived from this study, the following recommendations are proposed for practitioners and organizations managing projects in volatile, uncertain, or rapidly changing environments:

- **Adopt dynamic scope baselines** that clearly distinguish between core (non-negotiable) and adaptive (flexible or emergent) elements. This approach supports continuous alignment between evolving project conditions and strategic objectives while preserving clarity and accountability.
- **Institutionalize iterative evaluation loops** throughout the project lifecycle. These structured checkpoints should incorporate stakeholder feedback, performance data, and environmental scanning to facilitate timely and evidence-based scope reassessment.
- **Utilize risk-informed tools**, such as the scope-risk matrix, to guide prioritization decisions. Categorizing scope components by their strategic value and associated uncertainty allows for rational trade-offs regarding what to protect, scale, defer, or eliminate.
- **Develop adaptive stakeholder engagement mechanisms** that prioritize continuous, multidirectional communication. Emphasize transparency, collaborative decision-making, and context-aware negotiation to maintain stakeholder alignment amid changing priorities.
- **Promote training and organizational cultures** that reinforce responsiveness, risk awareness, and iterative planning capabilities. This is especially important in sectors frequently exposed to instability such as humanitarian response, digital innovation, and public policy, where traditional planning models may be insufficient.

These recommendations aim to help organizations operationalize the principles of the proposed framework and build capacity for resilient, context-sensitive scope management.

Title 10. Practitioner Recommendations for Adaptive Scope Management in Unstable Environments

Recommendation	Description	Purpose/Impact	Key Benefiting Principles
Implement Dynamic Scope Baselines	Define and maintain scope with clear distinction between core (fixed) and adaptive (flexible) elements	Enhances strategic alignment and accountability while allowing controlled flexibility	Adaptability, Risk Sensitivity
Institutionalize Iterative Evaluation Loops	Embed structured checkpoints for scope reassessment using data, feedback, and context scanning	Enables timely course corrections and responsive governance	Iterative Evaluation, Stakeholder Integration
Apply Risk-Informed Scope Tools	Use tools like the scope-risk matrix to assess and prioritize scope elements based on value and uncertainty	Supports rational, strategic decision-making under uncertainty	Risk Sensitivity, Adaptability
Develop Adaptive Stakeholder Engagement Mechanisms	Establish ongoing, multidirectional communication channels with mechanisms for feedback and conflict resolution	Maintains alignment, trust, and inclusivity in rapidly changing conditions	Stakeholder Integration, Adaptability
Foster Adaptive Competencies and Culture	Promote training, leadership support, and cultural norms that prioritize flexibility, risk awareness, and iterative thinking	Builds organizational resilience and prepares teams for effective scope navigation in volatile sectors	All four principles (Integrated)

6.3. Study Limitations

This study is conceptual in nature and does not include empirical validation of the proposed framework. While the framework is grounded in an extensive review and synthesis of established project management literature, its practical applicability may vary across project types, industry sectors, and levels of organizational maturity. For example, adaptive methodologies such as Agile and rolling-wave planning are inherently more compatible with software development and innovation-driven environments than with large-scale infrastructure or policy implementation projects, where iterative flexibility may be constrained.

Another key limitation lies in the assumption of organizational readiness to adopt flexible and adaptive practices. The successful implementation of dynamic scope evaluation tools depends on cultural openness, leadership support, and the presence of enabling governance structures. In highly bureaucratic or regulated environments, such as government agencies or compliance-heavy sectors, there may be institutional resistance to departing from traditional, control-oriented project management models (Cicmil et *al*., 2006). As such, the framework's adoption may require significant change management efforts and alignment with existing organizational norms and constraints.

These limitations underscore the need for further empirical research to assess the framework's real-world applicability and to identify sector-specific conditions that may enable or inhibit its effective use.

Table 11. Limitations and Applicability Considerations of the Proposed Framework

Limitation / Consideration	Description	Implication for Practice	Research/Implementation Need
Lack of Empirical Validation	The framework is conceptual, based on literature synthesis without real-world testing	Applicability may vary; effectiveness remains unverified across different settings	Conduct empirical studies (case studies, pilot testing)
Context-Specific Applicability	Adaptive approaches align better with dynamic sectors (e.g., tech, innovation) than with rigid fields (e.g., infrastructure)	May not fit well with projects requiring fixed deliverables or rigid approvals	Explore adaptations for less-flexible domains
Assumption of Organizational Readiness	Success depends on leadership support, governance flexibility, and cultural receptiveness to change	In bureaucratic or compliance-heavy environments, implementation may face resistance	Assess change management requirements for adoption
Institutional Resistance to Adaptivity	Highly regulated or hierarchical sectors may be unwilling or unable to shift away from control-oriented models	Framework adoption could be slow or require significant transformation efforts	Identify enablers/barriers to implementation in such contexts

6.4. Directions for Future Research

To build on the conceptual contributions of this study and enhance its practical relevance, several avenues for future research are proposed:

- **Empirical validation of the conceptual framework** across diverse sectors, including humanitarian aid, digital innovation, and infrastructure development in fragile or transitional states. Such studies could assess how the framework performs under real-world constraints and varying degrees of environmental instability.
- **Development of metrics and performance indicators** specifically tailored to dynamic scope evaluation. These indicators could help project teams and organizations assess the effectiveness, responsiveness, and value alignment of adaptive scope management practices in volatile contexts.
- **Comparative case studies** examining how different project teams interpret and operationalize adaptive scope evaluation. This research could identify best practices and highlight the organizational enablers—such as leadership style, governance models, and team culture, that support successful implementation.
- **Integration with emerging digital tools**, including AI-enabled risk modelling, predictive analytics, and real-time stakeholder sentiment analysis. These technologies have the potential to augment human decision-making by providing early warning signals, scenario projections, and stakeholder insights that improve scope agility and alignment.

Pursuing these research directions would not only enhance the empirical grounding of the proposed framework but also contribute to a more nuanced and actionable understanding of how scope evaluation can evolve to meet the growing demands of complexity, volatility, and rapid change in contemporary project environments

Table 12. Future Research Directions for Advancing Adaptive Scope Evaluation

Research Area	Focus	Purpose/Contribution	Potential Methods
Empirical Validation Across Sectors	Test framework in humanitarian aid, digital innovation, infrastructure in fragile contexts	Assess real-world applicability and effectiveness under varying environmental and organizational conditions	Field studies, cross-sector surveys, action research
Development of Tailored Metrics	Create performance indicators for adaptive scope evaluation	Measure responsiveness, value alignment, and decision-making quality in dynamic project contexts	Metric design, validation studies, Delphi method
Comparative Case Studies on Implementation	Analyze how project teams apply and adapt the framework	Identify best practices, operational challenges, and organizational enablers/barriers	Multi-case studies, ethnography, interviews

Integration with Digital Tools and AI	Explore use of AI, predictive analytics, and real-time data tools for scope-related insights	Enhance decision-making, foresight, and responsiveness through technology-enabled scope evaluation	Tech trials, design science research, prototyping

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About the Author

Prof. Dr. M. F. HARAKE

Bordeaux, France

Prof. Dr. M. F. HARAKE is a management professor based in France. He currently serves as the Assistant General Manager and Dean of Academic Affairs at MESOS Business School (France). In addition, he is the Manager of the Research Center at GBSB Global Business School (Malta). He is also affiliated as an Associate Research Fellow at the CEREGE Research Laboratory, University of Poitiers (France). Prof. Harake's research interests include Post-Conflict Public Management, Crisis and Urgent Operations Management, Humanitarian Logistics, and Project Management in Unstable Environments. His academic and professional contributions focus on bridging strategic theory with high-impact practical execution, especially in volatile and complex contexts.

He can be contacted at mfharake@mesos-bs.com