Improving Front-End ICT Portfolio Governance: Integrating PDRI and BSC [1]

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Abstract

Information and Communication Technology (ICT) programs and projects frequently underperform due to weaknesses in front-end definition, requirements discipline, and benefit ownership. Audit and Industry evidence repeatedly linked these early-stage governance gaps to downstream cost overruns, schedule delays, and unrealised benefits (Government Accountability Office, 2000, 2004; Musawir et al., 2017; Project Management Institute, 2025). In response, this paper develops an integrated pre-planning governance framework that combines (i) a Project Definition Readiness Index (PDRI) - an evidence-anchored, weighted readiness assessment tailored to ICT risk structures—and (ii) an ICT-adapted Balanced Scorecard (BSC) - a multi-perspective measurement system used to translate strategy into measurable objectives with accountable owners. Drawing on established definition-index logic (e.g., PDRI-type instruments and public-sector readiness adaptations) and Balanced Scorecard theory, the framework operationalises two linked governance tests at each decision gate: "Are we ready to deliver?" (definition readiness and feasibility) and "Is this worth delivering?" (strategic alignment and measurable value). The paper specifies the integrated operating model, evidence requirements, threshold and blocker rules, and a Value × Readiness portfolio lens to improve sequencing and reduce "execution bias." An evaluation approach is proposed using multi-archetype pilots and longitudinal tracking to calibrate scoring weights, thresholds, and Key Performance Indicator (KPI) feasibility over time. The contribution is a decision-grade, implementable governance system for the Project Management Office (PMO) to strengthen early risk visibility, improve investment decision quality, and enhance accountability for benefits realisation

Highlights

- Integrates definition readiness and outcome governance for ICT projects
- Proposes a decision-grade PDRI–BSC pre-planning framework
- Reduces execution bias through readiness and value-based gate decisions
- Strengthens portfolio prioritisation using value × readiness logic
- Discusses implications for governance of AI-enabled ICT initiatives

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1. Introduction

Organisations increasingly depend on ICT initiatives to enable digital services, regulatory compliance, cybersecurity resilience, data capabilities, and productivity. However, ICT projects often experience cost and schedule overruns, value shortfalls, and adoption failures, commonly rooted in decisions made before delivery begins—particularly the quality of early definition and the clarity of measurable outcomes. These governance challenges are further amplified in emerging digital initiatives such as artificial intelligence (AI) programs, where data readiness, model governance, and outcome measurability introduce additional front-end uncertainty. The implications of the proposed framework for AI-enabled ICT initiatives are discussed later in Section 7. AI initiatives are therefore used as a contemporary example of ICT governance complexity rather than as the central research focus of this paper.

Numerous studies have documented persistent underperformance in ICT and digital transformation initiatives, including cost overruns, schedule delays, scope creep, and unrealised benefits. Public-sector and private-sector audits repeatedly highlight weak front-end definition, inadequate requirements discipline, and insufficient benefit ownership as root causes of failure (Government Accountability Office, 2000, 2004; Musawir et al., 2017; Project Management Institute, 2025). These patterns suggest not an isolated execution problem, but a systemic governance gap in early investment decision-making.

PMI's Pulse of the Profession® reports (Project Management Institute, 2017, 2018, 2019) consistently identified incomplete requirements definition, shifting organisational priorities, and weak executive sponsorship as leading contributors to project underperformance, suggesting that these drivers represent structural rather than episodic governance weaknesses. Subsequent editions (Project Management Institute, 2021b;2025) continue to report material performance variability across cost, schedule, and benefit realisation metrics, suggesting that these structural conditions remain persistent rather than episodic.

Recent PMI industry reporting indicates that material performance variability persists across ICT initiatives, with measurable differences in goal attainment, budget adherence, and schedule performance across sectors (Project Management Institute, 2025). This continued variance reinforces the importance of disciplined governance mechanisms that link readiness and measurable value prior to mobilisation. Cost overruns remain common, and benefit realisation shortfalls persist even where technical delivery milestones are achieved. Public-sector audits have similarly reported recurring patterns of cost growth, schedule slippage, and unrealised benefits across major IT programs, often attributable to weaknesses in early planning and governance controls (Government Accountability Office, 2000, 2004). These recurring statistical patterns, observed across industries and over time, support characterising the issue as a structural front-end governance deficit rather than isolated execution failure.

Front-end planning disciplines in other domains emphasize that projects "go astray up front" and that front-end loading must answer foundational questions—why the project exists, what will be delivered, how delivery will occur, and who will perform the work—before execution commitments are made (National Research Council, 2002; Gibson et al., 1997). This aligns with the practical observation that the organisation's ability to influence cost and risk is highest early, while the cost of change rises sharply during execution.

This paper argues that ICT governance needs two complementary pre-planning instruments:

- A **definition readiness mechanism** that objectively measures whether the initiative is sufficiently defined to proceed with controlled delivery risk; and
- A **strategy-to-outcome mechanism** that proves the initiative will deliver measurable value and benefits aligned to organisational goals.

To that end, the paper proposes integrating a tailored Project Definition Readiness Index (PDRI) with a Balanced Scorecard (BSC) as a unified pre-planning system for ICT programs and projects. This integration provides organisations with a structured methodology to test delivery feasibility and measurable value prior to mobilisation, reducing execution risk and strengthening benefits accountability.

Methodological positioning. This paper is practice-oriented and offers a governance framework/design contribution. It synthesises established definition readiness instruments and Balanced Scorecard theory into an implementable stage-gate operating model (roles, evidence standards, thresholds and critical blockers) and proposes an evaluation strategy using pilots and longitudinal tracking to calibrate readiness scoring and outcome measurement over time.

2. Literature Review and Theoretical Foundations

This section reviews the foundational literature and practitioner evidence supporting the use of definition readiness instruments (e.g., PDRI and successors), requirements discipline as a dominant ICT risk driver, and outcome measurement approaches such as the Balanced Scorecard and benefits management. It also positions the proposed PDRI+BSC integration within established investment governance and portfolio maturity models.

2.1 Definition Readiness and Front-End Planning Instruments

A recurring theme in project governance literature is that "the project is defined" at the front-end: early decisions constrain downstream design and delivery options, while later changes become increasingly costly and disruptive. This is particularly salient in complex initiatives where uncertainty is high, and interdependencies are not yet visible.

The front-end planning (FEP) phase is therefore frequently characterised as the most critical phase of a project—yet one that often receives insufficient attention—because it is during this period that the decision rationale, scope boundaries, risk posture, and delivery strategy are established (and, in practice, locked in at key commitment points) for the remainder of the lifecycle (National Research Council, 2002; Project Management Institute, 2002; Government Accountability Office, 2000, 2004; National Aeronautics and Space Administration, 2006; U.S. Department of Energy, 2023). Within this view, definition readiness is not merely documentation completeness; it is a governance capability to reduce ambiguity to a level that permits the responsible commitment of major resources.

Definition readiness instruments operationalise this capability by converting "how well defined is this initiative?" into a structured assessment of required scope elements and decision-quality evidence. Empirical validation of the Infrastructure PDRI demonstrates that structured scope definition scoring is indicative of downstream project performance. Infrastructure projects with lower PDRI scores (indicating stronger definition completeness) significantly outperformed projects with higher PDRI scores (indicating weaker definition) in cost and schedule outcomes (Bingham & Gibson, 2017). The Construction Industry Institute (n.d.) Project Definition Rating Index (PDRI) is one of the most widely cited examples of such instruments. CII positions PDRI as a front-end planning tool spanning feasibility, concept development, and detailed scope definition. The method identifies and precisely describes critical elements of a scope definition package and enables teams to surface risk factors that may affect cost, schedule, and operating performance—before the point where downstream execution commitments materially reduce flexibility. Importantly, the tool is explicitly intended to support action: teams capture mitigation actions and can reassess scope definition completeness repeatedly up to the point of detailed design/authorisation, thereby using the score not only as a diagnostic snapshot but also as a progress-monitoring mechanism.

Two features of PDRI-type instruments are especially relevant for pre-planning governance design. First, the assessment is structured around a standardised set of elements, typically organised as a score sheet or checklist with element descriptions, which reduces reliance on informal judgement and improves cross-project comparability. Second, the approach commonly uses weighting to reflect the relative importance and risk contribution of different definition elements, recognising that not all definition gaps create equivalent delivery risk. Variants of PDRI developed for different capital contexts (e.g., buildings and infrastructure) reinforce the idea that the instrument logic is stable while the element set is adaptable to context and complexity. In effect, the readiness index becomes a disciplined means of aligning stakeholders on what "sufficient definition" means for a particular domain, and a way to make residual uncertainty visible and manageable before authorisation.

Evidence supporting the emphasis on front-end definition quality arises at two levels. At a general level, empirical work in the project management literature has shown a strong relationship between planning effort and project success outcomes, including in studies published within the project management field's core outlets (Zwikael & Globerson, 2006). This supports the baseline proposition that early-phase planning and definition are associated with improved project performance, particularly when planning addresses requirements, technical specifications, and management processes. At a more specific level, practitioner research associated with PDRI has treated definition scoring as an indicator of expected schedule and cost performance and has presented analysis on large samples of capital projects. For example, a PMI-hosted paper describing the use of PDRI in risk management reports data collection and analysis across a substantial sample of capital projects, framing PDRI as part of a structured risk identification and mitigation approach during pre-project planning (Project Management Institute, 2002). Although originating in capital construction contexts, these validation efforts demonstrate statistically significant relationships between definition completeness and downstream cost and schedule performance, reinforcing the broader governance principle that structured front-end assessment reduces execution uncertainty. While such evidence originates in capital construction contexts, it strengthens the argument that structured definition scoring can provide decision-relevant signals prior to committing to execution.

In addition, peer-reviewed research on the Infrastructure PDRI provides empirical support for the predictive validity of definition readiness scoring. Analysis of 26 infrastructure projects demonstrated that stronger early scope definition was associated with improved project performance outcomes, reinforcing the governance proposition that front-end readiness materially influences execution results (Bingham & Gibson, 2017).

A further justification for adopting the "definition readiness index" concept in ICT governance is the demonstrated portability of these methods into adjacent public-sector and infrastructure decision environments. The U.S. Department of Energy's Environmental Management organisation describes its Critical Decision Assessment Tool (CDAT) as a successor to Environmental Management Project Definition Rating Index (EM-PDRI), noting that EM-PDRI has been used for well over a decade to assist planning and to support critical decision assessments. CDAT is designed to measure project maturity and, importantly, assess readiness for achieving DOE critical decision levels—explicitly applying structured scoring to determine whether definition and supporting evidence are sufficient for gate progression. This evolution illustrates a pattern highly relevant to ICT: definition scoring tools can be adapted and formalised to align with staged governance thresholds, strengthening decision discipline and comparability across initiatives.

Similarly, NASA has published guidance for applying PDRI to facilities projects, emphasising that the tool is intended to evaluate the completeness of scope definition before a project proceeds to later stages such as the development of construction documents and construction authorisation. This reinforces the broader governance function of definition indexes: they provide a standardised, repeatable means to assess readiness before the organisation crosses major commitment points. The implication for ICT is not that construction element sets should be reused, but that the underlying governance principle—explicit, element-based definition assessment supported by evidence—can be migrated to ICT contexts where scope volatility, integration complexity, and security and operational constraints are dominant sources of downstream risk.

Taken together, the literature and practice record support a clear logic:

(i) front-end definition is a key driver of downstream performance,
(ii) structured definition readiness instruments provide a mechanism for identifying and mitigating definition gaps before execution commitments, and
(iii) Such instruments have been successfully adapted across domains and institutionalised within stage-gate decision regimes.

This provides the rationale for developing an ICT specific Project Definition Readiness Index (PDRI) in this paper: one that preserves the evidence based, weighted element logic of PDRI-type tools while tailoring the definition domains to ICT realities (e.g., requirements and NFR completeness, data and integration readiness, security and privacy assurance, and operating model/service acceptance readiness). Similar benchmarking efforts examining ICT adoption maturity in project environments further reinforce the value of structured readiness assessment in technology-intensive contexts (Ahuja et al., 2010).

2.2 Requirements Definition as a Dominant ICT Risk Driver

ICT initiatives are unusually sensitive to requirements definition quality because requirements act as the contract between strategy and delivery, and because software-intensive systems exhibit high coupling between:

(i) functional intent,
(ii) quality attributes, and
(iii) Technical architecture and operating model. Requirements are commonly defined as conditions or capabilities needed to solve a problem or achieve an objective that a solution must satisfy; requirements management then becomes the discipline of planning, eliciting, analysing, communicating, tracing, and controlling changes to those requirements across the lifecycle (Larson & Larson, 2008).

Early research into ERP pre-planning emphasised the importance of structured knowledge support during front-end definition phases (Kwon & Shin, 2003), reinforcing the governance logic underlying disciplined readiness assessment.

A consistent thread in practitioner and standards-aligned guidance is that weak or undefined requirements management processes are strongly associated with downstream failure modes—especially scope creep, cost overruns, and schedule delays. Kumar's PMI Global Congress paper frames poorly articulated or undefined requirements management processes as a leading cause of project failure and links this directly to the familiar pattern of uncontrolled change and rework that drives overruns (Kumar, 2006).

If an initiative proceeds to mobilisation without sufficient requirements definition discipline (including how changes will be controlled), the organisation effectively accepts uncontrolled uncertainty as a default risk posture.

A key complication for ICT is that requirements are not limited to "what the system must do." Non-functional requirements (NFRs) and other architecturally significant requirements frequently dominate architecture decisions and operational feasibility. Requirements volatility—changes driven by evolving needs, constraints, and learning—can disrupt architectural coherence, increase complexity, and drive cost, schedule, and quality impacts if poorly governed (Ferreira et al., 2009). Accordingly, governance should treat volatility as a predictable condition requiring disciplined practices (e.g., explicit NFR catalogues, traceability, and change-control) rather than an exception to be reacted to.

More recent empirical work continues to examine causes and mitigation practices for requirement volatility in agile contexts, emphasising that although agile methods can accommodate change, teams still require disciplined practices (e.g., structured ceremonies, artifact quality, and stakeholder engagement mechanisms) to reduce harmful, avoidable volatility (Mohammad & Kollamana, 2024).

These dynamics link directly to scope creep as a governance risk. Scope creep can be understood as the accumulation of additional features or work that is not properly authorised and controlled; PMI-published practitioner research characterises scope creep as one of the most prevalent causes of project failure and emphasises the importance of clear scope definition and change control mechanisms to prevent unauthorised expansion (Larson & Larson, 2009). In ICT, scope creep is often not a single event, but a gradual accumulation driven by ambiguous requirements, insufficient stakeholder alignment, and weak traceability between business objectives, solution features, and acceptance criteria.

For this paper's proposed PDRI, the implication is that requirements definition must be treated as a primary readiness domain rather than a secondary planning artifact. A readiness index suitable for ICT should therefore weight requirements-related evidence heavily and require objective artifacts that demonstrate decision-grade clarity, such as a requirements baseline (or at minimum a controlled backlog with acceptance criteria), explicit NFR and quality-attribute catalogues, traceability mechanisms (e.g., a requirements traceability matrix where appropriate), and a defined requirements change-control approach integrated with governance. PMI's guidance on requirements management planning explicitly links these artifacts (e.g., a Requirements Management Plan and traceability tools) to improved delivery discipline and reduced downstream disruption (Larson & Larson, 2008).

2.3 Balanced Scorecard as a Strategy-to-Measurement System

The Balanced Scorecard (BSC) was introduced by Kaplan and Norton (1992) as a performance measurement framework that supplements traditional financial measures with non-financial perspectives. In its original formulation, the scorecard balances lagging indicators of past performance with leading indicators that signal future performance, thereby providing decision-makers with a more complete view of whether the organisation is executing its strategy effectively (Kaplan & Norton, 1992).

Kaplan and Norton proposed four interrelated perspectives—Financial, Customer, Internal Business Processes, and Learning and Growth—to translate strategy into a coherent set of objectives and measures (Kaplan & Norton, 1992; Kaplan & Norton, 1993). The practical value of the model lies not simply in reporting, but in forcing explicit choices about:

(i) Which outcomes define success?
(ii) which operational drivers enable those outcomes, and
(iii) What evidence (metrics and targets) will demonstrate progress? This reduces ambiguity, improves strategic alignment, and supports cross-functional accountability for performance.

Later work reframed the Balanced Scorecard as a strategic management system. Rather than treating measurement as an end-state, Kaplan and Norton emphasised the scorecard as an active mechanism for strategy execution—clarifying and translating strategy, communicating and linking objectives, aligning initiatives and resources, and enabling strategic feedback and learning through recurring reviews (Kaplan & Norton, 2007). This evolution is especially relevant to governance settings, where leadership must decide which initiatives to authorise, how to monitor performance, and when to intervene to protect value and manage risk.

For ICT programs and projects, the BSC logic is particularly compelling because value often materialises through a combination of tangible and intangible outcomes. Many ICT initiatives deliver value by enabling new capabilities (e.g., data availability, automation, interoperability), improving service experiences, strengthening operational reliability, and reducing risk exposure (e.g., cybersecurity and compliance). These outcomes may be weakly represented by purely financial measures, especially in the early stages. A multi-perspective scorecard makes these value pathways explicit and measurable, supporting stronger benefit ownership and clearer benefit-realisation accountability.

In this paper, the BSC is adapted into an ICT-appropriate scorecard (expanded to include a risk/security/compliance perspective) and used as the "worth delivering" test during pre-planning. By requiring each strategic objective to be paired with at least one defined KPI (with baseline, target, data source, cadence, and accountable owner), the approach reduces the likelihood that projects proceed on persuasive narratives alone. It also creates a consistent measurement backbone for stage-gate governance and post-implementation evaluation, linking ICT delivery outputs to organisational outcomes and benefits.

2.4 Benefits Management and the Need for Measurable Outcomes

Benefits management provides the governance bridge between delivery outputs (e.g., an implemented platform, a migrated data set, or a new cybersecurity control) and organisational outcomes (e.g., reduced incident rates, improved customer experience, faster cycle times, regulatory compliance). The Association for Project Management (APM) (n.d.) similarly defines benefits management as the identification, definition, planning, tracking, and realisation of benefits, and defines benefits realisation as ensuring that benefits are derived from outputs and outcomes. This definition is important in the ICT context because many digital initiatives "complete" from a delivery perspective while still failing to produce sustained behavioural or operational change that creates value.

PMI's industry reporting distinguishes between meeting delivery constraints (time and budget) and delivering value that makes the project worthwhile, reinforcing the need for explicit benefit definition and measurable outcome governance prior to mobilisation (Project Management Institute, 2025). This persistent gap between delivery completion and value realisation underscores the need for measurable outcome governance prior to mobilisation.

A recurring weakness in ICT governance is that benefits are often assumed to occur automatically once a system is delivered. In practice, benefits frequently depend on factors outside the delivery team's direct control, such as operational adoption, process redesign, capability uplift, data quality stewardship, and sustained management attention. The PMI Benefits Realisation Management (BRM) Framework (Project Management Institute, 2016) reinforces this by positioning BRM as a lifecycle discipline that spans identifying, executing, and sustaining benefits, explicitly emphasising that value must continue to be created after project implementation is complete. In this framing, benefit realisation is not the same as project closure; it requires a managed transition to operations and post-implementation verification that the expected value is being realised.

From a governance standpoint, this implies that benefits require decision-grade specification during pre-planning—not after delivery has started. PMI's BRM Framework defines core artefacts that make benefits measurable and governable, including a benefits realisation plan (activities, timelines, metrics/KPIs, roles and responsibilities, and transition arrangements) and a benefits sustainment plan (risks, processes, measures, and tools required to ensure benefits continue). These artefacts create the conditions for credible outcome measurement and reduce the likelihood of "value leakage" after deployment (e.g., where the solution exists but usage, compliance, or performance outcomes do not persist).

A critical enabler of benefits realisation is clear benefits ownership. PMI's guidance on establishing benefits ownership and accountability defines BRM as ensuring benefits are identified, defined, linked to strategic outcomes, delivered, and fully realised, and notes that organisations often fail because roles and responsibilities for benefits are unclear. In practical terms, benefits ownership cannot be delegated solely to the project manager or delivery team; it must sit with accountable business owners who can influence adoption, operational controls, and resourcing decisions needed to sustain the change. This is particularly relevant for ICT initiatives where benefits are often realised through operational and behavioural change rather than technical delivery alone.

In parallel, contemporary professional guidance increasingly emphasises that project success must be evaluated in terms of **value**, not only delivery efficiency. PMI's 2025 Pulse of the Profession highlights the distinction between meeting "deadlines and budgets" and delivering value that makes the project worthwhile, reinforcing the need for governance mechanisms that explicitly test whether initiatives are measurable, beneficial, and strategically aligned. This strengthens the argument that front-end governance must require explicit benefit statements, measurable outcomes, and practical measurement mechanisms before major commitments are made.

Finally, the academic and applied literature increasingly connects benefits management and governance to overall project success. For example, Musawir et al. (2017) analysed relationships between project governance, benefit management, and project success, adding empirical weight to the view that benefits realisation is not a peripheral activity but a governance function that influences outcomes. For ICT portfolios, this supports a design principle central to this paper: pre-planning should require measurable outcomes (via a Balanced Scorecard logic) and explicit definition readiness (via a PDRI logic), ensuring initiatives are both deliverable and value-generating.

2.5 Portfolio and Governance Maturity for ICT Investments

ICT investment decisions are rarely made in isolation. Most organisations operate **portfolios** of digital initiatives competing for scarce funding, constrained specialist resources (e.g., architects, cyber, data engineers), and limited organisational change capacity. As a result, the governance challenge is not only "is this project well managed?" but "is this the right investment to make now and is it being managed in a way that protects and realises value across the portfolio?" Portfolio governance therefore requires repeatable decision logic for **selection**, **control**, and **evaluation**, supported by consistent data and comparable decision criteria.

A widely cited public-sector framing of IT investment governance is the U.S. Government Accountability Office's **Select/Control/Evaluate** model. In this approach, organisations:

(i) **select** initiatives by screening, ranking, and choosing investments based on expected costs, benefits, and alignment.
(ii) **control** approved initiatives by monitoring progress and taking corrective action; and
(iii) **Evaluate** completed investments to determine whether expected benefits were achieved and to capture lessons learned for future decisions (Government Accountability Office, 2000). Government Accountability Office (GAO) subsequent IT Investment Management (ITIM) guidance positions these practices as a maturity model, emphasising that high-performing organisations institutionalise repeatable processes and improve them over time rather than relying on ad hoc decision-making (GAO, 2004).

This maturity logic is particularly important for ICT for three reasons. First, ICT portfolios often include a mix of run, grow, and transform investments, where value profiles and risk profiles differ substantially (e.g., regulatory compliance and risk reduction versus revenue growth and capability enablement). Second, benefits are frequently distributed and interdependent: a data platform may enable multiple downstream products; a cybersecurity uplift may reduce systemic exposure rather than produce single-project financial returns; and an enterprise integration layer may unlock future agility at the cost of near-term complexity. Third, ICT execution uncertainty tends to be high due to evolving requirements, integration constraints, vendor dependencies, and operational adoption dynamics. These characteristics heighten the need for disciplined portfolio governance that can compare investments consistently and manage risk early.

In practice, governance maturity is expressed through repeatable decision gates and standardised evidence requirements. Mature investment governance does not merely ask whether a business case exists; it asks whether the organisation has credible evidence that:

(a) the initiative is sufficiently defined to proceed responsibly,
(b) the expected value is measurable and owned, and
(c) the initiative can be governed in a way that preserves strategic alignment while managing delivery risk.

GAO's model implicitly supports this by requiring comparable information for selection, structured monitoring during control, and post-implementation evaluation against expected benefits (GAO, 2000; GAO, 2004).

This is where the proposed PDRI+BSC integration fits directly into portfolio maturity needs.

Error! Reference source not found., summarises the complementary governance contribution of PDRI and BSC across portfolio decision phases:

Technique	Strengths	Description
PDRI	**"Control" readiness before commitment**	By requiring evidence-backed definition completeness (e.g., requirements/non-functional requirements (NFRs), integration and data readiness, security/compliance readiness, operating model readiness), PDRI reduces the likelihood that high-uncertainty initiatives enter execution without sufficient front-end risk mitigation. This supports more predictable delivery performance and reduces avoidable rework.
BSC	**"Select" and "evaluate" through measurable outcomes and benefits accountability.**	By forcing strategic objectives to be expressed as measurable KPIs with owners, baselines, and targets, the BSC structure makes value explicit at selection and enables credible evaluation after implementation. It also reduces the risk that projects are approved on persuasive narratives without a measurable value framework.

Table 1: Comparable Strengths of PDRI & BSC

Consequently, portfolio prioritisation improves when PMOs can compare initiatives on both value and readiness using standardised evidence.

This enables governance bodies to:

(i) defer or re-shape high-value but low-readiness initiatives until critical gaps are closed,
(ii) accelerate initiatives that are both strategically aligned and delivery-ready, and

(iii) use post-implementation outcome data to refine future selection criteria and readiness thresholds—consistent with a maturity-driven governance model (GAO, 2004).

3. Research Design and Theoretical Contribution

This paper is intentionally practice-oriented and positioned as a governance framework / design contribution for improving ICT pre-planning decision quality. Rather than testing a single causal hypothesis in a controlled setting, the paper develops an implementable "decision instrument" (an integrated PDRI+BSC model) grounded in established bodies of practice and governance logic and then proposes a structured evaluation approach (Section 6) to validate and refine the framework in operational use.

3.1 Paper Type and Methodological Stance

The manuscript adopts a design-and-justify approach common in applied project governance research. It:

(i) defines a recurrent governance problem in ICT programs/projects,
(ii) synthesises proven constructs and instruments relevant to that problem,
(iii) designs an integrated operating model and decision mechanism, and
(iv) specifies how that mechanism should be piloted, calibrated, and improved through empirical use.

In this framing, the "artifact" produced by the research is the integrated PDRI+BSC pre-planning governance system, including its scoring logic, evidence requirements, stage-gate decision rules, and PMO operating model.

3.2 Problem Framing and Design Motivation

The governance problem addressed is the persistent gap between:

- **Deliverability Risk**: ICT initiatives often mobilise with incomplete definitions (e.g., unclear requirements, unresolved integration and data dependencies, weak security/compliance readiness, or unclear operational ownership), leading to avoidable rework and performance variance; and

- **Value Realisation Risk**: ICT initiatives can be delivered "successfully" in delivery terms while failing to produce measurable benefits due to weak outcome definition, unowned benefits, and limited adoption management.

These risks tend to originate **before execution** (i.e., in the front-end), yet many governance systems approve initiatives largely on narrative business cases or optimistic planning artefacts rather than decision-grade evidence of readiness and measurability.

3.3 Research Questions

To structure the contribution, the paper is guided by the following questions:

- **RQ1:** How can an ICT governance system operationalise both definition readiness and strategic value measurability as joint gate criteria prior to major funding commitment?
- **RQ2:** What evidence standards, roles, and decision rules are required to make readiness scoring and outcome measurement auditable and comparable across an ICT portfolio?
- **RQ3:** How can PMOs use early PDRI/BSC signals to improve portfolio prioritisation and reduce "execution bias" (progressing high-value initiatives that are poorly defined)?

3.4 Framework Design Process

Table 2**:** Framework **Design**, summarises the proposed framework as developed through structured synthesis and adaptation:

Framework Element	Description
Concept selection (proven instruments):	PDRI draws from definition-index logic (element-based readiness assessment) and BSC draws from multi-perspective outcome measurement and strategy execution principles.
Contextual tailoring (ICT realities):	The definition domains are adapted for ICT risk structures (e.g., requirements/NFRs, architecture, data/integration, security/privacy/compliance, operating model readiness, and adoption).
Decision integration (stage-gate):	Readiness and worth are embedded into Gates 0–3 with increasing evidence maturity before major commitment.
Operationalisation (PMO model):	The framework specifies ownership, assurance controls, artifacts/templates, and "threshold + blocker" rules to reduce subjectivity and prevent superficial compliance scoring
Portfolio application	A Value × Readiness lens is defined to support portfolio prioritisation and sequencing decisions

Table 2: Framework Design

3.5 Contribution to Theory and Practice

Table 3: Contribution Level summaries the contributions expressed at three levels:

Contribution Level	Description
Conceptual	A unified governance construct that treats "ready to deliver" and "worth delivering" as interdependent approval conditions, reducing the common governance failure of approving initiatives on only one dimension (readiness without value measurability, or value claims without readiness evidence).
Method	A repeatable mechanism for converting front-end ambiguity into comparable, decision-grade signals through evidence-anchored scoring (PDRI) and KPI-anchored outcomes (BSC).
Practical	A deployable PMO operating model (roles, artifacts, assurance, thresholds, and blockers) plus a calibration and continuous-improvement approach that allows the system to mature and become predictive over time.

Table 3: Contribution Level

3.6 Scope Boundaries and Limitations of the Design Contribution

This paper proposes an implementable framework and associated operating model, but it does not claim universal performance improvement without evidence. The framework is designed for ICT environments where:

- stage-gate (or stage-gate like) governance exists or can be introduced,
- initiatives range from agile to hybrid to predictive delivery models, and
- Benefits measurement and adoption management are recognised as necessary conditions for value.

The predictive validity of PDRI scoring and BSC outcome measurability is expected to be strengthened through empirical calibration, which is explicitly addressed through the pilot and feedback mechanisms in Section 6.

4. The Integrated PDRI + BSC Pre-Planning Framework

This section defines the proposed integrated pre-planning governance framework and explains how it is designed to be used by PMOs and investment decision bodies before major execution commitments are made. The framework combines two complementary instruments: a Project Definition Readiness Index (PDRI), used to assess whether an initiative is sufficiently defined and feasible to proceed with controlled delivery risk; and a Balanced Scorecard (BSC), used to ensure the initiative has measurable, owned outcomes and is aligned to organisational strategy.

Figure 1: Integrated PDRI + Balanced Scorecard Governance Framework**.** illustrates an integrated PDRI + Balanced Scorecard governance framework as being intended to be applied progressively across decision gates, with increasing evidence maturity as initiatives move from intake to mobilisation.

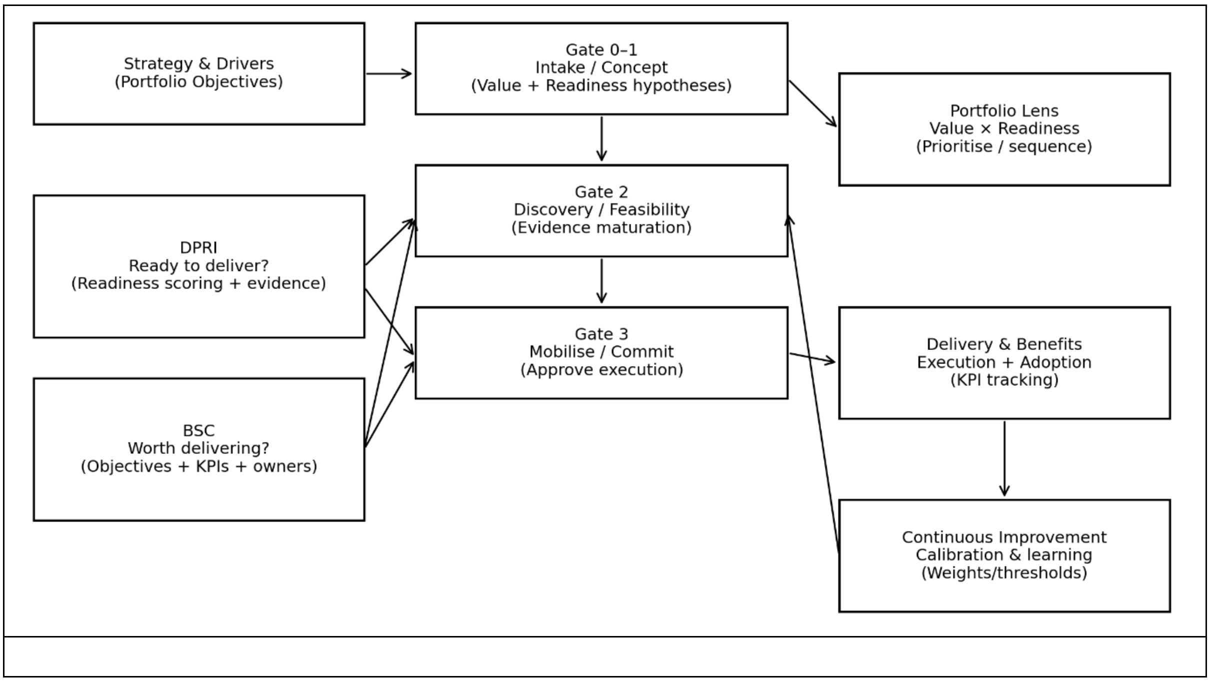

Figure 1: Integrated PDRI + Balanced Scorecard Governance Framework.

(Conceptual framework developed by the author integrating definition readiness (PDRI) and outcome measurability (Balanced Scorecard) for ICT investment governance.)

The framework illustrates how project definition readiness (PDRI) and outcome measurability (BSC) jointly inform gate decisions, portfolio prioritisation (value × readiness), delivery and benefits tracking, and continuous governance improvement.

The core design principle is that ICT governance should not treat "delivery readiness" and "strategic value" as separate or sequential concerns. Instead, the framework institutionalises a joint test: an initiative must be both ready enough to mobilise and worth delivering in terms of measurable outcomes and benefits. This directly addresses a common governance failure mode in ICT portfolios: initiatives that move forward because they have political urgency or compelling strategic narratives, but lack the definition quality and evidence required to control delivery risk;

and conversely, initiatives that are well defined operationally but lack measurable outcomes, benefits ownership, or adoption plans that would make the investment worthwhile.
Figure 2**:** Stage-Gate Decision Lifecycle with PDRI + BSC Feedback **Loop**, illustrates the stage-gate decision lifecycle, showing how PDRI and BSC jointly inform gate decisions and how post-implementation evaluation feeds back into governance calibration.

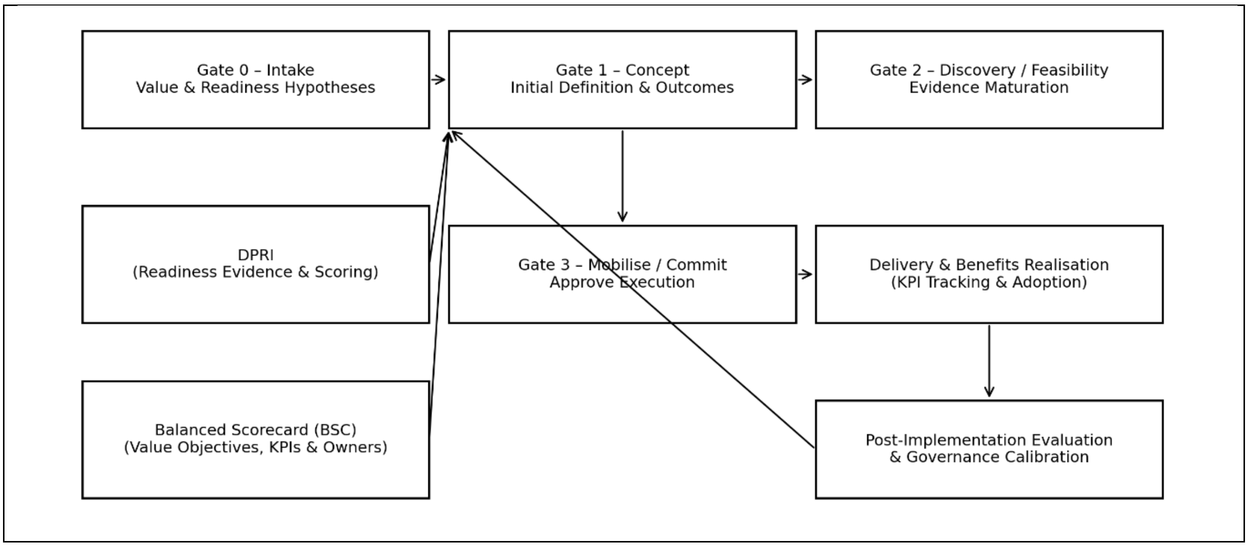

Figure 2: Stage-Gate Decision Lifecycle with PDRI + BSC Feedback Loop

(Conceptual model developed by the author illustrating how readiness (PDRI) and value (BSC) jointly inform gate decisions and governance calibration over time.)

4.1 Core Governance Question Pair

The integrated framework operationalises two executive governance questions that recur across ICT investment decision forums:

- **Ready to deliver?** (Definition quality, feasibility, and delivery risk exposure) → answered by PDRI
- **Worth delivering?** (Strategic alignment, measurable value, and benefits accountability) → answered by BSC

These questions act as paired gate criteria. The first question ensures that the initiative has sufficient clarity on scope boundaries, requirements (including non-functional requirements), architecture, data/integration dependencies, security/compliance obligations, delivery approach, and operational ownership to proceed responsibly. The second question ensures that the initiative's expected value is expressed in measurable terms, linked to strategic objectives, and owned by accountable stakeholders who can influence adoption and sustained benefit realisation.

In practice, ICT governance often defaults to an "execution bias," where momentum toward delivery is driven by urgency, sunk cost, or stakeholder pressure, even when definition gaps are evident. The integrated gate rule counteracts this by requiring a minimum standard of both readiness evidence and outcome measurability at each decision point. In effect, the framework forces leadership teams to align on two things before mobilisation:

1. What we are committing to deliver and how we will control delivery risk, and
2. Why the investment is worthwhile and how value will be measured and sustained.

This dual-question logic also creates clearer accountability boundaries. PDRI makes definition ownership explicit across technical and operational stakeholders (e.g., architecture, security, data), while the BSC makes value ownership explicit across business owners and benefit owners. The integration therefore strengthens governance discipline by ensuring that delivery teams are not asked to compensate for upstream ambiguity and that business sponsors are not permitted to delegate benefit accountability purely to deliver execution roles.

4.2 PDRI Structure Tailored for ICT Initiatives

The PDRI component is defined in this paper as a weighted, evidence-based scoring model that assesses how completely an ICT program or project is defined prior to mobilisation and major funding commitment. The purpose of the PDRI is not to produce administrative compliance scores, but to provide a decision-grade signal of delivery readiness by making residual uncertainty explicit, surfacing definition gaps that materially increase execution risk, and requiring ownership and closure actions before the initiative crosses major commitment points.

4.2.1 Conceptual Grounding and Adaptation Logic

The PDRI is conceptually grounded in the definition-index logic exemplified by Project Definition Readiness-Type (PDRI-type) instruments: projects are assessed against a standardised set of scope elements; each element is evaluated for maturity/completeness; and the resulting profile highlights the specific gaps most likely to drive cost, schedule, and performance risk if left unresolved. In this sense, the score serves as a proxy for front-end uncertainty exposure. Government adaptations (e.g., Environmental Management Project Definition Rating Index (EM-PDRI) and successor maturity tools) demonstrate that element-based scoring can be extended beyond construction into readiness and maturity assessment across staged decision regimes, reinforcing that the instrument logic is transferable even when the element sets differ by domain. Subsequent research extending the definition-rating logic to program-level contexts further demonstrates its adaptability beyond single-project applications (Cha et al., 2018).

The Infrastructure PDRI research further demonstrates that the structured element-based scoring logic is transferable beyond industrial and building contexts. Empirical findings confirm that readiness scoring is not merely diagnostic but correlates with measurable performance differences across infrastructure project samples (Bingham & Gibson, 2017).

For ICT, a direct transfer of construction element sets is inappropriate because ICT risk structures differ (software volatility, cyber and privacy obligations, integration complexity, data quality and migration risk, and adoption-driven benefits realisation). Therefore, the PDRI design follows a principled adaptation approach: preserve the readiness-index method (structured elements, weighting, evidence rules, repeatability) while tailoring the element domains to ICT realities.

4.2.2 PDRI Scoring Principles

Table 4: PDRI Scoring Principles for **Governance**, defines the proposed PDRI five scoring principles to support governance credibility:

Scoring Principle	Assessment Criteria
Element-Based Structure	Readiness is assessed across discrete definition domains and sub-elements, enabling diagnostic clarity ("where are we weak?") rather than a single opaque readiness label
Weighted Scoring	Elements are weighted to reflect their relative impact on execution risk in ICT contexts (e.g., requirements/non-functional requirements (NFR) completeness and integration readiness typically have higher risk leverage than minor documentation artefacts
Evidence Anchoring	Each score must be supported by verifiable artifacts (e.g., requirements baseline, architecture decisions, security classification) rather than subjective confidence
Repeatability	The same instrument is used across gates, enabling trend monitoring and demonstrating whether definition maturity is improving as expected
Action Orientation	Gaps must translate into explicit closure actions with owners and due dates; a score without an action plan is not governance-relevant

Table 4: PDRI Scoring Principles for Governance

4.2.3 Proposed ICT PDRI Domains

An ICT-specific PDRI should cover the definition and readiness dimensions most predictive of delivery disruption and operational failure. These domains were derived through synthesis of established PDRI constructs in capital project research (Bingham & Gibson, 2017; Cha et al., 2018), government readiness instruments used in infrastructure governance (U.S. Department of Energy, 2023; National Aeronautics and Space Administration, 2006), and ICT risk drivers identified in requirements and architecture management literature.

Table 5: Proposed PDRI ICT **Domains**, summarises alignment to dominate delivery risk drivers.

ICT Domain	Description
Strategic alignment and drivers	Clarity of business problem/opportunity, alignment to strategy, regulatory drivers, measurable success definition.
Stakeholders, governance, and decision rights	Identified sponsor and benefit owners, governance cadence, decision rights, escalation paths, vendor/customer stakeholder mapping.
Scope boundaries and assumptions	Scope statement, in/out boundaries, constraints, assumptions, dependencies, deliverable decomposition at an appropriate level for gate.
Requirements and user outcomes	Requirements baseline/backlog and NFRs; traceability and change-control; AI constraints where applicable
Solution architecture and design readiness	Target architecture, key design decisions, architectural fitness for purpose, technology selections, reference architectures and standards compliance.
Data, integration, and interoperability readiness	AI training data quality, provenance, representativeness, and lifecycle governance.
Security, privacy, and compliance readiness	AI model risk, explainability requirements, bias considerations, and regulatory obligations.
Delivery approach, roadmap, and estimates	Delivery methodology (agile/hybrid/predictive), roadmap, release/deployment approach, schedule and cost estimates with basis of estimate, critical path/constraints.
Resourcing and operating model readiness (Development and Operations (DevOps)/Information Technology Service Management (ITSM) ownership)	Team capability and capacity, key roles, operating model (build/run), DevOps/ITSM integration, production support ownership, service model readiness
Procurement and vendor readiness (where applicable)	Sourcing approach, contract strategy, vendor evaluation, commercial constraints, licensing model, vendor delivery governance.
Change management and adoption readiness	Change impacts, training approach, stakeholder engagement plan, adoption metrics, communications plan, transition readiness.
Testing, cutover, and operational readiness	Test strategy, environments, acceptance criteria, cutover plan, rollback approach, service acceptance checklist, operational controls and monitoring readiness.

Table 5: Proposed PDRI ICT Domains

These domains intentionally reflect ICT-specific risk leverage. For example, incomplete NFRs can lead to late architectural rework; unresolved integration constraints can create unplanned complexity; and unclear operational ownership can result in "delivered but unsupported" solutions.

4.2.4 Evidence Rules and Minimum Artifacts

A PDRI only improves governance if scoring is disciplined and auditable. Evidence should be anchored in auditable artifacts stored in a controlled repository—for example scope boundaries and dependency maps; requirements/NFR baselines and acceptance criteria; architecture decision records; integration/data profiling outputs; security classification and risk assessments; service acceptance artifacts; and a roadmap with basis-of-estimate. This reduces "greenwashing" where initiatives are marked as ready based on optimism rather than evidence.

4.2.5 Scoring Scale and Readiness Interpretation

Table 6: Scoring Scale and Readiness **Interpretation**, defines a simple and practical scoring scale recommended for improving consistency

Score	Meaning
0	Not started / unknown: no evidence; assumptions dominate
1	Early draft: partial artifacts exist but are incomplete or unverified
2	Defined: artifacts are present, reviewed, and coherent; some gaps remain
3	Verified / decision-grade: artifacts are validated by accountable parties

Table 6: Scoring Scale and Readiness Interpretation

Readiness interpretation is based on both the overall score and the presence of critical blockers (Section 5.3). High-level readiness thresholds are applied at gates (Section 4.4), with increasing expectation of "decision-grade" evidence closer to mobilisation.

4.2.6 Tailoring and Calibration

Because ICT portfolios vary widely (e.g., cloud migrations, cybersecurity uplift, and data platform modernisation), the PDRI must be tailorable without losing comparability. **Table 7** summarises the primary tailoring levers.

Tailoring Lever	Example
Add/Remove	Specific Archetypes Domain Sub-Elements
Weight Adjustment	Historical drivers of variance
Definition	Archetype-Specific critical blockers

Table 7: Tailoring and Calibration

Threshold and weighting calibration should be empirical and iterative, using the evaluation model in Section 6 to correlate early readiness scores with delivery variance and benefit outcomes. Over time, the PDRI becomes not only a pre-planning checklist but a portfolio learning tool that improves governance maturity.

4.3 Balanced Scorecard Structure for ICT Outcomes

The Balanced Scorecard (BSC) component of the integrated framework operationalises the governance question **"Is this worth delivering?"** by translating strategic intent into measurable outcomes, with defined owners and measurement rules (Kaplan & Norton, 1992, 1993, 2007). In ICT portfolios, this is essential because many initiatives are justified by capability enablement, risk reduction, or service quality improvements that are not captured well by delivery-only metrics (time/cost/scope). The BSC provides a structured method for defining what "success" means in measurable terms and for sustaining outcome accountability beyond go-live.

In AI-enabled initiatives, this perspective explicitly encompasses ethical risk, model governance, regulatory exposure, and trust outcomes, which frequently determine whether technical capability can be operationalised at scale.

4.3.1 Scorecard Purpose in ICT Governance

Within the integrated framework, the ICT-adapted scorecard serves four governance functions:

Governance Function	Governance Objective
Strategic translation	converts strategy statements (often broad) into explicit objectives that can be governed
Outcome measurability	forces each objective to be expressed through KPIs that can be baselined, targeted, and monitored
Accountability	assigns named owners for outcomes and benefits, separating benefit ownership from delivery accountability
Evaluation backbone	enables post-implementation evaluation of whether outcomes and benefits were realised, consistent with investment governance models

Table 8: Example ICT Governance Function and Objective

Importantly, the scorecard is not treated as a post-delivery reporting dashboard. It is used as a pre-planning approval requirement: if outcomes cannot be expressed in measurable, auditable terms at the relevant gate, the initiative is considered governance-immature regardless of delivery readiness.

4.3.2 ICT Scorecard Perspectives

This paper adopts a five-perspective scorecard that preserves the logic of the original BSC but reflects ICT value types and risk structures:

Perspective	Risk Structure
Financial / Value	• ROI, • cost avoidance, • unit cost reduction, • productivity, • value leakage reduction.
Customer / Stakeholder	• experience, • service quality, • satisfaction, • accessibility, • trust.
Internal Process	• cycle time, • reliability, • throughput, • defect rates, • automation coverage, • process compliance.
Learning & Growth	• capability uplift, • skills maturity, • knowledge transfer, • tool chain maturity, • innovation enablement.
Risk/Security/Compliance	• risk reduction, • control coverage, • audit outcomes, • incident rates, • resilience, • regulatory posture.

Table 9: ICT Balance Scorecard Perspective and Risk Structure

The addition of risk/security/compliance as a distinct perspective is justified by the reality that many ICT investments are primarily risk-driven (cyber, privacy, regulatory, resilience) and require explicit measurement beyond financial proxies.

4.3.3 Minimum Scorecard Standard for Gate Approval

To avoid "aspirational scorecards" that cannot be audited, the framework defines a minimum measurable standard. Table 10: Minimum Scorecard Standard for Gate **Approval**, defines recommended standard that must be satisfied before an initiative can pass the relevant stage-gate:

Requirement	Governance Rationale
≥1 KPI per objective	Prevents unmeasured value claims
KPI definition + baseline + target + owner	Enables auditability and accountability
KPI linked to benefits register	Ensures outcome traceability
Measurement enablement plan where needed	Avoids aspirational KPIs

Table 10: Minimum Scorecard Standard for Gate Approval

This requirement makes "worth delivering" an evidence-based governance condition rather than a narrative assertion.

4.3.4 KPI Dictionary and Measurement Rules (evidence discipline)

The operating model requires a KPI dictionary to ensure comparability and to prevent gaming or ambiguity.
Table 11: Minimum KPI **Entries**, defines the KPI dictionary fields required for auditable outcome governance.

KPI Description
KPI name and objective linkage
Definition (including numerator/denominator where applicable)
Unit of measure and directionality (improve/increase/decrease)
Baseline and baseline date range
Target(s), including interim targets if delivered incrementally
Data source system(s) and extraction method
Measurement cadence and reporting cadence
Data quality checks / auditability notes
KPI owner (accountable role/person) and operational contributor roles
Known limitations or assumptions

Table 11: Minimum KPI Entries

This structure is designed so that KPIs can be audited and used in post-implementation evaluation, not merely displayed.

4.3.5 Example Objectives and KPIs for Typical ICT Initiatives

To make the scorecard practical for PMOs, Table-style examples can be defined per archetype. These are illustrated in **Table 12:** Example Balance Scorecard Objective and KPIs for ICT Initiatives to demonstrate that ICT outcomes often require multi-dimensional measurement and that value is not reducible to budget performance.

Perspective	Example Objective	Example KPIs (Illustrative)
Financial / Value	Reduce cost-to-serve in customer operations	Cost per transaction (baseline vs target), automation rate, rework cost
Customer / Stakeholder	Improve digital service experience	Digital NPS/CSAT, task completion rate, average resolution time, accessibility compliance
Internal Process	Improve operational reliability	Service availability %, MTTR, incident volume per 1,000 users, deployment failure rate
Learning & Growth	Increase delivery capability maturity	CI/CD adoption rate, lead time for changes, % team certified/trained, platform reuse rate
Risk/Security/Compliance	Reduce cybersecurity exposure	Critical vulnerability remediation time, % coverage of key controls, audit findings closure rate, incident severity index

Table 12: Example Balance Scorecard Objective and KPIs for ICT Initiatives

4.3.6 Benefits Register Linkage (Outcome Traceability)

The BSC is operationally linked to a benefits register.

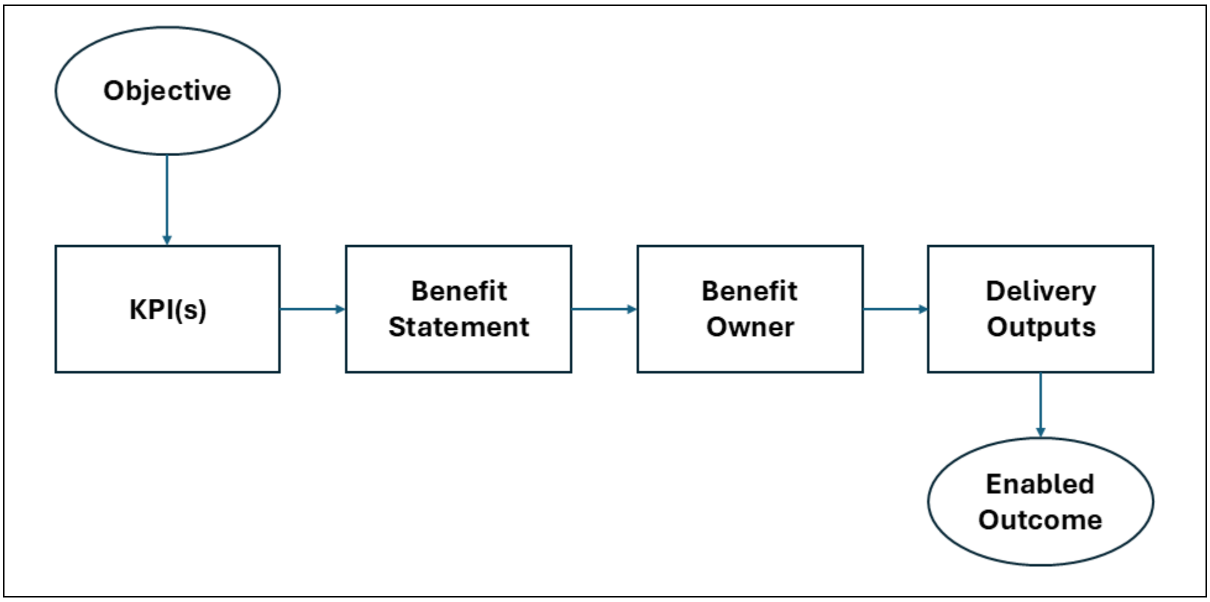

Figure 3: Benefits Register Traceability Workflow
(Author-developed workflow showing the traceability of strategic objectives, KPIs, benefits, and delivery outputs within the PDRI+BSC governance framework.)

Figure 3: Benefits Register Traceability Workflow illustrates the workflow that enables governance bodies to test whether benefits are realistic given delivery increments and adoption plans, and whether benefit ownership is credible. It also supports portfolio-level reporting by enabling aggregation of benefits across initiatives (e.g., risk reduction outcomes, cycle-time improvements, service reliability improvements).

4.3.7 Integration with PDRI at Gates

In the integrated framework, the BSC and PDRI are evaluated together:

- PDRI ensures the initiative is deliverable with controlled risk (definition readiness).
- BSC ensures the initiative is measurable and strategically aligned (worth).

An initiative should not pass a mobilisation gate if it is "deliverable but not valuable" (weak scorecard, no baselines, no owners) or "valuable but not ready" (high strategic narrative but major definition gaps). This joint test reduces execution bias and improves investment decision quality. Over the years, the Balanced Scorecard has been adapted for sector-specific and functional applications, including information systems and ICT evaluation contexts (Milis & Mercken, 2004). These adaptations demonstrate that the BSC is not a fixed template but a configurable governance architecture. The present framework does not propose a new scorecard theory; rather, it extends existing adaptation logic by explicitly embedding measurability and benefit ownership requirements into stage-gate governance for ICT portfolios.

Prior ICT-oriented adaptations of the Balanced Scorecard have primarily focused on evaluating IT function performance or project-level outcomes within technology departments (e.g., Milis & Mercken, 2004). In contrast, the present framework extends the adaptation logic by embedding measurability and benefit ownership directly into stage-gate investment governance. The distinction is not the addition of new scorecard perspectives per se, but the elevation of the scorecard from a post-hoc evaluation tool to a pre-commitment approval condition. This shift repositions the BSC from performance reporting architecture to an investment decision instrument, thereby integrating strategy execution logic with readiness-based funding control.

4.4 Stage-Gate Integration and Decision Criteria

The integrated PDRI+BSC framework is designed to be embedded into a **stage-gate governance model** so that decision-makers can progressively increase commitment as uncertainty reduces. The purpose of stage-gates in this context is not bureaucratic control but disciplined **progressive elaboration**: the initiative's definition maturity (PDRI) and value measurability (BSC) must increase at each gate to justify movement from concept to feasibility to mobilisation.
Accordingly, gate progression requires increasing evidence maturity for both readiness and measurable value. This ensures that approval decisions do not default to an execution bias where initiatives proceed because they have strategic urgency even when definition gaps remain unresolved, or proceed because the delivery plan is credible while outcomes remain vague or unmeasured.

4.4.1 Gate Structure Aligned to Investment Governance Logic

The gate sequence mirrors common investment governance logic (e.g., GAO's Select/Control/Evaluate) and provides explicit decision points where the organisation can stop, defer, reshape, or proceed:

Gate	Status	Governance Logic
Gate 0	**Intake (screening)**	confirm strategic intent and triage; test whether the initiative should enter discovery
Gate 1	**Concept (initial definition)**	confirm problem framing, scope boundaries, early risks, and draft outcome measurability
Gate 2	**Discovery/Feasibility (evidence maturation)**	confirm feasibility and reduce technical/operational unknowns; establish baselines and credible targets
Gate 3	**Mobilisation/Commit (authorisation)**	authorise execution only when readiness and measurability meet minimum standards and accountability is locked in

Table 13: Gate Structure

4.4.2 Evidence Maturity Expectations per Gate

Each gate has explicit evidence expectations so that "readiness" and "worth" are grounded in artifacts rather than optimism.

Table 14: Evidence Maturity Expectations Per **Stage-Gate** illustrates the progressive evidence maturity expectations required at each gate.

Gate	Gate intent	PDRI Evidence Expectations	BSC Evidence Expectations	Decision Outcome
Gate 0 – Intake	Value hypothesis + readiness hypothesis	High-level PDRI quick scan identifying major unknowns (requirements ambiguity; integration/data complexity; security/privacy sensitivity; operating model implications).	Draft strategic objectives and plausible KPI candidates (not baselined).	Approve investment in discovery if strategic relevance is clear and risks appear tractable.
Gate 1 – Concept	Defined enough to proceed to feasibility	PDRI v1 assessment using early artifacts (scope boundaries; stakeholder governance; preliminary architecture direction; initial security classification; initial requirements framing).	BSC v1 objectives confirmed; at least one KPI per objective identified; outcome owners nominated (not locked).	Confirm concept coherence and value potential; authorise feasibility work.
Gate 2 – Discovery / Feasibility	Evidence based feasibility and measurable outcomes	PDRI v2 evidence-based scoring for highest-risk ICT domains (requirements/NFR completeness; architecture readiness; data/integration feasibility; security/privacy/compliance readiness).	BSC v2 baselines established (or measurement-enablement plan approved); target ranges defined; benefits mapped to deliver increments and adoption mechanisms.	Confirm feasibility and outcome measurability; authorise mobilisation planning.
Gate 3 – Mobilisation / Commit	Controlled execution with locked value accountability	PDRI v3 meets threshold; residual gaps explicitly owned with closure plans and timing; no unresolved critical risks.	BSC v3 completed KPI dictionary (definitions, baselines, targets, sources, cadence); benefit owners confirmed; reporting cadence and post-implementation evaluation defined.	Release major funding and formally commit resources only if readiness and worth tests are met.

Table 14: Evidence Maturity Expectations Per Stage-Gate

This progression reduces narrative-driven approvals by formalising increasing evidence maturity prior to commitment.

4.4.3 Decision Criteria: Thresholds + Critical Blockers

Error! Reference source not found. defines the framework as a dual decision mechanism to strengthen governance reliability:

Blocker Category	Example Blocker Condition
Sponsorship & ownership	No Sponsor or benefit owner
Security & compliance	No classification / unclear obligations
Integration & dependencies	Unresolved integration constraints
Operating model	No service ownership / support model
Measurement	No KPI owner/data source

Table 15: Decision Criteria Thresholds and Critical Blockers

This dual mechanism prevents a common governance failure: a "good average score" masking a single fatal gap.

4.4.4 Governance Outputs per Gate (decision-grade artifacts)

Each gate should produce a bounded set of decision outputs that are standardised across initiatives:

Gate	Minimum Decision Pack Outputs
Gate 0	Intake brief; initial PDRI/BSC hypotheses
Gate 1	Concept Brief; PDRI v1; BSC v1
Gate 2	Feasibility pack; PDRI v2; BSC v2; benefits mapping
Gate 3	Mobilisation Pack; PDRI v3 KPI dictionary; benefits register; assurance plan

Table 16: Governance Outputs per Gate

These outputs allow portfolio leaders to make decisions based on consistent evidence, not presentation quality.

4.4.5 Tailoring Gates for Agile and Hybrid Delivery

The framework does not assume a single delivery methodology. In agile or hybrid settings, the stage-gates govern **investment commitment and evidence maturity**, not detailed predictive plans. For example, Gate 2 may validate feasibility through architectural spikes, prototypes, and data profiling rather than detailed design documents, provided the evidence supports the readiness score. Similarly, BSC targets may be expressed as ranges with staged measurement checkpoints aligned to incremental releases.

4.4.6 How Stage-Gates Reduce Execution Bias

Error! Reference source not found. summarises how the integrated gate model addresses two recurrent ICT failure modes:

Failure Mode	Blocked By
Well-intentioned but not ready: high strategic value claim but weak definition evidence	blocked by PDRI thresholds/blockers.
Deliverable but not valuable: clear delivery plan but weak or unowned outcomes	blocked by BSC measurability rules

Table 17: How Stage-Gates Reduce Execution Bias

By requiring both readiness and worth evidence before mobilisation, the framework improves decision quality, reduces preventable rework, and strengthens accountability for value realisation.

4.5 Portfolio Prioritisation: Value × Readiness

Portfolio governance requires more than evaluating initiatives individually. Decision bodies must also determine **which initiatives to prioritise**, **which to defer**, and **how to sequence work** given constraints in funding, specialist capability (architecture, security, data engineering), vendor capacity, and organisational change tolerance. In ICT portfolios, this bias often drives premature mobilisation. To counter this, the paper proposes a two-axis portfolio lens that jointly considers **strategic value** and **delivery readiness**.

4.5.1 Two-Axis Prioritisation Model

The recommended prioritisation model evaluates each initiative across two dimensions:

1. **Strategic Value (BSC-derived):**
   A structured assessment of expected benefit magnitude, strategic alignment, and confidence in measurability. This is not limited to financial returns; value includes service outcomes, capability enablement, and risk reduction where these can be expressed as measurable objectives and KPIs.

2. **Delivery Readiness (PDRI-derived):**
   A structured assessment of definition completeness and feasibility evidence, including whether critical readiness blockers have been resolved (e.g., architecture readiness, integration feasibility, security classification, operating model ownership).

The combined lens produces a more disciplined portfolio view than value-only business cases or readiness-only delivery assessments. It makes explicit that investments should be prioritised when they are both **worth delivering** and **ready to deliver**, and that initiatives that score strongly on only one dimension require governance action before mobilisation.

4.5.2 Practical Quadrant Interpretation and Decision Guidance

A simple quadrant model can support governance decisions. **Figure 4:** Governance Decision Guidance Matrix illustrates portfolio decision guidance based on the combined assessment of strategic value (via the Balanced Scorecard) and delivery readiness (via PDRI):

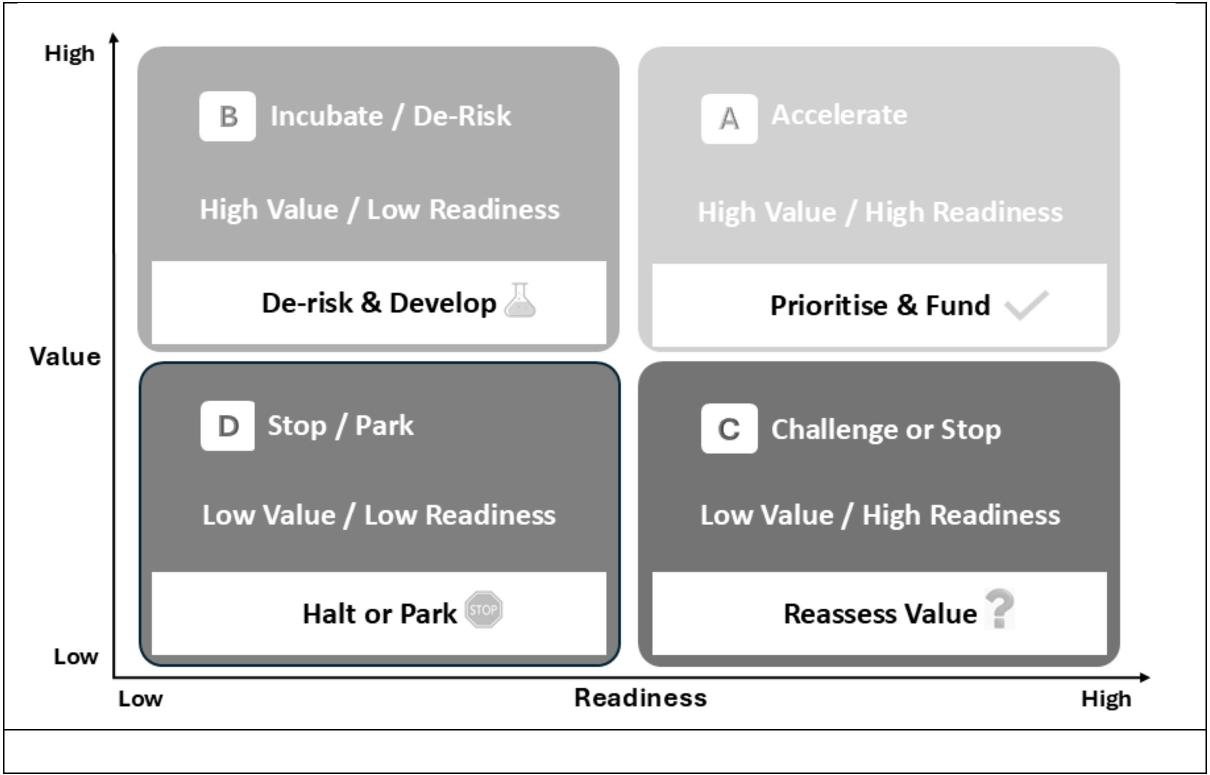

Figure 4: Governance Decision Guidance Matrix

(Author-developed decision model illustrating portfolio actions based on the combined assessment of strategic value (BSC) and delivery readiness (PDRI).)

Quadrant A: High Value / High Readiness ("Accelerate")

- These initiatives have clear strategic alignment, measurable outcomes with owners, and decision-grade readiness evidence.
- Governance action: prioritise for near-term funding and resourcing; confirm reporting cadence and benefits tracking.

Quadrant B: High Value / Low Readiness ("Incubate / De-risk")

- These initiatives may be strategically critical but lack definition maturity (e.g., uncertain integration constraints, incomplete NFRs, unclear operating model).
- Governance action: do not mobilise into full execution; fund targeted discovery, architecture spikes, data profiling, security classification and risk assessment; re-score PDRI at Gate 2/3 before committing major resources.

Quadrant C: Low Value / High Readiness ("Challenge or stop")

- These initiatives are deliverable but have weak measurable value, unclear benefits ownership, or poor strategic alignment.
- Governance action: require value clarification; reshape scope toward measurable outcomes; or stop/defer to avoid consuming scarce delivery capacity on low-impact work.

Quadrant D: Low Value / Low Readiness ("Stop / park")

- Weak value case and weak readiness definition.
- Governance action: generally, do not proceed; require fundamental rework if strategic conditions change.

This quadrant logic is intentionally practical: it creates an explicit mechanism for investment decision forums to avoid treating "strategic importance" as a substitute for readiness evidence, while also preventing teams from executing technically sound work that cannot demonstrate strategic value.

4.5.3 Translating Value × Readiness into a Scoring Rubric

To support consistent portfolio comparisons, PMOs can implement a simple scoring rubric like that defined in **Table 18:** Translating Value × Readiness into a Scoring Rubric for each axis:

Axis	Components (Illustrative)	Scale
Strategic value (BSC axis)	alignment, benefit magnitude, measurability confidence, ownership strength	0-3 each
Delivery readiness (PDRI axis)	overall score, critical domains, blocker status, estimate confidence	mixed

Table 18: Translating Value × Readiness into a Scoring Rubric

PMOs can then plot initiatives visually and use thresholds to recommend sequencing.

4.5.4 Portfolio Sequencing and Capacity Constraints

The Value × Readiness model also supports sequencing decisions based on capacity constraints and dependency structures.
Table 19: Portfolio Sequency and Capacity **Constraints** summarises these constraints and implications:

Constraint Type	Governance Implication
Governance Outputs per Gate	Enablement work before dependent initiatives
Change saturation	Stagger releases and adoption demand
Specialist bottlenecks	Stage work to fit constrained roles

Table 19: Portfolio Sequency and Capacity Constraints

By treating readiness as a first-class prioritisation input, the model reduces the risk of "starting too many things" and increases the probability that started initiatives finish with both delivery performance and realised value.

4.5.5 Governance Outcomes of the Prioritisation Model

Table 20: Governance Outcomes of the Prioritisation Model summarises the Governance outcomes with the aligned mechanism to yield benefits.

Governance Outcome	Mechanism
Decision transparency	Comparable Evidence + KPIs
Reduced rework	De-Risking Before Commit
Stronger value accountability	KPI Ownership; Benefit Register
Portfolio learning	Feedback Loop Calibration

Table 20: Governance Outcomes of the Prioritisation Model

5. Technical Operating Model for PMO Implementation

This section translates the integrated PDRI+BSC pre-planning concept into an implementable PMO operating model. In practice, the effectiveness of readiness scoring and outcome measurement depends less on the existence of templates and more on the operating discipline that governs how evidence is produced, validated, stored, and used for decisions. Accordingly, the operating model defines:

(i) governance roles and assurance responsibilities,
(ii) the minimum tooling and artifacts required to anchor scoring and measurement in auditable evidence, and
(iii) decision rules (thresholds and critical blockers) that prevent premature mobilisation when unacceptable definition gaps remain.

A central operating principle is that the PDRI and BSC must be applied as decision instruments, not compliance checklists. This requires clear accountability for evidence quality and explicit validation by specialist functions (e.g., architecture, security, data/integration). It also requires a small but non-negotiable set of assurance routines (calibration, sampling, and scoring consistency checks) to prevent "greenwashing" where projects are scored optimistically to secure approval.

5.1 Governance Roles and Assurance

Effective implementation requires clear allocation of responsibilities across delivery, technical assurance, and business ownership. **Table 21:** Governance Roles and Assurance Responsibilities outlines the recommended role model.

Role	Primary Responsibilities
Sponsor / Business Owner	Approves scorecard outcomes, targets, and benefit ownership; ensures strategic intent is clear; commits business resources needed for adoption and benefit sustainment
Program/Project Manager	Facilitates PDRI assessments, coordinating evidence gathering, maintaining the readiness action log, and ensuring closure of readiness gaps prior to gate decisions
Enterprise Architecture	Validates solution architecture readiness evidence (e.g., target architecture, design decisions, technology standards alignment); confirms architectural feasibility of requirements and NFRs
Security/Privacy	Validates security and compliance readiness evidence (classification, threat/risk assessment, privacy impacts, regulatory mapping); confirms that security obligations are explicit and feasible
Data/Integration Lead	Validates data profiling, migration, and integration readiness evidence; confirms key dependencies, interface feasibility, and data quality assumptions
PMO Assurance (or Portfolio Assurance):	Calibrates scoring consistency across initiatives, enforces evidence rules, conducts sampling audits of key artifacts, and ensures comparability of scoring outcomes across the portfolio.

Table 21: Governance Roles and Assurance Responsibilities

This allocation supports consistent and comparable readiness scoring by embedding subject-matter validation and reducing reliance on subjective opinion. It also ensures that benefits ownership is not delegated solely to the delivery team: sponsors retain accountability for outcomes and adoption, while delivery roles remain accountable for execution feasibility and readiness evidence.

5.1.1 Assurance Mechanisms to Prevent Scoring Bias

To prevent degradation into a compliance exercise, the operating model incorporates lightweight but essential assurance routines described in **Table 22:** Assurance Mechanisms to Prevent Scoring Bias:

Assurance Mechanism	Purpose	Practical Implementation
Scoring calibration sessions	Align interpretation of PDRI scoring scales and reduce inter-project variability.	Periodic (e.g., quarterly) cross-initiative reviews of scoring outcomes and supporting evidence, with exemplar cases used to reinforce consistent application.
Evidence sampling audits	Ensure readiness scores are supported by verifiable artifacts and deter optimistic scoring.	Random or risk-based sampling of key artifacts (e.g., requirements/NFRs, architecture decisions, security classification) to confirm evidence quality.
Challenge function at gates	Prevent approval based on unsupported or weak readiness claims.	PMO assurance and specialist validators formally challenge scores at gates and require documented gap-closure actions where evidence is insufficient.
Consistency rules and Guidance	Maintain comparability of readiness assessments across initiative types.	Standard scoring guidance, common element definitions, minimum evidence standards, and shared templates applied portfolio wide.

Table 22: Assurance Mechanisms to Prevent Scoring Bias

Together, these assurance mechanisms ensure that PDRI assessments function as decision-grade governance instruments rather than compliance checklists.

5.2 Tooling and Artifacts

The operating model requires a controlled evidence repository and structured templates to ensure PDRI and BSC assessments are auditable and repeatable.

Requirement	Purpose / Rationale
Single Source of Truth	Ensures consistent evidence for scoring and gate approvals.
Version Control and Traceability	Links artefacts to gate decisions and supports auditability.
Access Controls Aligned to Classification	Protects sensitive information and supports compliance obligation
Retention Rules	Enables post-implementation evaluation and audit requirements.

Table 23: Evidence Repository Requirements

Framework Component	Artifact Examples
PDRI (readiness evidence)	Scope statement and boundaries; dependency map; requirements baseline and NFR catalogue; acceptance criteria; conceptual/target architecture diagrams; decision records; integration inventory and dependency constraints; data profiling and migration strategy; security classification; threat model and risk assessment; operational readiness/service acceptance checklist; support ownership model.
BSC (value measurability)	Objective-to-KPI mapping and rationale; KPI dictionary (definitions, baselines, targets, sources, cadence); benefits register aligned to KPIs (owners, timing, dependencies); reporting dashboard specification; measurement enablement plan (where needed).

Table 24: Core Artefacts Supporting PDRI and BSC Governance

This tooling requirement aligns with the shift toward value-focused governance: reporting must go beyond "on time/on budget" to include measurable outcomes, benefits progress, and benefit sustainment. Benefits management definitions further require explicit identification and tracking of benefits over time, which demands structured artifacts and consistent measurement discipline.

5.3 Readiness Thresholds and Critical Blockers

Informed by the logic of definition indexes identifying and isolating poorly defined elements, the paper proposes two complementary approval mechanisms:

- Numerical thresholds: minimum PDRI overall score (and/or minimum domain scores) required for gate progression.

- Critical blockers: represent governance-level risk conditions that exceed acceptable tolerance thresholds and therefore prevent responsible mobilisation until the condition is resolved or explicitly owned by the appropriate authority.

Threshold calibration should be empirically tuned over time (Section 6) and must recognise that numeric cutoffs from other domains do not transfer directly. ICT programs require their own calibration due to distinctive risk structures (software volatility, cyber threats, adoption dynamics), and thresholds should evolve based on the observed correlation between early readiness scores and delivery outcomes (Project Management Institute, 2019a; 2021b)

6. Evaluation Pathways and Future Research

This section outlines high-level research pathways that may be used to examine the explanatory value and practical utility of the proposed governance framework. It does not constitute an empirical study design, nor does it prescribe a testing protocol within this manuscript. Rather, it identifies logically consistent directions for future empirical validation of the design artifact presented herein.

The integrated DPRI+BSC framework is proposed as a governance mechanism whose explanatory value and practical utility warrant empirical examination. Governance and project performance literature has consistently linked early planning discipline, benefit ownership clarity, and structured decision processes to improved outcomes (Zwikael & Globerson, 2006; Musawir et al., 2017). Accordingly, the framework generates testable propositions regarding the relationship between readiness maturity, outcome measurability, and portfolio performance.

6.1 Empirical Validation Logic

Prior research suggests that early definition completeness and structured front-end governance influence downstream cost and schedule performance (National Research Council, 2002; Project Management Institute, 2002). Similarly, benefit management and governance alignment have been associated with higher levels of realised value (Musawir et al., 2017). Building on this literature, the framework suggests several directional propositions intended solely to inform future empirical inquiry. These propositions are conceptual extensions of the design logic presented and are not advanced as empirically tested claims within this manuscript.

- P1: Higher readiness scores at feasibility gates are associated with lower schedule variance and reduced scope volatility during delivery.
- P2: Initiatives with defined baseline-linked KPIs at mobilisation demonstrate stronger post-implementation benefit realisation.
- P3: Portfolio sequencing using a Value × Readiness lens reduces premature mobilisation of high-risk initiatives relative to value-only prioritisation.

These propositions align with established front-end loading principles (National Research Council, 2002) and governance maturity models that emphasize structured decision checkpoints (Government Accountability Office, 2004).

6.2 Research Design Opportunities

A range of research approaches may be suitable for examining the framework's predictive and practical value, including comparative case studies and longitudinal portfolio observation. Such investigations would assess whether early readiness and measurable outcome governance correlate with improved delivery stability and benefit realisation over time. The specification of research design detail is intentionally deferred to future empirical work.

This research direction is consistent with calls for stronger links between project governance mechanisms and measurable organisational outcomes (Zwikael & Globerson, 2006; Musawir et al., 2017).

6.3 Governance Maturity and Learning Effects

Embedding readiness and measurable value criteria into stage-gate processes may contribute to governance maturity over time. Consistent with staged investment governance models (Government Accountability Office, 2000, 2004; Project Management Institute, 2021a), institutionalising structured evidence requirements may reduce decision variance and strengthen benefit accountability. Empirical assessment of these learning effects is proposed as a future research direction.

6.4 Boundary Conditions

The framework is most applicable in ICT-intensive environments where architecture dependencies, data complexity, and regulatory obligations materially influence delivery risk. In lower-complexity contexts, the marginal value of structured readiness scoring may be reduced. Empirical investigation should therefore examine contextual moderators, including organisational maturity, regulatory exposure, and portfolio scale.

7. Discussion

This section interprets why the proposed integrated PDRI+BSC framework is particularly suited to ICT contexts, clarifies practical implications for PMOs and governance bodies, and articulates limitations and boundary conditions. The discussion draws together the literature foundations (front-end definition readiness instruments, requirements-driven ICT risk, outcome measurement systems, benefits management, and investment governance maturity) to explain how an integrated readiness-and-worth decision system addresses common ICT failure modes. It also highlights where empirical validation is required and what implementation conditions are necessary for the framework to deliver value.

7.1 Why the Integration Matters in ICT Contexts?

ICT initiatives often underperform through two recurring governance failure modes:

- "Well-intentioned but not ready": The strategic rationale is credible, but definition maturity is weak. Typical symptoms include ambiguous requirements, incomplete non-functional requirements, unclear scope boundaries, unresolved integration and data dependencies, insufficient security/privacy classification, and an undefined operating/support model. These gaps result in high uncertainty entering execution, leading to rework, architectural churn, schedule slippage, and cost escalation.

- "Deliverable but not valuable": The initiative is sufficiently defined to be delivered, but the value proposition is weakly specified or unmeasurable. Outcomes are poorly articulated, benefits are not owned by accountable business stakeholders, adoption mechanisms are underdeveloped, and measurement data sources are unclear. The result is delivery completion without sustained organisational impact.

- The PDRI directly addresses the first failure mode by requiring evidence-backed definition maturity across ICT critical domains before mobilisation. The BSC directly addresses the second failure mode by forcing strategic objectives to be translated into measurable KPIs with baselines, targets, and owners—creating governance conditions for benefits accountability and post-implementation evaluation. Importantly, the integration is necessary because addressing only one failure mode leaves the other intact: readiness without measurable value permits "efficient delivery of the wrong outcomes," while value claims without readiness evidence permits "strategically justified failure."

- The integrated gate rule mitigates execution bias by requiring both readiness and outcome measurability before major funding commitment. In doing so, it improves decision quality and helps ensure that ICT investments are both feasible and strategically justified. This is particularly important in modern ICT environments characterised by rapid technology change, cyber risk exposure, and strong interdependence between technical delivery and organisational adoption.

7.2 Practical Implications for PMOs

The framework has several practical implications for PMO operating models and portfolio governance:

- Decision quality improves: PDRI requires explicit evidence and structured gap closure before gate progression, reducing reliance on optimism or presentation quality. BSC requires measurable value statements with defined KPI standards, reducing approvals based purely on narrative. Together, they strengthen the evidentiary basis of governance decisions.

- Transparency and comparability improve: Standardised PDRI scoring and KPI dictionary requirements make initiatives comparable across the portfolio. Governance bodies can assess not only which initiatives are high value but also which are sufficiently defined to proceed—improving prioritisation and sequencing decisions.

- Benefits accountability improves: By requiring benefit owners and measurable KPIs, the framework reduces the common pattern where benefits are implied but not governed. The benefits register and KPI dictionary create traceability from strategic intent to measurable outcomes, supporting credible post-implementation evaluation.

- Risk management is strengthened early: PDRI makes front-end risk drivers explicit (integration, data, security, operating model readiness), enabling earlier mitigation planning and reducing late-stage surprises. This aligns with evidence that standardised risk practices and scope discipline are associated with improved project performance.

- Portfolio throughput improves: By preventing poorly defined initiatives from entering execution prematurely, the framework reduces rework and protects constrained delivery capacity. Over time, this improves the portfolio's ability to complete high-value initiatives rather than starting many and finishing few.

- Governance maturity becomes measurable: The evaluation strategy (Section 6) enables PMOs to track whether readiness scores and outcome measurability are improving over time and whether these improvements correlate with better delivery and benefit performance—supporting iterative maturity development.

7.3 What is the practice innovation?

The practice innovation proposed in this paper lies not in introducing a new planning template, but in redefining the approval logic governing ICT investment decisions. By institutionalising a dual, evidence-based test—readiness to deliver and worth delivering—the framework alters the structure of executive gate conversations. Rather than approving initiatives primarily on strategic urgency or sponsor advocacy, decision forums are required to examine comparable readiness evidence and auditable outcome commitments before authorising mobilisation.

The integrated PDRI+BSC approach reframes gate decisions as an evidence-based test of readiness and value, shifting governance discussions from persuasive narratives toward comparable decision-grade evidence. In practice, this changes the behaviour of portfolio boards and PMOs. Gates become mechanisms for sequencing and de-risking work rather than binary approval checkpoints, high value but immature initiatives are deliberately incubated rather than prematurely mobilised, and technically ready initiatives with weak value propositions are challenged or stopped. The innovation is therefore not the creation of new artefacts, but the institutionalisation of a disciplined decision logic that reshapes how investment decisions are framed, challenged, and justified in ICT portfolios.

7.4 Limitations, Boundary Conditions, and Threats to Validity

The paper proposes a governance framework and operating model; therefore, performance claims require empirical validation through pilots and longitudinal tracking. Several limitations and boundary conditions are noteworthy:

- **Empirical Validation Requirement:** The predictive validity of PDRI scoring and the effectiveness of BSC-driven outcome accountability must be tested using structured pilots and multi-cycle observation. Without empirical evidence, claims of improved performance remain plausible but unproven.

- **Scoring Reliability and Governance Discipline:** PDRI effectiveness depends on consistent interpretation of scoring scales and disciplined evidence standards. Without assurance controls (calibration sessions and artifact verification), scoring may degrade into a compliance exercise or be inflated to obtain approvals (“greenwashing”), weakening governance credibility.

- **Data Availability and KPI Feasibility:** BSC performance depends on KPI measurability. In many organisations, baseline data is missing, inconsistent, or costly to collect. Scorecards must therefore be realistic and auditable; where data is unavailable, governance must require a measurement enablement plan rather than accepting unmeasurable objectives.

- **Organisational Adoption and Benefit Ownership:** Benefits realisation is highly dependent on business ownership, incentives, and change capacity. Where benefit owners lack authority or resources to drive adoption and process changes, the scorecard may formalise accountability but not ensure benefit delivery.

- **Context Dependence and Tailoring Risk:** The PDRI domain weights and blocker rules may require tailoring by ICT archetype and organisational context. Excessive tailoring can reduce comparability; insufficient tailoring can reduce relevance. Governance must balance standardisation with controlled flexibility.

- **Threats to Internal Validity:** Improvements observed during pilots may partially reflect heightened attention (Hawthorne effect) or concurrent process improvements. To mitigate this, PMOs should compare against historical baselines and track outcomes over multiple cycles.

Despite these limitations, the framework provides a structured and operationally implementable approach to strengthening ICT front-end governance. Its value proposition is strongest in organisations where:

(i) stage-gate or investment governance exists,
(ii) ICT initiatives are materially affected by integration/data/security/adoption risks, and
(iii) leadership seeks to institutionalise measurable value realisation alongside delivery discipline.

7.5 Implications for AI-Enabled ICT Initiatives

Artificial intelligence (AI) initiatives provide a contemporary example of why disciplined front-end governance is critical: weak problem framing, data readiness gaps, and unclear outcome definitions in AI programs often propagate into large-scale operational and ethical risks (OECD, 2019; Raisch & Krakowski, 2021).

From a definition readiness perspective, AI initiatives place exceptional demands on several PDRI domains. Requirements ambiguity is magnified when objectives are expressed at a high level (e.g., “improve decision quality” or “automate judgement”), while non-functional requirements such as explainability, bias tolerance, auditability, and model drift are frequently under-specified. Data readiness becomes existential rather than incremental: training data quality, provenance, representativeness, and governance directly constrain model validity and permissible use. Security, privacy, and compliance readiness also assume heightened importance, as AI systems may embed sensitive attributes, generate inferred personal data, or trigger regulatory obligations beyond those associated with traditional systems.

From a value-governance perspective, AI initiatives are especially prone to the "deliverable but not valuable" failure mode. Technical success in building or deploying a model does not guarantee measurable organisational benefits. Benefits are often contingent on adoption, trust, process redesign, and human-in-the-loop operating models that sit outside the technical delivery boundary. Without explicit outcome definition, baseline measurement, and accountable benefit ownership, AI initiatives risk producing sophisticated technical capabilities with limited realised value (Kaplan & Norton, 2007).

The integrated PDRI+BSC framework is therefore particularly well suited to AI-enabled ICT initiatives. PDRI provides a structured mechanism for making AI-specific readiness gaps visible before mobilisation, while the Balanced Scorecard forces AI value propositions to be expressed as measurable outcomes across financial, stakeholder, process, capability, and risk dimensions. In combination, the framework counteracts the tendency to accelerate AI initiatives based on novelty or perceived strategic urgency alone, replacing narrative-driven approvals with evidence-based governance.

In this sense, AI does not require a separate governance model; rather, it represents a demanding contemporary test case for readiness and value-based pre-planning (OECD, 2019; Grekul et al., 2019).

Organisations that cannot demonstrate disciplined front-end governance for AI initiatives are unlikely to do so for less complex ICT investments. Conversely, applying the PDRI+BSC framework rigorously to AI initiatives strengthens governance maturity across the entire ICT portfolio.

8. Conclusion

This paper proposed a practical, technical pre-planning governance framework integrating a Project Definition Readiness Index (PDRI) with a Balanced Scorecard (BSC) for ICT programs and projects.

The research questions posed earlier can now be answered directly.

RQ1: The framework operationalises readiness and value measurability as joint stage-gate criteria through structured PDRI readiness scoring and Balanced Scorecard outcome measurement.

RQ2: Decision-grade governance requires artefact-anchored readiness evidence, defined KPI dictionaries, and clearly assigned roles for readiness validation and benefits ownership.

RQ3: PMOs can use early PDRI and BSC signals through a Value × Readiness portfolio lens to prioritise initiatives, incubate strategically important but immature work, and prevent premature mobilisation of poorly defined initiatives.

The framework is grounded in established definition readiness scoring concepts used in front-end planning instruments (e.g., PDRI-type approaches) and in Balanced Scorecard theory that positions multi-perspective measurement as both a complement to financial metrics and a mechanism for strategy execution. By combining these approaches, the framework addresses two persistent ICT governance questions that are often treated separately: **"Are we ready to deliver?"** (definition maturity and feasibility) and **"Is this worth delivering?"** (strategic alignment and measurable value).

The proposed operating model embeds these questions into a progressive stage-gate mechanism aligned to investment governance logic (Select/Control/Evaluate). PDRI strengthens decision quality by requiring evidence-based definition completeness across ICT critical domains (requirements and NFRs, architecture, integration/data readiness, security/privacy/compliance, operating model readiness, and adoption readiness), while the BSC strengthens value accountability by requiring explicit objectives, measurable KPIs with baselines and targets, and accountable owners. Together, the integrated gate rule is designed to reduce "execution bias," limit preventable rework, and improve the likelihood that ICT investments deliver measurable benefits rather than merely completing delivery outputs.

The paper also defines a portfolio prioritisation approach (Value × Readiness) that supports sequencing decisions under constrained capacity and helps governance bodies avoid accelerating high-value initiatives that remain poorly defined. The primary contribution of this manuscript is the articulation of an integrated governance design; empirical validation, calibration modelling, and predictive testing are explicitly positioned as subsequent research activities rather than components of the present study. Finally, an evaluation strategy and continuous improvement loop is outlined to support empirical calibration of thresholds, weights, and blocker rules and to strengthen governance maturity over time.

This framework does not seek to replace established project management standards or benefits management practices; rather, it introduces a structured pre-commitment decision logic that makes readiness and measurable value explicit prior to mobilisation.

Future empirical research should evaluate the framework's predictive validity and practical impact across ICT portfolio contexts.

Declarations

Ethics Statement

This study does not involve human participants, personal data or animals.

Competing Interests

The author declares no known competing financial interests or personal relationships

Data Availability

No data sets were generated or analysed during the current study

Generative AI Disclosure

During the preparation of this work, the author used AI tools for language editing and structural feedback only. No analytical results or references were generated solely by AI systems; all sources were independently verified by the author. These tools include built Microsoft Word Editor, Grammarly and Turnitin. The author reviewed and edited all content and takes full responsibility for the content of the published article.

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