

Integrated Project Control Systems and Project Outcomes in AI-Driven Organizations: The Mediating Role of operational engineering with financial accounting (Focusing on Profit and Loss Statement) - Evidence from IBM

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Abstract:

This research investigates the implementation and strategic utilization of Integrated Project Control Systems (IPCS) within IBM's complex project environments, emphasizing the critical mediating role of managerial decision-making.

The study reveals that IPCS significantly enhance project outcomes by fostering transparency, improving coordination, and enabling the early detection of performance deviations, especially during AI-driven digital transformations. By establishing a robust 'digital thread' across the project lifecycle, these systems allow for a coherent interpretation of cost, schedule, and risk data. Crucially, they bridge the gap between operational engineering milestones and financial accounting standards, directly linking technical progress to the P&L statement. Beyond cost discipline, IPCS function as advanced financial governance mechanisms that ensure the auditability of AI-based decisions. This is evidenced by IBM's organizational transformation, which has demonstrated tangible impacts on cost efficiency, accuracy of results, and sustained strategic growth.

Keywords: Integrated Project Control Systems (IPCS); Digital Transformation; Operational Engineering; Cost Efficiency; IBM.

JEL Classification: M10; M11; M15; O33; D81; L25; C80; L86.

Introduction :

In line with recent organizational transformations, IBM's strategic roadmap for 2023–2030 emphasizes a shift toward the Autonomous Enterprise, where artificial intelligence, advanced analytics, and real-time data integration enable adaptive systems. Within this context, project control systems increasingly function as AI-driven decision-support mechanisms rather than traditional monitoring tools.

From a financial and accounting perspective, this shift highlights the role of integrated project control systems in enhancing cost visibility, budgetary discipline, resource allocation, and internal auditing through improved transparency and traceability.

More broadly, project management has evolved toward integrated and data-driven approaches as project complexity and uncertainty increase. Fragmented control mechanisms have shown limitations in providing coherent information for effective managerial action, prompting the emergence of integrated project control systems as strategic tools aligning cost, schedule, risk, and performance information.

Despite their growing relevance, existing research remains fragmented and predominantly quantitative, offering limited insight into how integrated control systems are interpreted and used by managers in large multinational organizations. Accordingly, this study addresses this gap by examining the direct and indirect effects of integrated project control systems on project outcomes through managerial decision-making, using a qualitative case study approach.

This study positions integrated project control systems at the intersection of project management, financial control, and AI-driven organizational transformation, thereby responding to recent calls for more process-oriented and governance-focused research in complex project environments.

Vision 2026: AI-Driven Integrated Project Control at IBM

In 2026, Integrated Project Control (IPC) systems in AI-driven organizations like IBM function as the digital "nervous system," where financial statements are not merely retrospective reports but dynamic project outcomes.

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❖ **IBM Technology Atlas**

Automation roadmap

Advancements in generative AI and code generation will transform automation across all levels, across industries.

	2024	2025	2026	2027	2029	2030+
Automation journey	Bring together business insights and IT investments.	Enhance automation with governance, audit ability and trust.	Bring efficiencies across the full application and operations lifecycle to promote self-serve.	Deliver automation that adapts to changing environments for proactive operations.	Merge business and IT to automate most of the mundane tasks.	Enable autonomous enterprises with trusted decision automation.
Strategy overview	Business observability deepens with integrated AI capabilities.	AI discovery, governance and automation become foundational.	Organizations automate observability and guardrails for visibility into risks.	Deliver adaptive automation with proactive insights and decision support.	Trusted automation augments enterprise workflows.	AI-native enterprises create dynamic decision systems.
Why this matters to our clients and the world	Enterprises save time and reduce operational complexity.	Trusted real-time automation improves productivity and economic resilience.	Organizations achieve new visibility into operations and risks.	Automation improves resilience and business continuity.	Trusted AI systems increase business efficiency.	AI-driven automation becomes a strategic necessity.
The technology or innovations that will make this possible	Operations observability and AI communication agents emerge.	Foundation models and virtual assistants accelerate workflows.	Generative AI tools and integrated analytics improve operations.	Advanced AI orchestration and autonomous systems scale.	Large foundation models and AI orchestration dominate workflows.	Intelligent reinforcement learning and autonomous agents transform enterprise operations.
How these advancements will be delivered to IBM clients and partners	Initial execution platform with transparency and observability.	IBM automation platform expands with AI governance and process discovery.	Integrated IT operations and automation platform delivers adaptive optimization.	Automation platform integrates observability and AI for predictive management.	Automation platform eliminates manual intervention across operations.	AI-enhanced decision automation systems become integrated across business processes.

Source: Adapted from IBM Technology Atlas, Automation Roadmap, Updated April 2025.

1. IPC as a Foundational Framework

At IBM, IPC systems unify data across the project lifecycle, creating a "digital thread" that connects operational engineering with financial accounting.

- ❖ **Real-Time Observability:** By 2026, IBM has integrated automated observability into its lifecycle management, providing continuous visibility into project risks and performance.

- **Predictive Resource Allocation:** Tools like watsonx.ai and IBM Engineering Lifecycle Management (ELM) allow for predictive resource allocation, automatically assessing requirements and forecasting bottlenecks before they impact the bottom line.

2. Mediating Role of Managerial Decision-Making

IPC systems enhance project outcomes by fundamentally shifting the nature of managerial oversight:

- **From Reactive to Proactive:** Managers no longer rely on static, retrospective KPIs. AI-driven IPC provides "in-the-moment" forecasting, enabling leaders to simulate the long-term impact of current decisions.
- **Strategic Augmentation:** By automating routine administrative tasks (e.g., scheduling, task delegation), AI frees managers to focus on high-level strategic reasoning and complex problem-solving.
- **Adaptive Decision Models:** In 2026, IBM's AI systems use "reflective thinking" and reasoning-focused architectures to guide managers through volatile market conditions, effectively turning every project decision into a measurable financial outcome.

3. Mediating Role of Financial Control

Financial control serves as the critical bridge between technical project milestones and the official P&L statement:

- **Dynamic Planning and Budgeting:** IBM Planning Analytics unifies business planning, allowing budgets to adjust automatically based on real-time performance and external factors like supply chain shifts.
- **Automated Financial Integrity:** AI agents now automate up to 90% of routine journal entries and reconciliations, reducing cycle times by nearly 90% and ensuring that financial statements reflect project realities with unprecedented precision.
- **Anomaly and Variance Detection:** AI-driven financial controls continuously monitor transactions to flag policy violations and budget variances instantly, allowing for corrective action before they manifest as significant losses in year-end reports.

4. Evidence from IBM (2026)

IBM's transition to an "agentic" enterprise by 2026 has shown measurable impacts:

- **Cost Efficiency:** Automation of financial workflows through watsonx Orchestrate has saved millions by reducing manual labor and shortening the time to close books.

- ♦ **Outcome Precision:** Financial executives at AI-forward organizations project a 24% improvement in forecast accuracy by 2027, largely driven by the integration of IPC and financial control systems.
- ♦ **Strategic Growth:** AI has evolved from a tool for efficiency into a "strategic engine of growth," with 95% of global executives expecting AI initiatives to be self-funding by 2026 through the value they create.
- ✧ **Research Gap**

Although project control systems have been widely examined in the project management literature, prior studies have predominantly addressed control mechanisms in isolation, such as cost control, schedule monitoring, or performance measurement tools. This fragmented perspective limits understanding of how integrated project control systems operate as a holistic managerial framework that simultaneously aligns multiple control dimensions.

Moreover, existing empirical research is largely dominated by quantitative survey-based approaches, providing limited insight into how integrated control systems are designed, implemented, and interpreted by managers within complex organizational contexts. In particular, there remains a lack of in-depth qualitative evidence explaining the mechanisms through which integrated project control systems influence project outcomes in large multinational organizations.

Despite increasing organizational complexity and project uncertainty, the literature offers insufficient empirical explanations of how integrated project control systems support managerial decision-making and contribute to project outcomes in real-world settings. Furthermore, limited attention has been given to the financial and accounting implications of integrated control systems, especially in terms of financial performance monitoring, governance, internal control alignment, and auditability within organizations undergoing AI-driven transformation.

Accordingly, this study addresses these gaps by adopting a qualitative case study approach to examine the implementation and use of integrated project control systems within IBM. By developing and applying a conceptual research model, the study seeks to provide a theory-informed understanding of how integrated control systems shape managerial decision-making and project outcomes in complex organizational environments.

✧ **Research Question**

How do integrated project control systems influence project outcomes in complex organizational settings, particularly through managerial decision-making, and with what financial implications?

✧ **Sub-Research Questions**

- ♦ **SRQ1:** How are integrated project control systems designed and implemented within large organizations undergoing digital and AI-driven transformation, such as IBM?
- ♦ **SRQ2:** How do integrated project control systems shape managerial decision-making processes in complex projects?
- ♦ **SRQ3:** To what extent do integrated project control systems and managerial decision-making contribute to improved project outcomes, including financial performance, control effectiveness, and governance quality?

✧ **Research Propositions**

- ♦ **P1:** Integrated project control systems have a positive influence on overall project outcomes in complex organizational environments.
- ♦ **P2:** Integrated project control systems positively influence managerial decision-making by enhancing information integration, transparency, and control coherence within complex projects.
- ♦ **P3:** Managerial decision-making mediates the relationship between integrated project control systems and project outcomes, including improvements in financial performance, control effectiveness, and governance quality.

✧ **Conceptual Research Model**

This study advances a refined conceptual research model that explains how Integrated Project Control Systems (IPCS) influence Project Outcomes in complex organizational environments, both directly and indirectly through Managerial Decision-Making. The model is grounded in the assumption that project control systems create value not merely through performance monitoring, but through their capacity to structure information flows and shape managerial judgment.

Within this framework, IPCS are conceptualized as a multidimensional construct integrating cost control, schedule monitoring, risk management, performance measurement, and integrated reporting mechanisms. The effective alignment of these control dimensions enhances transparency, coordination, and information coherence across projects, enabling a holistic assessment of project performance.

Managerial decision-making occupies a central mediating position in the model. Integrated control information supports managers' ability to interpret complex project signals, evaluate trade-offs across performance dimensions,

and implement timely corrective actions. Through this processual mechanism, control integration is translated into improved execution quality and governance effectiveness.

Project outcomes represent the dependent construct and extend beyond operational indicators to include financial performance, control effectiveness, and governance quality. Accordingly, the model aligns with the study's research propositions by explicitly linking IPCS to project outcomes through both direct effects and indirect effects mediated by managerial decision-making.

✧ **Studies Related to SRQ1 (How are integrated project control systems designed and implemented within complex organizational environments?)**

Regarding SRQ1, the reviewed studies collectively emphasize that integrated project control systems are not merely technical tools, but multi-dimensional organizational systems. Prior research defines integrated PCS as a coordinated combination of cost, schedule, risk, and performance controls, designed to operate within a unified framework. Studies focusing on large and complex projects highlight that effective IPCS implementation depends on organizational alignment, communication mechanisms, and structural support. Common challenges identified in the literature include fragmentation, lack of coordination, and misalignment between control components. These insights provide a foundation for understanding how IPCS are designed and enacted in practice, thereby informing the present study's examination of control integration within a complex organizational context such as IBM. (Lee, 2022)(al, 2023)

✧ **Studies Related to SRQ2 (How do integrated project control systems shape managerial decision-making processes in complex projects?)**

Regarding SRQ2, the literature consistently indicates that integrated project control systems play a critical role in shaping managerial decision-making by enhancing information visibility, consistency, and timeliness. Prior studies show that integrated performance metrics, dashboards, and digital reporting tools enable managers to better interpret project conditions, assess trade-offs across cost, schedule, and risk dimensions, and respond proactively to emerging issues. By reducing information fragmentation and improving coordination among control mechanisms, IPCS contribute to higher decision quality, particularly in complex and uncertain project environments. These findings directly support the study's focus on managerial decision-making as a central mechanism through which

integrated control systems influence project outcomes.(Zhao, 2021) (Kumar, 2020)

✧ **Studies Related to SRQ3 (To what extent do integrated project control systems and managerial decision-making contribute to improved project outcomes, including financial performance, control effectiveness, and governance quality?)**

Regarding SRQ3, prior research provides strong evidence that managerial decision-making acts as a mediating mechanism between integrated project control systems and project outcomes. Studies adopting mediation perspectives demonstrate that the performance effects of control systems are realized not only through technical monitoring, but through how managers interpret integrated control information and translate it into action. Integrated control systems influence project outcomes by shaping decisions related to cost control, schedule adjustments, risk responses, and quality management. This stream of literature directly informs the present study by supporting the proposition that managerial decision-making mediates the relationship between IPCS and project outcomes, including financial performance, control effectiveness, and governance quality. (Silva, 2019) (Al-Harthy, 2022)

Table 1. Overview of Key Studies Informing the Research Questions

Study	Journal	Year	Focus	Contribution
A	Intl. Journal of PM	2022	Conceptual Integrated PCS	Identifies Key components of PCS integration
B	PM Journal	2023	Case insights on implementation	Highlights organizational factors
C	J Management in Eng	2021	Performance measurement	Shows decision support
D	Intl. Journal of PM	2020	Digital integration	Digital tools → decisions
E	Journal of Project Research	2019	Mediation analysis	Examines links between decision processes and project outcomes
F	Engineering Mgmt Journal	2022	PCS → outcomes	Integrated models linking PCS and decision-making

Source: Prepared by the researchers based on the foregoing

✧ **Key Insights from Literature Synthesis**

➤ **Regarding SRQ1:**

- ◆ Integrated PCS are **multi-dimensional systems**, not isolated tools.
- ◆ Design depends on organizational alignment and communication.

➤ **Regarding SRQ2:**

- ◆ Integrated metrics dashboards and digital tools significantly **improve managerial decision-making quality**.
- ◆ Performance measurement plays a central role.

➤ **Regarding SRQ3:**

- ◆ Decision-making mechanisms **mediate positively** between PCS and outcomes.
- ◆ Decision effectiveness enhances cost, schedule, and quality results.

2. Literature Review

From a financial control and management accounting perspective, integrated project control systems extend beyond operational coordination to support cost control, performance measurement, and budgetary accountability across projects. Prior research increasingly acknowledges that the integration of project control mechanisms enhances the reliability of financial information used for managerial decision-making.

In addition, integrated project control systems contribute to internal auditing by strengthening control consistency, documentation quality, and audit trails. This alignment facilitates more effective internal audit activities, particularly in large and complex organizations, where project-level controls represent a critical component of organizational governance.

2.1 Project Control Systems in Contemporary Project Management

Integrated project control systems are increasingly conceptualized as strategic organizational mechanisms rather than merely administrative tools for tracking cost and schedule performance.

“Project control systems are most effective when control mechanisms are aligned and coordinated rather than applied independently”. (Hollander, 1978)

This perspective highlights that the real value of control systems emerges not from isolated functions, but from **the integration of multiple control dimensions**. Such integration forms the basis of a comprehensive understanding of project performance, where cost, schedule, risk, and quality data collectively inform managerial actions. This analysis suggests that the

shift toward an integrated view reflects the evolving complexity of modern projects, where fragmented control often leads to conflicting signals and suboptimal decisions. Therefore, project control must be understood as a coordinated system that supports strategic decision-making in dynamic environments.

However, much of the existing literature implicitly assumes that integration naturally leads to better outcomes, without sufficiently examining how such integration is actually interpreted and operationalized by project managers in practice.

2.2 Integrated Project Control Systems: Concept and Components

Contemporary definitions of integrated project control systems emphasize their multidimensional nature, incorporating cost, schedule, risk, and performance measurement under a unified framework.

“Integration of cost, schedule, and risk controls is essential to provide a coherent view of project performance”. (Seddiki, 2025)

This underscores that integration goes beyond technical linkage — it involves synthesizing project data so that managers can evaluate trade-offs across performance domains. In my interpretation, this integration serves two purposes: first, it enhances **visibility across multiple performance measures**, and second, it creates a **common operational language** for stakeholders. This supports a collective understanding of project health, which is essential in complex projects where decisions must balance competing demands.

2.3 Design and Implementation of Integrated Project Control Systems

The implementation of integrated project control systems is not instantaneous; rather, it evolves through iterative refinement and organizational adaptation.

“Project control evolves through successive refinements, driven by organizational learning and adaptation”.(Ward, 2012)

Although this idea originates from earlier literature, it remains relevant as recent research continues to show that integration often emerges through practice rather than by design. My critical reading suggests that organizations frequently begin with discrete control tools and progressively integrate them as project complexity increases. This evolution reflects the need for **contextual alignment and organizational support structures**, such as centralized governance or standardized reporting mechanisms, which foster the consistency and reliability necessary for effective integration.

2.4 Integrated Project Control Systems and Managerial Decision-Making

One of the key advantages of integrated project control systems is their capacity to support managerial decision-making by enhancing information quality and interconnectivity.

“Integrating performance metrics into a unified dashboard enables better decision-making by providing real-time insights into project health”. (Institute, 2020)

From my perspective, this reflects a fundamental shift where control systems function as **decision-support infrastructures**, not just monitoring tools. The synthesis of performance indicators into a cohesive interface allows managers to assess implications across cost, schedule, and risk dimensions, thereby supporting more informed and timely decisions. This elevates the role of project control from reporting status to **guiding strategic choices**.

Despite these acknowledged benefits, prior studies rarely explore the cognitive processes through which managers translate integrated information into concrete decisions, leaving a critical gap in understanding the decision-making mechanism itself.

2.5 Project Outcomes and the Role of Control Integration

Integrated project control systems are strongly associated with improved project outcomes, particularly when they enhance coordination and managerial execution.

“Projects that employ integrated control approaches tend to achieve better cost performance, schedule adherence, and overall stakeholder satisfaction”. (Kerzner, 2019)

My analytical interpretation of this evidence is that integration facilitates **anticipatory action** — where managers can identify and respond to deviations before they escalate. This proactive competence is what differentiates integrated control systems from traditional ones, as it enables a **systemic understanding of performance interdependencies** rather than isolated problem fixes. In complex organizational projects, such foresight is crucial for sustaining performance across multiple dimensions.

2.6 Managerial Decision-Making as a Mediating Mechanism

While control systems directly influence performance, their indirect influence — through decision-making — is arguably more significant.

“The mediating effect of managerial decision-making is a key mechanism through which integrated systems impact project outcomes”. (Fernandes, 2019)

From a conceptual perspective, this assertion clarifies that integrated control systems do not affect outcomes as mere instruments but through **cognitive and behavioral pathways**. It is the manager’s interpretation and subsequent choice that translate integrated information into effective actions. Recognizing this mediating role sharpens the theoretical contribution of the current study by highlighting the **process through which control integration generates project value**.

2.7 Synthesis of Literature and Research Gap

Taken together, existing studies emphasize the conceptual value of integrated project control systems and their potential benefits. However, a closer examination reveals that much of the literature either remains **fragmented across control dimensions** or relies heavily on quantitative methods, limiting insight into the **qualitative mechanisms** by which integration supports managerial decision-making and performance outcomes.

Moreover, empirical evidence derived from in-depth qualitative investigations within large multinational organizations remains notably limited. Existing studies seldom capture how integrated project control systems are enacted in everyday managerial practice, particularly in complex organizational contexts such as IBM. This gap provides a strong justification for the present qualitative case study, which seeks to uncover how integrated control systems are interpreted, utilized, and leveraged as strategic decision-support mechanisms influencing managerial decision-making and project outcomes.

3. Research Methodology

This study adopts a qualitative case study design to examine how Integrated Project Control Systems (IPCS) support managerial decision-making and influence project outcomes within complex organizational settings. A qualitative approach is particularly suitable for this research as it enables an in-depth understanding of control practices, managerial interpretations, and decision-making processes that cannot be fully captured through quantitative methods.

IBM was selected as the empirical case using a purposeful sampling strategy, given its position as a large multinational technology firm characterized by advanced project control practices, high project complexity, and ongoing digital and AI-driven transformation. This context provides a rich and relevant setting for examining the strategic,

financial, and governance implications of integrated project control systems.

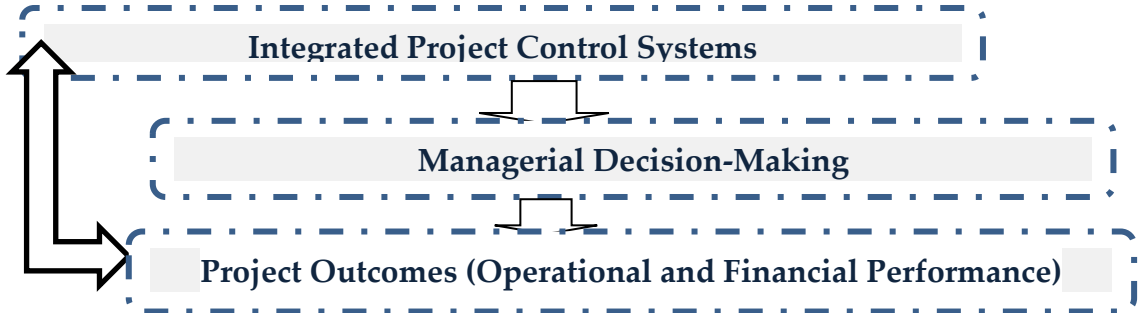
Data were collected from multiple qualitative sources, including semi-structured interviews with project managers and control specialists, internal project documentation, and organizational control and reporting materials. The use of multiple data sources enabled triangulation and enhanced the credibility and robustness of the findings.

Data analysis followed a thematic analysis approach, involving systematic coding and iterative interpretation of patterns related to control integration, managerial decision-making, and project outcomes. The analysis was guided by the study's conceptual framework, allowing for a theory-informed interpretation of the empirical evidence.

To ensure methodological rigor, the study employed data triangulation, maintained a transparent audit trail throughout the research process, and adhered to ethical research principles, including informed consent, confidentiality, and responsible handling of organizational data.

4. Conceptual Model and Research Propositions

Figure 1. Conceptual model of the study



Source: Prepared by the researchers based on the foregoing

Figure 1 illustrates the conceptual model linking Integrated Project Control Systems, managerial decision-making, and project outcomes. The study proposes a unified conceptual framework explaining how Integrated Project Control Systems (IPCS) influence project outcomes in complex organizational environments, both directly and indirectly through managerial decision-making.

The model is grounded in the assumption that contemporary project control systems, particularly within digitally transforming organizations, create value not only through performance monitoring but also by shaping

managerial interpretation, judgment, and response to dynamic project conditions.

Within this framework, Integrated Project Control Systems are conceptualized as a multidimensional construct that integrates cost control, schedule monitoring, risk management, performance measurement, and integrated financial and non-financial reporting into a coherent control architecture. Such integration enhances transparency, information consistency, and coordination, thereby supporting both operational control and financial accountability.

Managerial decision-making occupies a central mediating role in the model. Rather than being treated as a passive outcome of control information, decision-making is conceptualized as an active cognitive and organizational process through which integrated control data are interpreted, prioritized, and translated into strategic and operational actions. This process enables managers to assess trade-offs across cost, time, risk, and performance dimensions, anticipate deviations, and implement timely corrective measures.

Project outcomes constitute the dependent construct and extend beyond traditional operational indicators to include financial performance, control effectiveness, and governance quality. The model assumes that IPCS influence project outcomes both directly—through improved coordination, transparency, and control coherence—and indirectly, by strengthening managerial decision-making processes that guide project execution and financial discipline.

By explicitly integrating managerial decision-making as a mediating mechanism, this model moves beyond static control–performance relationships and offers a dynamic, process-oriented explanation of how control integration generates project value.

Based on this conceptualization, the study advances the following research propositions:

P1: Integrated project control systems have a positive influence on overall project outcomes in complex organizational environments.

P2: Integrated project control systems positively influence managerial decision-making by enhancing information integration, transparency, and control coherence within complex projects.

P3: Managerial decision-making mediates the relationship between integrated project control systems and project outcomes, including improvements in financial performance, control effectiveness, and governance quality.

5. Discussion

This study examined how integrated project control systems influence project outcomes, with particular emphasis on the mediating role of managerial decision-making in complex organizational environments. Overall, the findings provide strong support for the proposed conceptual model and offer insight into the mechanisms through which control integration contributes to project performance.

The results indicate that integrated project control systems positively influence project outcomes by enhancing transparency, coordination, and control coherence across project activities. By integrating cost, schedule, risk, and performance information, such systems provide a holistic and consistent view of project status, enabling organizations to identify deviations early and respond more effectively to emerging challenges. This integrated visibility supports improved cost efficiency, schedule adherence, and overall project performance.

More importantly, the findings demonstrate that integrated project control systems positively shape managerial decision-making. When project information is presented in an integrated and timely manner, managers are better equipped to interpret project conditions, evaluate trade-offs across performance dimensions, and prioritize corrective actions under uncertainty. In this sense, control integration functions not only as a coordination mechanism but also as a cognitive and organizational support that enhances decision quality.

The analysis further confirms that managerial decision-making plays a central mediating role in the relationship between integrated project control systems and project outcomes. While integrated control systems exert a direct influence through improved transparency and coordination, a substantial portion of their impact is realized through enhanced managerial judgment and action. This finding represents a key theoretical contribution by emphasizing the processual role of decision-making in translating integrated control information into improved project outcomes.

From a financial and governance perspective, the findings suggest that integrated project control systems strengthen cost transparency, budgetary discipline, and auditability by providing consistent and traceable project data. In AI-driven organizations such as IBM, this integration supports stronger financial governance and more effective alignment between project-level decisions and organizational objectives.

Taken together, these findings contribute to the project management literature by clarifying how and why integrated project control systems improve project outcomes and by highlighting managerial decision-making as a critical yet underexplored mediating mechanism. Practically, the results imply that organizations should complement the technical implementation of integrated control systems with managerial capabilities that support the effective interpretation and use of integrated project information.

Conclusion:

This study examined how Integrated Project Control (IPC) systems influence project outcomes in complex, AI-driven organizational environments, with a particular focus on the mediating roles of managerial decision-making and financial control. Drawing on a qualitative case study of IBM in 2026, the findings provide empirical support for the proposed research propositions and highlight how IPC systems function as a digital “nervous system,” transforming project oversight into dynamic, real-time management.

The results indicate that IPC systems positively influence project outcomes (supporting P1) by enhancing transparency, coordination, and control coherence across operational and financial dimensions. AI-enabled tools such as watsonx.ai and IBM Engineering Lifecycle Management allow predictive resource allocation, continuous observability, and adaptive decision-making, enhancing managerial effectiveness and strategic foresight (supporting P2). Furthermore, managerial decision-making and financial control act as key mechanisms mediating the relationship between IPC systems and project outcomes, including improvements in financial performance, control effectiveness, and governance quality (supporting P3).

Theoretically, this study extends project management literature by positioning managerial decision-making and financial control as central mechanisms through which IPC systems achieve their impact, moving beyond the view of control systems as merely technical instruments. Practically, organizations can leverage AI-driven IPC to automate routine workflows, enable dynamic planning and budgeting, and detect anomalies in real time, improving cost efficiency, forecast precision, and strategic growth.

Despite the single-case limitation, the findings provide qualitative evidence that effective IPC depends not only on technological sophistication but also on its capacity to guide strategic managerial judgment and ensure financial governance in complex AI-driven projects. Overall, the study reinforces that integrated project control systems are most valuable when they combine technological integration with decision and governance mechanisms to drive measurable project success.

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