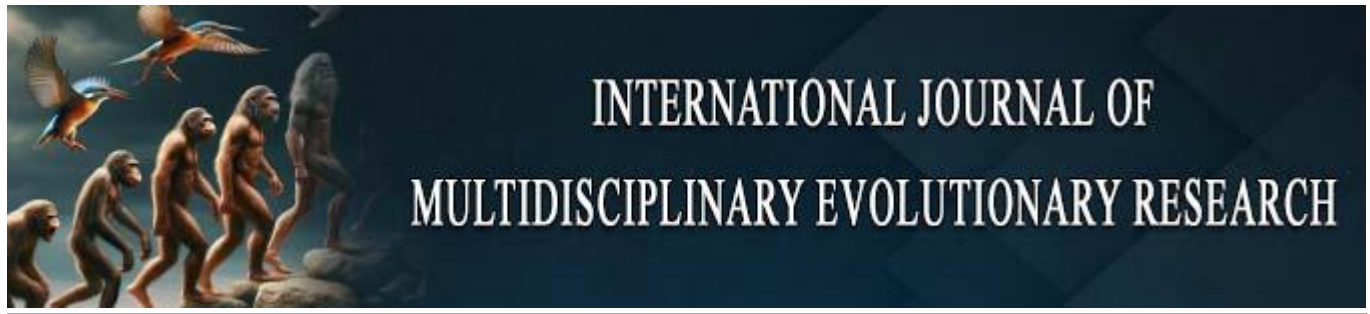




## Measuring Change Program Success: A Review of Multi-Dimensional Evaluation Frameworks in Program Management

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### Abstract

Change programs convert strategic intent into altered operating reality, yet how their success should be established remains unresolved. Evaluation practice stays anchored to delivery conformance, while program value is generated through adoption, behavioural embedding, capability accumulation and strategic repositioning occurring largely after delivery closes. This paper reviews multi-dimensional evaluation frameworks for change programs through an integrative narrative review of a consolidated corpus of applied program management, governance, assurance and sector implementation research published in the five years to 2022. Thematic coding yields five evaluation domains, namely delivery and governance performance, adoption and behavioural embedding, benefits and financial value realisation, stakeholder and workforce outcomes, and capability, maturity and sustainment, together with two cross-cutting conditions of validity, namely measurement infrastructure and causal inference. Evidence is drawn from healthcare infrastructure, energy and procurement, enterprise information technology, occupational safety, financial analytics and assurance, pharmaceutical regulation, education, aviation oversight, the built environment and agricultural development. Four weaknesses recur: adoption is systematically unmeasured, so implementation failure is misread as design failure; attribution is asserted rather than tested; sustainment is treated as a continuation of delivery rather than a distinct problem with its own decay dynamics; and measurement systems are weakly governed, so indicators used for accountability lose validity as measures. An integrative architecture of five domains across three horizons is set out, with governance conditions allowing measurement to survive program closure, and implications are drawn for theory, practice, governance and policy, together with limitations and directions for further research.

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### 1. Introduction

Change programs coordinate interdependent workstreams toward an outcome no single workstream could produce, and expect that outcome to persist after the coordinating organisation dissolves. They appear as coordinated multi-site healthcare infrastructure expansions (Aminu-Ibrahim *et al.*, 2021), capital delivery programs in high-risk environments (Aminu-Ibrahim *et al.*, 2019), enterprise technology migrations (Ladapo *et al.*, 2022), multi-jurisdictional compliance integrations (Ominyi, 2020) and programmatic strategies for renewable energy integration (Yeboah & Ike, 2020).

Evaluation has not kept pace. Program-level models specify coordination structures that determine whether dispersed workstreams converge (Aminu-Ibrahim *et al.*, 2021), yet the instruments most readily available remain those built for project control, which measure how efficiently activity was executed rather than what it produced. Research on infrastructure-driven expansion of diagnostic access makes the gap explicit, since asset completion says little about whether the intended service reach was achieved (Aminu-Ibrahim *et al.*, 2020), and sustainable infrastructure models judged against operating performance rather than construction outturn make the same point (Aminu-Ibrahim *et al.*, 2018).

Three features account for the difficulty. Intended output is altered behaviour rather than an artefact, so completion is at best a precondition, and work on socioeconomic barriers to technology adoption treats use rather than availability as the dependent variable (Michael & Ogunsola, 2022a), as does research on sustained human participation in machine-supported work (Ladapo *et al.*, 2022). Value accrues past closure, which is why energy efficiency and materials strategies for laboratory facilities are assessed across the operating life rather than at handover (Ogbete *et al.*, 2020). And programs operate in open systems where concurrent initiatives and personnel turnover act on the same outcome variables, so attribution requires argument rather than proximity.

The resulting failure pattern is characteristic: success is declared at closure on delivery conformance, adoption is never measured, benefit tracking lapses when the program organisation disbands, and persistence is never tested. Research on institutionalising life-preserving practice across project-based organisations identifies this discontinuity directly (Obriki & Arumosoye, 2021), work on recurrence mechanisms documents the decay that follows (Obriki & Arumosoye, 2022), and organisational learning maturity models supply the capability construct that determines whether the organisation can prevent it (Arumosoye & Obriki, 2021).

Section 2 sets out the conceptual background and Section 3 the method. Section 4 synthesises the literature into five evaluation domains and two cross-cutting conditions of validity. Section 5 presents sector evidence, Section 6 develops an integrative evaluation architecture, Section 7 discusses implications, limitations and directions for research, and Section 8 concludes.

## 2. Conceptual Background

**Programs and change programs:** A program coordinates related projects and continuing activities to obtain outcomes unavailable from managing them separately, a structure specified in program management models for coordinated multi-site expansion (Aminu-Ibrahim *et al.*, 2021) and in programmatic energy strategy, where portfolio sequencing and system integration are distinguished from individual asset completion (Yeboah & Ike, 2020). A change program adds the intent of altering behaviour, capability, structure or operating model, which matters because the program acts on the organisation hosting it. Governance models for compliance and operational quality across distributed retail networks treat that organisation as both instrument and object of change (Akin-Oluyomi & Akhigbe, 2022), and lean adaptations for smaller enterprises locate the unit of change in existing work routines rather than in a separable

deliverable (Ambali *et al.*, 2021; Eyetsemitan *et al.*, 2022).

**Success as a construct:** Three properties recur. Success is multi-dimensional and its dimensions trade off, which is why indicator frameworks distribute measurement across operational, financial and compliance categories (Sakyi *et al.*, 2022b) and why lean supply chain research assesses efficiency, waste and organisational outcomes jointly rather than singly (Ike *et al.*, 2022). Success is stakeholder-relative, so governance alignment in joint venture operations treats divergent objectives as the central design problem rather than as noise (Eyetsemitan *et al.*, 2020), and gender inclusion research across agricultural value chains shows aggregate gains distributed unevenly across participants (Michael & Ogunsola, 2022b). Success is time-dependent, so capability is staged over time rather than scored at a point (Arumosoye & Obriki, 2021), institutionalisation is assessed after the delivery organisation has gone (Obriki & Arumosoye, 2021), and comparative reform studies judge educational change against outcomes emerging well after implementation (Boakye *et al.*, 2021).

**Outputs, outcomes and value:** The distinction between what a program produces and what its production causes is fundamental. Talent development models specify capability as the outcome rather than the training delivered (Falemi *et al.*, 2020), end-to-end visibility frameworks specify traceability and compliance outcomes rather than system deployment (Nnabueze *et al.*, 2021), and data-driven teaching research measures learning progress rather than the introduction of a tool (Yeboah *et al.*, 2022). In each case the outcome variable is specified independently of the delivery variable, making their relationship an empirical question rather than an assumption.

## 3. Method

**Design:** The study uses an integrative narrative review, since the aim is conceptual synthesis across a methodologically heterogeneous applied literature rather than estimation of a common effect. Meta-analysis was rejected because the works share no common dependent variable, and a protocol-driven systematic review because the question concerns how success is conceptualised and instrumented rather than whether an intervention works. Three stages follow: assembling the corpus, coding it to derive domains inductively, and analysing each domain before synthesising an architecture.

**Corpus:** The evidence base is a consolidated collection of applied and conceptual research organised by subject area, spanning program and capital delivery, procurement and supply chain management, occupational safety and construction risk, healthcare infrastructure and health system strategy, enterprise information technology and platform governance, cybersecurity and data governance, financial analytics and audit, pharmaceutical regulatory science, technology and trade law, education, aviation oversight, energy systems, the built environment and agricultural development. Because this review is dated 2022, the search window was set to the five years ending in that year, so that only work published between 2018 and 2022 is eligible and nothing published later is cited. Applying that window yields 278 eligible items, of which 277 are cited here, one being excluded as an incomplete bibliographic record. The retained literature is weighted toward multinational operations and emerging market contexts.

**Inclusion:** Works were included where they met at least one

of four conditions: criterion specification, defining success or performance criteria at program, organisational or system level; instrumentation, specifying indicators, scales, maturity levels, audit mechanisms or analytical models; persistence, addressing whether performance is maintained or decays; and inference, addressing how an outcome is attributed to a managerial cause. Works were excluded where the contribution was purely technical or clinical with no organisational measurement dimension, or duplicated an included work without adding an evaluative dimension. Exclusion was conservative, since one purpose is to draw on semi-related literatures whose instrumentation transfers into program evaluation.

**Screening and coding:** Three screening passes were applied: classification by subject area, assessment against the four conditions, and a deliberate revisiting of areas initially judged peripheral, namely occupational safety, education, pharmaceutical quality management, cybersecurity and aviation oversight. That third pass materially changed the selection and accounts for the prominence of those fields below. Coding used three attributes, being the evaluative object, the instrument and the temporal position. Clustering produced five stable domains. Two further clusters, measurement infrastructure and causal inference, condition all five rather than standing alongside them and are treated separately. Boundary tests reassigned readiness constructs to

adoption, because they predict use rather than describe capacity, and maturity models to capability, because they measure a durable organisational property rather than the conduct of one program.

**Appraisal:** Formal quality appraisal was not applied, since excluding the many conceptual framework papers would remove most available instrumentation for the adoption, stakeholder and sustainment domains. Claims about what can be measured are therefore better supported than claims about what measurement achieves. Coding was performed by a single analyst and the corpus was assembled for other purposes, both developed in Section 7.2.

#### 4. Evaluation Domains in the Literature

This synthesis is organised by evaluation domain rather than by framework, author or sector, because the literature does not divide into competing frameworks answering one question but into bodies of work answering different questions and rarely acknowledging one another. Table 1 sets out the structure and the corpus strands supplying each domain. The domains are complementary, so omitting one leaves a distinct question unanswered rather than producing a partial answer; the two cross-cutting concerns are conditions of validity, so weakness in either degrades every domain at once.

**Table 1:** Evaluation domains and their principal sources in the corpus

| Domain                               | Evaluative question                                                | Principal corpus strands                                                                                                                            |
|--------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Delivery and governance              | Was the program executed with integrity?                           | Healthcare capital delivery, laboratory and facility design, energy procurement, contracting and vendor governance, construction risk management    |
| Adoption and behavioural embedding   | Was the change taken up and used as designed?                      | Technology adoption barriers, lean adoption in small enterprises, special education fidelity and compliance, behavioural safety, security awareness |
| Benefits and financial value         | Did the intended value materialise?                                | Financial analytics and planning, treasury and strategic finance, predictive retail and telecom analytics, sustainable procurement                  |
| Stakeholder and workforce            | How was the change experienced, and what did it cost relationally? | Joint venture governance, talent development, clinical and educational service delivery, workplace practice research                                |
| Capability, maturity and sustainment | What can the organisation now do, and do gains persist?            | Safety maturity and institutionalisation, regulatory readiness, aviation oversight maturity, predictive maintenance and integrity management        |
| Measurement infrastructure           | Can the measurements be trusted?                                   | Data governance and protection, internal audit and fraud analytics, cyber assurance, dashboards and indicator design, remote sensing                |
| Causal inference                     | Did the program cause the outcome?                                 | Attribution modelling, scenario and regulatory impact analysis, comparative benchmarking, lifecycle risk assessment                                 |

##### 4.1. Delivery and Governance Performance

This domain concerns execution efficiency and integrity. Measurement is most mature here and most often mistaken for the whole of success. Program management models for coordinated multi-site expansion specify the coordination structures through which delivery is controlled (Aminu-Ibrahim *et al.*, 2021), capital project delivery models address high-risk environments (Aminu-Ibrahim *et al.*, 2019), and risk-managed construction strategies treat control effectiveness as a delivery indicator in highly regulated facilities (Ogbete *et al.*, 2021). Design-side instrumentation is unusually explicit in laboratory and diagnostic facility research, covering spatial planning against diagnostic accuracy and safety (Ogbete *et al.*, 2018), regulatory-compliant design systems (Ogbete *et al.*, 2019), materials selection and energy efficiency (Ogbete *et al.*, 2020), operational planning standards for scalable collection networks (Ogbete *et al.*, 2022), sustainable infrastructure models (Aminu-Ibrahim *et al.*, 2018) and high-performance facility development under pandemic preparedness

conditions (Aminu-Ibrahim *et al.*, 2022).

Instrumentation extends beyond schedule and cost variance to supply-side control. Energy and infrastructure procurement research supplies risk management models for engineering, procurement and construction work (Agbabiaka *et al.*, 2019), resilience frameworks for critical infrastructure (Ogunwale *et al.*, 2021), geospatial and enterprise resource planning designs for procurement processes (Ahiaeke Patrick *et al.*, 2020; Ahiaeke Patrick *et al.*, 2021), logistics and demurrage elimination models (Okonkwo *et al.*, 2020), materials readiness and maintenance-driven performance models (Okonkwo *et al.*, 2021), regulatory-compliant procurement in high-risk environments (Okonkwo *et al.*, 2021), procurement optimisation and inventory availability models linked to plant uptime (Okonkwo *et al.*, 2018a; Okonkwo *et al.*, 2018b) and cost reduction through contract negotiation and vendor governance (Okonkwo *et al.*, 2019). Strategic procurement research adds process automation for efficiency and transparency (Akinleye & Adeyoyin, 2021), negotiation optimisation (Akinleye & Adeyoyin, 2022a),

supplier relationship frameworks (Akinleye & Adeyoyin, 2022b), profitability analysis (Akin-Oluyomi *et al.*, 2020), data-driven operations management (Efobi *et al.*, 2021), sustainable procurement in local manufacturing (Efobi *et al.*, 2022a), lean supply chain optimisation (Efobi *et al.*, 2022b) and decision frameworks reconciling safety with circular-economy targets (Okojie & Abioye, 2020). Internal audit systems for quality, health, safety and environment provide the assurance overlay (Obogo *et al.*, 2020a), and critical review of occupational safety management systems assesses the delivery regime as a whole (Obogo *et al.*, 2020c).

Built environment research instruments the same domain through analytical frameworks for public infrastructure delivery efficiency (Nwafor *et al.*, 2019b), partnership frameworks for affordable housing delivery (Uduokhai *et al.*, 2022), comparative morphological analysis (Nwafor *et al.*, 2018), envelope optimisation under climatic constraint (Nwafor *et al.*, 2018), evaluation of locally sourced materials (Nwafor *et al.*, 2019c), socioeconomic determinants of affordability (Gil-Ozoudeh *et al.*, 2018) and architectural interventions for flood resilience (Nwafor *et al.*, 2019a).

These strands measure different things under a single label, and the difference matters. Risk-managed construction research treats control effectiveness as the delivery variable, so the object of measurement is the conduct of the program (Ogbete *et al.*, 2021). Laboratory design research treats spatial configuration as a determinant of downstream diagnostic accuracy and biosafety, so the object is a property the program builds in and cannot later adjust (Ogbete *et al.*, 2018). A program reporting only the first can pass evaluation while having embedded a defect the second would have detected, and nothing in delivery reporting surfaces the difference. The same divergence appears between procurement instruments that measure transactional efficiency (Ahiaekwe Patrick *et al.*, 2020) and those that measure downstream plant availability (Okonkwo *et al.*, 2018b), where the second is the outcome of interest and the first is routinely substituted for it.

Three limits recur. Delivery measures relate weakly to eventual value, since completed assets do not establish service reach (Aminu-Ibrahim *et al.*, 2020). They are vulnerable to re-baselining, so conformance can be preserved by moving the baseline. And they terminate at handover, which is why coordination models extend to operational readiness (Aminu-Ibrahim *et al.*, 2021) and facility research judges performance across the operating life (Ogbete *et al.*, 2020). The domain should be weighted heavily at closure and discounted thereafter.

#### 4.2. Adoption, Readiness and Behavioural Embedding

**The missing layer:** Without an adoption reading, a disappointing outcome cannot be distinguished from a sound intervention implemented poorly, and the two require opposite remedies. Research on socioeconomic barriers to technological adoption among smallholder farmers treats uptake as a distinct problem with its own determinants rather than as a consequence of availability (Michael & Ogunsola, 2022a), and work on digital tools in agriculture assesses whether they shape practice rather than whether they were deployed (Michael & Ogunsola, 2021b; Michael & Ogunsola, 2021e).

**Readiness and acceptance:** Readiness supplies the earliest signal. Conceptual frameworks for translating regulatory requirements into workable compliance routines treat the

receiving organisation's capacity as the binding constraint (Eyetsemitan *et al.*, 2021), standard operating procedures research shows documented and enacted practice diverging unless the divergence is measured (Eyetsemitan *et al.*, 2022), and human-in-the-loop research makes system performance explicitly dependent on sustained human participation (Ladapo *et al.*, 2022). Data-informed learning platforms and real-time educational analytics instrument uptake rather than deployment (Orise & Niniola, 2020; Orise & Niniola, 2022).

**Fidelity:** Between readiness and outcome lies whether the change was used as designed. Special education supplies the most structured instrumentation for enacted practice, spanning compliance frameworks for statutory service delivery (Oloto & Yeboah, 2022), data-driven individualised programme development (Yeboah & Oloto, 2022), use of progress data to adapt teaching (Yeboah *et al.*, 2022), home-school partnership and parental collaboration (Ogbona *et al.*, 2020b), pedagogical strategies in resource-constrained settings (Bobga *et al.*, 2018), digital tool integration (Boakye *et al.*, 2020), professional development and teacher competence in managing exceptional learners (Yeboah *et al.*, 2019), comparative curriculum reform (Boakye *et al.*, 2021), cross-cultural communication and identity (Lilian *et al.*, 2020) and career transition pathways (Ogbona *et al.*, 2020a). Corrective and preventive action effectiveness in pharmaceutical quality systems provides the regulated parallel, being concerned throughout with whether a prescribed change was implemented and whether it worked (Aneke *et al.*, 2022a).

This strand deserves closer attention than its distance from program management suggests, because it is the only body of work in the corpus where fidelity is measured as routine practice rather than proposed as a framework. Three instruments operate together. Compliance frameworks specify conformance against statutory service requirements, establishing what should have been delivered (Oloto & Yeboah, 2022). Individualised programme development specifies the intended content for each recipient, so the design is documented at the level at which it is enacted (Yeboah & Oloto, 2022). Progress-data-driven teaching then measures whether practice changed in response to what the data showed, which is the behavioural test (Yeboah *et al.*, 2022). Taken together these supply what general program evaluation lacks: a documented design, a record of what was actually delivered, and evidence that delivery altered conduct. What the strand does not supply is evidence connecting fidelity to eventual outcome. Conformance is established, and its consequences are assumed. That limitation recurs throughout this domain and is the principal reason the adoption gap persists even where adoption is measured.

**Behaviour:** Where the object is behaviour, evaluation must reach the behavioural level rather than stopping at knowledge or satisfaction. Ethics and compliance training frameworks are designed for measurable cultural and behavioural change (Anichukwueze *et al.*, 2020), and evidence on password practice, authentication behaviour and records confidentiality measures conduct rather than awareness scores (Onche & Ogbonna, 2022; Onche *et al.*, 2020). Safety research supplies observation-based instrumentation through workforce training models evaluated against operational risk reduction (Obriki *et al.*, 2022a), emergency preparedness and evacuation systems (Obriki *et al.*, 2022b), human error causation frameworks that make behavioural indicators interpretable (Obriki & Arumosoye, 2020), explanations of

why behavioural gains reverse (Obriki & Arumosoye, 2022), hazard recognition and near-miss reporting (Arumosoye & Obriki, 2019; Obogo *et al.*, 2021), incident prevention in maintenance environments (Obogo *et al.*, 2021), hazard identification and risk control in urban construction (Obogo *et al.*, 2019) and data-driven occupational risk control (Obriki & Arumosoye, 2018). Adoption requires its own indicators, owner and schedule: folded into delivery reporting it disappears, folded into benefits reporting it is inferred rather than observed.

#### 4.3. Benefits, Value Realisation And Financial Outcomes

**From output to value:** The central requirement is separating the value variable from the delivery variable so their relationship can be tested. Conceptual models for financial analytics driven enterprise value creation establish the mechanism through which managerial action is expected to produce financial effect (Lawal & Oduleye, 2018a), executive decision systems for strategic financial planning specify the decision layer (Lawal & Oduleye, 2019b), and alignment models connect planning analytics to corporate strategy (Lawal & Oduleye, 2021b).

**Financial instrumentation:** Financial analytics supplies control through data-driven cost management for strategic planning and performance evaluation (Oduleye & Medon, 2021) and strategic accounting systems strengthening transparency (Bola-Sadipe *et al.*, 2019); forecasting through predictive budgeting from operational and market signals (Adesuyi *et al.*, 2022) and capital allocation decision models (Lawal & Oduleye, 2021a); risk assessment through transfer pricing models and cross-border tax governance (Lawal & Oduleye, 2018b; Lawal & Oduleye, 2019a); and reporting through comprehensive financial reporting for compliance and accountability (Medon & Oduleye, 2022). Treasury research extends this to multinational cash flow consolidation and foreign exchange control (Dada *et al.*, 2021a).

**Operational and non-financial value:** Restricting benefit measurement to financially expressible items undervalues capability, resilience and environmental outcomes. Sustainable procurement embeds environmental, social and governance criteria into supply decisions (Okojie *et al.*, 2020), supplier relationship strategies make the relational asset itself an object of measurement (Ike *et al.*, 2021), lean supply chain practice is assessed against efficiency, waste and organisational outcomes jointly (Ike *et al.*, 2022), and visibility frameworks measure transparency, compliance and traceability (Nnabueze *et al.*, 2021). Resilience appears in logistics frameworks for humanitarian supply chains (Anene & Clement, 2022) and real-time risk dashboards in hospital supply management (Filani *et al.*, 2022). Operational forecasting transfers from retail and telecommunications analytics through demand forecasting for revenue projection (Tonoyan *et al.*, 2021a), forecasting accuracy in supply chains (Aifuwa *et al.*, 2020) and audience segmentation and demand prediction (Basnet *et al.*, 2021). Customer service analytics treated as a revenue driver completes the set (Sakyi *et al.*, 2022a).

**Integrity of claims:** Benefit registers are self-reported artefacts produced by interested parties. Sectoral impact mapping with regulatory scenario analysis tests whether claimed effects survive external conditions (Akinola *et al.*, 2020), and consumer protection and marketing law research shows claims constrained by regulatory exposure rather than by internal reporting alone (Anichukwueze *et al.*, 2019).

Assurance, examined in Section 4.6, is what converts a benefit claim into evidence.

#### 4.4. Stakeholder, Workforce and Relational Outcomes

**Plurality.** This domain is separate because relational outcomes are frequently the cost side of a benefit case reporting only credit, and are distributed unevenly across parties whose judgements diverge. Multi-stakeholder governance alignment in joint venture operations treats divergent objectives as the central coordination problem, which implies recording the distribution of judgements rather than a single verdict (Eyetsemitan *et al.*, 2020). Distributional measurement is substantive rather than an ethical addendum, since gender inclusion across value chains (Michael & Ogunsola, 2022b) and access to enterprise finance (Michael & Ogunsola, 2019a) both show aggregate improvement coexisting with unequal participation.

**Workforce and capability:** Talent development models specify capability building across distributed operations as the measured outcome (Falemi *et al.*, 2020), and governance models for compliance and operational quality across retail networks connect workforce conduct to organisational performance (Akin-Oluyomi & Akhigbe, 2022). Leadership effect appears in leadership-driven safety culture transformation in large construction workforces (Obogo *et al.*, 2019a), in construction safety risk governance across multi-contractor projects (Obogo *et al.*, 2019b), in governance-oriented contractor safety performance models (Arumosoye & Obriki, 2020), in safety governance for large commercial facility operations (Obogo *et al.*, 2022) and in contractor compliance systems (Obogo *et al.*, 2021).

**Service and community outcomes:** Service delivery research demonstrates relational measurement in practice through systems-level integration of mental health screening into primary care (Akinlolu *et al.*, 2022), reduction of decision delays using real-time informatics (Nnaji & Akinlolu, 2022), multidimensional strengthening of infection prevention compliance (Omaghomi *et al.*, 2022), pharmacy-led delivery models for primary healthcare access (Ilodigwe & Adesemoye, 2020), last-mile distribution to underserved communities (Asiedu & Asiedu, 2022) and interaction risk frameworks in antenatal care (Asiedu, 2022). Population-level instrumentation appears in business intelligence for resource allocation in mental health services (Owoade *et al.*, 2022), risk stratification for emergency preparedness (Oparah *et al.*, 2021), predictive anticipation of outbreaks (Oparah *et al.*, 2022) and frameworks for scaling mobile health monitoring (Oparah *et al.*, 2021). These outcomes should be measured as seriously as financial ones, disaggregated by affected group and reported as distributions.

#### 4.5. Capability, Maturity and Sustainment

**Capability:** Maturity models stage capability across levels rather than scoring outcomes at a point in time, as in organisational learning models for continuous safety improvement (Arumosoye & Obriki, 2021), integrated regulatory readiness models for pharmaceutical companies (Eze *et al.*, 2022b) and comparative benchmarking of aerodrome certification compliance across developing economies (Adeyelu & Dagodzo, 2022). Aviation oversight supplies a well-developed set, including adaptive safety management implementation (Adeyelu, 2019), quantification of wildlife strike risk (Adeyelu, 2020), management of encroachment around airport boundaries (Adeyelu, 2021),

regulatory evidence frameworks for unauthorised structure violations (Adeyelu, 2022) and predictive compliance monitoring for detecting systemic risk through oversight data (Adeyelu, 2018).

**Sustainment:** Sustainment is not the continuation of implementation. Institutionalisation models address the difficulty that project-based structures dissolve the units sustaining practice (Obriki & Arumosoye, 2021), recurrence frameworks identify how improvement reverses (Obriki & Arumosoye, 2022), and frameworks linking management walkthrough frequency and coverage to safety culture treat a controllable managerial input as a sustaining mechanism (Obriki & Arumosoye, 2019). Corrective and preventive action effectiveness provides the regulated analogue (Aneke *et al.*, 2022a).

The two works most directly on point illustrate both the strength and the limit of this strand. Institutionalisation research identifies the structural cause of decay, namely that project-based organisations dissolve the very units through which practice is sustained, so the disappearance of a gain is a predictable consequence of the delivery model rather than a failure of will (Obriki & Arumosoye, 2021). Recurrence research identifies the behavioural mechanism, showing how unsafe practice re-establishes itself once attention and resourcing move elsewhere (Obriki & Arumosoye, 2022). Between them they supply a diagnosis. Neither supplies an instrument, since neither measures how fast decay proceeds or what rate should be considered acceptable. The field therefore knows why sustainment fails and cannot say when it has failed, which is why sustainment is rarely included in evaluation at all.

**Leading indicators:** Safety supplies the most developed pre-outcome set, spanning near-miss and hazard observation data utilisation (Arumosoye & Obriki, 2019), proactive hazard recognition and reporting (Obogo *et al.*, 2021), incident prevention in maintenance environments (Obogo *et al.*, 2021), hazard identification and control in urban construction (Obogo *et al.*, 2019), data-driven occupational risk control (Obriki & Arumosoye, 2018), integrated heat stress risk modelling (Arumosoye & Obriki, 2018), risk pathway models for lifting and rigging (Arumosoye & Obriki, 2022; Obogo *et al.*, 2020b), workforce training evaluated against risk reduction (Obriki *et al.*, 2022a) and emergency preparedness systems (Obriki *et al.*, 2022b), with human error causation models making the indicators interpretable (Obriki & Arumosoye, 2020) and system-level review assessing the regime as a whole (Obogo *et al.*, 2020c). Condition-based maintenance provides the physical-systems equivalent through predictive maintenance and condition monitoring in critical power infrastructure (Adaramola *et al.*, 2018), non-destructive testing for weld integrity (Atta *et al.*, 2021), integrity management and corrosion risk assessment (Atta *et al.*, 2020), welding inspection and quality assurance standards (Atta *et al.*, 2022), corrosion inhibitor evaluation (Atta *et al.*, 2018), sensor-based fault detection in building systems (Sunday & Omoegun, 2022), thermodynamic efficiency and control strategies (Sunday *et al.*, 2019), the transition from reactive to predictive regimes (Sunday *et al.*, 2020) and load distribution and integration decisions in hybrid installations (Sunday & Omoegun, 2018; Sunday & Omoegun, 2019).

#### 4.6. Measurement Infrastructure

**Data:** All domains depend on data that is available, trustworthy and comparable, which makes infrastructure a precondition for outcome measurement rather than a technical detail, as governance and architecture research on the data backbone of health system transformation argues (Ilodigwe & Adesemoye, 2021). The cybersecurity and data governance corpus supplies most of the control layer, covering legal and ethical risk modelling in enterprise data protection (Mbonu *et al.*, 2018), identity and access management across hybrid environments (Mbonu *et al.*, 2020), risk-based business intelligence architecture (Mbonu *et al.*, 2021a), artificial intelligence enabled general controls and audit automation (Mbonu *et al.*, 2022), comparative data protection regulation and secure cloud implementation (Mbonu *et al.*, 2019), embedded risk controls in agile supply chain transformation (Mbonu *et al.*, 2020a) and data protection impact assessment in multi-cloud financial infrastructure (Mbonu *et al.*, 2022a).

**Assurance:** Independent assurance converts self-reported claims into evidence. Internal audit research supplies models for enhancing audit quality through technology-enabled risk assessment (Akomolafe & Agu, 2018), risk-based internal control in insurance and banking (Akomolafe & Agu, 2019a), data-driven risk evaluation for emerging market institutions (Akomolafe & Agu, 2019b) and integrated governance and compliance strategies for financial resilience (Akomolafe & Agu, 2019c), with reconciliation control and workflow redesign addressing the transactional layer (Dogbatsey *et al.*, 2019) and systematic review of budget compliance and statutory reporting documenting the gap between requirement and practice (Dogbatsey & Ebhojie, 2018). Predictive anti-money laundering detection extends the layer into transaction-level surveillance (Atakpa, 2021). Tamper-evident recording appears in blockchain-enabled compliance and audit trail models for cloud configuration (Oshoba *et al.*, 2020) and architectures for regulatory recordkeeping and real-time audit readiness (Anichukwueze *et al.*, 2021).

**Security assurance:** Security programs supply comparable measurement through insider threat classification and risk modelling (Akeju *et al.*, 2018) and enterprise security audit and risk assessment frameworks (Dosunmu & Ogundele, 2019), with operational technology environments adding network security review in electric utilities (Adegbite *et al.*, 2020) and convergence architecture for regulated energy networks (Adegbite *et al.*, 2022).

**Reporting and observation:** What is measured must reach decision-makers useably, which is the explicit concern of business intelligence dashboard frameworks resolving executive visibility gaps (Sanni & Atima, 2021b), real-time risk dashboards in hospital supply chains (Filani *et al.*, 2022) and indicator frameworks developed for accountability across large-scale operations (Efobi *et al.*, 2021; Sakyi *et al.*, 2022b). Remote sensing supplies an independent observational channel less susceptible to self-report, through unmanned aerial integration into grid inspection programmes (Dagodzo, 2018a), pipeline and corridor monitoring (Dagodzo & Ahiaeké Patrick, 2020) and integrated aerial, lidar and geospatial corridor management (Dagodzo & Ahiaeké Patrick, 2021b).

#### 4.7. Attribution and Causal Inference

Programs run alongside market movement, leadership turnover and other initiatives, so improvement may be caused by the program, by concurrent factors, or by their interaction. Practice generally asserts attribution by proximity. The corpus engages the problem explicitly where it is commercially consequential, through systematic review of attribution modelling methods resolving bias in multi-touch journeys (Sanni *et al.*, 2022), analytical models addressing the measurement of marketing return on investment in regulated settings (Sanni *et al.*, 2020a), and predictive audience segmentation resolving targeting inefficiency (Basnet *et al.*, 2021).

Three approaches transfer. Scenario and counterfactual construction supplies the comparison, as in sectoral impact mapping with regulatory scenario analysis (Akinola *et al.*, 2020). Comparative and benchmarked design supplies an external reference point, as in benchmarking of aerodrome certification compliance across economies (Adeyelu & Dagodzo, 2022) and comparative study of curriculum reform across national systems (Boakye *et al.*, 2021). Predictive modelling supplies the expected trajectory against which realised outcomes are judged, as in demand forecasting accuracy (Aifuwa *et al.*, 2020) and executive visibility instrumentation that exposes divergence between expectation and outcome (Sanni & Atima, 2021b). A candid assessment of this domain is that the corpus contains no study establishing a counterfactual for a whole-organisation change program. The closest is attribution modelling for multi-touch journeys, which is methodologically serious but operates on a unit of analysis, the individual customer journey, that is orders of magnitude smaller and vastly better instrumented than an organisational change (Sanni *et al.*, 2022). Regulatory scenario analysis comes closer on scale but is prospective rather than evaluative, since it maps what might follow from a rule rather than testing what did follow from a program (Akinola *et al.*, 2020). This is the weakest domain in the review, and its weakness is not a gap in the corpus but a feature of the problem, since randomisation across whole organisations is rarely available and rival explanations are rarely enumerable in advance. The resulting standard is modest but demanding: state the expected pathway, identify rival explanations and gather evidence on each, and where longitudinal or experimental evidence is unavailable, use disaggregated comparison across units exposed to different program intensities.

#### 5. Sector Evidence

**Health systems:** Critical review of health insurance financing and provider payment reform establishes the incentive environment within which programs operate (Ilodigwe & Adesemoye, 2019a), models explaining why scientific innovation fails to improve patient outcomes diagnose the implementation gap (Ilodigwe & Adesemoye, 2019b), pharmacy-led delivery models address access (Ilodigwe & Adesemoye, 2020) and data governance research supplies the measurement layer (Ilodigwe & Adesemoye, 2021). Service instrumentation includes mental health screening integration (Akinlolu *et al.*, 2022), real-time informatics reducing decision delays (Nnaji & Akinlolu, 2022), infection prevention compliance (Omaghomi *et al.*, 2022), antenatal interaction risk (Asiedu, 2022) and last-mile distribution to underserved communities (Asiedu & Asiedu, 2022).

**Healthcare infrastructure:** This sector combines capital program management with service outcome measurement. Delivery structures appear in program management models for multi-site expansion (Aminu-Ibrahim *et al.*, 2021), capital delivery for high-risk environments (Aminu-Ibrahim *et al.*, 2019) and risk-managed construction (Ogbete *et al.*, 2021), while the outcome side is instrumented separately through diagnostic access reach (Aminu-Ibrahim *et al.*, 2020), sustainable laboratory infrastructure models (Aminu-Ibrahim *et al.*, 2018), spatial planning against diagnostic accuracy and safety (Ogbete *et al.*, 2018), regulatory-compliant design systems (Ogbete *et al.*, 2019), materials and energy efficiency strategies (Ogbete *et al.*, 2020), pandemic-preparedness facility development (Aminu-Ibrahim *et al.*, 2022) and operational planning standards for scalable networks (Ogbete *et al.*, 2022).

**Energy systems and transition:** Programmatic strategy for renewable integration draws on large-scale deployment (Yeboah & Ike, 2020), with technical outcome instrumentation supplied through smart grid architectures for high renewable penetration (Adenuga, 2022), comparative review of control architectures (Komi & Adamolekun, 2022) and co-optimisation of technical performance against community affordability (Komi & Adeniji, 2020).

**Enterprise information technology:** Platform and service instrumentation appears in scalable secure cloud architecture (Ahmed & Odejebi, 2018a), compliance and audit trail models (Oshoba *et al.*, 2020), migration strategy (Ladapo *et al.*, 2022) and lessons learned from offline assessment of security-critical systems (Ladapo *et al.*, 2018). Delivery governance is instrumented through deployment pipeline strategies (Badmus *et al.*, 2018), platform governance in regulated healthcare environments (Badmus *et al.*, 2019b), version control and code review governance (Badmus *et al.*, 2022a), integration pattern review (Badmus *et al.*, 2022b), comparative tooling evaluation (Badmus *et al.*, 2020) and predictive capacity planning across multi-program settings (Edivri & Oteri, 2022).

**Occupational safety:** Beyond the leading indicators discussed in Section 4.5, this literature supplies governance instrumentation of general relevance through contractor safety performance models (Arumosoye & Obriki, 2020), safety governance for large commercial facilities (Obogo *et al.*, 2022), contractor compliance systems (Obogo *et al.*, 2021), risk governance for multi-contractor projects (Obogo *et al.*, 2019b), leadership-driven culture transformation (Obogo *et al.*, 2019a), internal audit systems (Obogo *et al.*, 2020a), crane and heavy lifting risk management (Obogo *et al.*, 2020b) and whole-system review (Obogo *et al.*, 2020c).

**Procurement and supply chain:** Transformation is described through process automation for efficiency and transparency (Akinleye & Adeyoyin, 2021), and governance through multi-site compliance models (Akin-Oluyomi & Akhigbe, 2022) and supply chain risk management for engineering and construction projects (Agbabiaka *et al.*, 2019). Measurement is instrumented through predictive demand forecasting (Aifuwa *et al.*, 2020), supplier relationship strategies (Ike *et al.*, 2021), lean practices assessed jointly against efficiency and organisational outcomes (Ike *et al.*, 2022), end-to-end visibility (Nnabueze *et al.*, 2021), sustainable procurement (Okojie *et al.*, 2020), negotiation optimisation (Akinleye & Adeyoyin, 2022a), supplier frameworks (Akinleye & Adeyoyin, 2022b), profitability analysis (Akin-Oluyomi *et al.*, 2020), data-

driven operations management (Efobi *et al.*, 2021), sustainable practice in local manufacturing (Efobi *et al.*, 2022a), lean optimisation (Efobi *et al.*, 2022b) and circular-economy decision frameworks (Okojie & Abioye, 2020), with resilience and readiness models drawn from energy and infrastructure supply (Ogunwale *et al.*, 2021; Okonkwo *et al.*, 2018b; Okonkwo *et al.*, 2021).

**Pharmaceutical and regulated supply:** This sector provides explicit outcome instrumentation through traceability and chain-of-custody integration (Aneke & Adesemoye, 2019), risk-based decision making in manufacturing practice (Aneke & Adesemoye, 2020), risk-based import and interdiction compliance (Aneke & Adesemoye, 2021), corrective and preventive action effectiveness (Aneke *et al.*, 2022a), linkage of medicine quality failure to antimicrobial resistance (Aneke *et al.*, 2022b), drug shortage early warning and regulatory response (Eze *et al.*, 2022a) and integrated regulatory readiness maturity modelling (Eze *et al.*, 2022b).

**Financial services, payments and regulation:** Post-merger compliance integration describes a demanding class of change program (Ominyi, 2020), with privacy by design in corporate restructuring (Ominyi, 2021), regulatory clearance frameworks for cross-border transactions (Ominyi & Anichukwueze, 2020), anti-money laundering and anti-bribery regimes (Ominyi & Anichukwueze, 2021), harmonisation of data protection compliance (Ominyi & Anichukwueze, 2022a) and greenhouse gas disclosure obligations (Ominyi & Anichukwueze, 2022b) supplying the regulatory environment, alongside cross-border privacy governance for digital platforms (Annan, 2022). Transformation outcomes appear in fintech-enabled transaction banking and digital lending (Okafor *et al.*, 2021), smart contract automation with performance benchmarking (Akomolafe *et al.*, 2022), forensic detection of cyber-enabled fraud in telemedicine (Ekechi *et al.*, 2022) and review of cybersecurity investment against healthcare financial outcomes (Ozowara *et al.*, 2022). Trade and development programs raise comparable evaluative questions through legal barriers to import and export participation (Jones & Ominyi, 2020), value chain linkage to household outcomes (Jones & Ominyi, 2021), market access outcomes from trade agreements (Jones & Ominyi, 2022a) and export promotion under continental free trade arrangements (Jones & Ominyi, 2022b).

**Education and workforce development:** Fidelity and compliance instrumentation covers statutory service delivery (Oloto & Yeboah, 2022), individualised programme development (Yeboah & Oloto, 2022), progress-data-driven teaching (Yeboah *et al.*, 2022), home-school partnership (Ogbona *et al.*, 2020b), pedagogy in resource-constrained settings (Bobga *et al.*, 2018), digital tool integration (Boakye

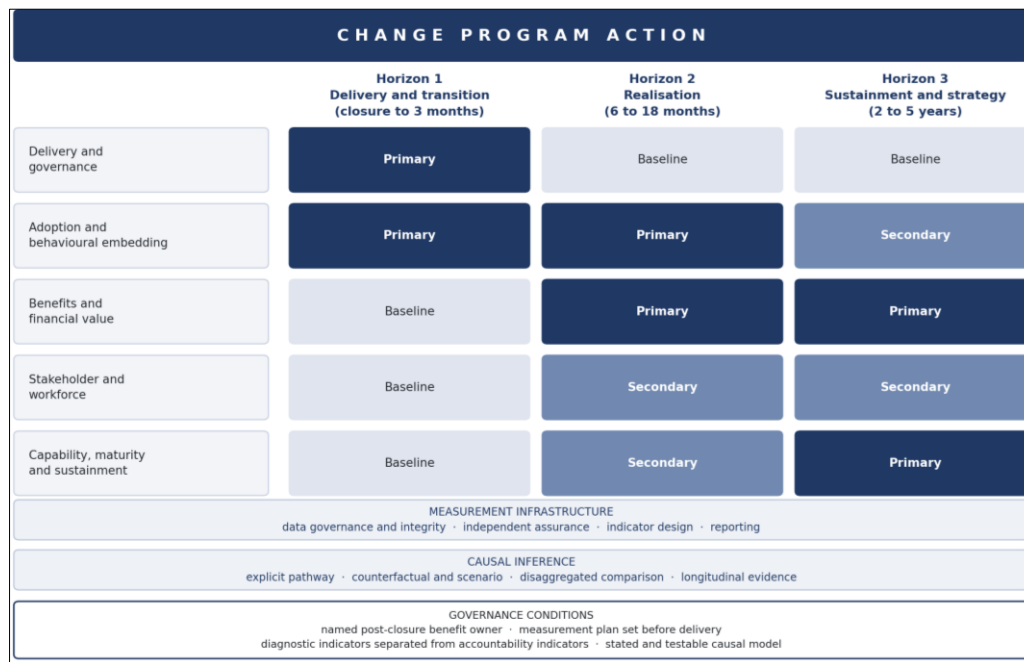
*et al.*, 2020), teacher competence and professional development (Yeboah *et al.*, 2019), comparative curriculum reform (Boakye *et al.*, 2021), cross-cultural communication (Lilian *et al.*, 2020), coaching and career transition pathways (Ogbona *et al.*, 2020a), data-informed learning platforms (Orise & Niniola, 2020), real-time educational analytics (Orise & Niniola, 2022) and vocational perspectives on graduate readiness (Joseph, 2022).

**Built environment and agricultural development:** Urban housing and construction research evaluates programs against resilience, affordability and environmental outcomes through flood vulnerability reduction (Nwafor *et al.*, 2019a), morphological comparison (Nwafor *et al.*, 2018), envelope optimisation (Nwafor *et al.*, 2018), local material evaluation (Nwafor *et al.*, 2019c), delivery efficiency analysis (Nwafor *et al.*, 2019b), partnership frameworks for affordable housing (Uduokhai *et al.*, 2022) and socioeconomic affordability determinants (Gil-Ozoudeh *et al.*, 2018). Agricultural and rural development programs offer a further evaluative tradition covering digital tool adoption and its socioeconomic barriers (Michael & Ogunsola, 2021b; Michael & Ogunsola, 2022a), extension services and innovation uptake (Michael & Ogunsola, 2021e), gender inclusion across value chains (Michael & Ogunsola, 2022b) and access to agribusiness finance (Michael & Ogunsola, 2019a).

Read across sectors, the pattern is not that some fields evaluate well and others badly, but that each field instruments the domain its regulator or its accident history forces it to instrument. Safety measures behaviour because injuries are attributable and legally consequential. Pharmaceutical quality measures corrective action because regulators inspect it. Education measures fidelity because statutory entitlement defines it. None of these fields chose multi-dimensional evaluation on analytical grounds; each was compelled into one domain and remains weak in the others. General program management, facing no equivalent compulsion, has defaulted to the domain that is cheapest to measure. Across these sectors the domain structure holds. What varies is which domain is best instrumented: delivery in infrastructure and procurement, adoption and fidelity in education and safety, benefit verification in financial services, assurance in regulated supply, and distributional outcomes in energy and development.

## 6. An Integrative Evaluation Architecture

The cross-domain analysis supports an architecture of five domains assessed across three horizons, offered as a scaffold for evaluation design rather than a validated instrument, whose function is to prevent silent omission of a domain. Figure 1 presents the architecture and Table 2 sets out each domain.



**Fig 1:** The five-domain, three-horizon evaluation architecture for change programs, showing the relative weight of each evaluation domain at each horizon and the two cross-cutting conditions of validity.

**Table 2:** Domains of the architecture, with instrumentation and failure modes

| Domain                               | What it establishes                                          | Representative instrumentation                                                                                   | Dominant horizon          | Principal failure mode            |
|--------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------|
| Delivery and governance              | Whether the program was executed with integrity              | Governance and assurance cadence, risk and control effectiveness, cost variance, contract and vendor performance | Closure                   | Mistaken for the whole of success |
| Adoption and behavioural embedding   | Whether the change was taken up and used as designed         | Readiness assessment, acceptance validation, fidelity monitoring, observed behaviour                             | Six to eighteen months    | Not measured at all               |
| Benefits and financial value         | Whether the intended value materialised                      | Variance analytics, benefit tracking with named owners, predictive budgeting, independent verification           | Six months to three years | Self-reported and unverified      |
| Stakeholder and workforce            | How the change was experienced and what it cost relationally | Segmented stakeholder judgement, retention and conduct measures, service and community outcomes                  | Twelve months onward      | Recorded as credit only           |
| Capability, maturity and sustainment | What the organisation can now do, and whether gains persist  | Maturity staging, regulatory readiness, decay and recurrence measurement, learning evidence                      | Two to five years         | Never revisited after closure     |

**Horizons:** At horizon one weighting concentrates on delivery and adoption, with baselines established for the remaining domains, since readiness and procedural instrumentation is already available (Eyetsemitan *et al.*, 2021; Eyetsemitan *et al.*, 2022) and baselines cannot be recovered retrospectively. At horizon two it concentrates on adoption, benefits and stakeholder outcomes, with fidelity re-measured to detect early decay (Yeboah *et al.*, 2022), benefits assessed through variance analysis (Oduleye & Medon, 2021) and relational effects observable in service and workforce data (Akin-Oluyomi & Akhigbe, 2022; Falemi *et al.*, 2020). At horizon three it concentrates on benefit persistence and capability, with sustainment tested directly rather than inferred (Obriki & Arumosoye, 2021), maturity re-assessed against the pre-program baseline (Arumosoye & Obriki, 2021; Eze *et al.*, 2022b) and recurrence examined as evidence of whether learning held (Obriki & Arumosoye, 2022).

**Governance conditions:** Four conditions make the architecture operable: transfer of benefit accountability to a named owner with budget authority, since the program organisation will not exist when decisive measurements fall due (Eyetsemitan *et al.*, 2020); a measurement plan and data

governance arrangement established before delivery (Ilodigwe & Adesemoye, 2021); separation of diagnostic from accountability indicators, supported by independent audit and tamper-evident recording (Akomolafe & Agu, 2018; Oshoba *et al.*, 2020); and an expected causal pathway stated as a testable proposition rather than assumed (Arumosoye & Obriki, 2022; Obriki & Arumosoye, 2019). For smaller programs a reduced form applies, with fewer indicators and two horizons, since lean adaptations show structured method scaling down without being abandoned (Ambali *et al.*, 2021; Oyeleye *et al.*, 2022).

## 7. Discussion

**The adoption gap is structural:** Adoption occupies a measurement vacuum between delivery and benefit, and practice moves from output completion to benefit claim without establishing whether the change was used. Ample instrumentation exists, including compliance routine design (Eyetsemitan *et al.*, 2021), procedural fidelity (Eyetsemitan *et al.*, 2022), statutory service fidelity (Oloto & Yeboah, 2022) and behavioural observation (Obriki *et al.*, 2022a), but it is developed in domains that do not routinely inform

program governance, so the gap arises from the separation of literatures and functions rather than the absence of method.

**Contested success needs a decision rule:** Instruments for capturing divergent judgement exist, including governance alignment across joint venture partners (Eyetsemitan *et al.*, 2020) and distributional analysis of participation and access (Michael & Ogunsola, 2019a; Michael & Ogunsola, 2022b), but guidance on acting when verdicts diverge does not. Aggregation conceals the divergence, while reporting the distribution transfers the interpretive burden without guiding it.

**Measurement shapes what it observes:** Indicators adopted for accountability alter the conduct they record, which the corpus answers through independent audit (Akomolafe & Agu, 2018; Akomolafe & Agu, 2019a), tamper-evident recording (Anichukwueze *et al.*, 2021; Oshoba *et al.*, 2020), reconciliation control (Dogbatsey *et al.*, 2019) and observational channels the program cannot influence, such as aerial and geospatial monitoring (Dagodzo & Ahiaeke Patrick, 2020; Dagodzo & Ahiaeke Patrick, 2021b). Mitigations are separating diagnostic from accountability indicators, using independent data sources, including at least one indicator outside the program's control, and reporting distributions rather than means.

**Sustainment is under-instrumented:** It determines whether value is real or transient yet receives the least routine measurement, safety and regulated-industry research being the exceptions (Aneke *et al.*, 2022a; Obriki & Arumosoye, 2021; Obriki & Arumosoye, 2022). Transferring that instrumentation into general practice is among the highest-value available improvements, and a decay half-life, the interval over which an improvement falls to half its initial magnitude, offers a compact testable indicator.

**Adaptive programs strain conformance-based evaluation:** Lean adaptations for smaller enterprises (Ambali *et al.*, 2021) and iterative migration practice (Ladapo *et al.*, 2022) assume continuous re-specification, so evaluation must assess the quality of adaptation alongside conformance to original intent, treating the benefit case as a revisable hypothesis rather than a fixed contract.

**Distribution belongs inside the evaluation:** Aggregate improvement can coexist with worsening distribution, as work on inclusion across value chains (Michael & Ogunsola, 2022b), finance access (Michael & Ogunsola, 2019a) and co-optimisation of technical performance against community affordability (Komi & Adeniji, 2020) together establish. Disaggregation is the operational response and is inexpensive relative to its diagnostic value.

### 7.1. Implications

**For theory:** Success is better modelled as a profile across domains than as a single score, since the domains answer different questions and can move in opposite directions within one program, as when procurement savings coexist with degraded supplier relationships (Ike *et al.*, 2021) or capability accumulates despite delivery overrun (Arumosoye & Obriki, 2021). Adoption should be treated as a theoretically distinct construct with its own antecedents and failure modes (Eyetsemitan *et al.*, 2022; Michael & Ogunsola, 2022a), which alters the causal structure of program theory because benefit becomes conditional on adoption rather than consequent on delivery. And time is constitutive rather than a nuisance parameter, since verdicts at closure, realisation

and sustainment measure different things (Obriki & Arumosoye, 2021; Ogbete *et al.*, 2020).

**For practice:** Design the evaluation before the program, since baselines cannot be reconstructed and data governance must precede reporting (Ilodigwe & Adesemoye, 2021). Instrument adoption separately from delivery and benefit (Eyetsemitan *et al.*, 2021; Eyetsemitan *et al.*, 2022; Yeboah *et al.*, 2022), because without an adoption reading a disappointing outcome cannot be diagnosed. Assign post-closure measurement ownership before closure (Eyetsemitan *et al.*, 2020). Separate diagnostic from accountability indicators, supported by audit and tamper-evident recording (Akomolafe & Agu, 2018; Oshoba *et al.*, 2020). Disaggregate, since aggregate results conceal the most actionable variation (Efobi *et al.*, 2021; Michael & Ogunsola, 2022b). And report the profile rather than a single verdict, since a favourable delivery indicator over an unmeasured adoption failure is the characteristic pattern preceding benefit shortfall, which makes dashboard and indicator design consequential (Sakyi *et al.*, 2022b; Sanni & Atima, 2021b).

**For governance and policy:** Assurance should extend beyond delivery conformance into benefit verification, which is largely a matter of scope definition since the instrumentation exists (Akomolafe & Agu, 2018; Akomolafe & Agu, 2019c). Funders should specify evidentiary standards at award rather than completion, since requirements set without corresponding measurement capability produce the documented compliance gap in statutory reporting (Dogbatsey & Ebhojie, 2018; Dogbatsey *et al.*, 2019). Policy actors commissioning system-level change should require distributional reporting (Komi & Adeniji, 2020; Michael & Ogunsola, 2022b). Regulators of technology-intensive programs face a distinctive version of the problem, and frameworks embedding privacy and compliance obligations into design illustrate building evaluability into the change itself (Ominyi & Anichukwueze, 2022a; Ominyi, 2021), with regulatory readiness maturity modelling supplying the corresponding measurement (Eze *et al.*, 2022b).

**For research:** The instrumentation problem is largely solved and the integration problem is not. Whether adoption measures predict benefit realisation, whether maturity gains predict later program performance, and how quickly improvements decay are empirical questions with tractable designs, set out in Section 7.3.

### 7.2. Limitations

This review is narrative rather than systematic, and its selection reflects the composition of the consolidated corpus, which is weighted toward applied and conceptual framework development in emerging market and multinational contexts and contains limited experimental or quasi-experimental work. Many reviewed works propose frameworks without empirical validation, and sources are not weighted by strength of evidence, so claims about what can be measured rest on firmer ground than claims about what measurement achieves. The 2022 window excludes subsequent work on the same questions, and several strands identified here as under-developed may have advanced since. Screening, coding and domain assignment were performed by a single analyst, so no inter-rater reliability statistic is available, and the corpus was assembled for purposes other than this review. The architecture in Section 6 is a conceptual synthesis and has not been tested.

### 7.3. Directions for Further Research

Five priorities follow. Longitudinal measurement across all three horizons is the most pressing, since few studies measure the same programs at closure, at realisation and at sustainment, which leaves claims about decay rates and about the adoption-benefit relationship conjectural. Transferring adoption instrumentation into program governance would test whether fidelity and readiness measures predict benefit realisation in general settings as they appear to in clinical, educational and safety contexts. Normative work is needed on decision rules for divergent stakeholder verdicts. Methods are needed for evaluating adaptive programs and for treating adaptation quality as a success dimension in its own right. And empirical work establishing decay profiles for different classes of organisational change would allow evaluation timing to be set on evidence rather than convention.

### 8. Conclusion

Change program evaluation agrees that success is multi-dimensional, stakeholder-relative and time-dependent. It does not agree on how to measure adoption, how to attribute organisational outcome to program action, or how to sustain measurement past the dissolution of the program organisation. These are not primarily conceptual gaps, since the instruments are developed to a usable standard in the literatures reviewed here. The barrier is that they sit in separate domains, are applied by separate functions, and are rarely assembled into one architecture that survives closure. The architecture set out here is deliberately modest: measure delivery, adoption, benefits, stakeholder outcomes and capability, at closure, at realisation and at sustainment, under governance arrangements that assign ownership of the later measurements before the earlier ones are taken. An organisation doing this will know substantially more than one measuring schedule and expenditure at handover. That is a low standard, and most programs do not meet it.

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