Keeping the Value Case Alive: Broadband, Wi-Fi and AI Governance[1]

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Abstract

Modern organizations run multiple technology programs simultaneously, including broadband expansion, wireless modernization, and artificial intelligence enablement. While each program may appear healthy in isolated delivery, this paper argues that governing them as separate efforts creates strategic risk when they are technically interdependent. Strategy often moves faster than infrastructure builds, and connectivity, wireless, and AI capabilities increasingly depend on one another for the value each promises to deliver. This paper asks how organizations should govern strategic alignment and benefits realization when broadband, wireless, and AI programs are interdependent rather than independent. Using a qualitative, scenario-based methodology, it proposes a portfolio governance model built on four linked artifacts, business case, charter, program management plan, and benefits register, that allow leaders to continually re-test the value case as conditions change. The paper illustrates the model through a composite cyber-physical resilience scenario in which connectivity disruption and AI compute demand surge together, showing how benefits can silently erode when programs are governed separately even though each appears successful on its own terms. It further argues that transition and sustainment must be visible at the portfolio level, since feature release does not constitute program closeout if promised benefits are not operationally sustained. The contribution extends benefits realization management literature by framing cross-program technical interdependency, rather than single-program tracking, as a first-class governance concern for broadband-centered technology portfolios.

Keywords: *Portfolio Management, Benefits Realization, Strategic Alignment, Broadband Infrastructure, AI Interdependency, Cyber-Physical Resilience, Program Governance, Sustainment*

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1. Introduction

Organizations today are not running one technology program at a time. They are running several at once: broadband expansion, wireless modernization, artificial intelligence initiatives, and related connectivity investments. Each of these may make sense on its own. Each may even look healthy in execution. But that does not mean the organization is creating the value it intended.

That is the problem this paper addresses.

Too often, technology programs are governed as separate delivery efforts. Each has its own milestones, budget reviews, dashboards, and steering discussions. If schedule and scope are holding, leaders assume the organization is progressing. But a portfolio can accumulate a great deal of successful activity and still drift away from strategy, particularly when the programs within it are not merely parallel but technically interdependent.

Broadband makes this easy to see. Broadband programs are expensive, long-running, and tied to a service people experience every day. They are also foundational to other capability ambitions, including AI enablement, wireless expansion, and broader cyber-physical system initiatives. That means broadband should not be treated as just another infrastructure build. It sits inside a larger system of capability, and its success or failure increasingly shapes whether adjacent programs can deliver on their own promised benefits.

This changes the management question. The issue is not only whether a broadband program is being delivered well. The issue is whether broadband, wireless, and AI programs are being governed together in a way that keeps their combined value case intact as conditions change.

Strategy moves faster than infrastructure. Market conditions shift, customer expectations change, technology baselines evolve, and competitive pressures move, yet major connectivity and digital programs often take years to design, fund, and implement. A program that was well aligned when it started can become partially misaligned long before it finishes. This is where strategic alignment and benefits realization matter most, and where existing literature leaves a gap.

Benefits realization management (BRM) literature has established that benefits must be actively managed rather than assumed to follow automatically from delivery, and portfolio-level BRM practice has extended this thinking across concurrent programs.

Separately, strategic alignment literature has shown that alignment between projects and organizational strategy measurably affects portfolio performance, and has proposed structured approaches for evaluating that alignment. What neither stream directly addresses is what happens when the underlying technical capabilities of separately governed programs become interdependent after each program has already been chartered and funded, a condition increasingly common as broadband, wireless, and AI initiatives are built to rely on one another.

This paper asks: how should organizations govern strategic alignment and benefits realization when broadband, wireless, and AI programs are technically interdependent rather than independent? Its objective is to propose a portfolio governance model that treats cross-program technical dependency, and the transition of delivered capability into sustained operations, as first-class concerns rather than assumptions left to individual program managers.

The paper proceeds as follows. The Literature Review situates this question within existing BRM and strategic alignment research. The Methodology section describes the qualitative, scenario-based approach used to test the proposed model. The Results section presents a four-artifact portfolio governance model extended to capture cross-program dependency and sustainment visibility. The Discussion illustrates this model against a composite cyber-physical resilience scenario involving connectivity disruption and AI demand surge. The Conclusion offers practical recommendations for portfolio leaders and states the limitations of this qualitative approach.

The organizations that will outperform will not be the ones that simply launch more technology programs. They will be the ones that govern those programs as a connected value system, and that discipline begins with how strategic alignment and benefits realization are structured from the start.

2. Literature Review

The literature relevant to this paper spans three streams: benefits realization management as a governance discipline, strategic alignment within project and program portfolios, and broadband-specific resilience and benefits practice.

2.1 Benefits Realization Management (BRM)

Breese et al. offer a unified view of BRM, framing it as the deliberate organization and management of change so that potential benefits from investment are actually achieved, rather than assumed to follow automatically from delivery. This framing challenges the

common practice of treating benefits as a reporting artifact fixed at business-case stage rather than a discipline actively managed through execution. PMI's practitioner research similarly identifies persistent challenges in implementing BRM, noting that organizations frequently under-invest in the methodologies and metrics needed to track benefits beyond initial delivery. Serra extends this further by explicitly linking BRM to portfolio, programme, and project governance, arguing that benefits realization is a strategic value discipline that spans multiple concurrent initiatives rather than a single-project concern. The UK Government's Project Delivery guidance reinforces this portfolio-level view, describing benefits management as a structured way to identify, plan, track, and verify positive impacts of investment across portfolios and programmes jointly, not in isolation.

2.2 Strategic Alignment in Portfolios

A parallel literature examines strategic alignment specifically within project portfolio management (PPM). Empirical PMI-sponsored research finds that strategic alignment between projects and organizational strategy has a measurable positive effect on PPM performance, establishing alignment as a governance variable rather than a one-time planning exercise. Academic work on IT project portfolio management proposes detecting and evaluating potential projects against strategic fit using structured evaluation approaches, such as balanced-scorecard-informed selection, reinforcing that alignment should be continuously tested rather than assumed at project initiation. Neither stream, however, directly addresses what happens when the underlying technical capabilities of separately governed programs become interdependent after initiation, a gap this paper's broadband/wireless/AI framing directly addresses.

2.3 Broadband and Cyber-Physical Resilience Context

Practitioner and industry sources ground this paper's infrastructure lens. Discussions of broadband network resilience emphasize that connectivity infrastructure increasingly underpins downstream capabilities such as AI enablement, wireless expansion, and IoT services, meaning that broadband cannot be governed as a standalone build without consequence to adjacent programs. This reinforces the argument that broadband functions as a foundational layer within a larger cyber-physical capability system, rather than an isolated infrastructure project.

2.4 The Gap

Across these three streams, existing literature treats benefits realization and strategic alignment as either single-program disciplines or portfolio-level financial/strategic exercises. None of the reviewed literature explicitly models how technical

interdependency between concurrently governed programs, for example, an AI capability's dependence on wireless capacity, or a resilience architecture's dependence on both, can cause benefits to decay even when each program individually reports healthy delivery status. This is the gap the proposed governance model addresses.

3. Research Methodology

This paper uses a qualitative, scenario-based methodology combining conceptual synthesis with an illustrative composite scenario.

First, a conceptual synthesis draws on established benefits realization management (BRM) and strategic alignment literature to construct a four-artifact governance model (business case, charter, program management plan, benefits register) applicable to interdependent technology portfolios.

Second, an illustrative composite scenario tests the model's explanatory value against a cyber-physical resilience situation involving connectivity disruption and AI compute demand. This scenario is constructed generically from publicly discussed architectural patterns in cloud-edge and mission-critical AI resilience research, used as a qualitative device to illustrate governance failure modes across interdependent programs.

The methodology uses architecture walkthroughs and structured qualitative reasoning to examine whether the proposed governance model would detect and address the value erosion it describes. Limitations of this approach are addressed in the Conclusions section.

No generative AI tools were used to produce the substantive analysis, arguments, or conclusions in this paper.

AI-assisted tools were used only for research support and editorial review, consistent with PM World Journal's disclosure requirements.

4. Results

The conceptual synthesis produces a four-artifact portfolio governance model designed to keep strategic alignment and benefits realization visible across interdependent broadband, wireless, and AI programs.

4.1 The Four Linked Artifacts

Business case – establishes why each program exists and what value it is expected to create, serving as the evidentiary basis for portfolio decisions

Charter – links the program's value proposition to strategic intent so that governance bodies can evaluate it against portfolio priorities, not just delivery status

Program management plan – coordinates execution, dependencies, and milestones, including explicit technical dependency points with other portfolio programs

Benefits register – makes expected benefits explicit by identifying owners, target values, baselines, measurement timing, and dependencies

4.2 Portfolio-Level Interdependency Mapping

The distinguishing feature of this model, relative to conventional single-program BRM practice, is that the benefits register and program management plan are extended to capture cross-program technical dependencies explicitly, rather than tracking each program's benefits in isolation. For example, an AI enablement program's benefit register would explicitly note its dependency on wireless capacity thresholds, and a broadband expansion program's register would note downstream dependency from AI or IoT initiatives relying on it. This mirrors benefits-dependency-mapping practice already used in portfolio management, extended here specifically to technical, not only financial or strategic, dependency.

4.3 Transition and Sustainment Visibility

The model treats transition and sustainment as a fifth tracked element rather than an implicit assumption following release. A capability's movement from delivery into operations is treated as a distinct governance checkpoint, with the benefits register requiring confirmation that operational teams are ready and that early-stage benefit signals are being monitored, addressing the common structural gap in which program accountability ends at deployment even though benefits typically materialize afterward.

5. Discussion — Scenario Illustration

To test the model's explanatory value, consider a composite scenario reflecting a common cyber-physical resilience pattern: a connectivity disruption occurring at the same time as a surge in AI-driven processing demand.

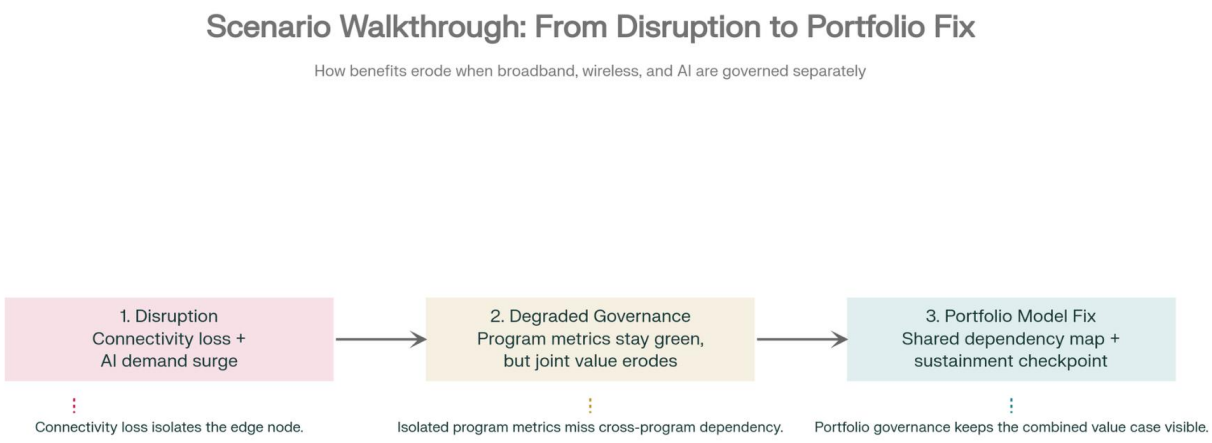

Figure 1. Scenario walkthrough: disruption, degraded governance, and portfolio model fix for interdependent broadband, wireless/WiFi, and AI programs.

5.1 Scenario

An edge-based operational system depends on both a wireless/broadband connection to a central coordination hub and a local AI-driven decision or analytics capability. A disruptive event occurs that simultaneously degrades connectivity and increases the volume of decisions the local AI capability must handle, a pattern consistent with the kind of correlated-failure conditions long recognized as a distinct hazard class in cyber-physical systems research. Individually, the broadband/wireless program governing the connection and the AI program governing the local analytics may each report healthy status: the network team sees connectivity eventually restored, and the AI team sees its model performing as designed under normal load.

5.2 Where Isolated Governance Fails

Under isolated program governance, neither program's benefits register captures the interaction between the two. The broadband program's benefits register tracks connectivity uptime and restoration time; the AI program's benefits register tracks model accuracy or throughput under expected load. Neither register is structured to flag that, during the overlap window of disruption and demand surge, the AI capability may be forced to prioritize among competing decisions with degraded input quality, a condition sometimes described in resilience-engineering terms as graceful degradation, where systems intentionally reduce functionality rather than fail outright. If no governance mechanism owns this interaction, the operational continuity benefit that both programs

were meant to jointly support can weaken even though each program's individual delivery metrics look intact.

5.3 Where the Portfolio Model Adds Value

Applying the four-artifact governance model with explicit cross-program dependency mapping changes this picture. The AI program's benefits register would carry an explicit dependency entry noting its reliance on a minimum connectivity/compute threshold during disruption events, and the broadband program's register would carry a corresponding entry noting that its resilience benefit is only fully realized if downstream AI capabilities can gracefully degrade rather than fail outright under correlated stress. This does not require the two programs to merge; it requires the portfolio governance layer to hold a shared view of the dependency and to re-test, at defined checkpoints, whether the joint benefit still holds as conditions change.

5.4 Broader Implication

This scenario illustrates the paper's central argument in concrete form: programs can each be executing well against their own charters while the combined value case they were meant to jointly deliver quietly erodes. Portfolio governance that makes technical interdependency visible in the benefits register, rather than assuming it will be caught informally, is what allows leaders to detect this kind of erosion before it becomes a service failure rather than after.

6. Conclusions and Recommendations

This paper set out to examine how organizations should govern strategic alignment and benefits realization when broadband, wireless, and AI programs are technically interdependent rather than independent. The proposed four-artifact portfolio governance model, business case, charter, program management plan, and benefits register, extended to capture cross-program technical dependency, offers one credible answer, and the composite cyber-physical resilience scenario demonstrates how the model would surface value erosion that isolated program governance misses.

6.1 Core Conclusions

Benefits realization is weakened not only by poor execution within a single program, but by the absence of any governance layer that tracks how one program's technical performance depends on another's

Transition and sustainment must be treated as a distinct, tracked governance checkpoint rather than an implicit assumption following delivery, since benefits typically emerge or decay after release, not at it
Programs can each report healthy delivery status while the combined value case they were jointly meant to produce erodes silently, particularly under correlated disruption conditions where connectivity loss and AI demand surge together
Extending the benefits register to include explicit cross-program technical dependencies is a practical and low-overhead way to make this interdependency visible without requiring programs to be merged or re-organized

6.2 Recommendations for Portfolio Leaders

Extend existing benefits registers to include a technical-dependency field, identifying which other portfolio programs a given program's benefits rely on or contribute to.

Establish a portfolio-level checkpoint at transition-to-operations, requiring confirmation that sustainment ownership, operational readiness, and early benefit signals have been reviewed before a program is treated as closed.

Periodically re-test joint benefit assumptions for interdependent programs, particularly where one program's resilience claim depends on another program's behavior under the same disruption.

Assign clear ownership for cross-program dependencies within the portfolio governance body, rather than leaving them to be caught informally by individual program managers.

6.3 Limitations

This paper is qualitative and scenario-based rather than empirically validated against a large sample of programs. The composite scenario illustrates plausible failure and governance dynamics but does not constitute a measured case study with quantitative outcome data. Future work could test the proposed model against real portfolio data, or refine the dependency-mapping mechanism into a more formal tool integrated with existing benefits management frameworks.

6.4 Closing Statement

Delivery discipline remains necessary but insufficient for organizations running interdependent broadband, wireless, and AI programs. The harder governance task is to keep asking whether the combined value case these programs were meant to jointly

create still holds as conditions change, and to build that question into the artifacts portfolio leaders already use rather than treating it as a separate exercise. That is the practical core of keeping the value case alive.

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