From Opinion-Based to AI-Augmented Project Management: Evidence-Based Decisions, Measurably Better Outcomes, and Effective Bias Management[1]

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ABSTRACT

Despite decades of ongoing methodological progress, heightened professional certification, enhanced project management maturity, and increasing organizational recognition of the strategic significance of projects, project success rates have consistently remained low across various industries and regions. This paper argues that such underperformance cannot be primarily attributed to external complexity or technological volatility but rather to structural weaknesses in project decision-making quality: in fact, in many organizations, critical project decisions continue to rely heavily on personal intuition, experience, and authority and are systematically shaped by cognitive, behavioral, and organizational biases.

Building on this premise, the paper explores the transition from opinion-based to evidence-based project management and examines how artificial intelligence can enable this shift when adopted as a form of project management augmentation. Specifically, the paper demonstrates how AI can enhance the decision-making processes in crucial yet often inadequately addressed areas, including retrospective intelligence, forward-looking decision support, data-driven corrective and preventive measures, stakeholder intelligence and sentiment analysis, early risk warning, issue management, and structured bias management.

Ultimately, AI augmentation results in an essential modern project management competency, which relies not only on technology but also on governance, culture, and professional expertise, since AI-enhanced project management provides a pragmatic and accountable approach to enhancing project performance, resilience, and enduring organizational learning through the reinforcement of evidence-based, bias-conscious decision-making.

INTRODUCTION: FROM OPINION-BASED TO EVIDENCE-BASED PROJECT MANAGEMENT

In recent decades, project success rates have consistently remained low, notwithstanding ongoing enhancements in project management methodologies, a rise in the number of certified project managers and practitioners, the evolution of project management and organizational maturity, and an overall increase in organizational awareness regarding the significance of projects within the strategic framework. Recent

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survey (Project Management Institute, 2024) demonstrates that nearly half of projects cannot be deemed fully successful, even when evaluated through contemporary, strategy-oriented, and value-driven criteria, rather than solely relying on the conventional "iron triangle."

This discovery is not unusual: it is more of a long-term structural pattern that has been affecting project performance for more than ten years. In fact, previous reports (Project Management Institute, 2021) have consistently shown that about 30% of projects do not meet the goals for which they were originally funded, almost half of these projects also have major schedule delays, budget overruns, or both, while scope creep, on the other hand, is still a common problem that affects about one-third of projects in all sectors and regions.

The fact that these numbers have stayed the same over so much time suggests that project underperformance is not mostly caused by an external volatility, a sector-specific complexity, or a technological disruption, but instead is due to structural problems with how projects are approached, initiated, planned, estimated, managed, and directed.

Indeed, when project failures and partial successes are examined more closely, two recurring root causes emerge, both having a hidden common denominator, which is the decision-making quality.

The first is a systematic misinterpretation—or incomplete understanding—of stakeholder requirements and expectations (especially these latter, which are often non-evident and should be made to emerge via a systemic analysis). In fact, while formal requirements are generally documented and approved, the underlying assumptions about value, priorities, and success criteria are often implicit, fragmented, subject to diverse interpretations, or misaligned across stakeholders: as projects progress and contextual conditions evolve, these latent misalignments tend to emerge in the form of change requests, rework, scope expansion, or late-stage dissatisfaction, so that what is commonly labeled as “scope creep” is frequently not a change more or less controlled, but rather the delayed correction of an initial misunderstanding.

The second root cause arises from structurally inaccurate estimates of time, cost, and effort, as forecasting practices often depend on expert judgment, informal analogies, and personal experience instead of systematic analysis of available data, lessons learned, and comparisons between internal analytics and external proposals received from diverse suppliers. As a result, even widely accepted techniques like analogous estimating, which are not based on robust datasets, become susceptible to optimism bias, planning fallacy, anchoring effects, and overconfidence, leading to a persistent tendency to underestimate, eroding trust, increasing pressure, and limiting managerial options as execution progresses.

Both issues are a consequence of the predominance of opinion-based decision-making in commonly practiced project management. In fact, in many organizations, critical project decisions—ranging from scope definition and business case approval to

scheduling, budgeting, and corrective actions—are still heavily influenced by intuition, seniority, level of authority, political considerations, and unchallenged assumptions. Experience undoubtedly remains valuable; however, when it is not systematically confronted with data, lessons learned, different sources and opinions, and empirical evidence, there is the dominant risk that it becomes an undesirable and unreliable substitute for planned and controlled analysis—and the consequences in terms of project performances are evident.

On the other hand, projects that properly define success criteria and key performance indicators (KPIs), rely on well-established measurement systems, monitor performance continuously, and integrate effectively both risk and stakeholder management achieve dramatically higher success scores than those that do not (Project Management Institute, 2024). Therefore, a shift to an evidence-based project management approach is the most appropriate path to enable, practice, and enhance the systematic use of:

- historical performance data, lessons learned, and organizational memory,
- explicit success criteria and measurable value KPIs,
- continuous monitoring and management of assumptions and emerging—also weak! —signals, including those of stakeholder satisfaction or dissatisfaction;
- transparent evaluation of alternatives and suitable trade-offs.

In this way, data-driven governance is not just a theoretical ideal, but it becomes an effective, measurable predictor of project success.

The transition from an opinion-based to an evidence-based project management approach cannot be considered anymore a major methodological challenge, since the principles are well known, and the value of data-driven decision-making is today fully recognized and well documented. The real constraints have historically been, and still are, cognitive, organizational, and practical in nature; these include the “presumption of knowing,” which often equates to an “assurance of ignorance”, as well as a limited analytical capacity, data fragmentation, continuous time pressure, and the significant complexity involved in interpreting large volumes of information.

Additionally, cognitive, behavioral, and organizational biases systematically shape project decisions. In fact, project managers, sponsors, and governance bodies operate under conditions that amplify well-documented distortions, such as optimism bias, planning fallacy, anchoring, confirmation bias, escalation of commitment, and strategic misrepresentation; these biases influence how information is selected, interpreted, and weighted, how risks are perceived, how estimates are produced, how corrective actions are delayed or avoided, and, over time, tend to reinforce opinion-based decision patterns that may seem reasonable to individuals but prove to be fragile These distortions are not the result of incompetence or poor intent but are real and structural features of human cognition and organizational life, especially in complex and time-constrained project environments. Therefore, the result of this is that simply “asking for better judgment” or “more discipline” is insufficient, and, without explicit mechanisms to surface assumptions,

challenge narratives, and confront decisions with empirical evidence, bias remains largely invisible—and therefore ungoverned.

Artificial Intelligence may fundamentally change this equation, enabling and enhancing the shift of paradigm, not, of course, by replacing project managers or automating judgment, but by augmenting human decision-making capacity, so allowing project professionals to access, analyze, and interpret evidence at a scale and speed that was previously unattainable. In addition, by continuously analyzing historical data, monitoring live project signals, comparing decisions against empirical baselines, and generating counterfactual scenarios, AI can act as a systematic debiasing mechanism, for instance, by exposing blind spots, highlighting inconsistencies, quantifying uncertainty, and presenting "objective" alternative interpretations that humans might otherwise overlook or unconsciously dismiss. In this perspective, the transition from opinion-based to evidence-based project management is inseparable from the challenge of bias-aware decision-making: AI cannot remove biases from human actors, but it can make their influence visible, measurable, and discussable—thereby enabling more transparent, accountable, and rational project governance.

Definitively, all these AI capabilities are already available today and can be responsibly integrated into project management practice to improve decision quality, reduce bias, and ultimately increase project success rates. However, AI-augmented project management is not synonymous with task automation, predictive dashboards, or algorithmic decision-making, but it represents a distinct paradigm in which AI functions as a "thinking" partner, supporting sensemaking, judgment, and learning while preserving human responsibility and ethical accountability to help project professionals see better, decide better, act better, and learn better throughout the project life cycle.

WHAT "AI-AUGMENTED PROJECT MANAGEMENT" REALLY MEANS

Since artificial intelligence entered project management, behaving as an AI-stakeholder in all respects (Pirozzi, 2024), the expression "*AI-augmented project management"* is ever more used, but often with unclear or ambiguous meanings, and its definitions vary from a set of productivity tools to the opposite extreme of a potential replacer for human decision-making. Since all these diverse interpretations may be misleading and risk confusing the real value that AI can bring to project management, it is therefore essential to clarify what AI-augmented project management actually means: the fundamental distinction concerns the difference between *automation* and *augmentation*.

Automation focuses on the delegated execution of repetitive tasks: in project management, this context may include activities such as data collection, report generation, schedule updates, document classification, or the consolidation of status information. Automation improves efficiency and consistency because it optimizes execution, but it does not fundamentally change or improve the decision-making process, except for the fact that it affords the possibility of dedicating more time to it.

Augmentation, which may be considered complementary to automation, affords the possibility, on the other side, of expanding human cognitive capabilities: in project management, for instance, it may support project managers and other governance roles in tasks that are inherently complex, uncertain, and judgment-intensive, including, e.g., interpreting ambiguous signals, balancing trade-offs, evaluating alternatives, anticipating consequences, and reflecting on lessons learned. Definitively, augmentation raises the quality of human decision-making by providing more profound insight, a broader perspective, and more disciplined reasoning, without removing or replacing human responsibility, since it supports decision-making without making any decisions. Ultimately, AI-augmented project management empowers governance by enabling project managers and other roles to do more and to do better.

From the perspective of automation, AI can be seen as an operator; however, from the perspective of augmentation, AI serves as a virtual cognitive companion that acts as a "thinking" partner—*though it is important to note that AI's "thoughts" are purely based on statistical correlations*—continuously supporting sensemaking, meaning assessment, and decision-making throughout the project life cycle. In this functional role as a thinking partner, AI may, for instance:

- make evident patterns that are otherwise difficult or quite impossible to detect,
- highlight emergent practices, anomalies, and weak signals before they become manifested risks or problems,
- evaluate and assess assumptions by comparing them with historical evidence,
- generate statistical descriptions, alternative interpretations, and scenarios, as well as inferences and simulations,
- support reflection—that today is often a “great absent” due to the chronic lack of time—by correlating present hypotheses of decisions with past outcomes.

Ultimately, what changes—for the better—is the quality of the decision environment: opinions are confronted with evidence, intuitions are complemented by analysis, and biases become more visible and faceable, while decisions remain human, contextual, and accountable. This framing is particularly important in project contexts, where decisions are rarely purely technical and are deeply embedded in contextual, organizational, relational and behavioral dynamics.

To make this perspective operational, AI-augmented project management can be described through a simple yet powerful conceptual model, structured in four reinforcing capabilities, each one having the purpose of “doing better.”

- **See better: insight generation.** AI may enable and help project professionals to see beyond surface indicators, mainly by integrating heterogeneous data sources—historical project data, performance metrics, risk signals, stakeholder communications, and other contextual information. In this way, through pattern recognition and anomaly detection, AI may support making evident emerging

trends, hidden correlations, and early warning signs that would otherwise remain unnoticed.

- **Decide better: decision intelligence.** Building on improved visibility, AI may support more quality decision-making by evaluating alternatives, simulating scenarios, estimating probabilities, and exposing trade-offs. In fact, by grounding choices in empirical baselines and counterfactual reasoning, AI may help to reduce overconfidence, planning fallacy, and other decision biases, in accordance with the governance needs in terms of decision-making and control.

- **Act better: guided corrective actions.** Augmentation extends from analysis to action, since AI can propose prioritized corrective or preventive actions, assess their potential impact on cost, schedule, quality, and stakeholder expectations, and support governance discussions with transparent rationales: in these cases, the goal is not evidently to automate responses but to **guide action selection** in a more structured, data-driven, and accountable way.

- **Learn better: continuous organizational learning.** Finally, AI may enable learning at scale: in fact, having the capability of systematically capturing outcomes, decisions, and contextual factors, AI may support the transformation of isolated lessons learned into reusable organizational intelligence, and this closes the feedback loop between past, present, and future projects, reinforcing an evidence-based culture over time.

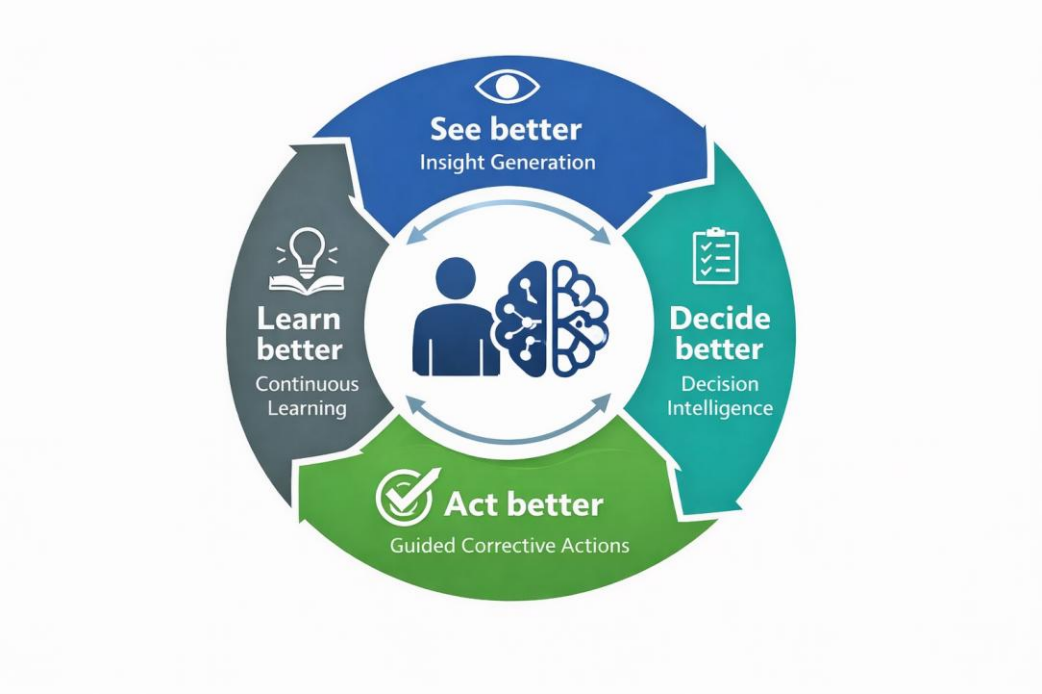

Fig.1 – The AI-Augmented Project Management Conceptual Model

These four abilities work together to create a clear cycle (Fig. 1) that improves understanding, decision-making, actions, and learning, demonstrating how AI can help project management shift from occasional, opinion-based choices to ongoing, evidence-based management.

WHAT PROJECT MANAGERS TYPICALLY DON'T DO TODAY – BUT CAN DO WITH AI

This section turns the AI-enhanced project management conceptual model into real-world management practices. It shows how AI can help project managers with tasks that are widely seen as important but are still not often addressed—or very rarely addressed in a systematic way—in everyday project work.

Retrospective Intelligence

Although project retrospectives are widely acknowledged as foundational mechanisms for continuous learning and improvement in project management, their actual contribution to daily managerial practice often remains limited (Project Management Institute, 2021; ISO, 2020; Schindler & Eppler, 2003). In fact, despite their formal relevance and frequent inclusion in standards and methodologies, retrospective activities are commonly perceived as time-consuming and predominantly backward-looking exercises whose outputs are weakly connected to or, in any case, not so important for future decisions. In particular, lessons learned are documented, archived, and formally closed even if they rarely translate into concrete adjustments of planning assumptions, governance practices, or managerial behavior in subsequent projects (Schindler & Eppler, 2003; Duffield & Whitty, 2015). This behavior shows a gap between how important retrospectives are thought to be and how little they actually help, which isn't mostly because project teams aren't committed or skilled enough. This is because retrospectives are often short-lived and depend heavily on how each person remembers and interprets the events, which makes the quality and depth of the analysis very different from team to team and organization to organization.

Definitively, retrospective discussions often focus on observable outcomes—such as schedule delays, cost overruns, scope changes, or problems in stakeholder relationships—and then provide only partial insights into the underlying mechanisms and interactions that generated the same outcomes. Moreover, in general, the retrospective process is frequently influenced by cognitive biases, defensive attitudes, and organizational dynamics, which further limit the ability to develop shared and analytically grounded conclusions (Tversky & Kahneman, 1974).

Today, AI represents a powerful tool for project managers, as it enables a systematic examination of historical data with an explicit objective in this case: identifying recurring patterns, relationships, and causal drivers of performance. This approach supports a shift from narrative reconstruction toward analytically grounded learning, in which human

judgment is not replaced but rather supported and expanded through data-driven insight. In fact, with the support of AI, it is possible to integrate and correlate heterogeneous sources of project information, including schedules, cost data, change histories, issue and risk registers, and records of communication and stakeholder interaction. These insights would be difficult to derive from fragmented data or purely qualitative reviews and can thus be surfaced and examined in a more systematic, transparent, and augmented manner: by examining these data sources jointly, it becomes possible to analyze how decisions, behaviors, and contextual factors evolve over time and interact in shaping project outcomes.

AI can also help uncover those KPIs that are not immediately apparent through traditional review practices in precise ways: applying pattern recognition and causal analysis techniques. For example, people often think that schedule delays are caused by one-time inefficiencies. However, they can also be caused by repeated delays in decision-making processes or higher-level approvals, whose effects only become clear when looked at over time and across projects. In the same way, cost overruns can happen when optimistic planning assumptions, changes in supplier performance, and delayed corrective actions all work together, rather than just one estimation error on its own; this kind of insight is not often the result of just talking about the past in a retrospective discussion.

The analysis of data across multiple initiatives allows AI to highlight recurring behaviors, structural characteristics, and contextual conditions that consistently influence project performance: this cross-project perspective enables project managers to distinguish between project-specific issues and more persistent weaknesses embedded in planning practices, resource allocation models, governance arrangements, or stakeholder management approaches—distinctions that are rarely achievable through conventional retrospectives conducted in isolation.

Finally, AI-supported retrospectives facilitate the translation of historical evidence into structured and context-sensitive guidance when dealing with the way lessons learned are captured and reused: rather than producing generic recommendations, lessons can be associated with specific conditions, early indicators, and decision points, increasing their relevance and likelihood of reuse. In this way, learning is no longer treated as static narrative documentation but as operational knowledge that can be reintegrated into future planning, risk assessment, and decision-support processes: retrospectives are transformed from episodic reviews into an ongoing learning capability embedded within project and portfolio management practices, where insights derived from past experience can inform forecasting models, risk assessment activities, and governance mechanisms, strengthening the ability to anticipate and address known patterns of underperformance. For these reasons, a retrospective analysis with the AI support enables the amplification of learning rather than solely experience-based reflection: the combination of AI and augmented human judgment, with evidence derived from historical project data, helps

project managers learn more consistently from past experiences and apply this new knowledge in a practical and actionable manner.

Forward-Looking Decision Support

Project management effectiveness ultimately depends on the quality of decisions made under uncertainty about the future, as project managers are routinely required to make forward-looking decisions regarding schedules, resources, costs, suppliers, and scope evolution, often in conditions characterized by incomplete information, time pressure, and competing stakeholder expectations. Today, forecasting and decision-support practices in many organizations remain quite straightforward, because they rely on static plans, deterministic assumptions, and limited scenario exploration, and traditional approaches tend to focus on single-point estimates or linear extrapolations of current performance trends, which may provide a basic reference but are not able to take into account both project complexity and VUCA environments. This situation occurs because forward-looking decisions are frequently influenced by optimism bias, planning fallacy, and overconfidence, so leading to underestimated risks and insufficient preparation for adverse or unexpected scenarios (Tversky & Kahneman, 1974; Lovallo & Kahneman, 2003; Flyvbjerg, 2006).

The challenge relies on understanding how to integrate AI in this decision-making process, as project managers can benefit from the AI support to explore alternative futures in a structured, probabilistic, and context-aware manner to extend the capabilities of traditional forecasting and decision-support practice. So, this new process does not rely on producing a single forecast, but it translates into the generation of multiple completion scenarios, each associated with explicit assumptions, probabilities, and confidence levels, with a final shift from asking what is most likely to happen to understanding what could happen under different conditions and how likely each outcome may be. In fact, by making uncertainty explicit and comparable across scenarios, with AI support, forecasting can help in terms of trade-offs rather than isolated estimates, reducing the tendency to anchor decisions to a single “most likely” plan. In particular, the AI can greatly support project management with simulations, e.g., Monte Carlo (Hulett, 2016; Vose, 2008), employing actual project data and real-time KPIs to continuously adapt simulations to the specific project environment characteristics. This AI-augmented simulation produces forecast estimates that are not only statistically robust but also grounded in empirical evidence derived from comparable projects and recurring organizational behaviors: in this way, AI can be an effective cognitive augmentation mechanism, greatly supporting project managers in VUCA scenarios.

In general, project managers can take advantage of AI in these forward-thinking decision-making processes to evaluate potential repercussions before committing to a particular course of action. For example, AI can be employed to evaluate the potential consequences of resource reductions or reallocations, changes in supplier configurations, milestone delays or accelerations, and scope adjustments. This process

enables organizations and project managers to compare alternative actions based on their anticipated effects on schedule, cost, risk exposure, and performance objectives.

This type of support does not aim to become an autonomous decision process but rather to let AI function as a cognitive amplifier that enhances human judgment by making uncertainty explicit, surfacing trade-offs, and highlighting non-obvious consequences of different choices. So, the final output takes the form of probabilistic forecasts, confidence intervals, and ranked alternatives accompanied by explainable reasoning, supporting more transparent and accountable decision-making. Ultimately, this combined approach based on both humans and AI allows switching from purely reactive responses to proactive, evidence-based governance, strengthening the capability to anticipate challenges and issues, engage stakeholders on realistic expectations, and make more resilient decisions in complex and uncertain project environments.

Data-Driven Corrective and Preventive Actions

Understanding which actions are necessary to ensure the project's success is a new challenge, since it is essential to be able to intervene in a timely and appropriate manner as deviations begin to emerge and spread across various aspects of project performance. Today, corrective and preventive actions are still primarily initiated by visible problems, escalating issues, or stakeholder pressure, rather than by a systematic analysis of early signals that may indicate emerging risks (Nikander & Eloranta, 2001); consequently, interventions frequently occur only after deviations have already impacted cost, schedule, or quality, significantly reducing the available margin for effective action and requiring project managers to operate under conditions of urgency. This reactive approach frequently results in a series of hasty decisions, including the compression of recovery plans, the escalation of costs, and the development of strategies that are motivated by the necessity to immediately mitigate deviation effects, rather than a structured and comprehensive assessment of the available solutions and their long-term effects.

Under these conditions, the AI support enables a substantive evolution in the way corrective and preventive actions are identified, prioritized, and evaluated by continuously analyzing project performance data across multiple dimensions—such as schedule trends, cost evolution, productivity dynamics, change patterns, quality indicators, and stakeholder-related signals—and by integrating these signals into a coherent analytical perspective. This integrated approach translates into distinguishing between fluctuations and structurally relevant patterns, with a focus on situations in which timely intervention is most likely to prevent escalation and limit downstream impacts, as well as the generation and comparison of multiple corrective or preventive strategies, each associated with an assessment of expected impact, required effort, residual risk, and potential side effects, making trade-offs explicit and comparable in a way that is rarely achievable through purely qualitative reasoning.

However, human judgment remains central when interventions involve trade-offs among cost, schedule, quality, performance, and stakeholder expectations**:** AI functions as a decision-support mechanism that enhances transparency and accountability by clarifying why certain actions are suggested, what assumptions reinforce them, and what consequences are expected under different scenarios. Over time, this approach reinforces a more proactive, evidence-based, and learning-oriented approach to project control, in which corrective and preventive actions are no longer treated as exceptional responses to failure but as an integral component of continuous performance management; by monitoring post-intervention performance across relevant dimensions, AI enables project managers to evaluate whether selected actions have achieved the intended outcomes or whether unintended side effects have emerged. Finally, by maintaining a link between actions and observed outcomes, project managers can move beyond *ad hoc* actions and, step by step, refine intervention strategies over time, as AI helps ground them in empirical evidence.

Stakeholder Intelligence & Sentiment Analysis

Although stakeholder-related issues and the management of their relations have been recognized as critical success factors (Pirozzi, 2019) and the primary causes of a project's total or partial failures (Project Management Institute, 2018), in practice, they are still approached in the vast majority of cases through qualitative assessments, episodic interactions, continuous simplifications, and personal interpretations, resulting in project performance outcomes that are as poor as those mentioned in the introduction. In fact, stakeholder requirements, expectations, concerns, levels of engagement, and perceptions of value are very frequently inferred only indirectly, based on meetings, personal impressions, and informal signals, rather than also directly, based on systematical analysis and monitoring over time. Therefore, misalignments are frequent and tend to emerge late, often when stakeholder dissatisfaction has already consolidated and corrective options and feasible alternatives are limited. In general, stakeholder-related issues are treated as communication or "political" problems rather than as observable and analyzable phenomena that evolve dynamically throughout the project life cycle; in other words, these behaviors are additional significant effects of opinion-based project management approaches.

The impacts on project results are particularly heavy in the contexts of complex and dynamic multi-stakeholder projects, in which project managers are exposed to a continuous flow of unstructured information—e.g., emails, meeting minutes, reports, social messages, brainstorming, presentations, but also informal communications—that contains various valuable—and sometimes weak!—signals about stakeholder sentiment, priorities, attitudes, satisfaction/dissatisfaction, perceived value and quality, tensions, conflicts, and emerging issues. In these cases, due to the combination of time constraints and cognitive limits—including presumption and superficiality!—only a small fraction of this information is actually processed, and their interpretation is often filtered through personal bias, selective attention, or hierarchical mediation: consequently, stakeholder

signals are frequently underestimated, misinterpreted, or entirely overlooked until they materialize as conflicts, escalation, dissatisfaction, disengagement, resistance, or loss of trust.

However, AI-augmented project management may drastically overcome this stagnant situation and enable a basic increase of quality by transforming dispersed, uneven, and unstructured signals and communication data into actionable and manageable stakeholder intelligence. In fact, through natural language processing and pattern recognition techniques, AI can systematically analyze stakeholder communications across multiple channels and over time, so identifying and effectively managing recurring themes, sentiment trends, changes in tone, and deviations from baseline interaction patterns: these capabilities augment de facto human centrality and the effectiveness of stakeholder relations by expanding accuracy, explainability, and transparency and properly reducing reliance on personal opinions that are not supported by facts. Moreover, in this way, stakeholder management moves from a barely usable discontinuous series of episodic perceptions to effective continuous sensing of events.

In general, AI can greatly support project managers to identify early signs of stakeholder unsatisfaction, disengagement, or misalignment, as well as warning signs, alarms, concerns, or loss of trust, before these become formal problems or, even worse, have consequences that are too big to handle. In fact, even small changes in language, tone, how often specific stakeholders communicate, emotional polarity, or the topic someone focuses on can show that some stakeholder is getting more uncomfortable, frustrated, or worried about scope, priorities, or performance. When these weak signals are carefully analyzed and compared to project events or non-events, like changes, lack of approvals, delays, or decision points, they can give us useful information about how stakeholders are feeling about the project, beyond just what is officially being delivered and communicated.

In addition, beyond sentiment detection and management, AI can help structure and contextualize stakeholder intelligence by mapping how perceptions and expectations evolve across project phases and stakeholder groups. This enables project managers to discriminate between isolated reactions and systemic patterns, as well as to effectively understand how decisions, communications, and outcomes influence stakeholder trust and engagement during the project lifecycle. In this perspective, stakeholder intelligence, instead of being limited as usual to a static identification exercise made just once at project initiation, becomes an effective dynamic input to governance, risk management, analysis of cause/effects and decision-making.

Moreover, AI may also support more effective and context-aware communication by suggesting tailored engagement strategies that are based on stakeholder profiles, historical interactions, and observed sentiment trends. For example, when interacting with a critical stakeholder, AI can help project managers reflect on previous exchanges, identify communication styles that proved effective or counterproductive, and adjust tone,

timing, and content accordingly, thus strengthening the evidence-based project manager's situational awareness and intentionality in stakeholder relations.

The integration of stakeholder intelligence and sentiment analysis at a governance level enhances both transparency and accountability, since decisions related to escalation, prioritization, or corrective actions can be based not only on technical performance indicators but also on systematically observed stakeholder dynamics: this may help reduce the frequent risk of underestimating the importance of stakeholder relations, support more informed and evidence-based decisions, and contribute to a more balanced assessment of project status that properly integrates performance, risk, and stakeholder dimensions.

Ultimately, AI-augmented stakeholder intelligence enables stakeholder management to evolve from an instinctive practice based on personal experience to a systemic managerial capability supported by evidence. In this way, stakeholder intelligence and sentiment analysis are a natural next step for evidence-based project management into the relational and behavioral realm, where decisions are rarely based only on technical factors but are instead deeply rooted in both human and organizational dynamics.

Risk Early Warning

Risk management is an important part of project management, and it is still often seen as a static and periodic task that is based on predefined risk registers, scheduled reviews, and qualitative assessments done at certain times (Project Management Institute, 2019; ISO, 2020). This approach, on one hand, gives a formal way to find and record risks, because we often can't see the whole picture or how a risk is changing in a complex project, but, on the other hand, it only recognizes risks once they happen, which gives us less time to respond and makes us more reactive than proactive. To alter this behavior, project managers should keep in mind that risks typically precede them with weak signals and performance changes. KPI monitoring or communication dynamics can detect these signals early, enabling timely mitigation or prevention (Nikander & Eloranta, 2001).

AI can help anticipate these emerging risk conditions before they materialize as formal risks or issues by continuously monitoring project data across multiple dimensions—such as schedule performance trends, cost evolution patterns, productivity dynamics, change requests, quality deviations, supplier performance variability, and stakeholder communication signals. Thanks to pattern recognition and contextual learning, AI can identify deviations from expected behavior, detect correlations among seemingly unrelated signals, and assess the likelihood and potential severity of emerging risks: for instance, a combination of declining productivity trends, increasing change request frequency, and shifts in stakeholder sentiment may signal a growing risk of schedule delay or scope instability, even if no single indicator appears critical in isolation (Nikander & Eloranta, 2001). Today, with the use of AI project managers, organizations can surface early risk signals without replacing human risk judgment but rather augment it by expanding visibility and extending the time horizon available for decision-making: AI

provides additional reaction time and supports more informed prioritization of attention and resources.

Finally, while dealing with risk management and/or the decision-making process, the use of AI brings tangible benefits: earlier identification of risks and more time to evaluate options, stakeholder engagement, and response before deviations become critical issues. This additional reaction time reduces the need for disruptive corrective actions, supports more stable planning, and enables more informed trade-offs among cost, schedule, scope, and quality. This approach would allow risks to be viewed as a practical capability that actively supports day-to-day decision-making, rather than a mere exercise that focuses on documenting threats. Therefore, instead of just relying on periodic reviews and reactive escalation, organizations could base risk-related decisions on continuously updated insights, thereby enabling a more consistent prioritization of attention and resources across projects and portfolios. This method enhances its capacity to identify recurring risk patterns, learn from previous warnings, and modify responses to risks as time progresses. Ultimately, the AI support in risk management is a critical asset that contributes to enhanced project management skills and more successful project outcomes.

Management of Issues and Problem Solving

In general, issues refer to actual questions that have not been considered as risks and that are already ongoing, often under conditions of urgency, partial information, and significant stakeholder pressure; for this reason, their management requires rapid and structured interventions. However, today's approach to managing issues remains reactive, relying on improvisation or personal experience instead of clear and structured processes. Issues are frequently addressed like isolated events, with limited understanding of their systemic implications and with responses that prioritize short-term containment over sustainable resolution: they tend to generate cascading effects across cost, schedule, quality, technical performance, governance processes, and stakeholder relationships. By integrating AI in this context, it is possible to classify and prioritize issues based on their severity, urgency, and criticality, while simultaneously mapping their potential impact across multiple dimensions: by connecting actual issues to historical patterns and similar past events, project managers can overcome purely intuition-driven assessments and develop a shared, evidence-based understanding of the real implications.

In addition, a structured problem-solving approach requires time to explore different strategies, while today teams are used to quickly choosing a single solution, driven by routines, opinion-based approaches, or hierarchical dynamics: this approach negatively impacts the capacity for alternative evaluation and increases the risk of collapsing on decisions less effectively. Instead, AI can support the decision-making process by generating multiple intervention options and assessing them in terms of feasibility, required effort, expected impact, residual risks, and alignment with project objectives and constraints: by making alternatives and trade-offs explicit, the AI integration promotes

more transparent and accountable decisions, reducing the influence of emotional reactions and opinion-driven dynamics that often characterize issue management under pressure.

Today, in many organizations, issues are treated as failures to be resolved and forgotten rather than as sources of usable knowledge; a different approach becomes possible when the systematic capture of data related to issues, response strategies, and outcomes is supported analytically, because linking problems to their resolution paths and observed results makes it easier to identify recurring patterns, evaluate which problem-solving approaches work under which conditions, and progressively refine response strategies over time, reinforcing evidence-based practices and a more resilient way of managing problems.

From a broader perspective, greater transparency and accountability are enabled through the explicit articulation of decision rationales and systematic documentation of how issues and responses evolve: clearer ownership, more informed escalation paths, and more constructive stakeholder communication, particularly in complex and high-pressure situations. This approach does not want to increase controls but to strengthen project managers' judgment with a further companion, where the final decision is not based on automated systems: AI can support the identification of structured problem solving, strengthening leadership rather than substituting it.

Finally, the progressive integration of analytical and decision-support capabilities enables organizations to move from reactive actions toward more structured, disciplined, and learning-driven ways of addressing problems. Organizations become better equipped to effectively address problems when they arise by supporting rapid understanding of operational impact, systematically evaluating response options, maintaining execution discipline, and fostering organizational learning, which improves immediate outcomes and strengthens maturity in issue management over time.

Managing Cognitive and Behavioral Biases

One of the most frequent, persistent, and underestimated sources of project underperformance lies in the systematic influence of cognitive, behavioral, and organizational biases on both estimate and decision-making processes. While all project management standards, predictive/adaptive/hybrid approaches, and governance frameworks emphasize accurate definition, rational planning, structured control, and continuous near-objective evaluations made in accordance with shared methodologies, actual project decisions are generally made by individuals and groups that operate in near-chaotic environments, under uncertainty, unavailability or inaccuracy of measures, time and management pressure, contextual constraints, and incomplete information—or, on the contrary, information overflow. Under these heavy conditions, well-documented distortions and deviations in project results are typical structural features of the project and project management environments (Flyvbjerg, 2021).

In general, cognitive biases systematically affect how information is selected, interpreted, weighted, transformed, managed, and communicated. Main cognitive biases in projects include optimism bias, planning fallacy, confirmation bias, anchoring bias, availability heuristic, overconfidence bias, hindsight bias, status quo bias, loss aversion, and sunk cost fallacy.

On the other side, behavioral and organizational biases further shape how estimates are made and decisions are proposed, justified, defended, approved or not, postponed, or reversed over time. Main behavioral and organizational biases in projects include groupthink, herding/bandwagon effect, authority bias, HiPPO effect (Highest Paid Person's Opinion), escalation of commitment, short-termism, silencing effect/fear of speaking up, blame culture bias, functional silo bias, and success bias/survivorship bias.

These mechanisms influence not only estimates of cost, schedule, and risk, but also how stakeholder signals and communications are perceived and interpreted, how corrective actions are implemented or delayed, and how the importance of early warnings is underestimated. In general, all these biases do not necessarily derive from incompetence or lack of professionalism, but they emerge and develop specifically because projects are intrinsically complex, decision-intensive, and influenced by stakeholders.

Traditional approaches to addressing bias in project management have largely relied on appeals to experience, discipline, and individual judgment. But years of research on behavior show that just being aware of bias isn't enough to get rid of it. Even experienced professionals remain vulnerable, especially when operating within organizational cultures that reward confidence, speed, and apparent decisiveness over reflective analysis and evidence-based reasoning. In this situation, generic and light suggestions to project managers to "be more objective" or "use better judgment" can't work, because, without clear ways to bring up assumptions, question dominant narratives, and back up decisions with real-world evidence, bias remains hidden and ungoverned.

AI-augmented project management introduces a fundamentally different approach by enabling systematic, continuous, and operational debiasing mechanisms. In fact, rather than attempting to eliminate bias—which is evidently neither realistic nor desirable—AI can help make bias visible, measurable, and discussable within the decision process: for instance, by grounding decisions in historical data, empirical baselines, and cross-project evidence, AI can counter optimism bias and planning fallacy by exposing how similar projects actually performed under comparable conditions; in addition, by presenting alternative interpretations, counterfactual scenarios, and probability distributions, AI can reduce anchoring effects and overconfidence, encouraging project managers and governance bodies to consider a broader range of plausible outcomes.

AI can help reduce bias at different levels of decision-making in the real world. In fact, AI can analyze historical performance distributions and compare them to the assumptions made during project estimation, initiation, and planning, which can reveal patterns of consistent underestimation and indicate when something is not adhering to the

established rules. Furthermore, AI can detect plans that repeatedly fail, decisions that take an excessive amount of time, or repeated delays in addressing issues during the course of a project. These are early indicators that a stakeholder is becoming more committed or that other stakeholders have incurred costs. Additionally, AI can contribute to the establishment of more equitable discussions regarding project governance by demonstrating the inconsistencies between stated objectives, decisions, and outcomes, as well as by elucidating the trade-offs.

In addition, a particularly relevant contribution of AI lies in its capacity to decouple decision evaluation from hierarchical dynamics and personal authority. In fact, seniority, "political" positioning, or stakeholder pressure, primarily from top management and clients, influence decisions in many, if not most, project environments. In project environments, decisions are influenced—sometimes unconsciously—by seniority, "political" positioning, or stakeholder pressure—mainly of top management and clients. By providing evidence-based assessments that are independent of individual status, AI can act as a "neutral" and "objective" reference that supports more transparent and accountable decision-making, reinforcing human responsibility by making decision rationales explicit and traceable.

Definitively, the role of AI in managing biases is not prescriptive: AI does not decide, overrule, or impose conclusions, while it enriches the decision environment by expanding visibility, exposing assumptions, and challenging dominant frames. All final decisions remain human, contextual, and value-laden, but there is the objective advantage that they are taken within a cognitive space that, in general, is more disciplined, less opaque, and more resilient to systematic distortion.

If we consider AI-enabled bias management from a governance and ethical perspective, it aligns closely with the principles of responsible project management. In fact, making biases explicit supports fairness, accountability, and transparency, especially when decisions have significant impacts on stakeholders, resources, and organizational credibility; moreover, organizations, by embedding debiasing mechanisms into everyday project practices—rather than treating them as exceptional reviews or audits—can progressively strengthen their decision-making maturity—and then their project management and organizational maturity too.

Ultimately, managing cognitive and behavioral biases represents a pillar of AI-augmented project management, since it is the connective tissue that links retrospective intelligence, forward-looking decision support, corrective action guidance, stakeholder intelligence, and early risk warning into a coherent evidence-based governance model. In fact, without addressing bias explicitly, there is the risk of limiting AI to merely a sophisticated reporting or forecasting tool, while, when bias management is effectively considered, AI becomes a genuine enabler of better judgment, better decisions, and measurably better project outcomes.

CONCLUSIONS – AI AUGMENTATION AS A CORE PROJECT MANAGEMENT CAPABILITY

This paper has argued that the persistent underperformance of projects is largely rooted in the quality of decision-making that shapes how projects are initiated, estimated, planned, implemented, controlled, and corrected over time, and that it cannot be justified just by factors such as increasing complexity, technological volatility, or methodological limitations. In fact, across diverse contexts, opinion-based decisions—often influenced by cognitive, behavioral, and organizational biases—continue to dominate critical project choices, despite decades of methodological refinement and the widespread adoption of standards and frameworks.

The transition from opinion-based to evidence-based project management therefore represents not a theoretical aspiration but a practical necessity, and, as shown throughout this paper, artificial intelligence offers a concrete opportunity to enable this shift by augmenting human judgment capacity. In fact, AI-augmented project management does not have the primary purpose of just automating routine work or delegating tasks to algorithms, but, instead, it expands the cognitive and analytical capacity of project professionals, enabling them to see better, decide better, act better, and learn better across the entire project life cycle.

By integrating retrospective intelligence, forward-looking decision support, data-driven corrective and preventive actions, stakeholder intelligence, risk early warning, and structured issue management, AI may then support a more disciplined, transparent, and anticipatory form of project governance. However, the transformational value of AI becomes most effective when its role in managing cognitive and behavioral biases is explicitly recognized, since bias management is one of the most strategic contributions of AI adoption and not just a secondary benefit of it. In fact, without addressing bias directly, AI risks being reduced to an advanced reporting or forecasting tool, while, when bias-aware decision-making is rightly placed at the center, AI becomes an effective enabler of better judgment and more resilient outcomes.

AI-augmented project management should therefore be understood as an additional capability, not merely as a technology upgrade. Its effectiveness depends not only on algorithms or data availability but also on governance arrangements, ethical principles, organizational culture, professional competence, and the inclusion of human-in-the-loop decision-making; transparency, explainability, and accountability are essential conditions for responsible adoption. Therefore, AI does not diminish human responsibility, while, on the contrary, it raises expectations regarding the quality, traceability, and justification of project decisions.

From both a professional and organizational perspective, such an approach implies a meaningful evolution in project management maturity: developing AI-augmented capabilities requires investment in data literacy, critical thinking, contextual awareness, and ethical judgment, alongside technical familiarity with AI tools. In addition, it also

requires a cultural shift: from valuing confidence over evidence, speed over reflection, and authority over analysis, toward a decision environment in which assumptions are challenged, uncertainty is explicitly addressed, and learning is systematically embedded into practice.

In conclusion, AI augmentation should be recognized as a core project management capability for organizations determined to improve decision quality, reduce bias, and achieve measurably better outcomes, thereby lowering the structural risk of total or partial project failure. The technologies are already available; the real challenge now lies in diffusing AI literacy and embedding these capabilities responsibly into governance and decision-making processes in ways that explicitly reinforce human judgment and accountability at the center of projects.

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