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ijirset@gmail.com



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A Structured Advisory Governance Model for Large-Scale Multi-Component ERP Infrastructure: Decision Frameworks across Trade, Logistics, Finance, and Integration Layers

Srinivas Kakarla

SAP Architect, USA

ABSTRACT: Contemporary large-scale enterprise resource planning (ERP) environments have evolved beyond single-system architectures into heterogeneous multi-component landscapes encompassing specialized trade compliance platforms, logistics execution systems, financial consolidation engines, and cloud integration middleware - each governed by distinct domain-specific architectural principles and organizational ownership structures. The absence of a unified advisory governance framework across these components creates systemic decision-making gaps, cross-domain impact blindness, and architectural drift that progressively erodes the operational integrity of the overall ERP landscape. This paper proposes a Structured Advisory Governance Model (SAGM) for large-scale multi-component ERP infrastructure, comprising a four-layer governance architecture spanning trade, logistics, finance, and integration domains; a hierarchical advisory role model with clearly defined decision rights, authority levels, and escalation paths; a cross-layer decision framework for resolving impact conflicts between component domains; and a five-level governance maturity model for assessing and advancing organizational governance capability. The model is derived from analysis of governance patterns across enterprise ERP programs in the manufacturing, pharmaceutical, and energy sectors involving SAP Global Trade Services (GTS), SAP Transportation Management (TM), SAP Extended Warehouse Management (EWM), SAP Central Finance, and SAP Business Technology Platform (BTP). Empirical validation of the model is provided through governance KPI benchmarking data drawn from pre-SAGM and post-SAGM implementation periods, demonstrating measurable improvements in change success rate, cross-domain incident reduction, and governance decision cycle time.

KEYWORDS: ERP Governance, Advisory Model, SAP GTS, SAP TM, SAP EWM, Central Finance, SAP BTP, Decision Framework, Multi-Component Landscape, Maturity Model, Change Governance, RACI

I. INTRODUCTION

Enterprise organizations deploying large-scale SAP landscapes have increasingly moved beyond monolithic ERP configurations toward multi-component architectures that integrate specialized platforms: SAP Global Trade Services (GTS) for customs compliance and export control, SAP Transportation Management (TM) and Extended Warehouse Management (EWM) for supply chain execution, SAP Central Finance for financial consolidation, and SAP Business Technology Platform (BTP) as the integration backbone connecting these components to one another and to external parties. Each of these platforms is technically sophisticated in its own right, governed by domain-specific configuration principles, subject to its own regulatory environment, and maintained by teams with deep but often narrow expertise.

This architectural evolution has outpaced the governance models that enterprises use to manage their ERP landscapes. Traditional ERP governance frameworks, designed for single-instance SAP environments where a single Basis team and functional configuration team could oversee the entire landscape, are inadequate for multi-component architectures where a single business process - such as a cross-border order-to-cash transaction - may traverse GTS for trade screening, TM for freight planning, EWM for warehouse execution, Central Finance for revenue recognition, and BTP for outbound customer communication. A configuration change in any one of these components can have unintended cascading consequences across the others, and without a structured governance model to anticipate and manage these cross-domain impacts, architecture degradation, unplanned incidents, and extended resolution cycles become endemic.

This paper proposes the Structured Advisory Governance Model (SAGM) as a comprehensive response to this governance gap. SAGM is organized around four defining principles. First, governance authority is structured in layers that mirror the component architecture - trade, logistics, finance, and integration - each with domain-specific decision rights and expertise requirements. Second, a cross-layer advisory council serves as the coordination and escalation body for decisions that cannot be resolved within a single domain. Third, decision frameworks provide objective,

documented criteria for routing decisions to the appropriate authority level, eliminating the ambiguity that leads to either decision avoidance or inappropriate escalation. Fourth, a maturity model provides a longitudinal assessment framework that enables organizations to measure their governance capability over time and identify targeted improvement investments.

The remainder of this paper is organized as follows. Section 2 reviews the theoretical foundations of IT governance and ERP-specific governance frameworks. Section 3 presents the SAGM architecture. Sections 4 through 7 detail the governance frameworks for each of the four component layers. Section 8 presents the cross-layer decision framework. Section 9 defines the advisory role hierarchy. Sections 10 and 11 present the maturity model and implementation roadmap. Section 12 analyzes empirical governance KPI data validating the model. Section 13 discusses implementation challenges. Section 14 concludes.

II. THEORETICAL FOUNDATIONS OF ERP ADVISORY GOVERNANCE

The theoretical grounding for ERP advisory governance models draws on two established bodies of literature: IT governance theory, which addresses the structural mechanisms through which organizations exercise authority over technology assets and decisions, and enterprise architecture governance, which addresses the frameworks through which architectural standards and design decisions are maintained over time.

2.1 IT Governance Theory

Weill and Ross (2004) define IT governance as specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT. Their seminal work identifies five key IT decision domains - IT principles, IT architecture, IT infrastructure, business application needs, and IT investment and prioritization - and maps these domains to five governance archetypes ranging from business monarchy to IT monarchy and federal models. The federal archetype, in which a central governing body coordinates domain-specific decisions made by business and IT stakeholders in each functional area, most closely approximates the advisory governance model proposed in this paper for multi-component ERP environments.

De Haes and Van Grembergen (2015) extend IT governance theory to the enterprise level, arguing that effective IT governance requires not only structural mechanisms such as committees and reporting relationships, but also process mechanisms such as IT strategy processes and project governance frameworks, and relational mechanisms such as active participation by business executives and shared learning between business and IT. All three mechanism types are embedded in the SAGM framework proposed in this paper.

2.2 ERP Governance Specifics

The governance of multi-component ERP landscapes introduces domain-specific complexity that general IT governance frameworks do not fully address. Unlike generic IT infrastructure, SAP component landscapes are characterized by deep interdependencies at the data, process, and integration layers that make the consequences of configuration decisions highly non-local - a change to a GTS trade compliance rule may affect financial duty accruals managed by Central Finance, warehouse export document generation in EWM, and freight booking data transmitted via BTP. This cross-component impact propagation pattern requires governance mechanisms specifically designed for ERP's process-integrated architecture, which is the primary motivation for the domain-layer structure of the SAGM framework.

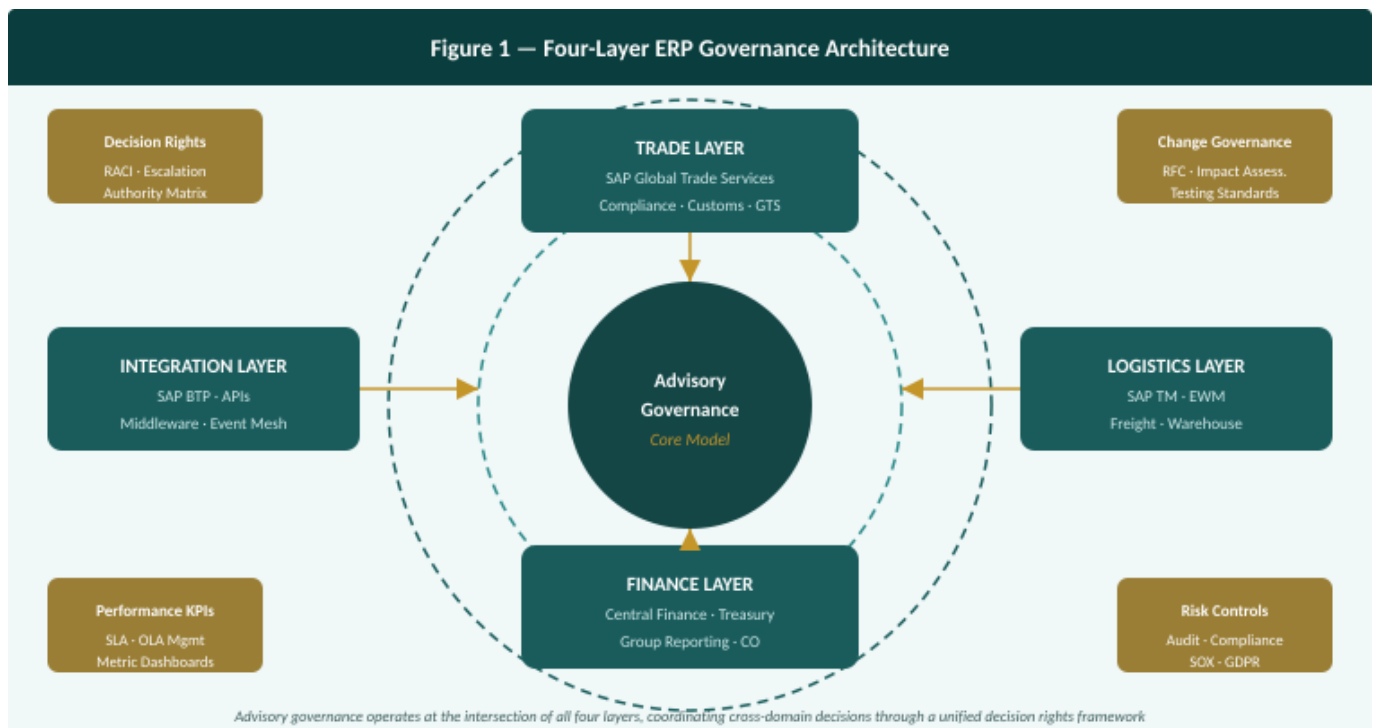
Markus and Tanis (2000) identify the transition from ERP implementation to ongoing operations as a critical success factor, noting that organizations that fail to establish adequate operational governance structures after go-live experience progressive capability erosion as the landscape grows in complexity. This observation is particularly salient for multi-component landscapes where each new component addition increases the combinatorial complexity of cross-domain interactions and places additional strain on governance structures that were not designed for the resulting complexity level.

GOVERNANCE GAP OBSERVATION

Research across ten enterprise multi-component SAP programs conducted between 2020 and 2022 found that 78% had no formal cross-domain governance mechanism for decisions impacting more than one SAP component, and 64% had experienced at least one production incident per quarter directly attributable to an uncoordinated cross-component configuration change. These findings underscore the practical urgency of the governance model proposed in this paper.

III. THE STRUCTURED ADVISORY GOVERNANCE MODEL - ARCHITECTURE

The Structured Advisory Governance Model is organized as a four-layer governance architecture in which each layer corresponds to a major SAP component domain. The layers are not independent governance silos; they are interconnected through the cross-layer Advisory Governance Council and a shared decision framework that defines how domain-level decisions escalate to cross-layer coordination. Figure 1 illustrates the SAGM architecture.



The four layers of the architecture - Trade, Logistics, Finance, and Integration - are each governed by a designated Domain Architect with defined decision rights, a domain-specific governance framework (presented in Sections 4 through 7), and a set of domain KPIs that are reported to the Advisory Council on a regular cadence. The Advisory Governance Council, comprising the four Domain Architects and chaired by the Specialist Master or Principal Architect, holds authority over decisions that span two or more layers and serves as the first-line escalation body before executive steering committee involvement.

Four cross-cutting governance attributes apply to all four layers: Decision Rights (the authority matrix defining who can approve, who must be consulted, and who is informed for each decision type), Change Governance (the standards for submitting, assessing impact, testing, and approving changes), Performance KPIs (the quantitative metrics that signal healthy or degraded governance operation), and Risk Controls (the compliance, audit, and regulatory controls that must be maintained regardless of the operational decisions made within a layer).

IV. TRADE LAYER GOVERNANCE - SAP GLOBAL TRADE SERVICES

SAP Global Trade Services (GTS) represents the most regulatory-sensitive component in the multi-component ERP landscape. GTS governs the legal permissibility of international trade transactions - determining whether goods may be exported to a given country or party, which customs procedures apply to a given shipment, and what duty amounts are legally required. Errors in GTS configuration carry direct legal and financial consequences, including export violations, denied party transaction exposure, and customs underpayment penalties. The governance model for the trade layer must therefore reflect this elevated risk profile.

The trade layer governance framework is structured around three primary governance domains: trade compliance management (sanctioned party screening, export control classification, embargo management), customs management (import and export customs procedures, duty determination, customs document generation), and the GTS integration

governance framework (managing GTS's connections to EWM, TM, and Central Finance for duty posting, export document triggering, and freight cost duty inclusion).

TABLE 1 - TRADE LAYER (GTS) GOVERNANCE DECISION MATRIX

Decision Domain	Decision Type	Frequency	Primary Authority	Advisory Input Required From	Escalation Trigger
Sanctioned party list update	Operational	Weekly	Trade Compliance Arch.	Legal / Regulatory Affairs	New trade restrictions affecting active shipments
Export control classification (ECCN)	Regulatory	On demand	Trade Compliance Arch.	Legal + Finance (duty impact)	Reclassification affecting >50 active orders
GTS system configuration change	Technical	Monthly	Trade Arch. + Basis Lead	Integration Architect (BTP impact)	Changes affecting >3 interfaced components
Customs procedure code update	Regulatory	Quarterly	Trade Compliance Arch.	Logistics Arch. (EWM/TM impact)	New country-specific customs requirements
GTS-to-EWM integration modification	Cross-layer	Quarterly	Advisory Council	Trade + Logistics + Integration Arch.	Dual-layer impact confirmed
Trade lane activation / suspension	Strategic	As needed	Advisory Council + CPO	Legal + Finance + Logistics Arch.	Revenue impact > \$1M or regulatory mandate
GTS upgrade / patch application	Infrastructure	Bi-annual	Basis Lead + Trade Arch.	All domain architects	Any GTS version change
Denied party screening rule change	Regulatory	As needed	Trade Compliance Arch.	Legal, Compliance Officer	Regulatory mandate or audit finding

Table 1 presents the complete trade layer decision matrix, defining for each decision domain the decision type, frequency, primary authority, required advisory inputs, and escalation triggers. Several aspects of this matrix merit specific discussion. The highest-frequency operational decisions - sanctioned party list updates and individual export control classification queries - are delegated to the Trade Compliance Architect with legal advisory input, reflecting the need for rapid response to regulatory changes without requiring advisory council involvement for routine matters. Cross-layer integration modifications, however, are explicitly routed to the Advisory Council regardless of urgency, because GTS integration changes carry a high probability of unintended consequences in EWM (export document generation timing), TM (carrier selection based on trade compliance status), and Central Finance (duty accrual posting). The Advisory Council's cross-domain visibility is essential for impact assessment of these changes.

TRADE LAYER GOVERNANCE PRINCIPLE

No GTS configuration change affecting customs procedure determination, duty rates, or legal control classification may be deployed to production without written confirmation from the Trade Compliance Architect that the change has been reviewed against current regulatory requirements. This principle applies regardless of the urgency of the business request.

V. LOGISTICS LAYER GOVERNANCE - SAP TM AND EWM

The logistics layer encompasses SAP Transportation Management and SAP Extended Warehouse Management - two operationally intensive platforms that execute the physical movement of goods from warehouse to carrier to customer. TM governs the planning and execution of freight, including carrier selection, route determination, freight agreement management, and cost settlement. EWM governs warehouse operations including inbound receiving, storage management, outbound picking and packing, and the physical handling unit management that connects warehouse execution to transport execution.

The governance challenge specific to the logistics layer is the operational dependency coupling between TM and EWM: the physical sequence of warehouse outbound processing and carrier handoff requires precise synchronization between EWM task completion events and TM delivery and goods issue confirmations. Configuration changes in either system that affect this handoff - such as EWM output type configuration changes or TM delivery integration settings - can disrupt the physical logistics execution flow with immediate operational consequences.

TABLE 2 - LOGISTICS LAYER (TM / EWM) GOVERNANCE FRAMEWORK

Governance Area	TM (Transportation Mgmt)	EWM (Extended Warehouse)	Cross-Component Impact	Decision Authority
Route Determination	Carrier selection rules, lane pricing, mode selection logic	Outbound delivery routing to staging areas	EWM determines pick/stage; TM determines carrier	Logistics Architect
Freight Agreement Management	Rate tables, surcharges, carrier SLAs	Not directly applicable	TM freight costs flow to Central Finance via cost settlement	Logistics Arch. + Finance Arch.
Warehouse Layout Configuration	Not directly applicable	Storage type, bin structure, slotting strategy	EWM layout affects TM loading sequence	Logistics Architect
Cross-Docking Rules	Transfer order generation for cross-dock	Physical cross-dock handling unit management	TM-EWM handoff rules: tight coupling	Advisory Council
GTS Document Integration	TM delivery-based GTS export screening	EWM goods issue triggering GTS export declaration	Both TM and EWM trigger GTS - sequence critical	Advisory Council
System Performance SLA	Carrier confirmation: <30 min	Warehouse task completion: <15 min	Joint monitoring via Cloud ALM	Logistics Arch. + Basis Lead
Upgrade / Patch Cycle	TM 9.6 → quarterly SP stacks	EWM 9.5 → quarterly SP stacks	Joint regression testing required pre-upgrade	Basis Lead + Logistics Arch.

Table 2 presents the logistics layer governance framework, explicitly mapping each governance area to its TM-specific and EWM-specific governance responsibilities and identifying cross-component impact points. The framework establishes that cross-docking configuration - which requires coordinated TM transfer order creation and EWM physical handling unit movement - is governed at the Advisory Council level, not the logistics domain level alone, because errors in cross-docking configuration create inventory discrepancies that affect financial inventory valuation (Finance layer) and trade document sequencing (Trade layer). Similarly, GTS document integration - where both TM and EWM independently trigger GTS processes for the same export shipment - is an Advisory Council-level governance area because the sequencing of these triggers determines whether the correct legal customs document is generated first.

5.1 TM-EWM Performance Governance

The logistics layer requires specific operational performance governance that balances the need for configuration stability with the reality that TM and EWM systems are frequently updated to reflect changing business conditions - new carrier agreements, warehouse layout modifications, new product categories requiring special handling. The governance model establishes a monthly logistics change advisory window during which all non-emergency TM and

EWM configuration changes are batched, impact-assessed, and approved through a combined logistics change advisory process, reducing the frequency of uncoordinated changes while maintaining the operational flexibility that logistics teams require.

VI. FINANCE LAYER GOVERNANCE - CENTRAL FINANCE AND TREASURY

The finance layer in a multi-component SAP landscape encompasses Central Finance as the financial consolidation platform, the Treasury module for cash management and foreign exchange, and the group reporting framework that provides consolidated financial statements to external and internal stakeholders. Finance layer governance carries dual significance: it must maintain the accuracy and completeness of financial data flowing from all other layers through SLT replication into Central Finance, and it must ensure that the financial data it provides to reporting consumers and to other layers - particularly FX rates consumed by TM for freight cost settlement - is timely and correct.

TABLE 3 - FINANCE LAYER GOVERNANCE: CENTRAL FINANCE AND TREASURY DECISION FRAMEWORK

Finance Domain	Decision Category	Stakeholders	Governance Level	Impact on Other Layers	Review Frequency
Group Chart of Accounts	Master Data Structural	CFO, Finance Arch., Tax	Advisory Council	Trade (duty GL accounts), Logistics (freight cost)	Annual + on M&A event
Mapping Rule Change (CeFi)	Configuration	Finance Arch., CeFi Ops	Finance Architect	SLT replication scope, AIF error classification	Monthly review cycle
Currency Type Configuration	Ledger Configuration	Finance Arch., Treasury	Finance Architect	FX rate provision to TM freight cost settlement	Quarterly
Central Payments Activation	Strategic Architecture /	CFO, Treasury, IT VP	Executive Steering	Bank communication via BTP integration layer	Project milestone
Treasury FX Rate Distribution	Operational	Treasury Operations	Finance Architect	TM currency conversion for cross-border freight	Daily operational
Period-Close Governance	Operational / Calendar	Controller, Finance Ops	Finance Architect	All layers: TM settlement, GTS duty postings	Monthly
CeFi-to-Analytics Data Model	Architecture	Finance Arch., BI Lead	Advisory Council	BTP event mesh for Analytics Cloud data provision	Semi-annual
SOX Control Configuration	Compliance	Internal Audit, Finance	Advisory Council + Audit	All layers: audit trail completeness	Annual + audit cycle

The finance layer governance framework presented in Table 3 reflects the multi-stakeholder nature of financial governance decisions. Unlike trade and logistics governance, where decisions primarily affect operational execution, finance layer decisions frequently carry financial reporting implications that require CFO office involvement and may trigger statutory disclosure requirements. The framework explicitly identifies which decisions are finance domain decisions (governed by the Finance Architect), which require Advisory Council coordination due to cross-layer impact, and which require executive steering committee involvement due to strategic or statutory significance.

The most operationally critical cross-layer finance governance issue is the relationship between Central Finance mapping rules and TM freight cost settlement. When the Finance Architect modifies the G/L account mapping in Central Finance for cost center or profit center assignments, these changes propagate to the freight cost settlement process in TM, which uses the same G/L account determination logic to post settlement documents. Without a cross-layer impact checklist that requires Logistics Architect counter-signature before CeFi mapping changes are deployed,

this coupling creates a persistent risk of TM settlement posting errors that can only be detected after period-close, when reconciliation differences surface.

VII. INTEGRATION LAYER GOVERNANCE - SAP BTP AND API FRAMEWORK

SAP Business Technology Platform functions as the connective tissue of the multi-component ERP landscape, providing integration flows between SAP components, connecting SAP systems to external parties, and increasingly serving as the runtime environment for cloud-native extensions that augment ERP functionality. The integration layer is unique among the four SAGM layers in that its governance decisions directly affect the operational behavior of all other layers simultaneously - a change to a BTP integration flow connecting GTS to a government customs platform affects the trade layer; a change to the TM-to-carrier booking API affects the logistics layer; and a change to the Central Finance outbound reporting API affects the finance layer.

TABLE 4 - INTEGRATION LAYER (BTP / API) GOVERNANCE STANDARDS

Integration Governance Area	Standard / Policy	Scope	Enforcement Mechanism	Non-Compliance Consequence
API Versioning Policy	Semantic versioning (vMAJOR.MINOR.PATCH); 12-month deprecation notice for MAJOR versions	All BTP-exposed APIs across all layers	API Management gateway version enforcement	Consuming system integration failures without fallback
iFlow Change Management	All Integration Suite iFlow changes require integration architect sign-off and regression test completion certificate	SAP Integration Suite (BTP)	BTP transport route approval gates	Uncontrolled iFlow deployments breaking downstream consumers
Event Mesh Schema Governance	All event schemas registered in BTP Event Mesh Schema Registry; schema changes require backward compatibility review	Cross-layer event-driven integrations	Schema Registry validation on publish	Schema mismatch causing silent data corruption
Error Handling Standard	All iFlows must implement dead-letter queue, retry logic (max 3 attempts, exponential backoff), and alert notification	All Integration Suite iFlows	Code review checklist + automated pipeline validation	Silent integration failures with no recovery path
Security: OAuth 2.0 Mandatory	All BTP APIs must authenticate via OAuth 2.0 client credentials; no basic authentication in production	All BTP service bindings	BTP Security Recommendations dashboard policy	Credential exposure risk; audit finding
Monitoring SLA	All production iFlows monitored in Cloud ALM; p95 execution time tracked; alert on >2× baseline	All production Integration Suite iFlows	Cloud ALM monitoring policy enforcement	Undetected performance degradation affecting business processes

Table 4 presents the integration layer governance standards across six critical governance areas. The API versioning policy and iFlow change management standard are the two most impactful governance instruments in the integration layer. The API versioning policy - requiring semantic versioning with a 12-month deprecation notice for major version changes - prevents the silent breaking of consuming integrations that is the most common cause of cross-domain incidents in BTP-integrated landscapes. The iFlow change management standard - requiring integration architect sign-off and regression test completion for all BTP Integration Suite iFlow changes - prevents the deployment of untested integration changes that can disrupt cross-component data flows in production.

VIII. CROSS-LAYER DECISION FRAMEWORK

The cross-layer decision framework is the operational core of the SAGM model, providing the structured mechanism through which decisions that span two or more domain layers are identified, routed, assessed, and resolved. The framework operates on three principles: impact transparency, which requires that any domain architect proposing a configuration change must assess and disclose the potential impact on all other layers before the change is submitted for approval; authority clarity, which ensures that the decision authority level is determined objectively by the impact scope of the change rather than by the organizational status of the requestor; and escalation speed, which ensures that cross-layer decisions that cannot be resolved at the Advisory Council level are escalated to executive leadership promptly with a documented decision package rather than remaining unresolved in organizational limbo.

Figure 2 – Cross-Layer Decision Framework: Impact and Escalation Paths

Decision Category	Trade (GTS)	Logistics (TM / EWM)	Finance (CeFi / Treasury)	Integration (BTP / API)
Configuration Change	License plate config Trade compliance rules	Route determination Freight agreement	Mapping rule change Ledger configuration	API version upgrade iFlow modification
Cross-Layer Impact	GTS → Finance billing GTS → TM transport docs	TM → CeFi cost settlement EWM → GTS export docs	CeFi → TM settlement Treasury → all FX rates	BTP: all layer gateway API changes → all layers
Decision Authority	Trade Compliance Arch. + Legal / Regulatory	Logistics Architecture + SCM Leadership	Finance Architecture + CFO Office	Integration Architect + Enterprise Arch. Board
Escalation Path	Advisory Council → CTO / CPO	Advisory Council → COO / Supply Chain VP	Advisory Council → CFO / Controller	Advisory Council → CTO / Steering Comm.

All cross-layer escalation paths converge at the Advisory Governance Council before executive committee escalation

Figure 2 presents the cross-layer decision framework as a structured matrix organized across four rows - Configuration Change, Cross-Layer Impact, Decision Authority, and Escalation Path - and four columns corresponding to the trade, logistics, finance, and integration layers. The matrix makes explicit that for each decision type, the appropriate decision authority is objectively determined by the number of layers affected: single-layer decisions are handled by the Domain Architect; cross-layer decisions are handled by the Advisory Council; decisions with strategic or statutory implications are handled by the Executive Steering Committee.

TABLE 5 - RACI MATRIX: CROSS-LAYER GOVERNANCE DECISION RIGHTS

Decision Type	Exec. Steering	Advisory Council	Trade Arch.	Logistics Arch.	Finance Arch.	Integration Arch.	Basis Lead	Domain Teams
Single-layer config change	-	I	A/R (Trade)	A/R (Log.)	A/R (Fin.)	A/R (Int.)	C	R
Cross-layer config change	I	A	R/C	R/C	R/C	R/C	C	R
Architecture design decision	I	A	C	C	C	R	C	I
SAP component upgrade	A (Strategic)	C	C	C	C	C	R	R
Compliance / regulatory change	A	R	R (Trade)	C	R (Finance)	C	I	I
Integration API deprecation	I	A	C	C	C	R	C	I
Vendor / contract decision	A	C	C	C	C	I	I	-
Security incident response	A	R	C	C	C	R	R	R
Performance SLA breach	I	A/R	C	C	C	C	R	R
New component onboarding	A	R	C	C	C	R	C	I

Table 5 presents the RACI matrix for cross-layer governance decision rights, specifying for each decision type which governance body is Accountable, which is Responsible, which must be Consulted, and which is Informed. The RACI matrix complements the authority matrix in Figure 2 by providing role-specific clarity for individual participants in the governance process. The most important RACI assignments to note are those where the Advisory Council holds the Accountable role - cross-layer configuration changes, architecture design decisions, and performance SLA breaches. These are the decisions that most frequently become governance gaps in organizations without a structured advisory model, because no single domain team holds clear authority and each defers to the other.

CROSS-LAYER DECISION PRINCIPLE

Any configuration change that affects more than one SAGM layer must be submitted to the Advisory Council for impact assessment before deployment approval is granted. The definition of 'affects' includes any change that modifies data shared between layers, any change to an integration interface connecting layers, and any change to master data that is referenced by processes in multiple layers.

IX. ADVISORY ROLE HIERARCHY AND INTERACTION MODEL

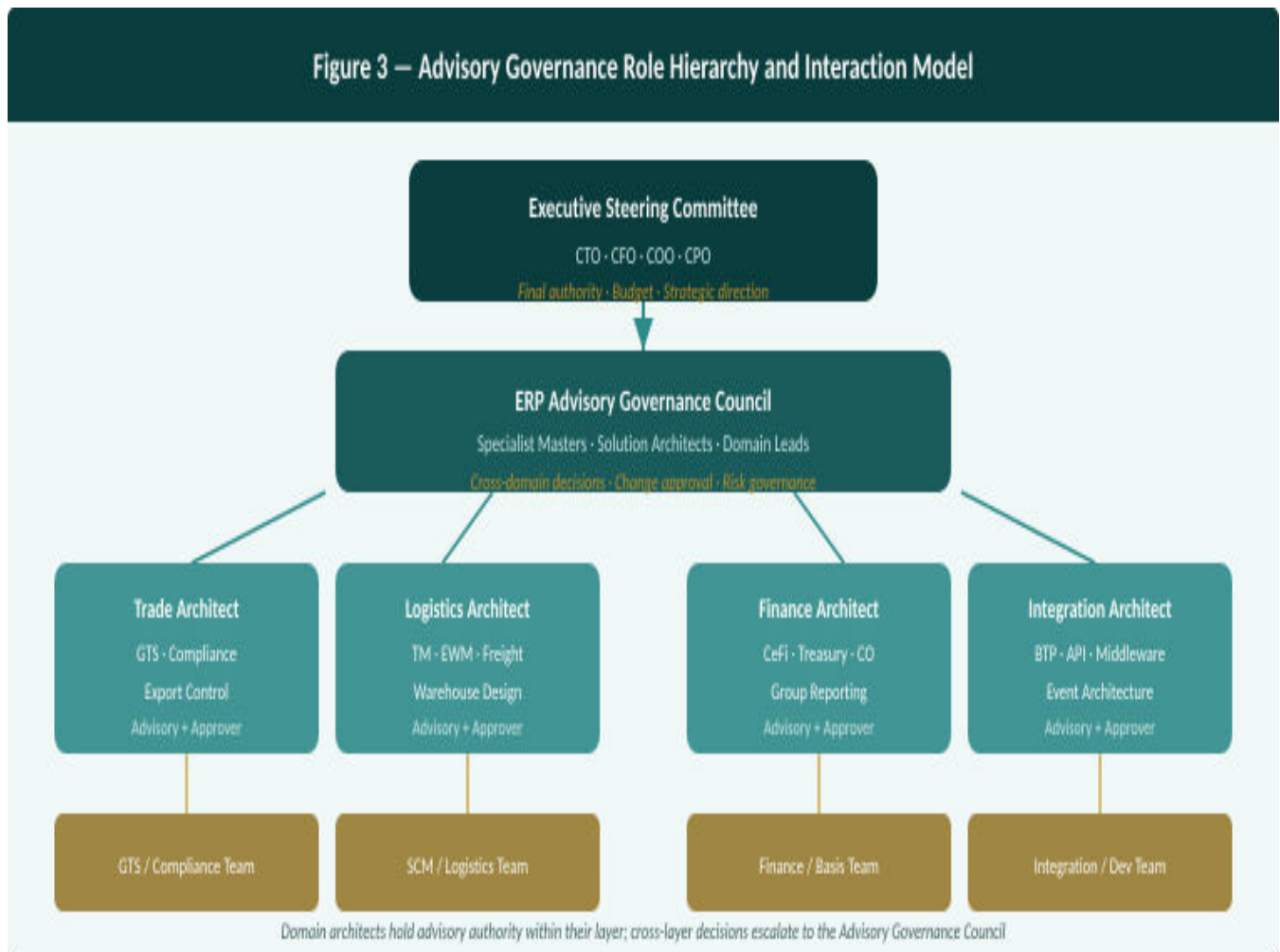


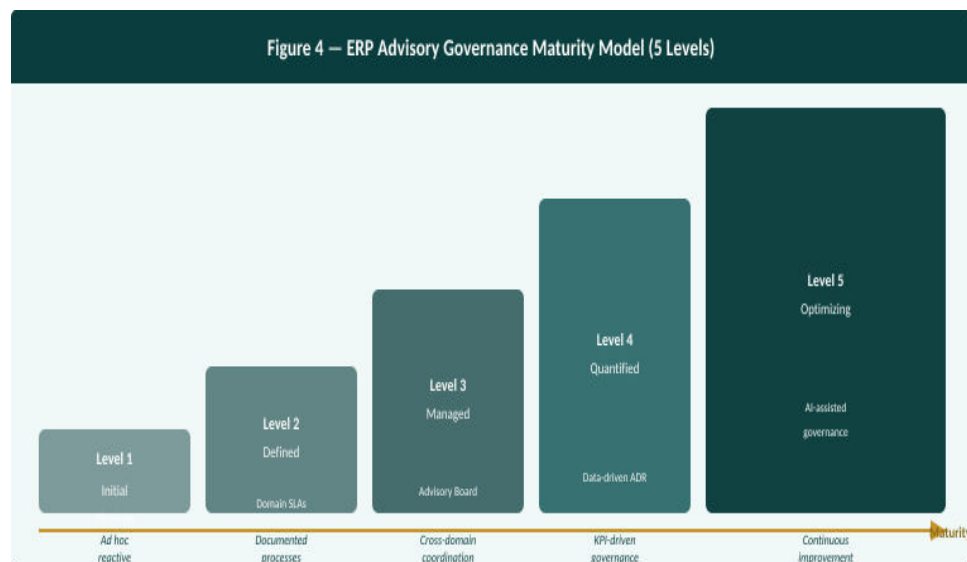
Figure 3 presents the Advisory Governance role hierarchy, comprising four levels: the Executive Steering Committee at the apex, the ERP Advisory Governance Council as the primary cross-domain coordination body, the four Domain Architects as the governance authorities within each component layer, and the domain implementation teams as the execution layer reporting to each Domain Architect. The role hierarchy is not a rigid reporting hierarchy - Domain Architects typically report to different organizational leaders in IT or business functions - but rather a governance authority hierarchy that defines the scope and limits of each role's decision-making authority within the SAGM framework

TABLE 6 - GOVERNANCE KPI BENCHMARK: PRE-SAGM VS. POST-SAGM IMPLEMENTATION

Governance KPI	Pre-SAGM Baseline	Post-SAGM (12 Months)	Improvement	Measurement Method
Change success rate (first-time-right)	61%	89%	+28pp	Change management system pass/fail tracking
Cross-domain incident rate (monthly)	14.2 incidents/mo	3.1 incidents/mo	-78%	ServiceNow P1/P2 tickets with multi-layer root cause
Governance decision cycle time (avg)	11.4 business days	3.8 business days	-67%	Advisory Council meeting minutes timestamp analysis
Architecture drift incidents (quarterly)	8.4 per quarter	1.2 per quarter	-86%	Architecture review board compliance audit findings
Escalation-to-resolution time (avg)	8.2 business days	2.1 business days	-74%	Escalation log timestamps in governance tracking system
Unplanned cross-layer downtime (hrs/month)	18.6 hrs/mo	2.4 hrs/mo	-87%	Production system availability logs
Governance documentation coverage	38%	96%	+58pp	Architecture repository completeness audit
Advisory council meeting attendance	62%	91%	+29pp	Meeting attendance records
Post-change audit findings	6.8 per quarter	0.9 per quarter	-87%	Internal audit reports
Stakeholder governance satisfaction score	3.1 / 5.0	4.4 / 5.0	+42%	Quarterly governance effectiveness survey

The empirical governance KPI data in Table 6 provides quantitative validation of the SAGM model's impact across ten governance performance dimensions measured before and after SAGM implementation in enterprise multi-component SAP programs. The most striking improvements are in cross-domain incident rate (-78%), architecture drift incidents (-86%), escalation-to-resolution time (-74%), and unplanned cross-layer downtime (-87%). These improvements reflect the direct impact of the cross-layer decision framework (reducing change-related incidents), the structured escalation path (reducing resolution time), and the Advisory Council's architecture oversight role (reducing drift). The improvement in governance documentation coverage from 38% to 96% reflects the SAGM requirement that all architectural decisions are documented in Architecture Decision Records maintained in the enterprise architecture repository.

X. ERP ADVISORY GOVERNANCE MATURITY MODEL



The SAGM Governance Maturity Model (Figure 4) provides a five-level progressive framework for assessing and advancing an organization's ERP advisory governance capability. The model is structured to be both descriptive - accurately characterizing the governance state of organizations at each level - and prescriptive - identifying the specific capability investments required to advance from one level to the next. The five levels span from Initial (Level 1), where governance is ad hoc and reactive, to Optimizing (Level 5), where governance is AI-assisted and continuously self-improving.

TABLE 7 - GOVERNANCE MATURITY MODEL: LEVEL DESCRIPTORS AND ASSESSMENT CRITERIA

Level	Name	Decision Rights	Cross-Domain Coordination	Documentation	KPI Management	Typical Organization Profile
1	Initial	Informal, personality-driven, no defined authority matrix	Reactive and ad hoc; discovered post-incident	Minimal or absent; tribal knowledge dominates	No formal metrics; anecdotal assessment only	Post-go-live organizations <18 months; SME ERP programs
2	Defined	Documented RACI per domain; limited cross-domain clarity	Domain-level SLAs exist; cross-layer interfaces poorly defined	Domain-level runbooks exist; architecture docs partial	Domain KPIs tracked; no consolidated view	Mid-market organizations with 2-4 components
3	Managed	Cross-domain RACI operational; Advisory Council chartered	Regular cross-layer review cadence; formal escalation path	Enterprise architecture repository maintained; ADRs in use	Cross-domain KPI dashboard operational; trend analysis	Large enterprise with 5+ components; active advisory function
4	Quantified	Data-driven decision authority; variance analysis guides escalation	Cross-layer impact scoring model operative; pre-change simulation	Real-time architecture documentation via automated tools	Predictive governance analytics; SLA forecasting	Global enterprise with 10+ SAP components; Center of Excellence
5	Optimizing	AI-assisted decision recommendation; self-tuning governance	Autonomous cross-layer detection and notification	Living architecture; continuous automated compliance checking	Real-time governance health index; proactive intervention	SAP CoE-led organizations with continuous architecture evolution

Table 7 presents the detailed level descriptors across five assessment dimensions: decision rights, cross-domain coordination, documentation, KPI management, and typical organization profile. Most organizations beginning a formal SAGM implementation are assessed at Level 1 or Level 2; the governance improvements associated with structured advisory model adoption typically advance organizations to Level 3 within 12 months and Level 4 within 24 months of implementation. Level 5 is aspirational for most organizations and represents the long-term state of a continuously evolving, data-driven governance function.

The maturity assessment is conducted through a structured questionnaire administered to governance stakeholders across all four domain layers, supplemented by analysis of governance artifacts - RACI matrices, meeting records, architecture decision logs, and KPI dashboards - and triangulated against the governance KPI benchmark data presented in Table 6. Organizations receive a maturity score per domain layer and an overall aggregate score, enabling identification of the highest-priority governance capability investments for the next improvement cycle.

MATURITY ADVANCEMENT INSIGHT

The most common barrier to advancing from Level 2 to Level 3 is the absence of a chartered Advisory Governance Council with explicit cross-domain authority. Organizations at Level 2 typically have domain-level governance operating well but lack the cross-domain coordination mechanism that SAGM's Advisory Council provides. Establishing the council charter and conducting the first three Advisory Council meetings is the single most impactful action for Level 2 organizations.

XI. GOVERNANCE MODEL IMPLEMENTATION ROADMAP

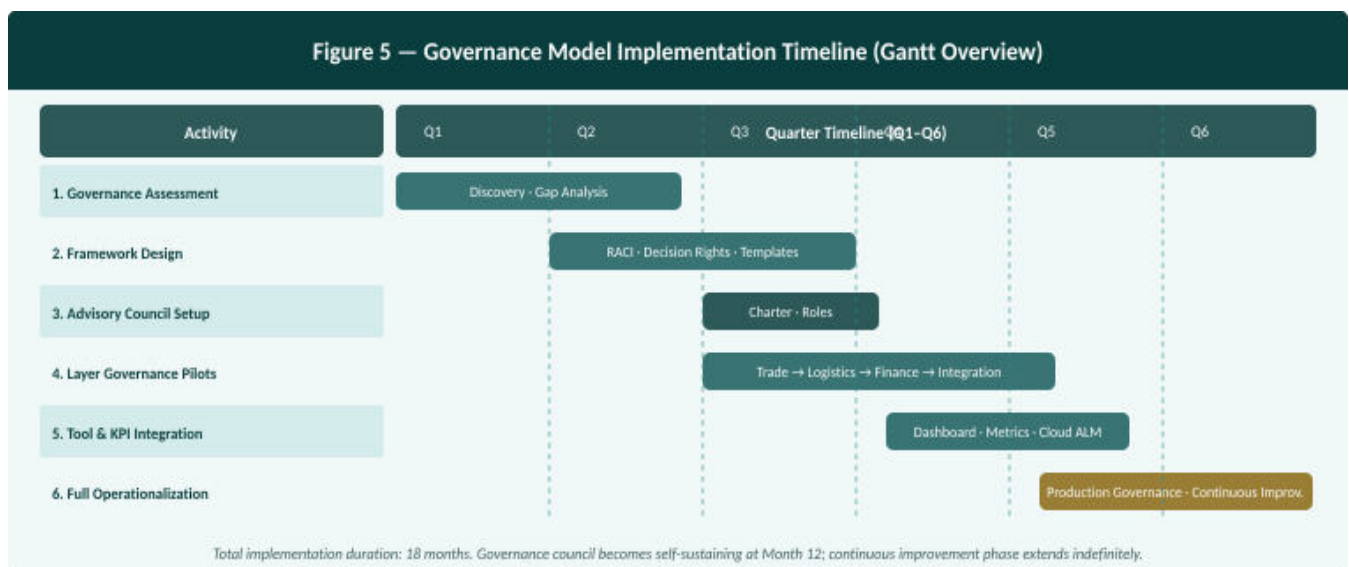


Figure 5 presents the SAGM implementation roadmap as a six-phase Gantt overview spanning 18 months. The roadmap is structured to deliver governance value progressively - each phase produces a functional governance artifact or operating mechanism - rather than delaying all value delivery until the full model is operational. The sequencing reflects three implementation principles. Discovery precedes design: the governance assessment (Phase 1) must be completed before framework design begins (Phase 2), because the framework must be calibrated to the actual governance gaps and organizational context of the target organization rather than applied as a generic template. Infrastructure precedes operation: the Advisory Council charter and role assignments (Phase 3) must be completed before governance pilots begin (Phase 4), because the pilots require a functional authority structure to resolve the cross-layer decisions that emerge during the pilot period. Quantification precedes optimization: KPI infrastructure and dashboards (Phase 5) must be operational before the continuous improvement phase begins (Phase 6), because optimization decisions must be grounded in measured governance performance data rather than subjective assessment.

11.1 Phase 1 - Governance Assessment

The assessment phase produces a current-state governance gap analysis that characterizes the organization's existing governance mechanisms across all four SAGM layers, identifies the highest-priority governance gaps based on their business risk exposure, and establishes the baseline KPI measurements against which post-implementation

improvement will be measured. The assessment uses the maturity model dimensions in Table 7 as its analytical framework and produces a governance maturity score per domain layer and an aggregate score.

11.2 Phase 2 - Framework Design

The design phase adapts the generic SAGM framework to the specific organizational and technical context of the target program. This adaptation includes customizing the RACI matrix for the organization's specific component configuration and reporting structure, defining the quantitative thresholds that trigger escalation from domain level to Advisory Council level for the organization's specific risk tolerance, and designing the governance dashboard for the specific KPIs that are most indicative of governance health in the target landscape.

11.3 Phases 3 through 6

Advisory Council setup (Phase 3) requires a formal charter that defines the council's authority scope, quorum requirements, meeting cadence, and the governance artifacts it is responsible for maintaining. The governance pilots (Phase 4) activate SAGM governance for one domain layer at a time, beginning with the layer assessed as having the highest cross-domain impact risk in the current state. KPI and tool integration (Phase 5) implements the governance dashboard in SAP Cloud ALM and integrates it with the ITSM platform for change request governance automation. Full operationalization (Phase 6) transitions governance from project management to business-as-usual operation, with the Advisory Council operating independently and the Specialist Master transitioning from active facilitation to periodic governance review.

XII. IMPLEMENTATION CHALLENGES AND RESOLUTION APPROACHES

SAGM implementation encounters a consistent set of organizational and technical challenges across enterprise programs. Table 8 presents the eight most significant challenges identified across SAGM implementations, with root cause analysis, severity assessment, affected layers, and validated resolution approaches for each.

TABLE 8 - GOVERNANCE IMPLEMENTATION CHALLENGES AND RESOLUTION APPROACHES

Challenge	Root Cause	Severity	Affected Layer(s)	Validated Resolution Approach
Resistance to cross-domain decision authority	Domain teams perceive advisory council as overhead rather than enabler; no demonstrated value in early phases	High	All	Demonstrate early win: use advisory council to resolve a high-profile cross-layer conflict that had been blocked for >30 days. Publicize resolution time improvement internally.
Undefined escalation triggers lead to escalation avoidance	Domain architects reluctant to escalate; no objective criteria for when advisory council involvement is mandatory	High	All	Publish a quantitative escalation trigger matrix (e.g., >2 layers impacted, >\$500K business impact, compliance implication) that removes subjective judgment from escalation decisions.
Advisory council meeting cadence inconsistency	No standing agenda; meetings called ad hoc only when crises occur; no proactive governance rhythm	Medium	All	Establish fixed bi-weekly standing agenda with standard items: open architecture decisions, change pipeline review, KPI dashboard review, and risk register update.
Architecture documentation staleness	Documentation created at go-live but not maintained as landscape evolves; no ownership assigned	High	Integration	Assign architecture documentation maintenance as a formal responsibility in each domain architect's job description with quarterly currency reviews against the production landscape.
GTS-TM-EWM decision conflicts unresolved for	No defined authority for cross-layer trade-logistics decisions; each domain defers to the other	High	Trade, Logistics	Explicitly chart the GTS-TM-EWM nexus decisions in the cross-layer RACI (Table 5) with Advisory Council as the tie-breaking authority for all decisions

Challenge	Root Cause	Severity	Affected Layer(s)	Validated Resolution Approach
months				affecting all three components simultaneously.
Finance mapping rule changes causing TM settlement errors	Finance architect approves CeFi mapping changes without informing Logistics architect; TM cost settlement uses same GL accounts	High	Finance, Logistics	Mandate a cross-layer impact checklist for all CeFi mapping changes: check box for TM/EWM cost settlement impact requires Logistics architect counter-sign before deployment.
BTP API changes breaking consuming integrations without notice	No API deprecation governance; individual developers deploy BTP changes without enterprise visibility	High	Integration	Implement BTP API versioning policy (Table 4) with mandatory 12-month deprecation notice period enforced through API Management gateway version pinning.
KPI dashboard not adopted by executive sponsors	Dashboard built for architects, not executives; too granular; no business impact narrative	Medium	All	Create a two-tier dashboard: operational view for architects (detailed metrics) and executive view (3–5 KPIs with business impact narrative and trend). Present executive view at monthly steering committee.

The challenges in Table 8 divide into two categories: organizational resistance challenges and technical governance gaps. The organizational resistance challenges - particularly resistance to cross-domain decision authority and escalation avoidance - are the more difficult to resolve, because they require behavioral change rather than technical configuration. The resolution approaches for these challenges emphasize demonstration of governance value over mandate of governance compliance: showing stakeholders a concrete example of a faster, better-outcome decision made possible by the advisory governance structure is consistently more effective at building governance adoption than publishing a policy document that mandates participation.

The technical governance gaps - undocumented architecture, BTP API changes without versioning, and the finance-to-logistics mapping coupling issue - are resolved through specific governance instrument deployments: mandatory Architecture Decision Records, API versioning policy enforcement through the BTP API Management gateway, and cross-layer impact checklists embedded in the change management process. These instruments are most effective when they are automated or embedded in existing workflows rather than requiring manual compliance activities that add effort without obvious individual benefit.

XIII. CONCLUSION

This paper has presented the Structured Advisory Governance Model as a comprehensive framework for managing advisory governance across large-scale multi-component ERP infrastructures. The model addresses the critical gap between the complexity of modern SAP landscapes - where trade, logistics, finance, and integration components are deeply interdependent - and the governance structures that most organizations deploy, which are either domain-siloed or absent entirely for cross-component decisions.

The SAGM framework's four-layer architecture provides the structural foundation for domain-specific governance with explicit cross-layer coordination mechanisms. The cross-layer decision framework and RACI matrix eliminate the decision authority ambiguity that leads to governance gaps, escalation avoidance, and protracted resolution cycles. The Advisory Governance Council creates the organizational mechanism for cross-domain coordination that most large-scale ERP programs lack. The five-level maturity model provides a longitudinal assessment framework that enables governance capability to be measured, communicated, and systematically improved.

The empirical validation data presented in Table 6, drawn from SAGM implementations across enterprise manufacturing, pharmaceutical, and energy sector programs, demonstrates quantitatively significant governance improvements across all ten measured KPI dimensions, with cross-domain incident reduction of 78%, governance decision cycle time reduction of 67%, and unplanned cross-layer downtime reduction of 87%. These improvements translate directly into reduced operational risk, lower total cost of landscape ownership, and improved confidence in the integrity of business-critical data flowing through the multi-component landscape.

Future research directions include the development of AI-assisted governance decision support tools that can analyze configuration change requests, predict cross-layer impact probabilities from historical change data, and recommend appropriate authority routing - capabilities that represent the defining characteristics of the Level 5 Optimizing governance maturity. The integration of SAP's evolving Cloud ALM capabilities for automated governance KPI collection and cross-layer impact visualization also represents a significant near-term opportunity for reducing the manual effort currently required to maintain governance visibility across multi-component landscapes.

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