

Temporal Compression and Governance Failure in Integrated Portfolio Management: A Case Study

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Abstract. When a heavyweight Integrated Product Development (IPD) system is transplanted into a fast-paced consumer electronics (3C) environment, "temporal compression"—a sheer physical conflict between sequential gate reviews and a compressed product lifecycle—emerges as a critical boundary condition that triggers means-ends decoupling and, ultimately, "governance regression": the collapse of collective portfolio governance into hierarchical executive fiat. Through an exploratory single-case study of Firm E, a clean energy firm expanding into the 3C sector, this study maps how compressed timelines reshape the formal Integrated Portfolio Management System (IPMS). Under such constraints, the IPMS incentivizes agents to engage in strategic information manipulation and ceremonial compliance. This creates a "governance blind spot" in which the Integrated Portfolio Management Team (IPMT) loses its abandonment option. As a result, the organization reverts to inefficient, centralized decision-making. To counter this regression, the paper proposes a structural compensation mechanism grounded in real options reasoning (ROR), combining strategic modularity with risk-contingency funding. Theoretically, the study extends institutional decoupling theory by identifying temporal compression as a structural antecedent of decoupling and integrates ROR into the principal-agent framework. Practically, it offers managers an actionable logic for restoring collective accountability and strategic flexibility when governing innovation under severe time pressure.

Keywords: Temporal Compression, Strategic Information Manipulation, Means-Ends Decoupling, Real Options Reasoning, Project Governance

1. Introduction

In high-technology industries, organizational agility often conflicts with the rigidity of formal innovation governance [1]. To manage complex product lifecycles and mitigate R&D risks, many enterprises adopt heavyweight frameworks, such as the Integrated Product Development (IPD) system and its governance mechanism, the Integrated Portfolio Management System (IPMS), which rely on sequential gate reviews and collective decision-making by an Integrated Portfolio Management Team (IPMT) [2]. Such frameworks were designed for long-cycle environments, yet when firms enter the fast-paced Consumer Electronics (3C) sector, they encounter a sheer conflict in industry rhythm. This study examines how this conflict—conceptualized as "Temporal Compression"—induces governance failure. Specifically, it asks two questions: how does extreme

temporal compression trigger institutional decoupling and exacerbate agency costs in transplanted R&D governance systems [3]; and how can organizations restructure IPMT governance to restore strategic flexibility?

To address these questions, this study adopts an exploratory single-case design, drawing on Case Firm E, a clean energy firm expanding into the 3C sector, and mapping how its transplanted IPD process behaves under compressed timelines [4, 5]. Theoretically, the study extends institutional decoupling and principal-agent theory by establishing temporal compression as a structural antecedent of means-ends decoupling, showing how physical timeline constraints, rather than purely opportunistic intent, drive symbolic compliance. Practically, it integrates real options reasoning into governance redesign, offering an actionable logic for restoring collective accountability and strategic flexibility when firms govern innovation under severe time pressure.

2. Literature review and theoretical framework

2.1. IPD/IPMS governance and organizational adaptation

The Integrated Product Development (IPD) system and its governing Integrated Portfolio Management System (IPMS) are heavyweight frameworks built around sequential gate reviews and collective decision-making by an Integrated Portfolio Management Team (IPMT), and were originally optimized for long-cycle, capital-intensive industries where deliberation outweighs speed [2]. Their effectiveness, however, depends on an organization's absorptive capacity to assimilate and recontextualize such transplanted routines [6]. When a firm extends an IPD/IPMS regime designed for slow-clock businesses into the fast-paced 3C sector, the gating cadence collides with a compressed product lifecycle, producing a structural mismatch between formal governance rhythm and operational rhythm. This tension is precisely what Case Firm E exhibits: an IPD system that functioned well in its energy business becomes a source of friction once applied to 3C, motivating a closer look at why the same structure governs effectively in one rhythm and fails in another.

2.2. Agency conflict and strategic information manipulation

The principal-agent framework provides the foundational lens for understanding goal incongruence and information asymmetry between cross-functional R&D teams (agents) and portfolio management boards (principals). Within an IPMT setting, this principal-agent relation is collective rather than dyadic: the IPMT acts as a multi-stakeholder principal that authorizes funding and retains the option to terminate projects, while product development and go-to-market teams act as agents whose performance is judged on time-to-market and gate passage [7]. Because the IPMT relies almost entirely on agent-supplied reports to evaluate project health, it is structurally vulnerable to ex-post moral hazard [7]. This competitive dynamic frequently incentivizes "strategic information manipulation," a phenomenon wherein R&D teams intentionally filter, soften, or delay the disclosure of negative technical or financial information to avoid project termination. Temporal compression sharpens this incentive: when the available window between gate reviews shrinks below the time physically required to validate technical or supply-chain risks, agents cannot resolve those risks before reporting, so disclosing them would only stall an already impossible schedule [8]. Time pressure thus converts information asymmetry from a latent condition into an active driver of strategic risk softening—a link this study traces empirically through Firm E's supply-chain crisis.

2.3. Institutional decoupling and temporal compression

Recent organizational theory distinguishes "policy-practice decoupling" from "means-ends decoupling" [3]. In policy-practice decoupling, a formal policy is adopted on paper but not implemented in practice—for instance, firms announcing stock-repurchase programs that are never executed or adopting quality codes that frontline routines ignore [9]. Means-ends decoupling is subtler: policies are genuinely implemented and activities are performed, yet they remain disconnected from the substantive outcomes they are meant to achieve, as documented in industrial R&D projects where mandated review procedures are followed without improving actual risk control [10]. This study focuses on the latter, because in Firm E the IPD gates are not skipped—they are dutifully executed—yet they fail to deliver genuine portfolio oversight. This decoupling is often exacerbated by a lack of "absorptive capacity", as the organization fails to assimilate and contextualize the imported governance mechanisms. Building on this, the present study argues that temporal compression is itself a structural antecedent of means-ends decoupling: when the formal process demands activities that cannot be completed within the physically available time, agents preserve schedule compliance by performing the procedure ceremonially while detaching it from its risk-management purpose. In this view, decoupling is less an act of opportunism than a rational response to an impossible timeline—a connection that remains underexplored in the decoupling literature and that this study seeks to make explicit.

2.4. Real Options Reasoning (ROR) and governance flexibility

When outcome control exacerbates strategic manipulation under high uncertainty, control theory suggests a shift toward granular process control [11, 12]. To manage the extreme uncertainty of R&D portfolios, scholars advocate for Real Options Reasoning (ROR), which equips decision-makers with the strategic flexibility to defer, abandon, or stage investments. At its core, ROR treats an uncertain project not as a fixed commitment but as a bundle of options whose value rises with uncertainty, because the firm can act on favorable information while limiting downside exposure [13]. Three option types are central to portfolio governance: the deferral option, which preserves the right to delay commitment until information improves; the staging (growth) option, which breaks investment into sequential, conditional tranches; and the abandonment option, which preserves the right to terminate a failing project and recover residual value [14]. Existing ROR research, however, largely treats these options as financial-evaluation devices for selecting or sequencing projects, and assumes the principal possesses reliable information to exercise them. It says little about how options operate when information itself is strategically distorted, or when severe time pressure removes the slack that deferral and staging presuppose. This gap is precisely where temporal compression and agency conflict intersect and where this study locates its contribution.

2.5. Research gap and theoretical framework

While existing literature independently addresses these theories, there is a critical dearth of research exploring their intersection under the boundary condition of extreme "temporal compression." Three specific gaps follow. First, institutional theory has established what means-ends decoupling looks like and that absorptive-capacity shortfalls aggravate it [3, 6], but it has paid little attention to how temporal compression causes means-ends decoupling—that is, how a sheer physical conflict between gating cadence and product lifecycle, rather than weak commitment or opportunism, can structurally generate symbolic compliance. Second, agency research documents strategic

information manipulation in R&D portfolios [8] and decoupling research documents ceremonial compliance [1], yet the mechanism connecting them remains unclear: how time pressure propagates from information manipulation through means-ends decoupling to a regression in collective governance has not been traced as a single causal chain. Third, ROR offers deferral, staging, and abandonment options as responses to uncertainty [13, 14], yet few studies have proposed an ROR-based structural compensation mechanism for the governance failures that temporal compression produces—leaving relatively open how risk-contingency instruments might restore the abandonment option once it has been eroded. Taken together, these three gaps motivate the present study: temporal compression is the common origin, decoupling and manipulation are its governance consequences, and an ROR-based mechanism is the proposed remedy, integrating the three literatures into a single explanatory and prescriptive framework.

3. Case study and findings

3.1. Research design and case selection

This study adopts an exploratory single-case study design. While single-case studies are occasionally scrutinized for their generalizability, they are exceptionally powerful for theory-building, particularly when the selected case possesses a "revelatory nature" [4, 5]. Following the "talking pig" rationale—which argues that a single anomalous case is sufficient to challenge existing paradigms [15]—Case Firm E serves as an ideal empirical setting. Firm E successfully operationalized the rigorous, heavyweight IPD system in its traditional energy sector; however, the exact same governance structure dramatically collapsed when applied to the 3C division. This internal variance within a single corporate entity provides a rare, quasi-experimental environment to isolate the impact of "temporal compression" on formal governance structures.

3.2. Data collection and analysis

To ensure construct validity and reliability, data collection relied on rigorous triangulation across multiple, independent sources spanning an 8-month observational period. The primary data streams included archival records, in-depth analysis of formal IPD and IPMS workflow diagrams, and internal governance documentation (e.g., project meeting minutes documenting critical bottlenecks and chronic prototype delivery failures), complemented by semi-structured interviews with key informants across hierarchical levels. Data analysis followed a systematic, inductive approach consistent with grounded theory techniques: the empirical evidence was continuously compared against the formal institutional mandates (IPD guidelines) to identify deviations, and the qualitative data were iteratively coded until theoretical saturation was achieved—the point at which no new structural insights regarding information manipulation or decoupling emerged.

3.3. Case overview: governance misalignment in Firm E

Case Firm E has historically relied on a robust IPMS framework adapted from industry best practices to govern its large-scale operations. However, the introduction of the 3C business line exposed critical vulnerabilities in this centralized model. The highly dynamic nature of 3C markets demands rapid iteration, creating immediate friction with the sequential, heavyweight gate reviews established by the IPMT.

3.4. Strategic information manipulation and governance blind spots

3.4.1. Case illustration: the "hidden" supply chain crisis

During the development phase, a sudden surge in semiconductor prices significantly inflated the Bill of Materials (BOM) cost, effectively eroding the product's projected competitive advantage. Empirical evidence from the PMO's internal records indicates that while the front-end market teams reported extreme price sensitivity and potential loss of market share, the formal reports submitted to the Integrated Portfolio Management Team (IPMT) for gate approval remained "cautiously optimistic." The technical risks and supply chain bottlenecks, which were explicitly discussed in informal "pre-meetings," were systematically "softened" in the official dossier.

To visualize this governance friction, Figure 1 illustrates the cross-functional information distortion map. It highlights the specific nodes where critical supply chain warnings were filtered out before reaching the IPMT level, substituting data-driven risk alerts with aesthetic, process-compliant documents.

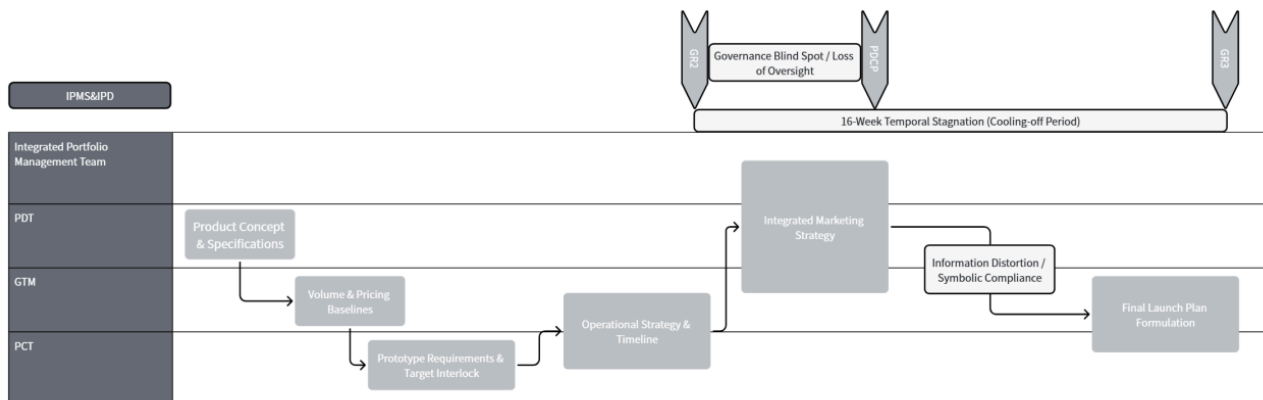


Figure 1. The cross-functional information distortion map: tracing strategic risk softening from frontline teams to the IPMT

Note: Visualizes the informal communication pathways across PDT and GTM swimlanes where negative technical and cost data are intercepted. The prolonged 16-week stagnation in the uppermost IPMT swimlane explicitly illustrates the resulting "Governance Blind Spot" where senior oversight is effectively neutralized.

Consequently, the IPMT—acting as the principal investor—was presented with a distorted reality that failed to reflect the true magnitude of the cost-competitiveness gap.

3.4.2. Theoretical deconstruction: moral hazard and information filtering

This phenomenon exemplifies ex-post moral hazard and strategic information manipulation within the principal-agent framework [7, 8]. The agents (PDT members) are often evaluated based on "Time-to-Market" and "Successful Gate Passage" as part of their organizational performance indicators. To mitigate potential penalization and protect individual performance metrics, agents engage in strategic risk softening—a process wherein critical negative information is systematically filtered or diluted to ensure the project secures continued funding and resource allocation.

3.4.3. Governance consequence: escalation of commitment and loss of the abandonment option

Deprived of high-fidelity data, the IPMT fundamentally loses its abandonment option—the strategic flexibility to terminate projects misaligned with corporate objectives [13, 14]. Consequently, the organization falls into an escalation of commitment (or sunk cost fallacy), compelling decision-makers to commercialize suboptimal products merely to recoup initial investments.

3.5. Means-ends decoupling and symbolic compliance

3.5.1. Stagnation at GR2 and GR3: a quantitative proxy for decoupling

The empirical data reveal a significant temporal anomaly at the GR2 and GR3 checkpoints, where projects frequently experience protracted stagnation. This results in a "renegotiation buffer" where marketing teams engage in ceremonial compliance and symbolic management [9]—refining and curating marketing materials not to reflect operational realities, but rather to satisfy the administrative criteria requisite for gate approval.

This decoupling phenomenon is most vividly demonstrated through the systematic downward adjustment of sales forecasts between gate checkpoints. Because the Global-to-Market (GTM) function is forced to provide volume commitments at GR2 before conducting rigorous market validation, these initial targets are often drastically inflated to secure IPMT approval. Table 1 presents the quantitative proxy for this decoupling behavior during a recent flagship 3C product launch.

Table 1. Quantitative proxy for means-ends decoupling: sales forecast variance

Checkpoint	Metric	Value
GR2 (Concept/Design)	Initial Volume Commitment	42,670 units
GR3 (Strategy/Readiness)	Adjusted Volume	21,700 units
Variance	Total Target Reduction	-20,970 units

As shown in Table 1, the initial volume commitment established at GR2 was 42,670 units. However, by the GR3 node, the GTM team drastically reduced this target by 20,970 units, finalizing the operational forecast at a mere 21,700 units. This staggering target reduction confirms that the GR2 node was functioning as an "empty-run" (substantively hollow execution), where commitments were completely disconnected from market reality simply to fulfill the procedural requirements of the IPMS.

3.5.2. Temporal compression: the 3C industry rhythm as a catalyst for decoupling

The research finds that the industry rhythm of 3C products acts as a dual-edged sword that accelerates this institutional decoupling. The structural misalignment between the rigid IPD phases and the rapid physical lifecycle of 3C products creates extreme temporal bottlenecks, as illustrated in Figure 2.

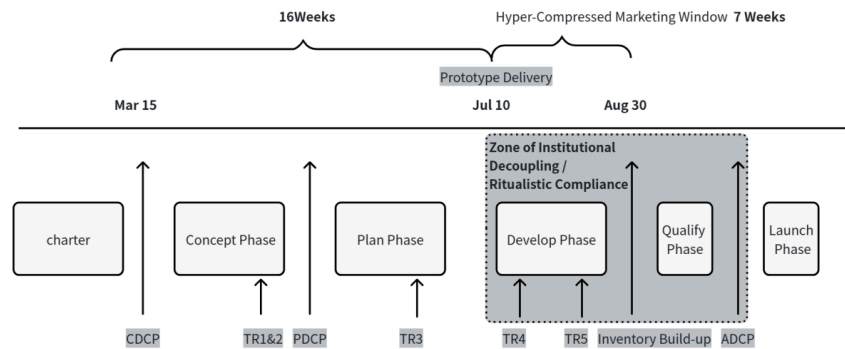


Figure 2. Empirical timeline of a 3C product launch (March 15 to August 30)

Note: This figure maps the standard IPD technical review nodes against the physical calendar. It explicitly highlights the extreme temporal compression where prototype delivery in July and stock preparation are aggressively squeezed into a 7-week window before the August 30 launch, triggering systemic decoupling.

In the case of Firm E, the empirical timeline of a flagship 3C product spans a mere 5.5 months from the initial Concept Phase (March 15) to the final Launch Phase (August 30). Critically, the gap between Prototype Delivery (occurring around July 10) and the final inventory build-up (August 30) is aggressively compressed into an approximately 7-week window. The formal IPMS process requires marketing material scheduling that is physically impossible to execute within this narrow timeframe. Consequently, cross-functional teams are forced into a "compliance paradox": they must engage in ritualistic box-ticking to maintain the launch schedule, even though the physical lack of mature prototypes makes high-quality market validation impossible.

3.5.3. Governance implication: blind spots and the erosion of procedural legitimacy

Because decoupling serves as a defensive mechanism for agents to navigate unrealistic gate requirements, the formal signals generated by the IPMS lose their predictive validity and diagnostic power. When the process cannot resolve the friction created by its own decoupling, the organization is forced to regress to a centralized executive control model.

3.6. Governance regression: from process rules to hierarchical fiat

3.6.1. Case illustration: crisis-driven escalation as a governance shortcut

Rather than resolving the trade-off through formal portfolio rules, the decision is escalated to a superior (+1 decision-maker) through a mechanism of defensive escalation. The executive is essentially asked to internalize the liability for the failure, thereby transforming a rule-based strategic decision into an executive fiat, bypassing the formal accountability of the IPMS.

3.6.2. Theoretical deconstruction: responsibility diffusion and hierarchical regression

When the formal process lacks a "safe harbor" for managers to make difficult trade-offs, the agents engage in defensive escalation. This phenomenon triggers a structural hierarchical regression: the organization defaults to a traditional command-and-control paradigm, primarily because the transplanted formal governance framework lacks the requisite cultural and institutional "trust buffers" to process suboptimal outcomes [6].

3.6.3. Governance impact: the erosion of professional management and strategic focus

Middle managers lose their "management muscles" regarding conflict resolution and strategic trade-offs, shifting their focus from process optimization to upward management. The executive layer (the IPMT) becomes increasingly bogged down by tactical, operational firefighting rather than focusing on long-term portfolio strategy.

4. Mechanism design and discussion

4.1. Governance optimization mechanism under temporal compression

The findings reveal a critical absorptive-capacity gap in Case Firm E [6], in which the lack of localized IPMS expertise amplified the governance failures traced above. Building directly on the three pathologies identified in the case—temporal compression, strategic information manipulation, and means-ends decoupling—this section proposes a reusable, three-part compensation mechanism that shifts governance from macro-level outcome control toward granular process control, procedural streamlining, and real-options flexibility.

First, mitigating information manipulation through granular process control. To curb strategic risk softening, the governance paradigm is shifted from macro-level outcome control to rigorous, granular process control [11, 12]. Two instruments operationalize this shift. Front-loading cross-functional anchoring mandates GTM's deep participation at the earlier Charter and Concept Decision checkpoints to actively estimate and lock in sales-volume baselines before incentives to inflate them take hold. High-frequency, process-oriented auditing replaces traditional heavy-weight monthly reviews with a micro-level work-package tracking system, moving the control mechanism from a purely result-based assessment toward continuous process-oriented auditing that leaves less room for late-stage information filtering.

Second, resolving means-ends decoupling through procedural streamlining. A primary structural driver of the decoupling observed in Firm E was the severe misalignment between the R&D execution timeline (IPD) and the marketing milestone timeline (IPMS); workflow analysis revealed a protracted 16-week gap between GR2 and GR3 that pushed the project into a "cooling-off period," dissolving operational momentum and fostering ceremonial compliance. The proposed remedy restructures the IPMS and IPD frameworks into a state of strategic modularity—interlocked at critical milestones yet procedurally decoupled in execution. By excising decision nodes that were consistently subject to substantively hollow execution [3, 10], the organization minimizes the administrative incentives for symbolic management.

Third, restoring strategic flexibility via real options reasoning. Implementing a "risk reserve" (risk-contingency fund) at the IPMT level represents a strategic transition toward real options reasoning in portfolio governance [13, 14]. This directly addresses the temporal-compression dilemma: the extreme compression of the 3C industry—the 7-week window between late-stage prototype delivery and launch readiness—renders traditional, sequential go-to-market strategies mathematically impossible. The Risk Reserve functions as a formal deferral option for the IPMT, providing predefined financial flexibility to execute rapid mitigation strategies that compensate for early-stage information gaps and prototype delays, effectively restoring the organization's collective accountability and shifting governance back from power to process.

4.2. Theoretical implications

These mechanisms substantiate the study's two theoretical contributions foreshadowed in the introduction. First, by tracing how a physical timeline conflict—rather than opportunism alone—drives ceremonial compliance, the study extends institutional decoupling theory by establishing temporal compression as a structural antecedent of means-ends decoupling. Second, by showing how a risk-contingency reserve operates as a deferral option that restores the eroded abandonment option, the study integrates real options reasoning into the principal-agent framework, clarifying how options behave when information is strategically distorted and slack has been removed.

4.3. Managerial implications

For managers transplanting heavy-weight governance systems into fast-clock businesses, the case offers an actionable logic. Rather than importing gate structures wholesale, organizations should diagnose whether the gating cadence is physically compatible with the product lifecycle, front-load cross-functional commitments before inflation incentives emerge, streamline interlocked-yet-decoupled milestones to eliminate hollow decision nodes, and establish a risk-contingency reserve that preserves deferral and abandonment options under severe time pressure. Together, these steps help restore collective accountability and strategic flexibility instead of allowing authority to collapse into hierarchical fiat.

5. Conclusion

This study examined why a heavyweight integrated product development system, transplanted from a long-cycle industry into the fast-paced 3C sector, fails to govern innovation effectively. Through an exploratory single-case study of Firm E, it shows that extreme temporal compression—a physical conflict between sequential gate reviews and a compressed product lifecycle—sets off a predictable cascade of governance failure. Unable to complete substantive validation within the available time, agents resort to strategic information manipulation, gate procedures are executed ceremonially while detached from their risk-management purpose, and the portfolio team loses its abandonment option, so authority collapses back into centralized executive fiat, a pattern this paper terms "governance regression". The study makes two main contributions: it establishes temporal compression as a structural antecedent of means-ends decoupling, showing that timeline constraints rather than opportunism alone can drive symbolic compliance; and it integrates real options reasoning into the principal-agent framework, demonstrating how a risk-contingency reserve can act as a deferral option that restores collective accountability and strategic flexibility.

This study has several limitations. As an exploratory single-case study, its findings draw on one firm transitioning into the 3C sector, which offers revelatory depth but limits statistical generalizability, and it relies largely on archival and interview data from a single observation window, with the proposed compensation mechanism not yet tested across full implementation cycles. Future work could validate the temporal-compression boundary condition through multiple-case and cross-industry designs, complement the qualitative account with longitudinal or quantitative measures of decoupling, and empirically evaluate the risk-reserve mechanism in practice. The author intends to focus subsequent research on this last direction—developing and testing ROR-based governance instruments that help organizations preserve strategic flexibility under severe time pressure.

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