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AN INTEGRATED KPI FRAMEWORK FOR ORGANISATIONAL INFORMATION SYSTEMS: MAPPING SEVEN GOVERNANCE - LEVEL METRICS TO ISO/IEC 25010:2023 ATTRIBUTES

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Information systems have become strategic organizational assets, but classical success literature in the field of information systems offers qualitative models without predetermining which measurement attributes implement each dimension. This article proposes an integrated framework of key performance indicators (KPIs) that bridges this gap by mapping seven new government - level indicators to a vocabulary of measurement attributes taken from the ISO/IEC 25010:2023 standard. The subject of the study is an integrated framework of key performance indicators (KPIs) for evaluating organizational information systems at the government level. The purpose of the study is the group of organizational information systems along with their dimensions of quality, success, and risk in private and public sector deployments. The aim of the paper is to formulate, justify and formulate an integrated framework that maps seven governance - level metrics: Organization - Wide Effectiveness (OWE), Decision Lag (DL), Artificial Intelligence Adoption (AIA), Management Attention Index (MAI), Executive Engagement Score (EES), Risk Response Compliance (RRC) and Risk Mitigation Response Rate (RMAR) – to 25 measurable quality attributes taken from the ISO/IEC 25010:2023 standard. Mapping or suggesting dependencies is done using 37 literature - based dependency links. To achieve this goal, the paper addresses the following tasks:

- *To organize classical information systems success theory, technology acceptance models and contemporary key performance indicator (KPI) hierarchies into a single conceptual vocabulary.*
- *To define the seven governance - level metrics in a form that is ready to be measured using variables observable from organizational data.*
- *Build an explicit dependency mapping between the seven metrics and the 25 characteristics of ISO/IEC 25010:2023.*
- *Formulate sector - specific weighting profiles for private and public sector deployments; and specify a three - stage empirical validation plan.*

As a result of the study, a literature - based framework is presented that combines classical information systems success theory with contemporary constructs of AI adoption, management engagement, and project risk governance. The framework is implemented using a three - tier architecture, produced for both private and public sector deployments. The framework is illustrated using a use case diagram and a customer journey map, and is based on a life cycle interpretation of risk metrics based on a defect profile. A three - stage empirical validation plan (Delphi panel, case implementation, and cross - sector Partial Least Squares Structural Equation Modeling: PLS - SEM survey) is proposed for further research.

Keywords: information systems success; KPI framework; ISO/IEC 25010:2023; AI adoption; executive engagement; risk management; DeLone and McLean model; defects - profile life cycle.

Introduction

Information systems (IS) have evolved from operational support tools to strategic assets that shape organizational competitiveness, service quality, and evidence - based decision - making [2, 3, 14]. Despite four decades of research on IS success, a significant proportion of IS projects still fail to deliver the expected business value [9], revealing IS implementation as a socio - technical task whose success depends on the alignment of people, processes, and technology. Organizations routinely evaluate IS through three different lenses, and they misapply each of them. The first is the efficiency lens: relying on cost and schedule lag measures rather than actionable performance measures. The second is the financial rigor lens: treating mathematical estimates of return on investment as if they were objective guarantees of future value. The third is the contextual fit lens: the application of private sector benchmarks to public sector realities, while ignoring the accountability, budget, and citizen service obligations that govern public sector IS.

This article addresses two interwoven gaps in the literature. First, canonical information systems success models [2, 3] describe quality dimensions without specifying which measurable attributes implement each dimension. Second, recent constructs relevant to contemporary information systems governance—including the adoption of artificial intelligence, managerial mindfulness, managerial engagement, and risk response compliance—have entered the discourse of practitioners without a formal mapping to the existing vocabulary of quality attributes defined by ISO/IEC 25010:2023 [1].

The contribution of this work is an integrated KPI framework that:

(a) Combines financial, engineering, and managerial - behavioral metrics.

(b) Defines seven new governance - level metrics in a measurement - ready form.

(c) Constructs a literature - based dependency mapping between these metrics and 25 measurable quality attributes.

(d) Formulates sector - specific measurement priorities.

Literature review

This section reviews the body of work on which the proposed framework is based and identifies the gaps that drive it. The review is structured along a diagnostic trajectory: it begins with the long - standing distinction between efficiency and effectiveness, traces the boundaries of canonical models of success in information systems, and then moves to four contemporary fronts—AI adoption, data quality and decision latency, management engagement and risk management, and sector context. Each has accumulated significant evidence beyond 2023 that classical information systems assessment has not yet captured. The literature is drawn from canonical information systems sources, the ISO/IEC 25010:2023 standard [1], and a focused group of recently published studies that apply these constructs in a measurement - ready manner.

From Efficiency to Effectiveness in IS Assessment. The IS assessment literature has made a fundamental distinction between efficiency – doing things right – and effectiveness – doing the right things. Efficiency captures input - output relationships, resource utilization, and minimizing operating costs. Effectiveness captures the extent to which goals are achieved, the quality of results, and the fulfillment of strategic intent. Measuring activity without measuring results is the fastest way to organizational sub-optimization [22]. Recent research on performance measurement systems reinforces this distinction: integrative models of performance measurement system (PMS) assessment systemize dimensions and criteria in the literature [27]; nineteen specific barriers to performance measurement system effectiveness were identified and assessed against a well - established PMS in light of selected development goals [28]. Recent reviews of enterprise performance under Industry 4.0/5.0 [29] show that current PMSs overemphasize technological advancement and economic efficiency at the expense of human - centric and sustainability dimensions. The bibliometric mapping by Kapse et al. [30] confirms that KPIs and Key Risk Indicators (KRIs) are routinely integrated. The industrial case study in [31] shows how 22 standard KPIs deployed via a Power BI dashboard yield measurable gains in decision speed and consistency; and the empirical work in [45] confirms that strategic planning only translates into financial performance when implemented using well - defined metrics.

Classical IS - success models and their limitations. The DeLone & McLean (D&M) model [2] identified six interrelated dimensions: system quality, information quality, usability, user satisfaction, personal impact, and organizational impact. The updated model [3] added service quality and incorporated personal and organizational impacts into net benefit. Seddon [13] separated perceived benefit from actual use; Peter et al. [14] unified the concept of organizational impact. Despite extensive validation [15, 16], the canonical models have a structural limitation: they describe qualitative dimensions of success but do not specify which measurable attributes embody each dimension. Recent empirical applications make this gap apparent. A modified D&M model applied to learning management systems [25] found that two of the nine standard relationships hypothesized were meaningless for the population surveyed, suggesting that the abstract dimensions are not sufficiently indicative for practical measurement and need to be re - anchored with feature - level instruments. A study on ChatGPT acceptance among students [26] also extends the D&M model with PLS - SEM analysis but again must add new constructs to make the model measurement - ready. There is therefore an urgent need to bridge qualitative D&M dimensions with the vocabulary of quantitative features defined in ISO/IEC 25010:2023 [1].

Technology acceptance and AI adoption. The Technology Acceptance Model [4] and the Unified Theory of Technology Acceptance and Use [5] remain the dominant lenses for adoption. The post - 2023 literature has extended these models to the contexts of AI and generative AI. Park Woo [10] showed using a Korean business survey of 300 employees that effort expectancy and social influence significantly drive generative AI adoption; Simeon et al. [11] validated a combined Technology Acceptance Model - TAM/ Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)/PLS - SEM model in Small and Medium-sized Enterprises - SMEs; Chen et al. [19] demonstrated that understanding and trust mediate adoption intention. Comprehensive bibliometric [18] and thematic [17] reviews of workplace AI adoption have examined influencing factors and outcomes up to 2024.

Evidence from MDPI beyond 2023 sharpens the picture: Blaskas et al. [32] applied TAM, UTAUT - 2 and PLS - SEM to 297 stakeholders in the Greek banking ecosystem and showed that adoption motivations differ markedly between bank employees, digital professionals and the general public. Wang [33] empirically links AI technology adoption to organizational decision - making effectiveness, with senior management support, perceived usefulness and perceived ease of use being significant drivers – directly driving the treatment of AIA as a measure linked to decision latency and management attention. Despite this rich empirical base, the literature still lacks a formal mapping between the pace and depth of AI adoption and a structured KPI hierarchy at the management level [9].

Data quality, timeliness, and decision latency. Wang and Strong [7] identified timeliness as a top - tier data quality dimension alongside accuracy, completeness, and consistency. Erlinger and Voss [20] reviewed current tools for measuring data quality; IBM [21] directly linked old or incomplete data to decision delay and financial exposure. Recent comparative reviews significantly deepen the foundations: the framework comparison in [34] systematically maps Total Data Quality Management - TDQM, ISO 8000, ISO 25012, IMF DQAF, BCBS 239, World Health Organization Data Quality Assessment - WHO DQA, and Attributable, Legible, Contemporaneous, Original, Accurate (data-integrity principles) - ALCOA+ to a common dimension vocabulary. The parallel review in [35] integrates the Findable, Accessible, Interoperable, Reusable (data-management principles) - FAIR principles with the ISO/IEC 25000 series. Melner [36] addresses the perceived - actual gap using an automated DQM framework with over 100 assessment tools. In Industry 5.0 environments, the recent treatment in [37] characterizes poor data quality as a factor affecting operational decline and decision - making, while the industrial data quality pipeline in [38] implements continuous monitoring of accuracy, completeness, consistency, and timeliness on real IoT sensor data, demonstrating that the four canonical dimensions are operationally manageable in real - time environments.

Executive engagement, risk management, and IT governance. Rockart [8] presented critical success factors through a study of managers' information needs. Ali et al. [9] provided meta - analytic evidence that senior management support is among the strongest predictors of information systems project success. The Project Management Institute [6] formally defines risk response planning and monitoring. Testorelli et al. [23] propose a holistic framework for creating value for risk in a project. Omar et al. [12] provide empirical evidence that risk practices aligned with the PMBOK drive the success of agile projects. The post - 2023 evidence shows that these factors translate into measurable governance structures. Akbar et al. [39] surveyed 408 IT professionals on ERP projects in Pakistan and showed using Smart Partial Least Squares (statistical-modeling software) - SmartPLS, that transformational leadership is positively associated with ERP project success, with change management mediating the relationship. The study of IT service project success in [40] used regression, confirmatory factor analysis, and SEM; Tavares et al. [41] developed and validated the AGP risk management model on 1,868 European and Asian survey responses, accounting for up to 76% of the variance in potential project risks. Almutairi [42] presented an AI - driven decision support system for agile software project management. The MDPI Computers systematic review of IT management [43] covers 380 articles (1999–May 2025), and the Platform Quality Measurement Study [24] confirms that the ISO/IEC 25010:2023 sub - characteristics are practically measurable in terms of reliability, security, and maintainability.

Sector context as a first - class determinant. A common approach throughout the literature is that the appropriate weighting of evaluation metrics depends on the sector. Private sector deployments emphasize financial flexibility, time - to - market, and competitive advantage; public sector deployments emphasize accountability, transparency, regulatory compliance, and citizen service. The NIST Baldrige Program [22] frames this distinction at the level of managerial accountability, while Peter and colleagues [14] recognize it as a mediator of development - management relationships. Recent work by MDPI makes the specificity of the public sector measurable. Diaz and colleagues [44] adapt the agile Scrum methodology to public administration contexts (Scrum@PA), explicitly modeling additional quality assurance roles, transparency requirements, and citizen - stakeholder communication channels. The comprehensive review in [46] demonstrates that digital transformation in the public sector improves efficiency, citizen engagement, and government accountability, but also reveals risks of a digital divide that require accountability - oriented metrics. The proposed framework incorporates the sector context as a first - order determinant rather than an afterthought.

Synthesis: five gaps motivating the framework. The state of technology reviewed above leaves five interrelated gaps.

First, an operational gap: canonical information systems success models [2, 3, 13, 14] describe qualitative dimensions but do not dictate measurable attributes. Second, a contemporary structural gap: adoption of artificial intelligence [10, 11, 17, 18, 19, 32, 33], management engagement [8, 9, 39, 40], and risk compliance governance [6, 12, 23, 41, 42] have not been formally mapped to the vocabulary based on quality attributes [1]. Third, a translation gap: no accepted mechanism translates attribute - level measurement results into top - level outcomes that senior managers can act on. Fourth, a currency gap: Current developments in generative AI, data quality automation [34, 35, 36, 37, 38], and AI - DSS in agile risk [42] challenge classical models [2, 3]. Fifth, a sectoral context gap: Generic frameworks for assessing information systems fail to capture the structurally different accountability regimes of public versus private deployments [22, 44, 46].

As a result of the review of research in the field, it can be argued that despite the extensive research that exists in the field of information systems success and quality management, there is currently no integrated framework that maps a small set of governance - level performance indicators (KPIs) onto the standard vocabulary of quality attributes. While incorporating contemporary AI/risk constructs and the sector context as top - of - mind concerns.

Purpose of the article

The purpose of this paper is to formulate, justify, and formulate an integrated framework of key performance indicators (KPIs) for evaluating enterprise information systems. The framework is built by unifying financial, engineering, managerial - behavioral, and user - centric metrics within a single architecture. It derives an explicit, literature - based dependency mapping between seven governance - level metrics and 25 metric quality characteristics taken from ISO/IEC 25010:2023 [1]; formulates sector - specific weighting profiles for private and public deployments; and outlines an empirical validation plan through which the framework can be tested, improved, and benchmarked over time.

To achieve this goal, the article addresses the following tasks:

- to systematize the existing IS - success models [2, 3, 13, 14, 15, 16, 25, 26], technology acceptance models [4, 5], and KPI hierarchies (efficiency - oriented, effectiveness - oriented, KPI/KRI integrated) [27, 28, 30, 31] into a single, internally consistent conceptual vocabulary;
- to define seven new governance - level metrics — Organization - Wide Effectiveness (OWE), Decision Latency (DL), AI Adoption (AIA), Management Attention Index (MAI), Executive Engagement Score (EES), Risk Response Compliance (RRC), and Risk Mitigation Adherence Rate (RMAR) — in measurement - ready form using variables observable from organizational data such as system - usage logs, risk registers, steering - committee attendance records, project change requests, and decision - trace records;
- to construct an explicit dependency mapping between the seven metrics and the 25 ISO/IEC 25010:2023 measurable attributes [1], yielding 37 documented links each annotated with at least one supporting reference;
- to articulate sector - specific weighting profiles for private and public deployments, with private - sector deployments emphasizing DL and AIA [11, 32] and public - sector deployments emphasizing MAI, EES, RRC, and RMAR [22, 44, 46];
- to specify a three - stage empirical validation plan covering Delphi expert review, case application in contrasting public and private organizations, and a cross - sector PLS - SEM survey following the design conventions of [10, 11, 32, 41].

Methodology

The framework was built through a conceptual design process with four main phases:

Phase 1 (Measure Definition) - The seven governance level measures were defined in a measurement - ready form using the vocabulary of existing literature on information systems success and quality management. Each measure was defined in terms of an observable organizational behavior or system state, making it a calculation from data that organizations typically already collect .Phase 2 (Attribute Selection) - A vocabulary of 25 measurable quality characteristics was taken from the ISO/IEC 25010:2023 standard [1], which replaces ISO/IEC 9126. The 25 characteristics span technical, flexibility - oriented, and user - facing dimensions of information systems quality .Phase 3 (Dependency Mapping) - For each of the seven new measures, the set of measurable characteristics whose quality substantially drives the measure was identified through a conceptual analysis of the measure definition. Each proposed dependency was then verified against recent literature, where possible, supplemented with canonical sources where necessary. Sixteen academic sources were incorporated, yielding 37 dependency relationships. Phase 4 (Sectoral Distinction) - The weights of the indicators were separated by sectoral context, comparing private sector priorities (financial flexibility, time to market) with public sector priorities (accountability, budgetary control, service to the citizen). The output is a conceptual framework; empirical validation is deferred to the program described in the section on future research.

Proposed framework

Three - tier architecture. The proposed framework - a model, organized as a three - layer architecture (Figure 1). Layer 1 contains the 25 measurable quality characteristics taken from the ISO/IEC 25010:2023 standard, which forms the tools. Layer 2 layer contains the seven new management and governance level metrics that serve as measurement inputs. Layer 3 contains the outcomes of information systems success: net benefit and organizational impact, user and task success, and governance status and risks. The dependency arrows flow downward, representing the 37 literature - based relationships between the layers.

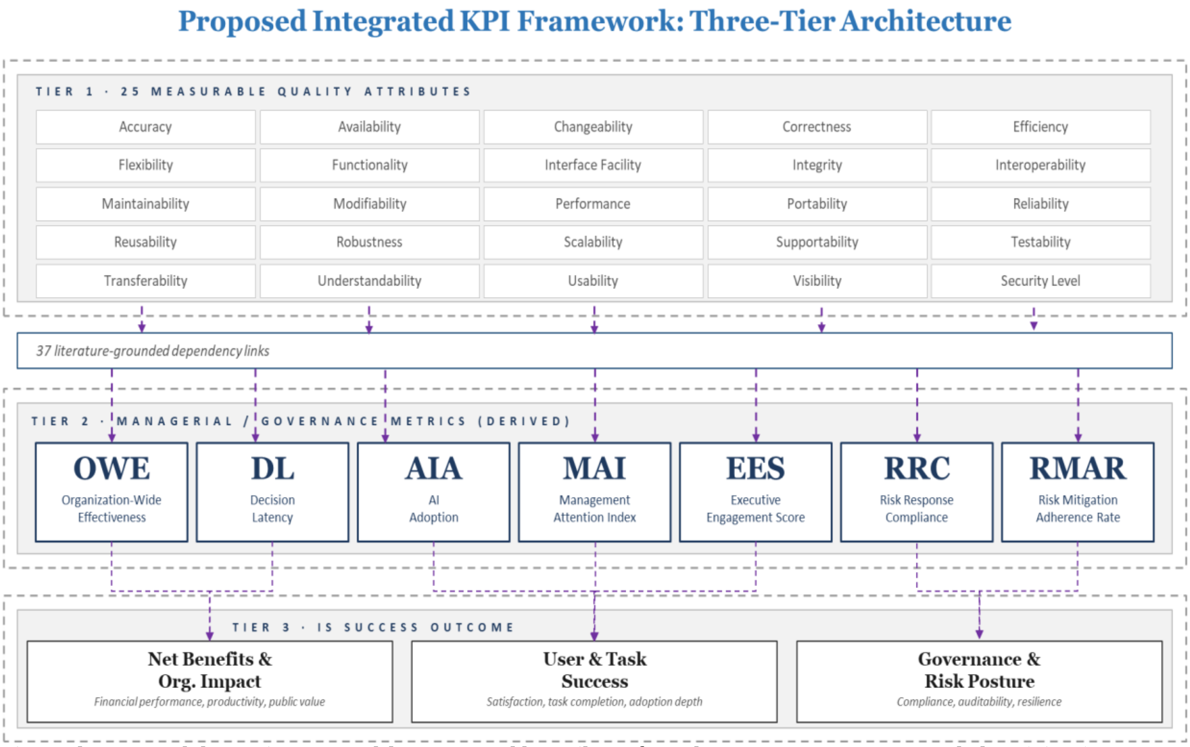

Fig. 1. The proposed three - tier KPI model. 25 measurable attributes from the ISO/IEC 25010:2023 vocabulary (Tier 1) aggregate through 37 literature - grounded dependency links into seven governance - level metrics (Tier 2), which in turn drive IS - success outcomes (Tier 3).

Seven new governance - level metrics. Organization - wide Effectiveness (OWE) captures measurable benefit generated by the information system across the organization as a whole, rather than at the individual user level. Decision Lag (DL) captures the time elapsed between the availability of data and the making of a management decision based on that data. Artificial Intelligence Adoption (AIA) captures the rate and depth at which AI - based features of the information system are actually used by the workforce. Management Attention Index (MAI) captures senior management behavior, including time on improvement teams, decisions based on system data, and a culture of lessons learned. Executive Engagement Score (EES) captures direct management involvement: sponsorship, steering committee presence, and decisions attributable to information system output. Risk Response Compliance (RRC) captures adherence to planned risk responses over time. Risk Mitigation Response Rate (RMAR) captures the portion of planned mitigation actions that are implemented on time and in full throughout the project lifecycle.

Dependency mapping. The seven metrics are linked to the 25 characteristics through 37 dependency links. OWE depends on functionality, usability, understanding, efficiency, and visibility. DL depends on performance, efficiency, availability, reliability, and accuracy. AIA depends on usability, understanding, functionality, accuracy, interface, and visibility. MAI depends on visibility, accuracy, availability, understanding, and performance. EES depends on visibility, functionality, usability, understanding, and accuracy. RRC depends on completeness, security level, reliability, supportability, and testability. RMAR depends on maintainability, changeability, robustness, correctness, changeability, and reliability. Each dependency is based on the literature. For example, Delon supports the OWE - functionality relationship and McLean's [2] premise that the impact of an organization depends on the system's ability to provide the required functions. The AIA - usability relationship is supported by TAM [4] and its UTAUT extension [5], which is reinforced by recent empirical work [10, 11]. The RRC–security level relationship is supported by ISO/IEC 25010:2023 security sub - characteristics [1] and by Project Management Body of Knowledge (PMBOK_ risk response processes [6], reinforced by Omar et al. [12]. Wang and Strong's data quality framework [7] supports the DL–accuracy relationship.

As mentioned, the relationships described here are derived from the literature. In order to validate the relationships, quantitative research is required to empirically strengthen and establish the relationships. Furthermore, by conducting research, weights of the impact of the measuring indicators on the seven KPIs should be found.

Sector - specific priorities. Private sector deployments should give more weight to Decision Latency and AI adoption, while maintaining the priority of financial flexibility and time to market. Public sector deployments should give weight to the Management Attention Index, the Management Engagement Score, and the two Risk Resilience Metrics (RRC and RMAR), while maintaining the priority of accountability, transparency, and citizen service.

Use case scenarios. To illustrate how the framework works in practice, Figure 2 shows six representative actors and their interactions with the framework. The actors fall into two groups: governance - oriented stakeholders on the left (CIO, CFO, steering committee) who define and control the framework, and operational stakeholders on the right (IT operations manager, quality and risk auditor, end user/department head) who provide, validate, and consume measurements. Three illustrative scenarios anchor the diagram. In Scenario 1 (CIO - driven framework instance creation), the CIO defines and weights the seven governance metrics and sets sector - specific priorities; the steering committee approves the instance creation; the IT operations manager defines the data intake from logs and surveys. In Scenario 2 (CFO - led financial review), the CFO reviews the net benefit versus the total cost of ownership (TCO), relying on OWE and DL outputs calculated by IT operations and validated against the 25 ISO/IEC 25010:2023 characteristics by the quality and risk auditor [1]. In Scenario 3 (Audit - driven risk evidence), the auditor reviews the RRC-RMAR evidence path, end users provide user satisfaction feedback that feeds into the OWE metric.

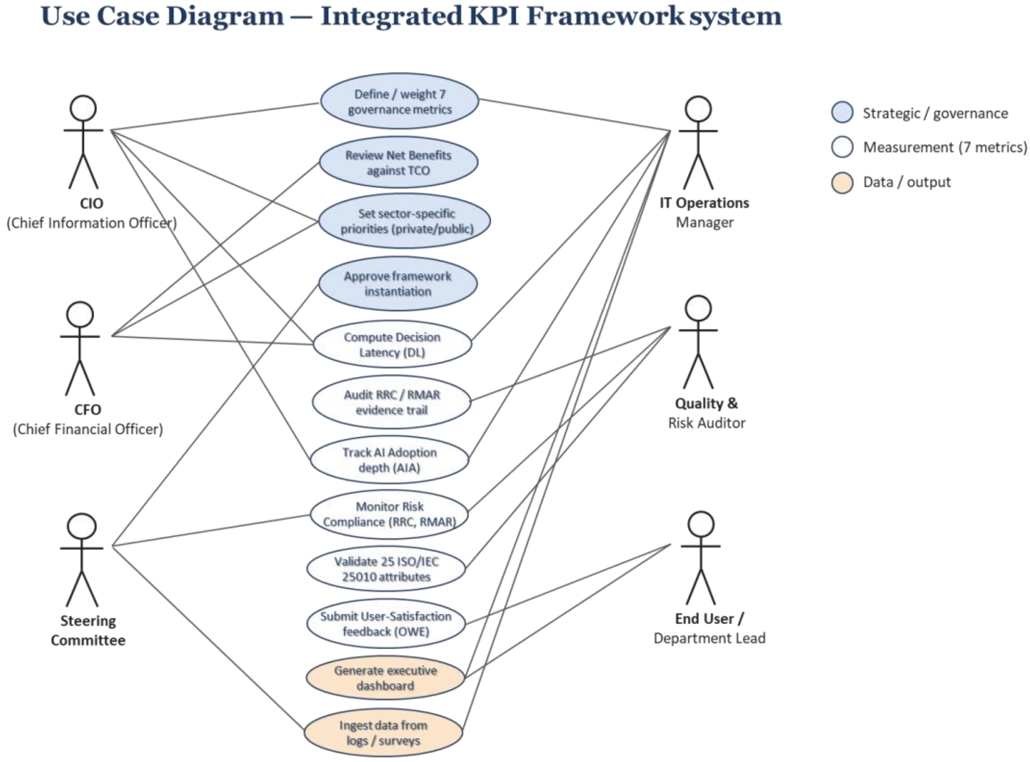

Fig. 2. Use case diagram for the integrated KPI framework. Six stakeholders: CIO, CFO, Steering Committee, IT Operations Manager, Quality and Risk Auditor, and End User / Department Lead — interact with the framework through twelve representative use cases organized by tier (strategic / governance, measurement, and data / output).

Customer journey. Beyond the synchronous view of actors and use cases, the adoption of the framework by the organization unfolds diachronically over five stages, summarized in Figure 3. The journey map traces five paths—actions, touchpoints, pains and risks, gains, and metric focus—against the five stages, and covers a sentimental trajectory.

Stage 1 (Discovery) - begins when a CIO or steering committee identifies a measurement gap and comes across this paper through conferences, peer recommendations, or industry forums. Stage 2 (Diagnosis) - is the friction point of the journey - sentiment drops as the organization grapples with data scattered across silos, confidentiality constraints, and tool mismatches, while a Delphi panel of 8 - 12 experts conducts a gap analysis workshop and selects the appropriate sector profile. Stage 3 (Pilot) - implements one or two metrics in one business unit using a BI dashboard MVP for six months. Stage 4 (Full Adoption) deploys all seven metrics across business units; the manufacturing dashboard goes live; the CFO can finally see the net - benefit - versus - TCO relationship directly.

Stage 5 (Refine) reweights metrics, integrates AI - powered decision support [42], extends to hybrid organizational forms, and exposes the framework for peer benchmarking using an open data set. The journey map presents two practical insights: The diagnostic phase is where most adoption attempts get stuck, because the measurement infrastructure - not conceptual clarity, is the compelling constraint; and creating instances in stages that start with OWE and DL and gradually incorporate the remaining metrics reduces the cognitive and instrumentation burden on the adopting organization.

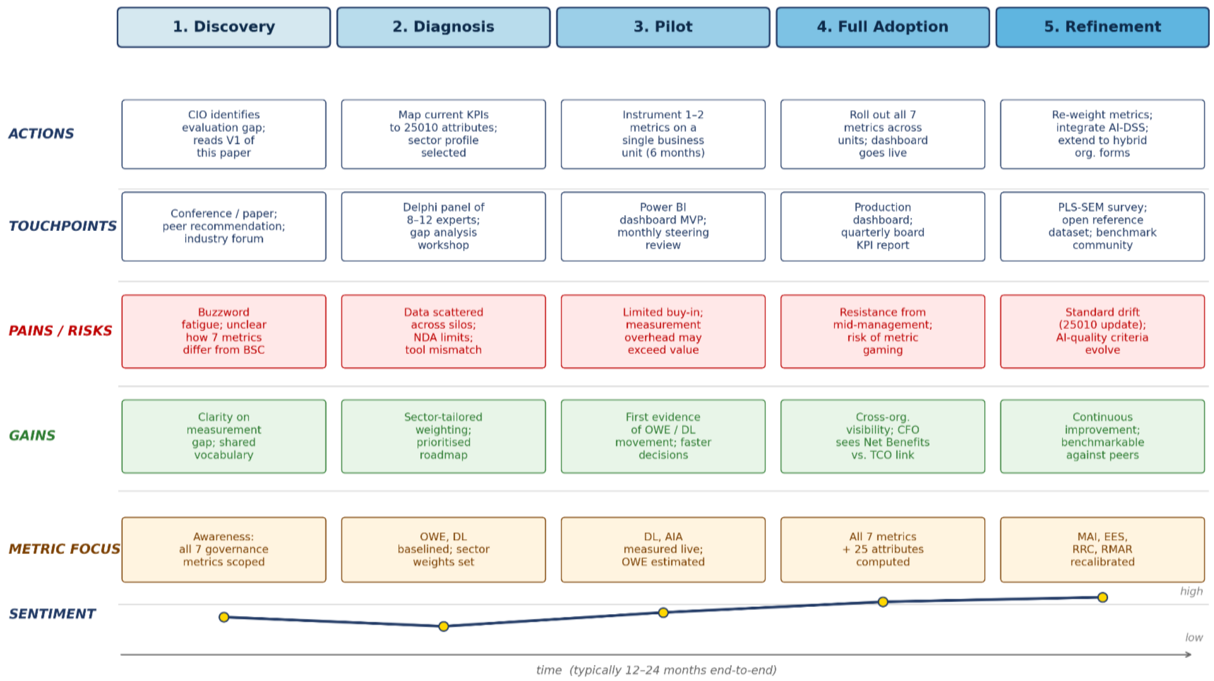

Fig. 3. Customer journey map for organizational adoption of the integrated KPI framework, showing actions, touchpoints, pains, gains, metric focus, and a sentiment trajectory across five stages: Discovery, Diagnosis, Pilot, Full Adoption, and Refinement. Typical end - to - end duration is twelve to twenty - four months.

Defects - profile life - cycle integration with risk metrics. The two risk - oriented metrics in the framework—Risk Response Compliance (RRC) and Risk Mitigation Response Rate (RMAR)—are implemented in addition to the Defect Profile Lifecycle (DPLC) approach proposed by Gordeev, Israel, and Kharchenko [47]. This work introduced an Injection Need Assessment Model (INAM) that characterizes the distribution and evolution of defects across the canonical stages of the software lifecycle—analysis, design, coding, testing, and operation—and provides a decision mechanism for whether to inject a fix at each stage boundary. The central premise of DPLC is that defects are not a static reservoir to be emptied, but a dynamic flow whose stage - by - stage profile carries actionable information about where and when a remediation effort yields the greatest marginal benefit. RRC and RMAR are the natural implementations of DPLC within the proposed framework. RRC measures the extent to which actual risk response decisions made on a project match the responses recommended by the INAM decision set, given the defect profile observed at each stage boundary; RMAR measures the proportion of INAM - determined mitigation actions that are implemented on time and in full throughout the remainder of the lifecycle. RRC captures the quality of decisions; RMAR captures the quality of execution. Both are calculated from data that organizations already collect through defect tracking systems, change request logs, and code review records. The inclusion of the DPLC also clarifies the dependency mapping: RMAR depends on Maintainability, Modifiability, Robustness, Correctness, Changeability, and Reliability precisely because INAM injection decisions depend on whether the system can absorb the proposed change without regression. RRC depends on Integrity, Security Level, Reliability, Supportability, and Testability because the response policy must be auditable, maintain system functionality, and be verifiable through testing. A practical result is that the framework supports a temporal view—not just a cross - sectional view—of risk: management can distinguish between timely and late injection, and the time elapsed between the detection of a deviation and the decision to inject becomes itself a measure of the decision latency in the risk response domain.

Discussion

Theoretical contribution. The model makes three theoretical contributions.

First, it closes the gap between the qualitative dimensions of classical information systems success models [2, 3] and the quantitative vocabulary of characteristics of ISO/IEC 25010:2023 [1] by clarifying which characteristics materialize which dimensions.

Second, it extends the Delon and McLean tradition beyond technical delivery and service benefit to include contemporary governance concerns: adoption of artificial intelligence, managerial attention, and the discipline of risk governance.

Third, it incorporates the sector context as a primary consideration, recognizing that private and public sector organizations face different structural accountability regimes [22].

Practical implications. The model is intended for operational use. Each of the 37 dependency links can be calculated from data that organizations typically already collect, such as system usage logs, risk logs, steering committee attendance records, and project change requests. Therefore, organizations can build the framework incrementally, starting with the metrics most salient to their industry and expanding as the data pipeline matures.

Limitations. Three limitations should be acknowledged:

First, as noted, the dependency mapping is analytical rather than empirical; the 37 links represent expert judgment based on literature, rather than directly tested causal claims.

Second, the framework refers to internal inter-organizational information systems and does not address inter-organizational information systems, open data ecosystems, or platform economies. To address this limitation, a very comprehensive study is needed, with different assumptions than the ones left for finding weights and empirically validating the model.

Third, the distinction between sectors is binary (private versus public); hybrid organizational forms such as government enterprises, public-private partnerships, and regulated utilities may require intermediate weighting profiles, depending on the weights of the indicators and the results of statistical data analysis.

Future study

It should be emphasized that the present contribution is conceptual only. A three-stage empirical validation plan for further research is proposed:

Phase 1 - an expert review using a Delphi panel of 8-12 researchers and information professionals. Panel members will be asked to rate the plausibility of each of the 37 dependencies on a five-point Likert scale and suggest additions or deletions. Convergence will be sought over at least three iterative rounds.

Phase 2 - a case study. The framework will be demonstrated in two contrasting organizations—one from the private sector and one from the public sector—with each of the seven measures calculated from existing organizational data over a three-month observation window. The case study results will examine the estimated sector weights and the superficial implementation challenges.

Phase 3 - a cross-sector survey (target N = 200) designed to test the proposed sector weights using a partial least squares structural equation model (PLS-SEM), following the design conventions of Park and Woo [10] and Simion et al. [11]. The survey tool will implement each of the seven measures using organization-level items and examine the hypothesized dependencies on the 25 measured characteristics.

Beyond validation, three extensions are expected: adaptation to hybrid organizational forms (government companies, public-private partnerships), extension to inter-organizational information systems and platforms where measurement boundaries differ, and development of an open dataset that allows for comparison of the performance of the seven measures across sectors and geographic regions.

Conclusions

The paper establishes an integrated framework of key performance indicators (KPIs) that bridges three previously separate research traditions - classical information systems success theory, technology acceptance, and AI adoption literature, and strategic performance and risk management, governance research by mapping seven new governance-level metrics onto a vocabulary of 25 metric quality characteristics taken from the ISO/IEC 25010:2023 standard. A review of the current scientific literature on information systems evaluation, AI adoption, data quality, risk management, and sectoral context, including 22 studies recently published, revealed five interconnected gaps that the proposed framework is designed to close.

The seven new governance-level metrics: OWE DL, AIA, MAI, EES, RRC, and RMAR—are not independent constructs. Each is fully decomposable into a small, auditable set of measurable attributes, taken from the vocabulary of the ISO/IEC 25010:2023 standard [1]. Meaning they can be calculated from data that is already being collected and protected, with reference to the established success literature of information systems [2, 3].

The framework is presented as a three-layer architecture with 37 literature-based dependencies, illustrated by a use case diagram and a customer journey map, and its risk metrics are anchored in a defect profile lifecycle interpretation [47] that gives them a temporal – rather than just a cross-sectional – nature. The sector context shapes the weight assigned to each metric: private sector deployments should give the most weight to “decision delay” and AI adoption, while public sector deployments should give the most weight to “management attention”, “management involvement” and the two “risk compliance” metrics.

True adoption, reflected in ongoing and visible managerial use of the system, remains the ultimate criterion for the success of information systems. The proposed framework establishes a conceptual and methodological foundation for further development of measurement-ready evaluation systems for organizational information systems, with a three-stage empirical validation program (Delphi panel, case implementation, and cross-sector PLS-SEM survey) outlined for follow-up research.

ADDITIONAL INFORMATION

AUTHOR CONTRIBUTIONS

The authors' contributions are as follows: Mark Israel — methodology, algorithms, assessments; Vyacheslav Kharchenko — supervising, validating and editing study.

DECLARATION ON THE USE OF GENERATIVE ARTIFICIAL INTELLIGENCE TOOLS

In the preparation of this work, the authors used ChatGPT, Claude, and Grammarly for grammar and spelling checks, paraphrasing, and rephrasing of individual sentences. After using these tools/services, the authors reviewed and edited the content and take full responsibility for the content of this publication.

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ІНТЕГРОВАНИЙ ФРЕЙМВОРК КЛЮЧОВИХ ПОКАЗНИКІВ ЕФЕКТИВНОСТІ ДЛЯ ОРГАНІЗАЦІЙНИХ ІНФОРМАЦІЙНИХ СИСТЕМ: ВІДОБРАЖЕННЯ СЕМИ МЕТРИК РІВНЯ КЕРУВАННЯ НА АТРИБУТИ ISO/IEC 25010:2023

Інформаційні системи стали стратегічними активами організацій, але класична література з питань успіху в галузі інформаційних систем пропонує якісні моделі без попереднього визначення, які атрибути вимірювання реалізують кожен вимір. У цій статті пропонується інтегрована система ключових показників ефективності (KPI), яка усуває цю прогалину шляхом зіставлення семи нових показників урядового рівня зі словником атрибутів вимірювання, взятих зі стандарту ISO/IEC 25010:2023. Предметом дослідження є інтегрована система ключових показників ефективності (KPI) для оцінки організаційних інформаційних систем на урядовому рівні. Метою дослідження є група організаційних інформаційних систем разом з їх вимірами якості, успіху та ризику при впровадженні в приватному та державному секторах. Метою статті є формулювання, обґрунтування та формулювання інтегрованої структури, яка відображає сім показників рівня управління: Ефективність в масштабах всієї організації (OWE), Затримка прийняття рішень (DL), Впровадження штучного інтелекту (AIA), Індекс уваги керівництва (MAI), Оцінка залученості керівників (EES), Відповідність реагування на ризики (RRC) та Коефіцієнт реагування на пом'якшення ризиків (RMAR) – до 25 вимірюваних атрибутів якості, взятих зі стандарту ISO/IEC 25010:2023. Відображення або пропонування залежностей здійснюється за допомогою 37 літературних зв'язків залежностей. Для досягнення цієї мети в статті розглядаються такі завдання:

•Упорядкувати класичну теорію успіху інформаційних систем, моделі прийняття технологій та сучасні ієрархії ключових показників ефективності (KPI) в єдиний концептуальний словник.

•Визначити сім показників рівня управління у формі, готовій до вимірювання за допомогою змінних, що спостерігаються з організаційних даних.

•Побудувати явне відображення залежностей між сімома показниками та 25 характеристиками ISO/IEC 25010:2023.

•Сформулювати специфічні для сектору профілі зважування для розгортання в приватному та державному секторах; та визначити триетапний план емпіричної валідації.

В результаті дослідження представлено основу літератури, яка поєднує класичну теорію успіху інформаційних систем із сучасними концепціями впровадження ШІ, залучення керівництва та управління ризиками проектів. Основу реалізовано з використанням трирівневої архітектури, створеної для розгортання як у приватному, так і в державному секторах. Основу проілюстровано за допомогою діаграми варіантів використання та карти шляху клієнта, і вона базується на інтерпретації життєвого циклу показників ризику на основі профілю дефектів. Для подальшого дослідження пропонується триетапний план емпіричної валідації (панель Delphi, впровадження варіантів використання та міжгалузеве опитування PLS - SEM).

Ключові слова: інформаційна система; рамка КПЕ; ISO/IEC 25010:2023; впровадження ШІ; залученість керівництва; управління ризиками; модель DeLone - McLean; життєвий цикл дефектів