The Crisis of Knowledge and the Knowledge of Crisis: Rethinking Project Management and Decision-Making in an Age of Permanent Uncertainty[1]

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Abstract

Crises are increasingly normalized in contemporary project environments, challenging classical project management assumptions that uncertainty is temporary and reducible through planning, control, and risk rationality. This article reframes crises not merely as operational disruptions but as epistemic events that reveal the strengths and limits of dominant project management knowledge systems. Building on the French management formulation *"crisis of knowledge, knowledge of crisis"*, the analysis advances a dual argument. First, crises expose a crisis of knowledge: frameworks oriented toward prediction, linear causality, and methodological control become fragile in contexts marked by non-linearity, emergent dynamics, fragmented expertise, information saturation, and epistemic overconfidence. Under systemic uncertainty, risk registers, dashboards, and expert models may generate an illusion of control while obscuring meaning, delaying response, and producing misalignment across stakeholders and governance levels. Second, crises simultaneously generate a knowledge of crisis: adaptive forms of understanding emerge through practice, improvisation, transdisciplinary coordination, and accelerated feedback. This knowledge is tacit, situated, and relational, enabling action before certainty is possible and revealing how projects function when formal routines collapse. Yet crisis-generated insights are frequently marginalized after stabilization, as organizations revert to compliance-driven "lessons learned" and reassert familiar epistemic frameworks. To address this gap, the article proposes a shift from knowledge accumulation to knowledge navigation, an epistemic orientation that treats uncertainty as informative, privileges sensemaking and integration over exhaustive prediction, and redefines rigor as disciplined action under ambiguity. The implications are significant for leadership and governance: project leaders must facilitate collective understanding with epistemic humility, while governance systems should enable flexibility, iterative decision-making, and institutional learning that preserves crisis knowledge across projects. The article concludes by outlining avenues for empirical, comparative, and longitudinal research on crisis knowledge production, loss, and institutionalization.

Key Words: Crisis as epistemic event, Crisis of knowledge, Knowledge of crisis, Sensemaking, Knowledge navigation.

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1. Introduction: Crises as Epistemic Events in Project Environments

1.1. Uncertainty in Classical Project Management

Classical project management theory is fundamentally grounded in the assumption that uncertainty is a temporary and manageable condition. Through detailed upfront planning, standardized methodologies, risk identification, and control mechanisms, uncertainty is expected to be progressively reduced as a project advances from initiation to closure (Turner, 2008; Kerzner, 2009; Turner, 2008; PMI, 2021). Within this paradigm, deviations from plan are framed as risks to be mitigated, exceptions to be corrected, or failures of execution rather than as inherent features of project work. Stability, predictability, and control are implicitly treated as attainable and desirable outcomes of project activity.

This understanding of uncertainty reflects an underlying epistemological stance in which projects are viewed as bounded systems operating in relatively stable and knowable environments. Knowledge is assumed to be available, measurable, and progressively refined over time, enabling managers to transform uncertainty into calculable risk through analysis and forecasting (March 1991; Flyvbjerg, 2014). Under such conditions, effective project management consists primarily of selecting and applying the appropriate tools, techniques, and governance structures to optimize performance against predefined objectives (Morris, 2013; PMI, 2021).

1.2. Normalization of Crisis in Contemporary Project Environments

This classical assumption is increasingly challenged by the nature of contemporary project environments. Over the past two decades, projects have been repeatedly exposed to crises that are systemic rather than incidental. Global pandemics, climate-related disruptions, geopolitical instability, supply chain breakdowns, financial volatility, and rapid technological change have become recurring features of the contexts in which projects are conceived and delivered (Boin et *al*., 2016; Flyvbjerg, 2014). Rather than appearing as exceptional disturbances, these crises increasingly shape project lifecycles, governance arrangements, and stakeholder relationships from the outset.

Crises therefore cannot be treated as external shocks that temporarily interrupt otherwise stable project execution. Instead, they constitute persistent and interacting conditions that redefine what normality means in project work (Boin & ’t Hart, 2010; Boin et *al*., 2016). In such environments, uncertainty is not episodic but endemic, emerging from complex interdependencies, institutional pressures, and dynamic stakeholder landscapes (Morris, 2013; Aaltonen & Kujala, 2016).

This shift has profound implications for project management as a knowledge-based discipline. When crises are recurrent and overlapping, the assumption that uncertainty can be progressively reduced through planning and control becomes increasingly difficult to sustain. Project underperformance under such conditions cannot be fully explained by deficiencies in execution alone. Instead, it points to more fundamental challenges concerning how projects perceive,

interpret, and make sense of their environments, particularly in situations characterized by ambiguity, surprise, and contested meanings (Weick, 1995; Taleb, 2007; Weick & Sutcliffe, 2015).

1.3. Crisis as Epistemological Challenges

The French formulation *''crise de la connaissance, connaissance de la crise''* (English: The Crisis of Knowledge and the Knowledge of Crisis) provides a powerful conceptual lens through which these challenges can be examined. It foregrounds an epistemological tension at the core of contemporary project management: crises are not merely operational breakdowns requiring corrective action, but critical moments that reveal the limits of dominant ways of knowing and acting. Rather than signaling simple failures of execution, crises expose mismatches between prevailing epistemic assumptions and the realities of complex, unstable project environments.

In project-based organizations, this tension is particularly visible. Despite the widespread deployment of increasingly sophisticated management instruments, such as risk registers, performance dashboards, scenario planning tools, and earned value management systems, projects continue to experience substantial cost overruns, delays, and strategic failures when confronted with high levels of uncertainty and complexity (Flyvbjerg, 2014; PMI, 2021). These instruments are largely designed for contexts in which variables can be identified ex ante, causal relationships remain relatively stable, and historical data provides a reliable basis for prediction and control (Turner, 2008; Kerzner, 2009).

Crises fundamentally disrupt these assumptions. They introduce non-linearity, ambiguity, and rapid contextual shifts that existing epistemic frameworks struggle to accommodate. As a result, project managers are often confronted with situations in which information is abundant, yet knowledge remains insufficient for meaningful action. In such circumstances, decision-making becomes less a matter of optimizing choices within known parameters and more a process of interpretation, sensemaking, and collective construction of plausible courses of action under conditions of uncertainty (March 1991; Weick, 1995; Weick & Sutcliffe, 2015).

1.4. The Limits of Data, Models, and Expert Knowledge

Many project failures during crises cannot be attributed to a lack of information. On the contrary, decision-makers are frequently confronted with an excess of data, competing analytical models, and divergent expert interpretations. The core difficulty lies not in informational scarcity but in a structural mismatch between the complexity of the phenomena confronting projects and the epistemic instruments used to represent and manage them (March, 1991; Weick, 1995).

Quantitative indicators and predictive models necessarily simplify dynamic social, political, and organizational realities. While such simplification is indispensable for coordination and control, it becomes problematic when models are treated as objective and exhaustive representations of reality rather than as provisional, partial, and context-dependent constructs (Taleb, 2007; Flyvbjerg, 2014). Under crisis conditions, the assumptions embedded within these models frequently collapse, causal relationships become unstable, and performance indicators lag rapidly evolving conditions, offering a false sense of control.

This situation reveals a crisis of knowledge not as an absence of expertise, but as an overreliance on forms of knowledge that are poorly suited to systemic uncertainty and ambiguity. In such contexts, the challenge facing project management is less one of improving prediction accuracy than of developing interpretive capacities that enable actors to recognize the limits of their models, revise assumptions in real time, and construct shared understandings that support action under conditions of uncertainty (Argyris & Schön, 1978; Weick & Sutcliffe, 2015).

1.5. Crises as Sites of Knowledge Production

At the same time, crises generate alternative forms of knowledge within project environments. As formal plans, predictive models, and standardized procedures lose relevance, actors at multiple organizational levels engage in improvisation, experimentation, and real-time problem-solving. Frontline managers, engineers, contractors, and local stakeholders develop situated understandings through direct engagement with unfolding problems, often outside formal governance and reporting structures (Weick, 1995; Weick & Sutcliffe, 2015).

This form of knowledge is predominantly tacit, context-specific, and relational. It emerges through action rather than through abstract analysis, as actors continuously test provisional interpretations against immediate consequences. Learning unfolds through feedback, adjustment, and collective sensemaking in practice rather than through formal post hoc evaluation (Argyris & Schön, 1978; Nonaka & Takeuchi, 1995). Such crisis-generated knowledge frequently proves decisive in sustaining project activity under conditions of uncertainty and disruption.

Yet despite its practical significance, this knowledge is rarely fully recognized, formalized, or institutionalized once the crisis subsides. Instead, project organizations often revert to pre-existing frameworks, codified procedures, and dominant performance metrics, thereby marginalizing experiential insights that do not easily translate into standardized artifacts (March, 1991; Morris, 2013). As a result, valuable learning remains localized and ephemeral, limiting the capacity of project-based organizations to adapt their epistemic frameworks in preparation for future crises.

1.6. The Dual Nature of Crises in Project Management

This article advances the thesis that contemporary crises in project environments constitute a dual epistemic phenomenon. First, they represent a crisis of knowledge, in which dominant project management frameworks, grounded in assumptions of prediction, control, and functional specialization, prove inadequate for capturing the complexity, dynamism, and ambiguity of contemporary project realities (Morris, 2013; Flyvbjerg, 2014; PMI, 2021). Under such conditions, established tools and models fail not because of poor application, but because their underlying epistemic premises no longer align with the environments they seek to represent.

Second, crises simultaneously give rise to a knowledge of crisis, in which new and adaptive forms of understanding emerge through practice, sensemaking, and collective learning under pressure.

These forms of knowledge are generated through action, improvisation, and interaction among diverse actors, enabling projects to function despite radical uncertainty and disrupted assumptions (Weick, 1995; Nonaka & Takeuchi, 1995; Weick & Sutcliffe, 2015).

Understanding this duality is essential for rethinking project management under conditions of permanent uncertainty. Rather than treating crises solely as operational failures or external disruptions, this perspective reframes them as epistemic events that challenge how projects generate, validate, and mobilize knowledge. Such a reframing opens space for more reflexive, integrative, and resilient approaches to project management, approaches that acknowledge the limits of prediction, value situated knowledge and strengthen collective sensemaking capacities in an increasingly uncertain world (Argyris & Schön, 1978; Taleb, 2007).

Table 01. Crises as Epistemic Events in Project Environments

Core Focus	Key Assumptions / Arguments	Epistemic Implications for Project Management
Classical view of uncertainty	Uncertainty is temporary, reducible, and manageable through planning, control, and standardized tools. Projects are treated as bounded and predictable systems.	Knowledge is assumed to be objective, stable, and progressively refined; uncertainty can be transformed into calculable risk.
Changing project contexts	Crises such as pandemics, climate change, geopolitical instability, and supply chain disruptions are systemic, recurrent, and embedded in project lifecycles. Uncertainty becomes endemic.	Planning-and-control logic is weakened; uncertainty can no longer be fully eliminated or stabilized through traditional methods.
Crisis as epistemological challenge	Crises expose the limits of dominant project management assumptions. Failures reflect mismatches between prevailing models and complex realities rather than simple execution errors.	Existing epistemic frameworks struggle with ambiguity, non-linearity, and surprise, revealing an epistemic gap in project management.
Limits of data, models, and expert knowledge	Project failures during crises stem from overreliance on data, predictive models, and expert forecasts that oversimplify dynamic social and organizational realities.	Information abundance does not ensure actionable knowledge; interpretation, judgment, and sensemaking become central managerial capacities.
Knowledge creation during crises	Crises generate tacit, situated, and practice-based knowledge through improvisation, experimentation, and real-time problem-solving by diverse actors.	Learning emerges through action and feedback but is rarely formalized or institutionalized, limiting long-term adaptation.
Dual nature of crises	Crises represent both a *crisis of knowledge* (failure of dominant frameworks) and a *knowledge of crisis* (emergence of adaptive, practice-based understanding).	Crises should be understood as epistemic events that challenge how projects generate, validate, and mobilize knowledge under permanent uncertainty.

2. The Crisis of Knowledge in Project Management

2.1. Knowledge Abundance and the Paradox of Reduced Understanding

Contemporary project environments are characterized by an unprecedented abundance of information. Digitalization, advanced analytics, real-time reporting systems, and artificial intelligence have dramatically increased the volume, speed, and granularity of project data. From a managerial perspective, this expansion of information is often assumed to enhance rational decision-making, improve foresight, and progressively reduce uncertainty (PMI, 2021).

Paradoxically, however, major projects appear increasingly difficult to anticipate, interpret, and govern. Persistent cost overruns, schedule delays, and strategic misalignments continue to occur across sectors such as infrastructure, information systems, defense, and energy, despite ever more sophisticated information systems and analytical tools (Flyvbjerg, 2014). This paradox suggests that the crisis of knowledge in project management is not rooted in information scarcity, but in the limitations of how information is transformed into shared understanding and actionable judgment.

Knowledge becomes fragile when its volume exceeds the cognitive and organizational capacities required to integrate it meaningfully. Under crisis conditions, decision-makers are frequently confronted with competing signals, contradictory indicators, and rapidly shifting contexts, which complicate interpretation and coordination (Weick, 1995; Weick & Sutcliffe, 2015). Rather than clarifying reality, information saturation can obscure critical issues, reinforce false confidence in flawed models, and delay timely action, thereby exacerbating the very uncertainties it is intended to manage (March, 1991; Taleb, 2007).

2.2. Fragmentation of Expertise and Epistemic Silos

One of the central drivers of the crisis of knowledge in contemporary project environments lies in the increasing fragmentation of expertise. Modern projects depend on highly specialized forms of knowledge distributed across disciplines, organizations, and professional communities. Domains such as engineering, finance, procurement, legal compliance, risk management, and stakeholder engagement operate according to distinct logics, vocabularies, and evaluative criteria, each producing partial yet authoritative representations of project reality (Kerzner, 2009; Morris, 2013).

While specialization enables technical precision and local optimization, it simultaneously generates epistemic silos that constrain holistic understanding. Expert domains tend to define problems narrowly, guided by domain-specific assumptions, performance indicators, and success criteria. As a result, systemic interactions, feedback loops, and second-order effects that cut across disciplinary boundaries are frequently overlooked or undervalued (March, 1991; Flyvbjerg, 2014).

Complex crises do not originate within disciplinary boundaries. They emerge from interactions among technical systems, organizational processes, political dynamics, institutional constraints, and social behavior. When project knowledge remains fragmented, no single actor, model, or governance structure possesses a coherent representation of the project as a whole. Decision-making is therefore grounded in partial perspectives that may be internally consistent within expert domains yet collectively incoherent at the system level (Weick, 1995; Aaltonen & Kujala, 2016).

This fragmentation undermines the capacity of project governance arrangements to anticipate cascading risks, recognize emerging patterns, and coordinate responses across organizational and disciplinary boundaries. Under such conditions, crises are less the result of isolated technical failures than of breakdowns in collective sensemaking and integration across fragmented epistemic communities (Weick & Sutcliffe, 2015; Boin et *al.,* 2016).

2.3. The Limits of Risk-Based Knowledge Frameworks

Risk management occupies a central position in contemporary project management practice. Risks are systematically identified, categorized, quantified, and monitored through formalized processes intended to support anticipatory and rational decision-making (PMI, 2021; Kerzner, 2009). Under relatively stable conditions, such frameworks can be effective in managing known uncertainties and supporting coordination across complex project structures.

Crises, however, expose the structural limits of risk-based knowledge. Risk management frameworks are grounded in epistemic assumptions that threats can be identified ex ante, probabilities can be meaningfully estimated, and mitigation strategies can be designed in advance. Systemic crises violate these assumptions. They are typically characterized by novelty, ambiguity, tight coupling, and interdependence, conditions under which probabilistic reasoning becomes unreliable and historical data loses explanatory power (Taleb, 2007; Boin et *al.,* 2016).

In crisis situations, risks evolve dynamically, interact with one another, and generate emergent effects that cannot be reduced to isolated variables or linear cause-effect relationships. As a result, instruments such as risk registers, likelihood-impact matrices, and heat maps may create a false sense of security. Rather than enhancing understanding, they can obscure emerging threats by framing uncertainty within predefined categories and static representations of risk (Flyvbjerg, 2014; Weick & Sutcliffe, 2015).

The crisis of knowledge in project management is therefore closely linked to the limits of risk rationality when confronted with non-linear, tightly coupled, and rapidly evolving environments. Under such conditions, managing projects requires not only improved risk identification, but alternative epistemic approaches capable of recognizing surprise, interpreting weak signals, and supporting adaptive sensemaking in the face of fundamental uncertainty (March, 1991; Weick, 1995).

2.4. Quantification, Objectivity, and the Loss of Meaning

Project management knowledge systems tend to privilege quantification. Performance is monitored through key performance indicators, milestones, budgets, schedules, and dashboards, which play a critical role in coordination, control, and accountability, particularly in large and complex projects (Kerzner, 2009; Kerzner, 2009; PMI, 2021). These instruments provide a shared reference framework that enables comparison, reporting, and managerial oversight.

However, this emphasis on quantification can also contribute to a loss of meaning. Numerical indicators necessarily abstract rich social, political, and organizational realities into simplified representations. Under crisis conditions, this abstraction becomes increasingly problematic. Indicators frequently lag behind rapidly evolving situations, fail to capture qualitative shifts in stakeholder relationships or organizational dynamics, and obscure emerging tensions that do not readily translate into measurable variables (Weick, 1995; Morris, 2013).

Moreover, different indicators may point in contradictory directions, generating ambiguity rather than clarity. Cost, schedule, quality, safety, and legitimacy metrics can signal conflicting priorities, leaving decision-makers without a coherent interpretive framework to explain actions, justify trade-offs, or align stakeholders. When numbers lose their narrative and contextual grounding, they weaken rather than strengthen collective understanding (March, 1991; Weick & Sutcliffe, 2015).

The crisis of knowledge in project management thus reflects not only technical or methodological limitations, but a deeper epistemic tension between measurement and interpretation. While quantification remains indispensable, its effectiveness depends on complementary sensemaking processes that restore meaning, integrate qualitative insight, and enable collective judgment in situations where numerical representation alone is insufficient.

2.5. Epistemic Overconfidence and the Myth of Control

A further dimension of the crisis of knowledge concerns epistemic overconfidence. Project management methodologies and professional discourses often promote the belief that uncertainty can be progressively mastered through better tools, increased data availability, and more sophisticated analytical models. This belief reinforces a culture of control in which deviations from plan are framed as anomalies to be corrected rather than as signals of deeper systemic tensions or flawed assumptions (Kerzner, 2009; PMI, 2021).

Crises directly challenge this culture by exposing the widening gap between planned representations of projects and lived organizational reality. When foundational assumptions collapse, project actors may nevertheless continue to rely on existing models, forecasts, and performance indicators longer than is epistemically justified. Such persistence delays adaptation, suppresses dissenting interpretations, and can amplify failure rather than contain it. This dynamic has been widely documented in large-scale project failures, where early warning signs

were ignored, reinterpreted, or normalized in order to preserve the appearance of control and managerial competence (Morris, 2013; Flyvbjerg, 2014).

Epistemic overconfidence thus contributes to the durability of ineffective knowledge frameworks even in the presence of contradictory evidence. The crisis of knowledge in project management is sustained not only by structural features such as fragmentation, quantification, and risk rationality, but also by cognitive biases and institutional pressures that discourage acknowledgment of uncertainty and error (Argyris & Schön, 1978; March, 1991; Taleb, 2007). In this sense, crises reveal not merely gaps in information or technique, but deeper resistance to questioning the epistemic foundations upon which project governance is built.

2.6. Knowledge Failure as a Structural Condition

The crisis of knowledge in project management should not be interpreted as a temporary anomaly or as a consequence of deficient professional competence. Rather, it constitutes a structural condition arising from the interaction between increasingly complex, volatile project environments and epistemic frameworks that remain largely oriented toward stability, predictability, and control. When these frameworks are applied beyond the conditions for which they were designed, their limitations become systematically exposed.

Fragmented expertise, risk-based rationality, excessive reliance on quantification, and epistemic overconfidence collectively constrain the capacity of projects to interpret, anticipate, and respond to crises. These constraints remain largely invisible under routine conditions but become sharply apparent when projects confront systemic uncertainty, interdependence, and rapid change. Crises thus function as epistemic stress tests, revealing the inadequacy of dominant ways of knowing rather than isolated failures of execution.

This diagnosis sets the stage for examining the second dimension of the dual epistemic phenomenon introduced earlier, the knowledge of crisis. The following section therefore shifts focus from epistemic breakdown to epistemic emergence, exploring how projects learn, adapt, and make sense of reality under conditions of disruption, ambiguity, and pressure.

Table 02. The Crisis of Knowledge in Project Management

Core Focus	Key Assumptions / Arguments	Epistemic Implications for Project Management
Knowledge abundance and reduced understanding	Digitalization, analytics, and AI have vastly increased information availability, yet projects remain difficult to anticipate and govern. Information overload generates competing signals and contradictory indicators.	The core problem is not information scarcity but the inability to transform data into shared understanding and sound judgment; information saturation can amplify uncertainty.
Fragmentation of expertise	Specialized knowledge domains operate with distinct logics, vocabularies, and success criteria, producing partial representations of project reality.	Epistemic silos undermine holistic understanding, weaken governance, and impair collective sensemaking across disciplinary and organizational boundaries.
Limits of risk-based frameworks	Risk management assumes identifiable threats, stable probabilities, and advance mitigation, assumptions violated by systemic and novel crises.	Risk tools may create false certainty, obscure emergent threats, and constrain understanding through static and predefined categories.
Quantification and loss of meaning	Project control relies heavily on KPIs, budgets, schedules, and dashboards that abstract complex social and organizational realities.	Quantitative indicators lose explanatory power under crisis conditions unless complemented by interpretive, qualitative sensemaking processes.
Epistemic overconfidence and control	Professional discourses promote the belief that uncertainty can be mastered through better tools, data, and models, reinforcing a culture of control.	Persistence in flawed models delays adaptation, suppresses dissent, and sustains ineffective knowledge frameworks despite contradictory evidence.
Knowledge failure as a structural condition	The crisis of knowledge arises from a mismatch between complex, volatile environments and epistemic frameworks oriented toward stability and predictability.	Crises act as epistemic stress tests, exposing structural limitations of dominant ways of knowing rather than isolated execution failures.

3. The Knowledge of Crisis in Project Environments

3.1. Crises as Moments of Epistemic Revelation

Crises function as moments of **epistemic revelation** in project environments. Under conditions of stress and disruption, established routines break down, taken-for-granted assumptions are tested, and latent characteristics of project systems become visible. Structures and processes that appear robust during periods of stability often reveal their fragility, while informal practices, tacit coordination mechanisms, and previously overlooked dependencies acquire sudden and decisive importance (Weick, 1995; Weick & Sutcliffe, 2015).

Within project contexts, crises expose the actual functioning of governance arrangements, decision hierarchies, and coordination mechanisms. Formal procedures may be bypassed or reconfigured in favor of faster, improvised responses, highlighting the discrepancy between designed processes and enacted practices. This exposure generates a form of knowledge that is largely inaccessible under normal operating conditions, as it emerges only when project systems are pushed beyond the boundaries assumed by formal models and plans (Argyris & Schön, 1978; Morris, 2013).

This crisis-generated knowledge is neither abstract nor purely theoretical. It is grounded in lived experience and shaped through direct engagement with failure, uncertainty, and constraint. In this sense, crises operate as epistemic events that reveal how projects actually function in practice rather than how they are formally represented in methodologies, governance frameworks, or official accounts.

3.2. Tacit and Situation Knowledge in Crisis Response

During crises, the effectiveness of project responses often depends less on formal methodologies and standardized tools than on tacit and situated knowledge. Project actors draw on accumulated experience, intuition, and contextual awareness to interpret ambiguous signals, prioritize competing demands, and act under severe time pressure. In such conditions, sensemaking precedes analysis, and action frequently unfolds before full understanding is possible (Weick, 1995; Weick & Sutcliffe, 2015).

This form of knowledge is developed through practice rather than through codified procedures. Frontline engineers adjust technical solutions in real time, project managers renegotiate priorities with stakeholders, and teams improvise coordination mechanisms to sustain continuity of work. These adaptations are deeply embedded in local contexts and contingent on unfolding circumstances, making them resistant to abstraction, standardization, or transfer across projects (Argyris & Schön, 1978; Nonaka & Takeuchi, 1995).

Tacit crisis knowledge is also fundamentally relational. It relies on trust, informal communication, and shared frames of reference among actors who may operate outside formal hierarchies or prescribed roles. In many crisis situations, the capacity to respond effectively depends less on

formal reporting lines than on pre-existing social networks and mutual credibility built through prior interaction (Morris, 2013; Aaltonen & Kujala, 2016).

Despite its decisive role in sustaining project activity under conditions of disruption, tacit and situated knowledge is rarely documented or institutionalized. Once stability returns, project organizations tend to revert to formal procedures and dominant epistemic frameworks, leaving crisis-generated knowledge largely unarticulated and vulnerable to loss. As a result, valuable insights gained through practice and improvisation often fail to inform future project governance or preparedness, perpetuating cycles of epistemic fragility.

3.3. Learning Under Pressure and Accelerated Feedback

Crises accelerate learning processes in project environments by radically compressing feedback loops. Decisions are tested almost immediately by their consequences, making outcomes highly visible and difficult to ignore. Errors are exposed quickly, while effective adaptations are reinforced through direct and often consequential feedback. Under such conditions, learning is driven less by formal evaluation than by the practical necessity to sustain action (Argyris & Schön, 1978; Weick, 1995).

This compressed learning cycle differs markedly from learning under stable conditions. During routine project execution, feedback is often delayed, mediated by reporting systems, or diluted through multiple layers of interpretation and accountability. In crisis situations, by contrast, the temporal distance between action and outcome is drastically reduced, narrowing the gap between experience and learning and forcing rapid reassessment of assumptions and practices (March, 1991; Weick & Sutcliffe, 2015).

At the same time, crisis-driven learning is inherently costly. It unfolds under conditions of heightened stress, constrained resources, and elevated stakes, where errors carry immediate and sometimes irreversible consequences. Cognitive overload, emotional pressure, and time scarcity can limit opportunities for reflection and increase reliance on heuristics and reactive decision-making. As a result, learning during crises tends to be pragmatic, situational, and action-oriented rather than systematic, abstract, or easily articulated (Argyris & Schön, 1978; Taleb, 2007).

The central challenge for project organizations therefore lies not in generating learning during crises, but in retaining and transforming this experiential knowledge once immediate pressures subside. Without deliberate mechanisms to capture, interpret, and integrate crisis-generated insights, organizations risk reverting to pre-crisis epistemic frameworks, allowing valuable learning to dissipate and leaving projects vulnerable to recurring epistemic failure in future disruptions (March, 1991; Morris, 2013).

3.4. Improvisation, Adaptation, and the Redefinition of Competence

Crises redefine what counts as competence in project management. While technical expertise and methodological rigor remain important, they are no longer sufficient. Under conditions of disruption and uncertainty, competence increasingly encompasses the ability to improvise, to reframe problems, and to coordinate collective action in the absence of stable reference points. Effective project actors must navigate ambiguity, interpret weak signals, and act without the reassurance of complete or reliable information (Weick, 1995; Weick & Sutcliffe, 2015).

Improvisation in this context should not be understood as the absence of structure or discipline. Rather, it reflects the capacity to recombine existing resources, knowledge, routines, and relationships in novel ways that respond to evolving circumstances. Skilled project actors draw on experience, contextual understanding, and social networks to construct provisional solutions that are "good enough" to sustain action, even when optimal outcomes cannot be defined in advance (Argyris & Schön, 1978; Nonaka & Takeuchi, 1995).

Adaptation during crises frequently entails revising project objectives, renegotiating success criteria, and redefining priorities in light of emerging constraints and opportunities. Such adjustments challenge the assumption that project goals are fixed and that performance can be assessed solely against original baselines. Crisis-generated knowledge thus introduces a more dynamic, contingent, and process-oriented understanding of project performance, one that values responsiveness, learning, and resilience alongside traditional measures of efficiency and control (Morris, 2013; Flyvbjerg, 2014).

3.5. The Marginalization of Crisis Knowledge After Stabilization

Despite its practical significance, the knowledge generated during crises is frequently marginalized once projects return to a semblance of normality. Post-crisis reviews, audits, and "lessons learned" exercises tend to emphasize procedural compliance, technical corrections, and accountability rather than the deeper epistemic transformations that occurred during the crisis itself. As a result, the most consequential forms of learning, those related to how uncertainty was interpreted, how decisions were made under pressure, and how informal coordination supplanted formal structures, often remain unarticulated and unexamined (Argyris & Schön, 1978; Morris, 2013).

Several factors contribute to this marginalization. Crisis-generated knowledge frequently challenges established hierarchies, professional identities, and claims to expertise. It may expose the limits of formal methodologies or underscore the centrality of informal practices, improvisation, and relational competence, forms of knowledge that are difficult to codify and legitimize within existing governance frameworks (Weick, 1995; Weick & Sutcliffe, 2015). Moreover, in the aftermath of disruption, organizations often seek to reassert stability and control by reinstating familiar epistemic frameworks rather than confronting the uncertainty and ambiguity revealed through crisis experience (March, 1991; Taleb, 2007).

As a consequence, project-based organizations risk reproducing the same epistemic vulnerabilities in subsequent crises. When crisis knowledge is not institutionalized, disruptions are repeatedly framed as unprecedented anomalies rather than as manifestations of recurring structural patterns. This failure to integrate crisis-generated insight perpetuates a cycle of epistemic fragility, in which projects remain ill-prepared for future disruptions despite having previously encountered similar conditions (Flyvbjerg, 2014; Boin et al., 2016).

3.6. Crisis Knowledge as an Underutilized Resource

The knowledge of crisis constitutes a rich yet systematically underutilized resource in project management. Crises generate distinctive insights into system behavior, organizational dynamics, and decision-making under conditions of uncertainty and time pressure, insights that are difficult, if not impossible, to obtain through conventional analytical tools or ex ante planning approaches (Weick, 1995; Taleb, 2007). These insights illuminate how projects actually function when formal structures are strained and assumptions no longer hold.

Crisis-generated knowledge is experiential, situated, and fundamentally relational. It emerges through action, improvisation, and interaction rather than through formal analysis or codified procedures, and in doing so, it challenges dominant epistemic assumptions about control, prediction, and expertise in project management (Argyris & Schön, 1978; Nonaka & Takeuchi, 1995). Despite its practical and theoretical significance, the integration of such knowledge into mainstream project management practice remains limited, constrained by institutional routines and epistemic preferences for stability and standardization.

Recognizing crisis knowledge as a legitimate and valuable form of understanding is therefore a critical step toward more resilient, adaptive, and reflexive approaches to project management. The following section examines the epistemological gap between knowledge systems designed for normal project conditions and those required during crises and explores the implications of this gap for project governance, leadership, and professional practice.

Table 03. The Knowledge of Crisis in Project Environments

Core Focus	Key Assumptions / Arguments	Epistemic Implications for Project Management
Knowledge abundance and reduced understanding	Digitalization, analytics, and AI have vastly increased information availability, yet projects remain difficult to anticipate and govern. Information overload generates competing signals and contradictory indicators.	The core problem is not information scarcity but the inability to transform data into shared understanding and sound judgment; information saturation can amplify uncertainty.
Fragmentation of expertise	Specialized knowledge domains operate with distinct logics, vocabularies, and success criteria, producing partial representations of project reality.	Epistemic silos undermine holistic understanding, weaken governance, and impair collective sensemaking across disciplinary and organizational boundaries.

Limits of risk-based frameworks	Risk management assumes identifiable threats, stable probabilities, and advance mitigation, assumptions violated by systemic and novel crises.	Risk tools may create false certainty, obscure emergent threats, and constrain understanding through static and predefined categories.
Quantification and loss of meaning	Project control relies heavily on KPIs, budgets, schedules, and dashboards that abstract complex social and organizational realities.	Quantitative indicators lose explanatory power under crisis conditions unless complemented by interpretive, qualitative sensemaking processes.
Epistemic overconfidence and control	Professional discourses promote the belief that uncertainty can be mastered through better tools, data, and models, reinforcing a culture of control.	Persistence in flawed models delays adaptation, suppresses dissent, and sustains ineffective knowledge frameworks despite contradictory evidence.
Knowledge failure as a structural condition	The crisis of knowledge arises from a mismatch between complex, volatile environments and epistemic frameworks oriented toward stability and predictability.	Crises act as epistemic stress tests, exposing structural limitations of dominant ways of knowing rather than isolated execution failures.

4. The Epistemological Gap Between Normal Project Conditions and Crisis Conditions

4.1. Knowledge Systems Designed for Stability

Dominant project management frameworks are largely designed for environments characterized by relative stability. Planning methodologies, governance structures, and performance measurement systems typically assume that project objectives can be clearly specified in advance, that causal relationships remain sufficiently stable over time, and that deviations from plan can be identified and corrected through managerial intervention. Within this paradigm, projects are treated as bounded systems whose behavior can be anticipated and controlled through appropriate design and oversight.

Under such conditions, knowledge is conceptualized primarily as an input to decision-making. Information is collected, analyzed, and translated into action through formalized procedures, while learning is assumed to be incremental, cumulative, and largely retrospective. Uncertainty is expected to decrease as projects progress from initiation to completion, reflecting an epistemological orientation in which improved analysis and execution progressively transform uncertainty into manageable risk. This orientation underpins many widely adopted standards, methodologies, and best practices in project management (Turner, 2008; Kerzner, 2009; PMI, 2021).

These knowledge systems perform reasonably well when environmental change is incremental, when interdependencies are limited, and when past experience provides a reliable guide to future outcomes. However, their effectiveness diminishes sharply when projects are confronted with systemic crises that disrupt underlying assumptions of continuity, predictability, and control. In such contexts, the very epistemic foundations upon which these frameworks are built become sources of vulnerability rather than resilience.

4.2. Non-Linearity and Emergent Dynamics in Crisis Situations

Crisis conditions introduce non-linear dynamics that fundamentally challenge the epistemic foundations of conventional project management. Under such conditions, clear separations between causes and effects become difficult to sustain, feedback loops intensify, and small interventions may generate disproportionate and often unintended consequences. The assumption that project behavior can be understood through linear chains of causality therefore becomes increasingly fragile.

Within project environments, non-linearity manifests through cascading failures, abrupt shifts in stakeholder behavior, and rapid changes in external constraints such as regulatory, political, or market conditions. Interventions designed to stabilize one aspect of the project may unintentionally exacerbate vulnerabilities elsewhere, producing second- and third-order effects that escape conventional planning models (Flyvbjerg, 2014; Boin et *al.,* 2016). Under such circumstances, knowledge frameworks premised on predictability, decomposition, and linear control offer limited guidance.

Emergent dynamics further complicate understanding. Novel patterns of interaction, coordination, and conflict arise that cannot be extrapolated from initial conditions or predefined scenarios. Crisis situations therefore demand epistemic approaches that are adaptive, iterative, and responsive to unfolding events, approaches that privilege continuous sensemaking, real-time learning, and provisional action over fixed plans and stable representations (Weick, 1995; Taleb, 2007; Weick & Sutcliffe, 2015).

4.3. Expertise and the Limits of Specialized Knowledge

Contemporary projects rely on deep technical knowledge distributed across multiple professional domains. Under normal operating conditions, such specialization enhances efficiency, precision, and quality. By allowing complex tasks to be decomposed and optimized within expert domains, specialization supports reliable execution and technical excellence.

In crisis situations, however, specialization can become an epistemic liability. Experts may focus narrowly on problems defined within their own domains while overlooking systemic interactions and cross-boundary effects. Divergent expert assessments, grounded in different assumptions, metrics, and temporal horizons, can generate confusion, delay decision-making, and undermine coordinated action, particularly in the absence of shared interpretive frameworks capable of integrating diverse perspectives (Morris, 2013; Aaltonen & Kujala, 2016).

The epistemological gap becomes most visible when expert knowledge fails to translate into collective understanding. In crises, the central challenge is not simply to possess expertise, but to align interpretations, priorities, and actions across actors who hold different forms of knowledge, authority, and responsibility. Effective crisis response therefore depends less on disciplinary depth alone than on the capacity for integration, sensemaking, and coordination across epistemic boundaries (Weick, 1995; Weick & Sutcliffe, 2015).

4.4. Sensemaking Under Conditions of Uncertainty

Crisis situations shift the central epistemic challenge in project management from prediction to sensemaking. Rather than forecasting outcomes or optimizing plans, project actors must interpret ambiguous signals, construct plausible accounts of unfolding events, and coordinate action despite incomplete, contradictory, and rapidly evolving information (Weick, 1995; Weick & Sutcliffe, 2015).

Sensemaking is inherently a social and communicative process. It involves framing problems, assigning meaning to unexpected events, and negotiating interpretations among diverse stakeholders whose interests, expertise, and temporal horizons may differ. Unlike analytical problem-solving approaches, sensemaking does not seek to eliminate uncertainty. Instead, it enables action *within* uncertainty by creating shared understandings that are sufficiently coherent to support coordinated response (March, 1991; Weick, 1995).

Conventional project management frameworks tend to underestimate the importance of sensemaking. Formal reporting systems, dashboards, and performance metrics generate large volumes of information, yet they do not necessarily foster shared interpretation or collective understanding. During crises, the absence of effective sensemaking mechanisms can intensify epistemic fragmentation, amplify misunderstandings among stakeholders, and undermine coordination precisely when alignment is most critical (Morris, 2013; Aaltonen & Kujala, 2016).

4.5. Time Pressure and Epistemic Humility

Crises compress time horizons and dramatically increase the cost of delay. Decisions must be made rapidly, often before reliable or complete information is available. This temporal compression exposes the limits of epistemic frameworks grounded in certainty, prediction, and analytical completeness. Under crisis conditions, waiting for definitive knowledge can be more damaging than acting on provisional understanding (Weick, 1995; Taleb, 2007).

In such contexts, epistemic humility emerges as a critical competence. Epistemic humility involves recognizing the provisional and situated nature of available knowledge, remaining open to revision, and resisting overconfidence in models, forecasts, and expert judgments. Leaders who explicitly acknowledge uncertainty are often better positioned to adapt as conditions evolve, because they encourage continuous learning, questioning of assumptions, and timely course correction (March, 1991; Weick & Sutcliffe, 2015).

Despite its value, epistemic humility is frequently discouraged by prevailing project governance systems. Many governance structures implicitly reward displays of confidence, control, and decisiveness, while interpreting expressions of uncertainty as weakness or lack of competence. As a result, project leaders may feel pressured to project certainty even when underlying conditions are ambiguous or unstable. This tension further widens the epistemological gap between knowledge systems designed for normal project conditions and those required for effective action during crises (Morris, 2013; Flyvbjerg, 2014).

4.6. Implications of the Epistemological Gap

The epistemological gap between normal project conditions and crisis conditions carries profound implications for project performance, governance, and organizational learning. When knowledge systems designed for stability, predictability, and control are applied uncritically in crisis contexts, they tend to generate rigidity, misalignment, and delayed or inappropriate responses. Rather than reducing uncertainty, such systems can amplify it by constraining interpretation and discouraging adaptation.

Bridging this gap requires more than incremental methodological adjustments or the addition of new tools. It calls for a fundamental reexamination of the assumptions that underpin project management's understanding of knowledge, control, and decision-making. Projects must be approached not only as technical undertakings to be optimized, but as social systems in which meaning, coordination, and action are continuously negotiated under conditions of uncertainty and change.

Building on this analysis, the next section explores how project management can shift from a paradigm centered on knowledge accumulation toward one focused on knowledge navigation. It examines the organizational, governance, and leadership implications of this transition, and considers how projects can develop epistemic capabilities that support resilience, learning, and effective action in an increasingly uncertain world.

Table 04. The Epistemological Gap Between Normal and Crisis Project Conditions

Core Focus	Key Assumptions / Arguments	Epistemic Implications for Project Management
Knowledge systems designed for stability	Dominant project management frameworks assume stable objectives, linear causality, and controllable deviations, treating knowledge as an input to rational decision-making.	Frameworks effective under stable conditions become sources of vulnerability when continuity, predictability, and control collapse.
Non-linearity and emergent dynamics	Crisis conditions introduce cascading effects, feedback loops, and disproportionate consequences that undermine linear planning and causal reasoning.	Project knowledge must shift from prediction and decomposition toward adaptive, iterative, and real-time sensemaking approaches.
Limits of specialized expertise	Deep disciplinary specialization supports efficiency under normal conditions but fragments understanding during crises.	Effective crisis response depends on integration, coordination, and shared interpretation across epistemic boundaries rather than domain depth alone.
Sensemaking under uncertainty	Crises shift the epistemic challenge from forecasting to interpreting ambiguous, contradictory, and evolving signals through social interaction.	Shared meaning-making becomes central to coordination; information systems alone are insufficient without collective sensemaking processes.
Time pressure and epistemic humility	Crises compress decision time and increase the cost of delay, exposing the limits of certainty-based knowledge frameworks.	Epistemic humility—openness to revision, acknowledgment of uncertainty, and provisional action—becomes a critical leadership competence.
Implications of the epistemological gap	Applying stability-oriented knowledge systems in crisis contexts generates rigidity, misalignment, and delayed response.	Bridging the gap requires rethinking project management as knowledge navigation within social systems rather than knowledge accumulation for control.

5. From Knowledge Accumulation to Knowledge Navigation in Project Management

5.1. The Limits of Knowledge Accumulation

Traditional project management approaches are largely oriented toward knowledge accumulation. Project success is commonly associated with gathering ever more information, refining forecasts, expanding documentation, and increasing analytical sophistication. This logic rests on the assumption that uncertainty can be progressively reduced through additional data, better models, and more comprehensive planning.

In crisis-prone environments, however, the accumulation of knowledge quickly reaches diminishing, and sometimes negative, returns. Additional data can amplify complexity without improving clarity, while increasingly detailed plans may become obsolete faster than they can be revised. Under such conditions, the pursuit of exhaustive knowledge can delay action, fragment attention, and obscure critical judgment rather than enhance it (Weick, 1995; Taleb, 2007).

The central challenge facing contemporary project management is therefore not one of insufficient knowledge, but of epistemic orientation. What matters is not how much is known, but how available knowledge is interpreted, prioritized, and mobilized in real time under conditions of uncertainty. This shift from accumulation to navigation reframes project competence as the capacity to make sense of evolving situations, act provisionally, and continuously adjust understanding as events unfold (March, 1991; Weick & Sutcliffe, 2015).

5.2. Knowledge Navigation as an Epistemic Shift

Knowledge navigation refers to the capacity to move *through* uncertainty rather than to eliminate it. It emphasizes interpretation, integration, and judgment over prediction, optimization, and control. Within project environments, this orientation recognizes that knowledge is inherently provisional, situated, and often contested, particularly under conditions of disruption and rapid change (March, 1991; Weick, 1995).

Navigating knowledge requires project actors to engage in ongoing assessment of what is known, what remains uncertain, and which assumptions underpin prevailing interpretations. It involves distinguishing signals from noise, identifying critical uncertainties that warrant attention, and continuously revising decisions as new information emerges. Rather than seeking definitive answers, knowledge navigation supports provisional action informed by evolving sensemaking and feedback (Weick & Sutcliffe, 2015; Taleb, 2007).

This epistemic shift fundamentally redefines competence in project management. Instead of privileging mastery of tools, methods, and predictive techniques alone, it foregrounds reflexivity, contextual awareness, and the capacity to adapt mental models as conditions evolve. Competence thus becomes less about controlling outcomes and more about sustaining

coordinated action, learning, and adjustment in the face of uncertainty (Argyris & Schön, 1978; Morris, 2013).

5.3. Integrative and Transdisciplinary Sensemaking

Effective knowledge navigation depends on the integration of diverse perspectives. Crises cut across technical, organizational, social, and political dimensions, producing forms of complexity that cannot be adequately understood from within any single disciplinary or professional frame. No individual expert or functional domain can claim epistemic sufficiency under such conditions (Morris, 2013; Aaltonen & Kujala, 2016).

Project governance structures must therefore actively support transdisciplinary sensemaking. This entails creating institutional spaces in which heterogeneous forms of expertise can be articulated, compared, and synthesized into shared interpretations that guide action. Integration is not achieved through formal coordination mechanisms alone, such as reporting lines or escalation procedures, but through dialogic processes, shared narratives, and opportunities for mutual learning that enable actors to negotiate meaning across epistemic boundaries (Weick, 1995; Weick & Sutcliffe, 2015).

Such integrative processes challenge hierarchical models of decision-making that concentrate interpretive authority at the top of the organization. Instead, they require leaders to act as facilitators of understanding, enabling sensemaking, legitimizing multiple viewpoints, and supporting collective judgment rather than imposing unilateral solutions. Knowledge navigation is therefore not merely an analytical capability, but a fundamentally social and relational process embedded in governance, leadership, and organizational culture (Argyris & Schön, 1978; March, 1991).

5.4. Treating Uncertainty as Informative Rather Than Deficient

In conventional project management, uncertainty is typically framed as a deficiency to be reduced or eliminated through improved analysis, planning, and control. From a 44knowledge navigation'' perspective, however, uncertainty is treated as informative rather than problematic. It signals the limits of current understanding, reveals underlying assumptions, and highlights areas where flexibility, vigilance, and adaptive capacity are most needed (March, 1991; Weick, 1995).

Explicitly articulating uncertainty can enhance decision quality by discouraging premature closure and encouraging contingency-oriented thinking. Rather than forcing false precision, acknowledging ambiguity allows project actors to keep multiple interpretations in play, explore alternative courses of action, and remain responsive as conditions evolve. Moreover, transparent engagement with uncertainty can strengthen trust among stakeholders by replacing overconfident claims with credible, reflexive judgment (Taleb, 2007; Weick & Sutcliffe, 2015).

Adopting this stance requires a cultural shift within project environments. Expressions of doubt, ambiguity, and partial knowledge must be legitimized rather than penalized. When uncertainty

is treated as acceptable and discussable, emerging issues are more likely to be surfaced early, weak signals are less likely to be ignored, and adaptive responses can be mobilized before disruptions escalate. In this sense, legitimizing uncertainty becomes a core organizational capability underpinning resilient and crisis-capable project management (Argyris & Schön, 1978; Morris, 2013).

5.5. Institutionalizing Learning From Crisis Experience

Knowledge navigation must be supported by organizational structures capable of preserving, translating, and transmitting learning from crises. Without deliberate institutional effort, crisis-generated knowledge tends to remain personal, informal, and ephemeral, embedded in individual experience rather than integrated into organizational memory (Argyris & Schön, 1978; March, 1991).

Institutional learning therefore requires more than post-project reviews narrowly focused on procedural compliance, technical corrections, or performance metrics. It calls for reflective processes that explicitly examine how underlying assumptions were challenged, how problem framings were revised, and how collective sensemaking evolved under conditions of uncertainty and pressure. Such reflection enables organizations to surface not only *what* was done, but *how* knowledge was constructed, contested, and adapted during crises (Weick, 1995; Morris, 2013).

Mechanisms such as learning histories, cross-project communities of practice, and scenario-based reflection exercises can help embed crisis knowledge into organizational memory. By connecting experiential insights across projects and over time, these mechanisms support epistemic continuity and reduce the tendency to treat each disruption as unprecedented. In doing so, they strengthen the organization's capacity for anticipation, adaptation, and resilient project governance (Nonaka & Takeuchi, 1995; Weick & Sutcliffe, 2015).

5.6. Implications for Project Leadership and Governance

The shift from knowledge accumulation to knowledge navigation carries far-reaching implications for project leadership. Leaders are required to balance decisiveness with openness, and authority with epistemic humility. Their role expands beyond directing action or enforcing plans to enabling collective understanding, fostering dialogue across perspectives, and sustaining coordinated action under conditions of ambiguity and time pressure.

Project governance frameworks must evolve accordingly. Flexibility, iterative decision-making, and adaptive forms of control become as critical as compliance, accountability, and formal oversight. Governance, in this sense, is less about enforcing predefined trajectories and more about maintaining alignment, coherence, and legitimacy as conditions change and assumptions are revised. Effective governance thus supports continuous sensemaking rather than merely monitoring adherence to plans.

By embracing knowledge navigation, project management can move toward forms of practice better suited to environments of permanent uncertainty. This shift does not entail abandoning

rigor or professionalism. Rather, it redefines rigor as the disciplined capacity to interpret complexity, question assumptions, and act wisely despite incomplete knowledge. In doing so, project management becomes not only more resilient to crises, but more capable of learning, adapting, and creating value in an increasingly uncertain world.

Table 05. From Knowledge Accumulation to Knowledge Navigation in Project Management

Core Focus	Key Assumptions / Arguments	Epistemic Implications for Project Management
Limits of knowledge accumulation	Traditional project management equates success with more data, better models, and detailed planning, assuming uncertainty can be progressively reduced.	In crisis-prone environments, knowledge accumulation yields diminishing or negative returns, delaying action and obscuring judgment.
Knowledge navigation as epistemic shift	Knowledge navigation emphasizes interpretation, prioritization, and provisional action over prediction and control.	Project competence shifts from mastering tools to navigating uncertainty through ongoing sensemaking and adaptive judgment.
Integrative and transdisciplinary sensemaking	Crises cut across technical, social, organizational, and political domains, exceeding the capacity of single disciplines.	Governance must enable transdisciplinary dialogue, shared narratives, and collective interpretation across epistemic boundaries.
Uncertainty as informative	Uncertainty signals limits of understanding rather than deficiencies to be eliminated.	Legitimatizing uncertainty supports flexibility, early issue detection, trust, and adaptive decision-making.
Institutionalizing learning from crises	Crisis knowledge is experiential and easily lost without deliberate organizational mechanisms.	Learning systems must capture how assumptions, framings, and sensemaking evolved, not only procedural or technical fixes.
Implications for leadership and governance	Leadership must balance authority with epistemic humility, and decisiveness with openness.	Governance shifts from enforcing plans to sustaining alignment, coherence, and sensemaking under permanent uncertainty.

6. Conclusion: Knowing and Managing Projects in an Age of Permanent Uncertainty

6.1. Crises as a Mirror of Project Knowledge

This article has argued that contemporary crises should be understood not merely as operational disruptions, but as epistemic events that reveal both the strengths and the limitations of dominant project management knowledge systems. The recurring failure of projects under conditions of systemic uncertainty cannot be adequately explained by shortcomings in planning, execution, or individual competence alone. Rather, such failures point to deeper issues concerning how projects produce, organize, validate, and mobilize knowledge in complex and volatile environments.

The formulation *"crisis of knowledge, knowledge of crisis"* captures this dual dynamic. On the one hand, crises expose the inadequacy of project management frameworks grounded in assumptions of prediction, control, and linear rationality. On the other hand, crises simultaneously generate alternative forms of knowledge, emergent, situated, and relational, that arise through practice, improvisation, and collective sensemaking under pressure. Recognizing this duality is essential for understanding why traditional responses to uncertainty so often prove insufficient, and why improving tools or tightening controls alone cannot resolve the epistemic challenges that crises reveal.

6.2. Rethinking Project Management as an Epistemic Practice

A central implication of this analysis is that project management must be understood not only as a technical or managerial activity, but as an epistemic practice. Projects are not merely vehicles for execution; they are sites in which interpretations are constructed, assumptions are tested, and meaning is continuously negotiated under conditions of constraint, ambiguity, and change.

From this perspective, the effectiveness of project management depends as much on how uncertainty is understood, articulated, and communicated as on the formal tools used to manage it. The persistent emphasis on knowledge accumulation through data, models, and documentation risks obscuring the interpretive, social, and relational dimensions of project work. In crisis-prone environments, these dimensions become decisive, as coordination, trust, and shared understanding often determine the capacity to act effectively when predictive control is no longer viable.

Reframing project management as an epistemic practice therefore calls for greater attention to sensemaking, reflexivity, and learning as core managerial competencies rather than as peripheral or "soft" skills. Such a reframing not only enriches theoretical understanding of project management, but also provides a foundation for more adaptive, resilient, and context-sensitive forms of practice in an increasingly uncertain world.

6.3. Implications for Project Leadership and Governance

The findings of this article point to a fundamental need to rethink prevailing models of project leadership and governance. Leaders operating under conditions of permanent uncertainty cannot rely solely on authority derived from technical expertise, standardized methods, or formal position. Instead, effective leadership increasingly involves facilitating shared understanding, legitimizing the expression of uncertainty, and enabling adaptive responses across organizational, professional, and institutional boundaries.

Project governance systems require a corresponding reorientation. Rather than privileging strict compliance with predefined plans and performance baselines, governance mechanisms should support flexibility, iterative decision-making, and the integration of diverse perspectives over time. Such arrangements are better aligned with environments in which project objectives, constraints, and risk profiles evolve dynamically and cannot be fully anticipated in advance.

Importantly, this shift does not imply abandoning rigor, discipline, or accountability. On the contrary, rigor is redefined as the disciplined capacity to navigate uncertainty responsibly, through transparency, reflexivity, and collective judgment, rather than through the illusion of control. Accountability, in this sense, is anchored not in adherence to static plans, but in the quality of sensemaking, decision processes, and learning that guide action under uncertainty.

6.4. Learning From Crisis as a Strategic Capability

One of the most significant challenges highlighted in this article concerns the institutionalization of crisis knowledge. Although projects often generate rich and consequential learning during periods of disruption, this knowledge is frequently lost once a semblance of stability returns. The systematic marginalization of crisis-generated insights contributes to recurring epistemic failures and sustains the illusion that each crisis is unprecedented rather than part of a broader pattern.

Developing strategic learning capabilities therefore requires project-based organizations to move beyond procedural “lessons learned” exercises focused on compliance or technical correction. It calls instead for deeper forms of reflection that examine how assumptions were invalidated, how mental models shifted, and how decision frameworks were reconfigured under crisis conditions. Such reflective processes enable the creation of organizational memory that transcends individual projects and short-term performance cycles.

In environments characterized by recurring and overlapping crises, the capacity to learn from disruption becomes a core source of organizational resilience rather than an optional improvement activity. Institutionalizing crisis knowledge strengthens not only preparedness for future disruptions, but also the epistemic foundations upon which adaptive, reflexive, and resilient project management practices can be built.

6.5. Contribution and Directions for Future Research

This article contributes to project management scholarship by framing crises as epistemic phenomena and by foregrounding the limitations of dominant project management knowledge paradigms under conditions of systemic uncertainty. By introducing the distinction between *crisis of knowledge* and *knowledge of crisis*, it offers a conceptual lens for reexamining how projects understand, generate, and mobilize knowledge in the face of disruption. This perspective shifts attention from operational failure alone to the deeper epistemic dynamics that shape project behavior under crisis conditions.

Future research could extend this framework in several directions. Empirical studies could investigate how crisis-generated knowledge is produced, interpreted, and lost across different types of projects, sectors, and institutional contexts. Comparative research could examine how alternative leadership and governance models enable or constrain knowledge navigation and collective sensemaking. Longitudinal studies could explore how organizations that successfully institutionalize crisis learning differ from those that repeatedly encounter similar failures, thereby illuminating the mechanisms through which epistemic resilience develops over time.

Such lines of inquiry would deepen understanding of project management not merely as a collection of tools and techniques, but as a dynamic, situated, and evolving knowledge practice. In doing so, they would support the development of more reflexive, adaptive, and resilient approaches to managing projects in an increasingly uncertain world.

6.6. Final Remarks

Crises will remain a defining feature of contemporary project environments. The central challenge is therefore not how to eliminate uncertainty, but how to know and act within it. The future of project management depends less on ever more sophisticated tools and techniques than on the capacity to integrate diverse forms of knowledge, to practice epistemic humility, and to learn systematically from disruption.

In this sense, the *knowledge of crisis* is not an afterthought to project management. It is its foundation in an age of permanent uncertainty.

Table 06. Knowing and Managing Projects in an Age of Permanent Uncertainty

Core Focus	Key Assumptions / Arguments	Epistemic Implications for Project Management
Crises as mirrors of project knowledge	Crises expose both the limits of dominant project management frameworks and the emergence of alternative, practice-based knowledge.	Project failure under crisis reflects epistemic misalignment rather than execution deficits alone.
Project management as an epistemic practice	Projects are sites of interpretation, sensemaking, and negotiated meaning, not merely vehicles for execution.	Managerial effectiveness depends on how uncertainty is understood, communicated, and acted upon, not only on technical tools.
Leadership under permanent uncertainty	Authority based on expertise and position is insufficient in crisis-prone environments.	Leadership centers on facilitating shared understanding, legitimizing uncertainty, and enabling adaptive response.
Governance beyond control	Governance systems must move beyond strict plan compliance toward flexibility and iterative decision-making.	Rigor is redefined as disciplined navigation of uncertainty through transparency, reflexivity, and collective judgment.
Learning from crisis as strategy	Crisis-generated knowledge is rich but frequently lost after stabilization.	Institutionalizing reflective learning strengthens epistemic resilience and long-term project adaptability.
Contribution and future research	Crises are framed as epistemic phenomena through the crisis of knowledge / knowledge of crisis distinction.	Opens new research agendas focused on knowledge navigation, epistemic resilience, and sensemaking in projects.
Final synthesis	Uncertainty is permanent rather than exceptional in contemporary projects.	The knowledge of crisis becomes foundational to project management in an age of systemic uncertainty.

Disclosure of AI and Digital Tools Used

This manuscript was finalized with the assistance of standard digital and AI-enabled tools used for routine text preparation. No AI system was used to generate, expand, or create the conceptual, theoretical, or analytical contributions of the paper, which remain entirely the author's own work.

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