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Data-Driven Framework for Service Issue Escalation and Resolution in Large Scale Insurance Portfolios

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Abstract

Service issue escalation and resolution in cloud enabled enterprise case management are difficult to govern in large insurance portfolios, where tickets can trigger avoidable escalation, stalled ownership, and inconsistent closure. This study developed and tested a data driven framework linking escalation criteria standardization (ECS), workflow automation support (WAS), cross functional coordination (CFC), data quality (DQ), analytics effectiveness (AE), and governance and accountability (GOV) to escalation effectiveness (EE) and resolution performance (RP). Using a quantitative, cross sectional, case-based design, a five-point Likert survey captured perceptions from 228 employees in one enterprise portfolio using a cloud-based case management workflow (frontline 42.1%, specialists 28.5%, supervisors 19.3%, QA or support 10.1%). Analysis included data screening, Cronbach reliability, descriptive statistics, Pearson correlation, two multiple regression models, and a mediation test. Internal consistency was high (alpha 0.83 to 0.91). Mean scores indicated moderate capability but uneven execution (3.42 to 4.11), and pathway integrity was weakest on documentation completeness (M 3.41) and ownership continuity (M 3.38) compared with routing accuracy (M 3.79). Correlations supported key links, including ECS with EE (r 0.56), WAS with EE (r 0.49), CFC with EE (r 0.52), DQ with AE (r 0.58), AE with RP (r 0.61), EE with RP (r 0.57), and GOV with RP (r 0.46), all with p below 0.001. Regression results showed ECS (beta 0.31), WAS (beta 0.24), and CFC (beta 0.29) explained 54% of variance in EE (R2 0.54), while AE (beta 0.33), EE (beta 0.28), GOV (beta 0.19), and DQ (beta 0.17) explained 62% of RP (R2 0.62). EE partially mediated ECS to RP, with the direct effect decreasing from beta 0.34 to 0.21 and an indirect effect of 0.13 (p below 0.01). These findings highlight actionable levers for service leaders and BI governance. Implications are that teams can improve closure speed and durability by enforcing complete handoff packages, expanding automated routing and aging controls, and using analytics dashboards under clear ownership rules.

Keywords

Service Issue Escalation; Resolution Performance; Analytics Effectiveness; Governance and Accountability; Insurance Portfolio Operations;

INTRODUCTION

Service-issue escalation and resolution refer to the structured set of activities through which an organization detects a service disruption, classifies its severity, routes it to increasingly specialized decision makers when frontline capacity is insufficient, and closes the case after restoring agreed service outcomes (Homburg & Fürst, 2005). Escalation can be viewed as a governance mechanism embedded inside service recovery, because it formalizes when authority shifts from routine handling to exception handling, and it dictates accountability across roles and levels of expertise (Ensslin et al., 2017). In operational environments that rely on ticketing, escalation is also expressed through workflow states and routing rules that determine who owns the issue at each step and how quickly the issue moves toward resolution (Al-Hawari et al.; Gelbrich & Roschk, 2011). These definitions are central for large-scale insurance portfolios, where service issues can include claim processing delays, policy servicing errors, billing disputes, coverage clarification requests, and technology-enabled service outages. Insurance service systems operate at the intersection of high documentation requirements, time-sensitive customer needs, and multi-party coordination across adjusters, underwriters, agents, third-party administrators, and digital service platforms. As a result, service-issue escalation is not merely a customer-care activity; it is also an operational control process that helps stabilize service levels, manage work-in-progress, and reduce variability in cycle time and customer experience outcomes (Hazée et al., 2017; Holmlund et al.). Research on service failures further emphasizes that customer responses to failures and recoveries involve cognitive evaluations of fairness and procedural integrity, along with affective reactions such as anger, anxiety, or perceived disrespect (Holmlund et al., 2020; Orsingher et al.). These customer-level responses interact with system-level mechanics, because the design of routing, prioritization, and escalation thresholds shapes the speed and credibility of recovery in the customer's eyes (Cai & Chi; Luo & Mattila, 2020). Within this context, the present study's emphasis on a data-driven framework treats escalation as a measurable socio-technical process: a process that produces auditable traces (timestamps, reassignments, severity changes, communications, and closure reasons) and that can be modeled statistically to explain resolution performance variation across a large portfolio.

The international significance of escalation and resolution in insurance portfolios follows from the sector's scale, societal role, and dependency on trust-based relationships. Insurance mediates financial risk for households and firms, supports credit and investment activity, and contributes to resilience after adverse events; therefore, service breakdowns can create cascading consequences, including delayed financial relief, reputational harm, and customer churn. In service recovery research, complaint handling quality is repeatedly linked with loyalty, retention, and relationship strength, indicating that recovery is a strategic capability rather than a purely corrective action (Min & Kim, 2019). Customer reactions to failure and recovery are also shaped by justice perceptions—distributive, procedural, and interactional justice—making escalation pathways consequential because they determine whether customers experience recovery as transparent, respectful, and competent (Matos et al., 2009). Studies show that failure contexts can activate strong discrete emotional responses that drive voice behavior and switching, reinforcing the practical value of timely, well-governed escalation (Luo & Mattila; Montgomery et al., 2018).

In technology-enabled service delivery, many modern service interactions occur through digital channels and support systems; therefore, operational trace data and analytics become increasingly relevant as a means to understand and manage recovery performance variation (Orsingher et al., 2010; Roschk & Gelbrich). The analytics perspective treats organizational data as an asset for generating predictive and explanatory insights that can guide managerial decisions in complex service systems (Patterson et al.; Roschk & Gelbrich, 2011). Insurance portfolios are archetypal complex systems: they involve heterogeneous product lines, customer segments, and jurisdictional requirements; they rely on standardized processes such as policy issuance and claims management; and they contain rare but high-impact exception cases that require escalation to specialists.

Figure 1: Integrated Escalation–Resolution Workflow

Operationally, such environments produce large volumes of service tickets and case records, creating an opportunity to study escalation not as anecdote but as measurable patterns in workflow transitions and outcomes (Patterson et al., 2006; Shmueli & Koppius). Research on ticket escalation prediction demonstrates that escalation events are not random; they can be modeled using engineered features from ticket histories and operational metadata, supporting the idea that escalation risk and resolution performance can be quantified (Vaerenbergh, Hazée, et al.; Vaerenbergh et al., 2018). A data-driven approach is also consistent with process governance scholarship, which frames governance as a set of structures and performance evaluation mechanisms that guide process execution and control (Shmueli & Koppius, 2011; Vaerenbergh & Orsingher). For large-scale insurance service operations, these streams converge: customer complaint handling and fairness perceptions shape reputational outcomes, while ticket routing and governance design shape operational outcomes such as cycle time, rework, and closure accuracy.

Service escalation is commonly triggered by misfit between the complexity of a service issue and the capability, authority, or bandwidth of the current handler. In practice, escalation may be *functional* (moving the issue to higher expertise), *hierarchical* (moving the issue upward for authority or exception approval), or *time-based* (moving the issue when deadlines approach or breach). Empirical studies in customer complaint contexts show that complaint-handling actions are evaluated through both the outcome delivered and the process through which that outcome is achieved, placing procedural integrity at the center of perceived recovery quality (Vaerenbergh & Orsingher, 2016; Vaerenbergh, Orsingher, et al.; Vaerenbergh et al., 2014). Complaint-handling quality has been linked to loyalty outcomes through organizational responsiveness, communication, and the perceived competence embedded in the handling process (Xu & He, 2018b). In escalation-intensive environments, the process itself becomes visible to customers through response time, message consistency, number of handoffs, and clarity of accountability—features that align with the literature's emphasis on interactional justice and emotional responses (Xu & He, 2018a). Cultural value orientation can further shape how fairness and recovery are interpreted, indicating that global or multi-regional insurance operations may face heterogeneous customer expectations around voice, apology, and compensation (Chen & Li, 2021; Lou

et al.). When failures are interpreted through sensitive frames such as perceived discrimination, voice behaviors and emotional intensity can increase, highlighting how escalation systems also operate as safeguards for respectful and legitimate treatment during recovery episodes (Cai & Chi, 2018; Hazée et al.). At the organizational level, escalation creates workload concentration in specialized queues, generating operational risk when thresholds are crossed and when high-severity cases cluster. This aligns with governance perspectives where performance evaluation systems are used to ensure that processes remain aligned with strategic and service-level objectives (Díaz et al., 2009). Data-driven decision-making literature provides methods for turning such operational traces into measurable indicators and models, enabling the study of escalation as a structured phenomenon rather than an informal practice (Ding & Lii, 2016; Gelbrich & Roschk). In ticketing contexts, routing models formalize who should handle a ticket to minimize resolution time and reassignments, and these models position escalation as an outcome of routing mismatch, information quality issues, or insufficient early diagnosis (Chen et al., 2012; Ding & Lii). Thus, escalation can be defined as both a customer-facing recovery mechanism and an internal coordination mechanism that reallocates expertise and authority under performance constraints.

This study is structured around a set of objectives that collectively define how a data-driven framework for service-issue escalation and resolution can be examined within a large-scale insurance portfolio using a quantitative, cross-sectional, case-study–based approach. The first objective is to clearly identify and operationalize the core organizational and process factors that shape escalation effectiveness in insurance service operations, focusing on how escalation criteria are standardized, how ownership is assigned and transferred, how handoffs are documented, and how coordination occurs across functional units that jointly handle complex service issues. The second objective is to measure the extent to which analytics capability supports escalation decisions by enabling accurate classification, prioritization, and routing of issues, and by improving the visibility of bottlenecks and delays across escalation tiers. The third objective is to quantify resolution performance within the case setting by capturing reliable indicators related to timeliness, closure quality, rework frequency, and perceived SLA adherence, thereby producing measurable outcome variables suitable for descriptive profiling and inferential testing. The fourth objective is to test the statistical relationships among the study variables through correlation analysis, establishing the direction and strength of associations between escalation drivers, escalation effectiveness, analytics effectiveness, and resolution performance in the case organization. The fifth objective is to evaluate the predictive influence of the identified factors through regression modeling, determining the relative contribution of each driver to escalation effectiveness and resolution performance while controlling for relevant respondent and operational characteristics. The sixth objective is to enrich the trustworthiness of the results through study-specific analyses that examine escalation pathway integrity, compare perceived resolution confidence against perceived resolution performance to detect systematic gaps, and identify workload threshold conditions under which escalation quality and resolution outcomes weaken. The final objective is to consolidate the empirical findings into an integrated framework that organizes the drivers, governance mechanisms, analytics enablers, and operational outcomes into a coherent structure that reflects how escalation and resolution functions as an interconnected process in large insurance service environments.

LITERATURE REVIEW

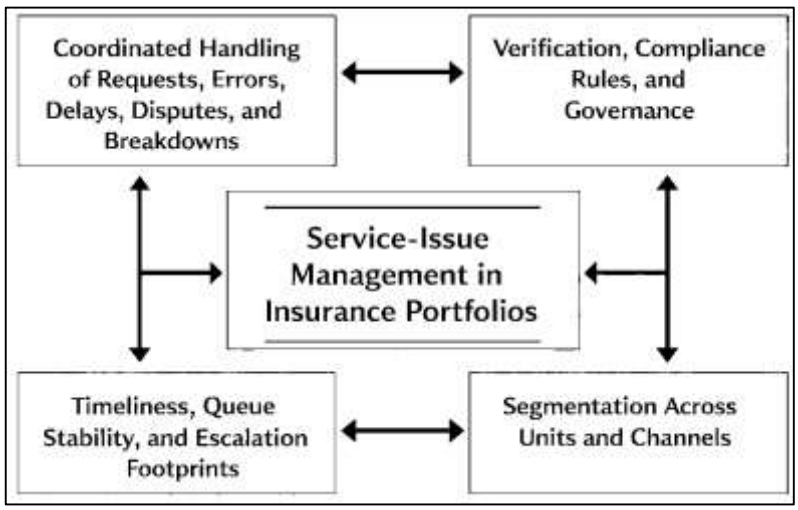
The literature on service-issue escalation and resolution spans multiple research streams that jointly explain how organizations detect service breakdowns, allocate responsibility, and restore expected outcomes while maintaining customer trust and operational stability. In service management and service recovery research, escalation is embedded within broader recovery and complaint-handling processes, where response speed, communication quality, and procedural integrity shape customer evaluations such as satisfaction, loyalty, and perceived justice. This stream emphasizes that service failures trigger cognitive and emotional reactions, and that recovery performance depends not only on the final outcome but also on transparency, respectful interaction, and consistency throughout the handling process. A second stream focuses on service operations and process management, treating escalation as a structured workflow of decisions and handoffs that can be standardized, measured, and governed through policies, roles, and performance indicators. In complex organizational settings, escalation becomes a mechanism for coordinating expertise and authority across tiers, reducing

ambiguity about ownership, and controlling operational risk when cases exceed frontline capability (Rauf, 2018). A third stream, originating from information systems, business intelligence, and analytics, frames escalation and resolution as data-generating activities captured in case management systems, ticket histories, and operational logs (Haque & Arifur, 2021; Ashraful et al., 2020). This perspective highlights how data quality, classification accuracy, routing logic, and decision-support tools can improve escalation precision and reduce resolution time through descriptive monitoring and statistical modeling. In parallel, research on routing and workflow automation shows that assignment decisions and early diagnosis strongly influence downstream escalation frequency and rework, reinforcing the role of standardized triggers and analytics-enabled triage in maintaining pathway integrity (Fokhrul et al., 2021; Zaman et al., 2021). Within insurance portfolios specifically, these streams intersect because service issues arise in high-volume, high-variation environments with regulatory constraints, documentation requirements, and multi-party coordination across claims, policy servicing, billing, underwriting support, and digital channels. The literature therefore provides conceptual and empirical foundations for examining escalation effectiveness and resolution performance as linked constructs influenced by governance, operational capability, and analytics maturity (Fahimul, 2022; Hammad, 2022). Taken together, prior studies establish a basis for developing measurable constructs that reflect escalation criteria standardization, cross-functional coordination, workflow automation, data quality, analytics effectiveness, and resolution outcomes, supporting a quantitative, cross-sectional, case-study–based approach to building and testing a data-driven framework in a large-scale insurance service setting.

Insurance Service-Issue Escalation in Portfolio Operations

Service-issue management in insurance portfolios concerns the coordinated handling of customer requests, errors, delays, disputes, and breakdowns that arise across policy servicing, billing, underwriting support, and claims operations. Because insurance services are contract-based and documentation-intensive, many service issues require verifying coverage terms, confirming transaction histories, and aligning decisions with internal policy rules and external regulation. In large-scale portfolios, the same issue type can surface through multiple channels (branch, call center, agent, email, portal, or mobile app) (Hasan & Waladur, 2022; Arifur & Haque, 2022), which increases the probability of duplicated cases, conflicting information, and repeated contacts. For this reason, insurance service organizations typically treat issue management as a portfolio problem, aiming to control volume, severity mix, and queue stability across specialized units while maintaining a consistent service promise. Complaint-handling evidence from the Dutch health insurance market shows that consumers differentiate between functional quality (how the interaction and handling process feels) and technical quality (the perceived correctness of the outcome), and that these dimensions relate to complaint satisfaction and trust after a complaint episode (Wendel et al., 2011).

Figure 2: Insurance Service-Issue Escalation and Resolution in Portfolio Operations

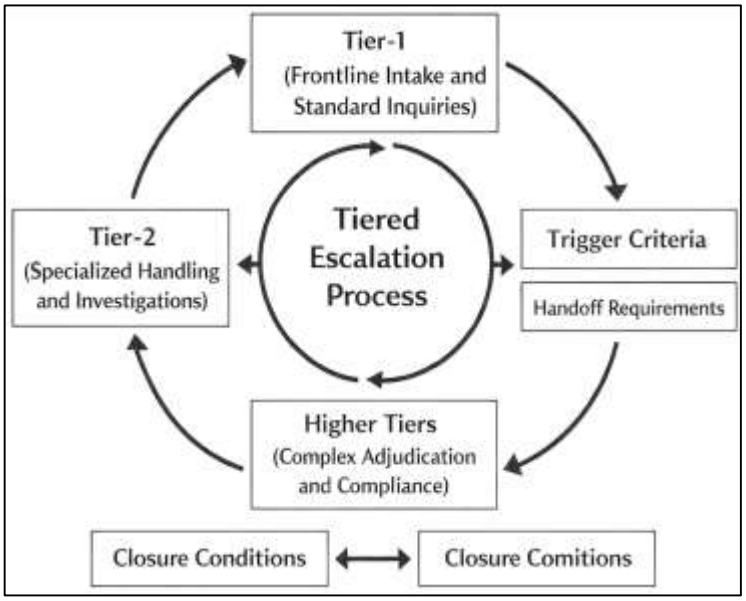


This distinction is highly relevant for insurance portfolios because many service issues combine an outcome decision (e.g., eligibility or payment) with a process experience (e.g., clarity, responsiveness, and documentation). Service-issue management therefore includes front-end intake and classification, back-end investigation and decision steps, and a governance layer that monitors timeliness, accuracy, and escalation triggers when cases exceed frontline authority (Ratul & Subrato, 2022; Rifat & Jinnat, 2022). When these elements are misaligned, portfolios experience rework, reopenings, and intensified escalations, which can be observed as increased handoffs, prolonged cycle times, and inconsistent closure reasons across sub-portfolios. In empirical research, these mechanics can be operationalized through indicators such as first-contact resolution, reassignments, documentation completeness, and SLA breach frequency. Portfolio-level measurement also supports segmentation by product line, claim type, and customer tier, enabling clearly comparisons of issue patterns across units and time windows.

Tiered Escalation Structures in Service Operations

Escalation management in tiered support structures refers to the formal rules, roles, and workflow routines that move a service issue from a frontline handler to progressively specialized or higher-authority actors when predefined criteria indicate that the current tier cannot deliver a timely, compliant, or accurate resolution. In large-scale insurance portfolios, tiering typically mirrors both knowledge boundaries and authorization limits: Tier-1 teams focus on intake, identity verification, basic troubleshooting, and standard policy/claim inquiries; Tier-2 units handle product- or process-specialized investigations (e.g., billing exceptions, endorsements, claim documentation gaps); and higher tiers address complex adjudication, compliance sign-off, dispute handling, or system-level remediation (Rashid & Sai Praveen, 2022; Towhidul et al., 2022). The value of a tiered structure is not simply "more expertise," but a predictable mechanism for matching issue complexity to capability while reducing wasteful looping and ambiguous ownership. A practical implication is that the escalation design must specify (a) trigger criteria (severity, aging, repeat contact, missing documentation, monetary threshold, compliance sensitivity), (b) handoff requirements (minimum data package, evidence attachments, audit trail), and (c) closure conditions (what constitutes "resolved" and how it is documented). Evaluation-focused IT service management research reinforces that escalation performance should be measured through multidimensional metrics—timeliness, quality, business impact, and benefit realization—rather than a single KPI such as closure speed, because speed without correctness can create reopens and downstream risk (McNaughton et al., 2010). A systematic review of IT service management implementation research further highlights that service management frameworks emphasize service orientation, customer expectations, and process-based control, which aligns with viewing escalation pathways as governed processes that must be designed, adopted, and monitored for consistent execution at scale (Iden & Eikebrokk, 2013).

Figure 3: Tiered Escalation Structures and Escalation Governance in Service Operations



Tiered escalation works effectively when escalation criteria are explicit, shared, and consistently applied across teams, and when escalation pathways reflect both technical expertise and governance authority. Escalation policies commonly combine functional escalation (moving to deeper expertise) with hierarchical escalation (moving to higher authority), a dual-path structure that is especially important in regulated insurance settings where decisions may require supervisory approval, documented rationale, and audit readiness (Rifat & Khairul Alam, 2022). The central governance problem is preventing "unproductive escalation," where cases move upward due to incomplete intake, inconsistent categorization, weak knowledge access, or unclear accountability rather than true complexity. Implementation evidence from successful ITIL adoption studies shows that organizations that gain value from structured service processes prioritize role clarity, training, process ownership, standardized reporting, and stakeholder communication—elements that directly translate into more reliable escalation behavior and fewer avoidable handoffs (Pollard & Cater-Steel, 2009). Empirical work on IT service management frameworks also indicates that process standardization can deliver benefits while introducing challenges such as cultural resistance, documentation overhead, and uneven process maturity across units; these findings matter for escalation governance because different insurance departments may interpret severity rules differently, generating inconsistent pathway integrity across the portfolio (Marrone & Kolbe, 2011). In portfolio environments, governance therefore needs escalation "guardrails," such as required data completeness checks before transfer, tier-specific responsibility matrices, and feedback loops that return misrouted tickets with learning signals rather than silently reassigning them. This governance layer supports measurable stability: fewer reassignments, fewer escalations driven by aging alone, fewer reopenings, and more consistent cycle times by issue class.

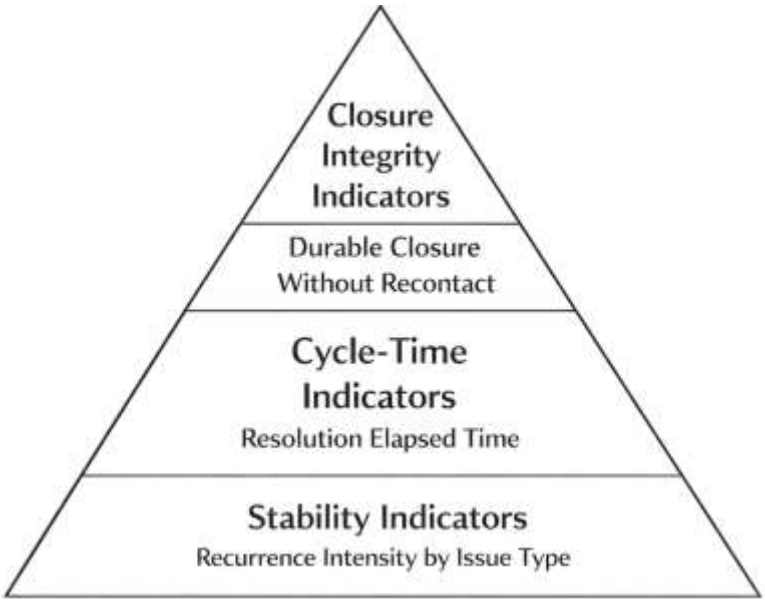
Resolution Performance Metrics

Resolution performance in large-scale insurance service operations is best understood as a multi-metric construct that captures whether a reported issue is closed correctly, consistently, and sustainably across the entire portfolio. In escalation-driven environments, "resolution" functions as an operational *state* rather than a single closure event, because a case can be marked resolved while still generating repeat contacts, reopenings, or downstream complaints. This durability requirement makes repeat-contact–based quality central to performance measurement, especially in high-volume queues where small failure rates scale into substantial rework. Evidence from call-center operations research shows that resolution can be modeled as an outcome influenced by both the routing decision and the agent's probability of resolving the issue without a callback, emphasizing that quality is a measurable property of the service system rather than an abstract sentiment. When routing rules allocate complex call types to agents with higher resolution probability, the overall resolution rate improves while congestion can decrease because fewer callbacks re-enter the arrival stream, producing a measurable operational advantage for large service organizations (Mehrotra et al., 2012). For insurance portfolios, this perspective supports performance frameworks that combine (a) closure integrity indicators (e.g., durable closure without recontact), (b) cycle-time indicators (e.g., resolution elapsed time), and (c) stability indicators (e.g., recurrence intensity by issue type). Resolution performance, therefore, becomes a measurable bridge between customer experience and operational efficiency, linking escalations, workload, and closure durability into a single evaluative lens that is well suited to quantitative modeling.

A key methodological challenge is the speed–quality trade-off, because faster handling can coexist with weaker diagnosis, incomplete documentation, or premature closure that later triggers rework. In practical escalation settings, time-based measures (average handling time, elapsed time to close, time-in-queue) are often treated as efficiency indicators, while repeat contact or reopen measures are treated as effectiveness indicators; however, these indicators can move in opposite directions depending on staffing pressure and workflow design. Behavioral evidence from call-center contexts indicates that frontline employees do not simply "spend time," but exercise discretion over service duration in ways shaped by organizational and relational conditions. When service climate and leader–member exchange support thorough service behavior, longer interactions may reflect stronger engagement and improved problem handling rather than inefficiency, which complicates any simplistic interpretation

of time as waste (Luria et al., 2015). Similarly, customers' perceptions of poor quality service frequently center on experience attributes such as slow service, poor attitudes, and inattentiveness—factors that can degrade the perceived legitimacy of a resolution even if the technical steps were completed (Helms & Mayo, 2008). For insurance service-issue resolution, this implies that resolution performance metrics should explicitly include "closure confidence" proxies (e.g., adequacy of explanation, completeness of documentation, perceived clarity), alongside objective indicators. Doing so allows the quantitative model to distinguish between closures that are fast and closures that are *trusted*, which is especially relevant when escalation pathways involve multiple handoffs and stakeholders.

Figure 4: Resolution Performance Metrics and Quality Indicators



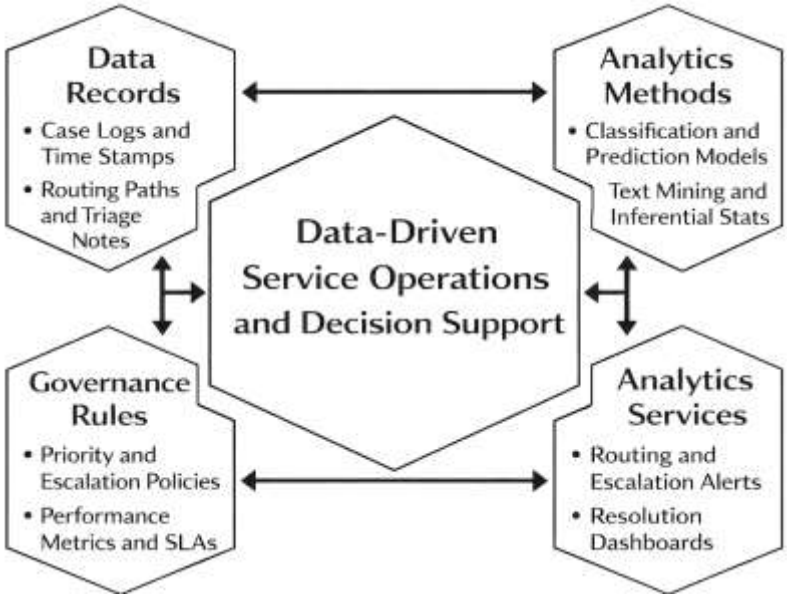
Resolution performance should also be evaluated as a system outcome that links customer-facing closure results to internal process learning and workforce enablement. A resolution that satisfies the customer but fails to fix the underlying process defect will tend to generate recurring escalations, increasing portfolio-level load and creating a cycle of repeated failure. Research in financial-services call centers conceptualizes service recovery as an integrated set of outcomes: customer recovery (restoring satisfaction), process recovery (fixing causes to prevent recurrence), and employee recovery (supporting staff capability and morale), with evidence that imbalance among these dimensions can reduce overall recovery effectiveness (Kumar & Kumar, 2016). This systems view aligns well with insurance escalation environments, where durable resolution often depends on how effectively the organization learns from complaints and converts them into corrective actions. In addition, customer satisfaction in call centers has been linked to human-factor pathways—such as managerial practices and employee-related drivers—which suggests that resolution performance in large portfolios is partly shaped by organizational design and HR practices, not only workflow mechanics (Chicu et al., 2019). For this thesis, these findings justify creating resolution performance measures that combine durable closure, process-cause removal signals, and employee enablement indicators, enabling correlation and regression models to test how escalation structure, workload, and organizational supports jointly predict resolution outcomes at scale.

Data-Driven Service Operations and Decision Support

Data-driven service operations and decision support describe the systematic use of operational data, analytics methods, and governance routines to improve how organizations classify, prioritize, route, and resolve service issues at scale. In large insurance portfolios, case-management platforms record detailed traces of service activity—timestamps, queue placement, handoffs, notes, attachments, status transitions, and closure codes—that can be converted into decision signals for escalation and resolution. A data-driven orientation treats these records as operational evidence that supports standardized

intake, consistent triage, and disciplined escalation triggers. From a decision-support perspective, the service system is strengthened when information and analytics are delivered as reusable "services" that can be embedded directly into workflows, enabling frontline teams and supervisors to access relevant data and analytic outputs without needing to rebuild analyses for each case (Delen & Demirkan, 2013).

Figure 5: Data-Driven Service Operations and Decision Support Framework



In practical terms, this includes automated data validation at intake, recommended priority levels based on severity cues, suggestions for the appropriate resolver group, and monitoring views that surface aging risk before SLA breaches occur. Such capabilities are especially important in insurance contexts where a single case can require coordination across claims teams, underwriting support, billing operations, compliance, and technology units, making escalation both a control mechanism and a coordination mechanism. Data-driven decision support also emphasizes traceability: escalation decisions should be explainable through measurable features such as missing documentation, repeat contact patterns, monetary authority limits, or policy-rule ambiguity. When decision support is integrated into the service workflow, escalation becomes less dependent on informal judgment alone and more dependent on consistent rules and evidence, which improves comparability of performance across product lines, channels, and departments.

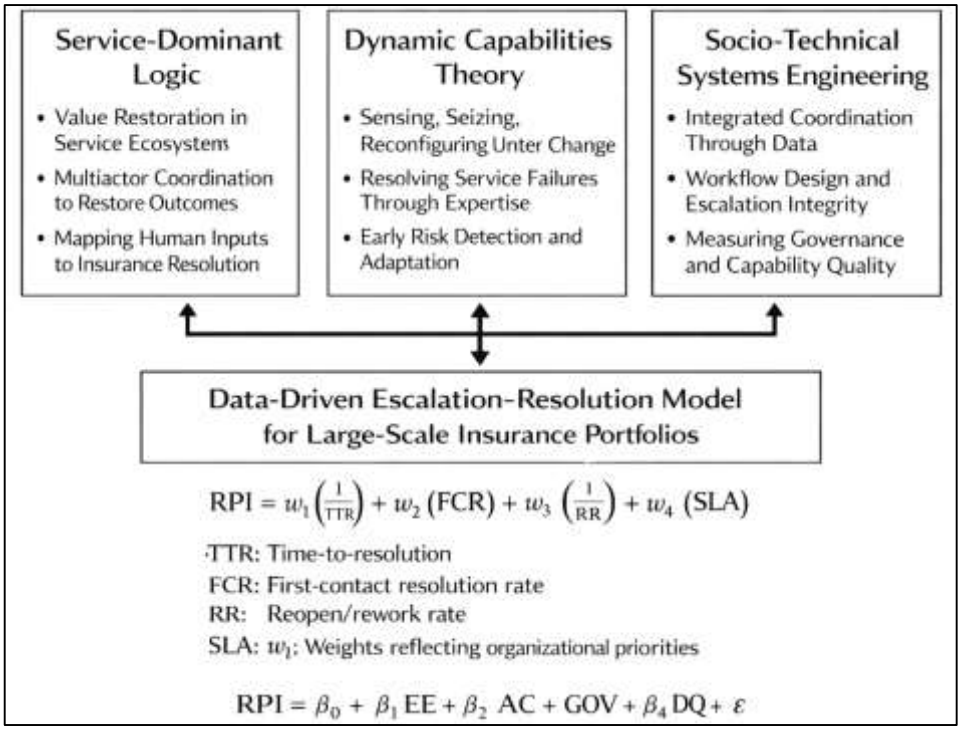
The effectiveness of data-driven escalation depends on the nature of the data being analyzed and on the analytic methods used to transform raw records into usable information. Insurance service operations increasingly generate mixed data types, including structured case fields as well as unstructured narratives in adjuster notes, customer emails, agent messages, and chat transcripts. A major insight from big data scholarship is that unstructured information often carries decisive meaning about intent, severity, context, and causality, yet it requires specialized analytic approaches to avoid noise-driven conclusions (Gandomi & Haider, 2015). In escalation settings, unstructured text can signal emerging disputes, fairness concerns, missing evidence, or compliance sensitivity, all of which influence whether a case should be escalated and to whom. The quality of data-driven escalation therefore depends on disciplined case documentation practices, consistent labeling, and common definitions for severity, resolution, and escalation triggers. Evidence from analytics capability research further suggests that organizations benefit when analytics resources are aligned with business strategy and embedded into operational routines, because analytic outputs must be actionable and adopted by users rather than merely produced (Akter et al., 2016). In insurance portfolios, this means that routing recommendations, escalation alerts, and dashboard signals must fit local authority structures and service-level policies, and they must support the actual decisions that agents and supervisors face under workload pressure. A data-driven framework thus conceptualizes escalation as a measurable outcome influenced by data quality, documentation completeness, and the match between analytic

recommendations and operational governance rules.

Theoretical Framework Foundation

A theoretical foundation for service-issue escalation and resolution in large-scale insurance portfolios can be built by combining complementary lenses that explain (a) *why* escalation is necessary in complex service ecosystems, (b) *how* organizations organize resources and interactions to restore service outcomes, and (c) *what* capabilities allow service systems to sustain performance under variability. Service-dominant logic positions service as the basis of exchange and frames value as co-created through interactions among customers, employees, partners, and enabling technologies, making escalation a coordinated "value-restoration" mechanism that links multiple actors when routine handling cannot maintain the service promise (Vargo & Lusch, 2008). In insurance contexts, this lens clarifies why escalation is not merely a technical handoff: customers provide information, consent, and documentation; employees interpret coverage rules and apply procedures; and partners contribute verification and service delivery, all of which shape resolution. Dynamic capabilities theory adds a strategic operations view by describing how organizations sense issues, seize corrective actions, and reconfigure resources to protect performance in environments characterized by rapid change, dispersed knowledge, and high exception rates (Teece, 2007). When applied to escalation, dynamic capabilities are reflected in the organization's ability to detect emerging service risks early (sensing), mobilize specialist attention and authority quickly (seizing), and redesign routing rules, knowledge resources, and staffing structures after recurring failures (reconfiguring). Together, these theories justify modeling escalation and resolution as interdependent system behaviors rather than isolated events, and they support selecting study constructs such as governance clarity, analytics capability, coordination quality, and pathway integrity as empirically measurable indicators of a service system's capacity to recover reliably at portfolio scale.

Figure 6: Theoretical Framework Foundation for A Data-Driven Escalation–Resolution Model



A second theoretical pillar is socio-technical systems engineering, which treats performance as an outcome of the joint optimization of social elements (roles, incentives, coordination norms, accountability) and technical elements (case-management tools, routing logic, automation, data quality). Socio-technical systems engineering emphasizes that acceptable, resilient performance

emerges when system design aligns work practices with technical representations and decision routines, and when feedback loops help organizations adapt designs to operational reality (Baxter & Sommerville, 2011). This lens is directly compatible with escalation governance because escalation triggers, tier boundaries, documentation requirements, and ownership transfers are "design choices" embedded into workflows and systems. The same lens also supports building measurable constructs that capture both technical reliability (e.g., correct routing, complete data packages at handoff) and social reliability (e.g., role clarity, coordinated action across units). In process-oriented governance research, the combined presence of a process owner role and systematic process performance measurement is associated with stronger organizational performance than adopting either mechanism alone, implying that escalation effectiveness is improved when accountability structures and measurement systems operate together (Kohlbacher & Gruenwald, 2011). Within this theoretical framing, the quantitative model can treat escalation and resolution as governed processes where performance depends on the coherence of responsibilities, metrics, and workflow design. This foundation also legitimizes study-specific metrics such as pathway integrity and load thresholds by treating them as observable manifestations of socio-technical alignment or misalignment across escalation tiers.

These theories can be operationalized through formulas that translate theoretical ideas into empirical indicators suitable for correlation and regression testing. A practical composite for Resolution Performance Index can be expressed as:

$$RPI = w_1\left(\frac{1}{TTR}\right) + w_2(FCR) + w_3\left(\frac{1}{RR}\right) + w_4(SLA)$$

where TTR is time-to-resolution, FCR is first-contact resolution rate, RR is reopen/rework rate, SLA is adherence level, and $w_i$are weights reflecting organizational priorities. Similarly, Escalation Effectiveness can be represented as:

$$EE = \frac{N_{\text{resolved after escalation}}}{N_{\text{escalated}}} \times \left(1 - \frac{H}{H_{\max}}\right)$$

where Hcaptures excessive handoffs during escalation. For hypothesis testing, a standard regression form can connect drivers to outcomes:

$$RPI = \beta_0 + \beta_1 EE + \beta_2 AC + \beta_3 GOV + \beta_4 DQ + \varepsilon$$

where AC is analytics capability, GOV is governance/accountability, and DQ is data quality. Justice-based service recovery research further supports treating escalation quality as consequential for customer evaluations because perceptions of procedural and interactional fairness shape satisfaction and repurchase-related responses during recovery episodes (Gohary et al., 2011). Collectively, these theoretical lenses provide a coherent foundation for explaining why escalation structures exist, how they should be designed as socio-technical systems, and how capability and governance mechanisms can be empirically linked to resolution outcomes in a data-driven portfolio model.

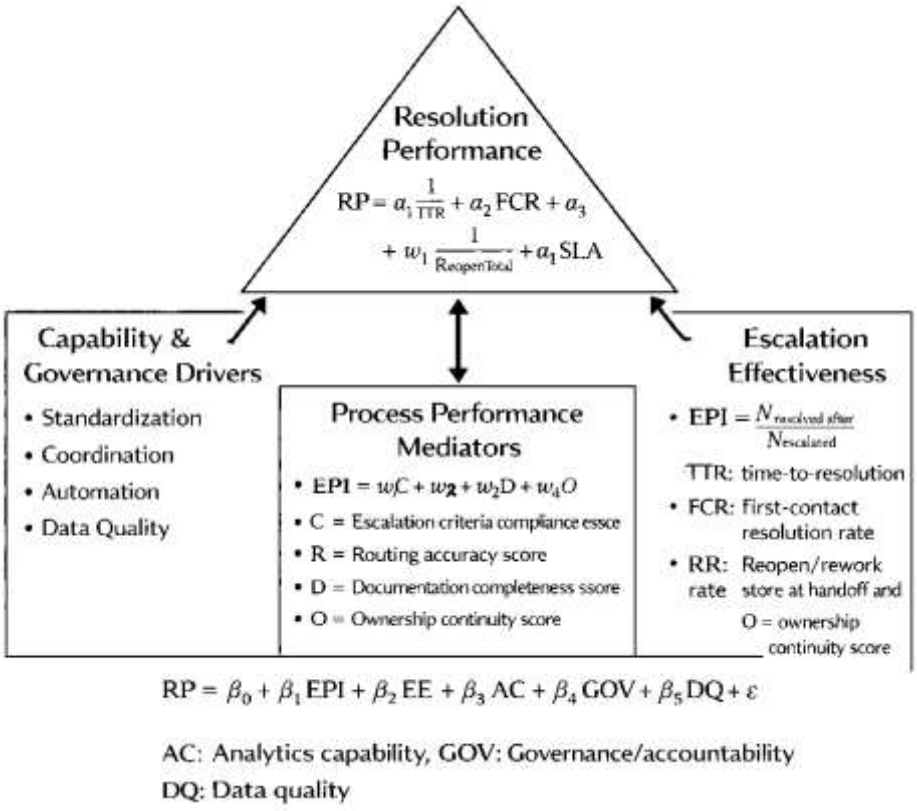
Conceptual Framework in Large Insurance Portfolios

A conceptual framework for this study is designed to represent escalation and resolution as an end-to-end service process that is both customer-facing (service experience, complaint handling, perceived reliability) and operations-facing (workflow routing, handoffs, queue behavior, and closure integrity). The framework begins with the idea that large insurance portfolios behave like "high-divergence" service systems where issue types, required evidence, and authorization limits vary across products and channels; therefore, escalation is a normal control mechanism that enables organizations to restore service outcomes by reallocating work to higher expertise or authority. Service blueprinting research provides a useful conceptual basis for structuring this model because it separates customer-facing actions, front-stage employee activities, back-stage activities, and supporting systems, allowing escalation points to be explicitly mapped to "lines of visibility" and "lines of internal interaction" within a service process (Kostopoulos et al., 2012). This separation is important for insurance operations because many escalations occur when the back-stage system cannot validate a policy rule or documentation requirement quickly enough for front-stage service commitments. The conceptual

model further embeds process mapping logic by aligning customer touchpoints and internal transitions with measurable escalation triggers such as aging, repeat contact, documentation incompleteness, or authority limits. To ensure the framework can be operationalized for empirical testing, the model defines constructs at two levels: (a) capability and governance drivers (standardization, coordination, automation, data quality) and (b) process performance mediators (escalation pathway integrity and escalation effectiveness) that link drivers to the dependent construct of resolution performance. By framing escalation as an explicit transition between process layers, the conceptual model clarifies why the study measures both "how the pathway behaves" and "how the outcome performs," making it suitable for descriptive statistics, correlation analysis, and regression-based hypothesis testing.

To translate the conceptual model into a measurable structure, the framework adopts a process representation that can integrate insurance service workflows with formal process notation. Research comparing service blueprinting and BPMN demonstrates that service blueprinting is strong in capturing customer interaction and visibility boundaries, while BPMN is strong in representing organizational workflow logic and formal handoffs; used together, these tools support a conceptual model where escalation is captured as a governed handoff between lanes, roles, and tiers (Milton & Johnson, 2012). This combined view supports the study's unique results sections (pathway integrity, confidence–performance gaps, and load thresholds) because these outcomes are inherently tied to how handoffs occur and how work moves between tiers. The framework further incorporates quality-of-process modeling logic from the Quality Evaluation Framework (QEF), which emphasizes that business process quality can be evaluated through structured dimensions such as correctness, completeness, compliance, and maintainability—dimensions that align closely with escalation pathway integrity in regulated service environments (Heidari & Loucopoulos, 2014).

Figure 7: Conceptual Framework Development for Escalation–Resolution in Large Insurance Portfolios



Conceptually, escalation pathway integrity is defined as the degree to which cases follow the expected escalation route with the required information package, correct routing, and stable ownership transitions. This enables the model to distinguish between "necessary escalation" driven by issue

complexity and "avoidable escalation" driven by upstream misclassification or incomplete documentation. For operationalization, the conceptual framework defines measurable indicators for each construct and proposes linkages such as: standardized criteria → improved pathway integrity; data quality → improved analytics effectiveness; pathway integrity → improved escalation effectiveness; and escalation effectiveness → improved resolution performance. This is consistent with building a testable causal-logic structure in which governance and capability factors predict process mediators, which then predict outcome performance. Because the framework is intended for quantitative testing, it includes explicit measurement formulas that convert conceptual relationships into indices suitable for correlation and regression. A practical index for Escalation Pathway Integrity (EPI) can be expressed as:

$$EPI = \frac{w_1 C + w_2 R + w_3 D + w_4 O}{w_1 + w_2 + w_3 + w_4}$$

where C= escalation criteria compliance score, R= routing accuracy score, D= documentation completeness score at handoff, and O= ownership continuity score, with weights $w_i$reflecting organizational emphasis. Resolution performance is represented as a composite outcome that captures both speed and closure durability:

$$RP = \alpha_1 \left(\frac{1}{TTR}\right) + \alpha_2 FCR + \alpha_3 \left(1 - \frac{Reopen}{Total}\right) + \alpha_4 SLA$$

where TTR= time-to-resolution, FCR= first-contact resolution, and the reopen term captures rework intensity. The conceptual framework then links constructs using a regression-ready structural form:

$$RP = \beta_0 + \beta_1 EPI + \beta_2 EE + \beta_3 AC + \beta_4 GOV + \beta_5 DQ + \varepsilon$$

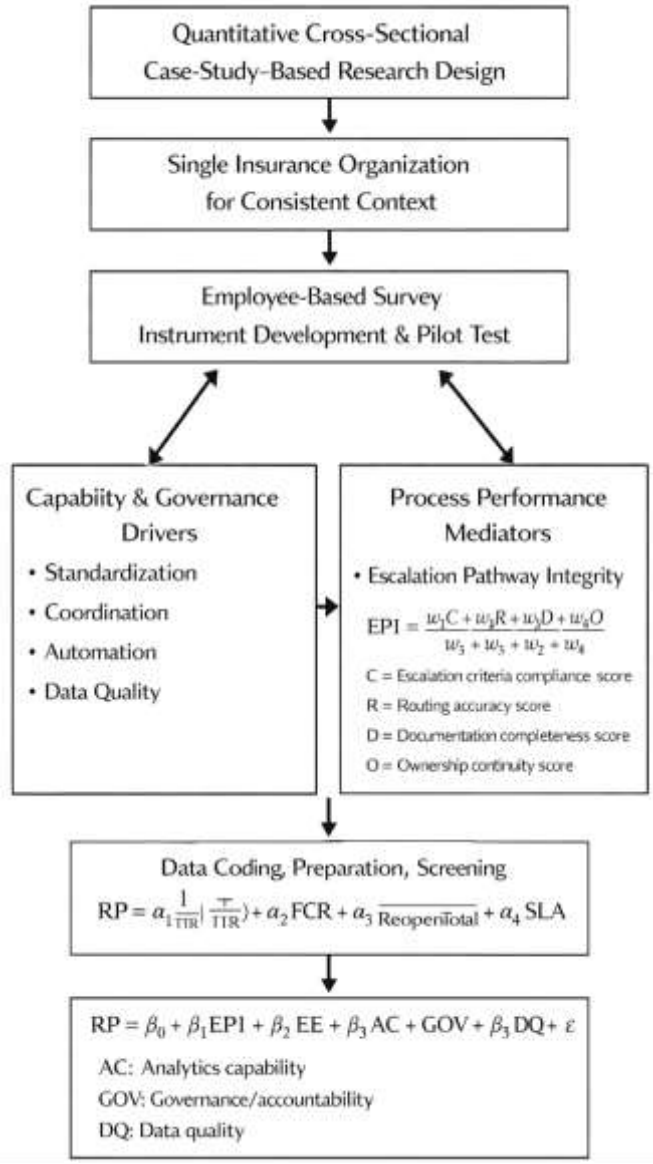
where EE= escalation effectiveness, AC= analytics capability, GOV= governance/accountability, and DQ= data quality. To strengthen measurement credibility, the framework aligns with business process performance measurement scholarship emphasizing that process indicators must reflect both efficiency and effectiveness and must be explicitly defined to support consistent interpretation across contexts (Van Looy & Shafagatova, 2016). Finally, the framework recognizes that modern service systems can validate pathway behavior using process evidence from event logs, supporting the idea that "what should happen" and "what actually happens" can be compared to assess conformance and performance at multiple levels of analysis (Leno et al.; Leno et al., 2021). Together, these elements yield a conceptual framework that is not only visually representable but also empirically testable within a cross-sectional, case-study setting.

METHOD

This study has adopted a quantitative, cross-sectional, case-study–based methodology to examine how service-issue escalation and resolution have been managed within a large-scale insurance portfolio and how data-driven capabilities have shaped resolution performance. The methodological approach has been designed to capture measurable relationships among escalation drivers, escalation effectiveness, analytics capability, governance clarity, and resolution outcomes through structured survey data collected from personnel who have directly participated in issue intake, escalation handling, supervisory decision-making, and case closure activities. A single organizational case has been selected to ensure that escalation pathways, tier structures, service policies, and tooling context have been observed within a coherent operational environment, allowing the study variables to be interpreted against consistent process rules and service-level expectations. The unit of analysis has been the individual employee respondent, and the target population has included frontline service staff, escalation team members, supervisors, quality assurance personnel, and supporting technical or operations staff involved in service-issue routing and resolution. Data collection has been structured around a self-administered questionnaire that has used a five-point Likert scale ranging from strongly disagree to strongly agree, enabling the operationalization of key constructs such as escalation criteria standardization, workflow automation support, cross-functional coordination, data quality, analytics effectiveness, escalation pathway integrity, and resolution performance. Instrument development has been grounded in the constructs defined in the literature review and has been refined to reflect

insurance portfolio realities such as documentation completeness, authority thresholds, and repeat-contact pressure. A pilot test has been conducted to confirm clarity, improve item wording, and assess preliminary internal consistency before full deployment. Reliability and validity procedures have been incorporated, including expert review for content validity and Cronbach's alpha analysis for internal reliability. Data preparation has included coding, screening for missing responses, and checking consistency across construct items prior to analysis. Statistical analysis has been performed using descriptive statistics to summarize respondent profiles and construct tendencies, correlation analysis to examine the strength and direction of relationships among variables, and regression modeling to test hypotheses and estimate the predictive influence of escalation and analytics factors on resolution performance. Additional study-specific analyses have been incorporated to evaluate escalation pathway integrity, assess confidence–performance gaps, and examine workload threshold effects using grouped comparisons derived from survey-based workload measures.

Figure 8: Research Methodology



Research Design

This study has employed a quantitative, cross-sectional, case-study–based research design to examine service-issue escalation and resolution within a large-scale insurance portfolio. The design has been selected because it has enabled the measurement of relationships among clearly defined variables at a single point in time while keeping the organizational process context constant. The case-study setting

has allowed escalation tier structures, routing rules, documentation requirements, and governance practices to have been interpreted within the same operational environment rather than across incompatible systems. A structured survey strategy has been used to capture standardized perceptions from employees who have participated in issue handling and escalation decisions. The research design has supported the use of descriptive statistics to profile patterns, correlation analysis to test associations among constructs, and regression modeling to estimate the predictive influence of escalation drivers and analytics capability on resolution performance. This approach has ensured that hypotheses have been tested using consistent quantitative procedures.

Case Study Context

The study has been situated within a large-scale insurance portfolio environment where service issues have been processed through structured case-management workflows and tiered escalation channels. The case context has involved multiple service functions, including policy servicing, billing support, claims-related inquiries, underwriting assistance, and customer communication channels, each of which has contributed to issue volume and variability. Escalation has occurred when frontline resolution has not met predefined criteria for complexity, authority thresholds, compliance sensitivity, or SLA timelines. The organization's operating model has included roles such as customer service agents, senior specialists, escalation coordinators, supervisors, and quality assurance staff, who have collectively influenced pathway integrity and closure quality. The case environment has provided an appropriate context because escalation decisions have generated traceable process behaviors such as handoffs, reassignments, documentation checks, and aging-based triggers. The case has enabled the study constructs to have been grounded in real operational routines.

Population and Unit of Analysis

The population for this study has comprised employees who have directly contributed to service-issue handling, escalation decision-making, and resolution closure activities within the selected insurance portfolio. Participants have included frontline service agents, claims support staff, billing and policy servicing representatives, escalation team members, supervisors, quality assurance personnel, and supporting operations or IT staff who have interacted with the case-management workflow. The unit of analysis has been the individual respondent because perceptions of escalation criteria clarity, workflow support, coordination quality, and resolution reliability have been best captured at the employee level. This approach has allowed variation in experience, role exposure, and escalation responsibility to have been reflected in the dataset while maintaining a consistent organizational context. The population definition has ensured that responses have represented the operational actors who have experienced escalation triggers, handoff requirements, and governance checks in practice. This structure has supported comparative profiling across roles and has strengthened regression testing by preserving respondent-level variability.

Sampling Strategy

A structured sampling strategy has been applied to ensure that respondents have represented the main groups involved in escalation and resolution across the portfolio. Stratified selection has been used in principle, because escalation behaviors have differed by department and tier exposure, and the study has required representation from frontline handling roles as well as specialist and supervisory roles. Eligibility criteria have been defined to include participants who have managed service issues for a minimum operational exposure period and who have engaged with escalation workflows or resolution closures as part of their responsibilities. The sampling plan has aimed to balance coverage across functional units such as claims-related support, policy servicing, billing operations, and escalation management, thereby reducing the risk that results have reflected only one sub-process. The sample size target has been set to support correlation and regression analysis with multiple predictors while maintaining practical feasibility in the case organization. This strategy has helped ensure that the dataset has captured cross-role and cross-unit variation.

Data Collection Procedure

Data collection has been executed through a structured, self-administered questionnaire that has been distributed to eligible participants within the case organization. The procedure has been designed to protect respondent anonymity and to encourage honest reporting of escalation practices, governance clarity, analytics support, and resolution outcomes. Participants have been informed about the study

purpose, the voluntary nature of participation, and the confidentiality conditions under which responses have been handled. The questionnaire has been delivered through an accessible channel, and a defined response window has been used to ensure cross-sectional consistency in measurement. Follow-up reminders have been used to improve participation rates while avoiding coercion and maintaining ethical standards. Responses have been monitored for completeness and basic consistency, and incomplete submissions have been handled through predefined screening rules before analysis. The data collection procedure has ensured that the study has captured a snapshot of escalation–resolution performance perceptions and has aligned the timing of measurement across all respondent groups.

Instrument Design

The instrument has been designed as a structured survey using a five-point Likert scale ranging from strongly disagree to strongly agree to measure the study constructs consistently. Item sets have been developed to operationalize escalation criteria standardization, workflow automation support, cross-functional coordination, governance/accountability clarity, data quality, analytics effectiveness, escalation pathway integrity, escalation effectiveness, and resolution performance. Each construct has been represented by multiple items to improve reliability and to capture the multidimensional nature of escalation and resolution in insurance portfolios. Wording has been tailored to the case context by incorporating operational language related to tier routing, documentation packages, ownership transfer, SLA pressure, and closure integrity. The instrument has also included demographic and role-exposure questions so that escalation experiences have been interpreted by department, tier involvement, and experience levels. The survey structure has ensured logical flow from capability drivers to pathway behaviors and finally to resolution outcomes. This design has supported quantitative scoring and statistical testing.

Pilot Testing

A pilot test has been conducted to evaluate clarity, relevance, and usability of the survey instrument before full-scale data collection. The pilot group has included a small set of participants representing different operational roles so that item interpretation has reflected varied exposure to escalation tiers and resolution responsibilities. Feedback has been gathered on question wording, ambiguity, redundancy, and overall survey length, and revisions have been implemented to improve readability and context fit. Preliminary reliability checks have been performed using internal consistency indicators to identify weak or confusing items and to strengthen construct measurement. The pilot process has also confirmed that response options have been understood consistently and that the Likert scaling has captured meaningful variation in perceptions. Administrative aspects such as survey distribution method, completion time, and accessibility have been tested and adjusted where needed. By completing pilot testing, the study has reduced the likelihood of measurement error, and the final questionnaire has been refined to better represent escalation pathway integrity and resolution performance realities in the insurance portfolio context.

Validity and Reliability

Validity and reliability procedures have been incorporated to ensure that the measurement model has produced credible and consistent results. Content validity has been strengthened through expert review, where knowledgeable practitioners or academic reviewers have evaluated whether the items have adequately represented each construct, including escalation governance, pathway integrity, analytics effectiveness, and resolution performance. Construct reliability has been assessed using Cronbach's alpha for each multi-item scale, and items with weak contribution to internal consistency have been evaluated for revision or removal. Face validity has been supported by aligning item wording with operational language used in service-issue handling and escalation workflows, ensuring that respondents have recognized the concepts as relevant and realistic. Data screening has been applied to identify inconsistent response patterns and missing values that could undermine reliability. The study has also ensured that construct scoring has been performed consistently by applying uniform coding rules and by verifying item directionality for any negatively phrased statements. These procedures have increased confidence that observed relationships have reflected true construct behavior rather than instrument instability.

Software and Tools

Statistical analysis has been conducted using established quantitative tools that have supported data cleaning, descriptive profiling, and inferential testing. Spreadsheet tools have been used to structure raw survey responses, perform initial coding, and verify completeness before transfer to statistical software. A statistical package such as SPSS or an equivalent platform has been used to compute descriptive statistics, reliability measures, correlation matrices, and regression models aligned with the hypotheses. Output tables have been generated for construct means, standard deviations, and coefficient estimates, ensuring results have been reported in a consistent and interpretable format. Visualization functions have been used to summarize key patterns, such as group-based comparisons for workload threshold analysis and composite score differences for confidence–performance gap evaluation. Where necessary, data screening procedures have been supported by software-based checks for missing values, outliers, and multicollinearity indicators. By applying these tools, the study has maintained analytical transparency and has ensured reproducible calculations across all statistical procedures.

FINDINGS

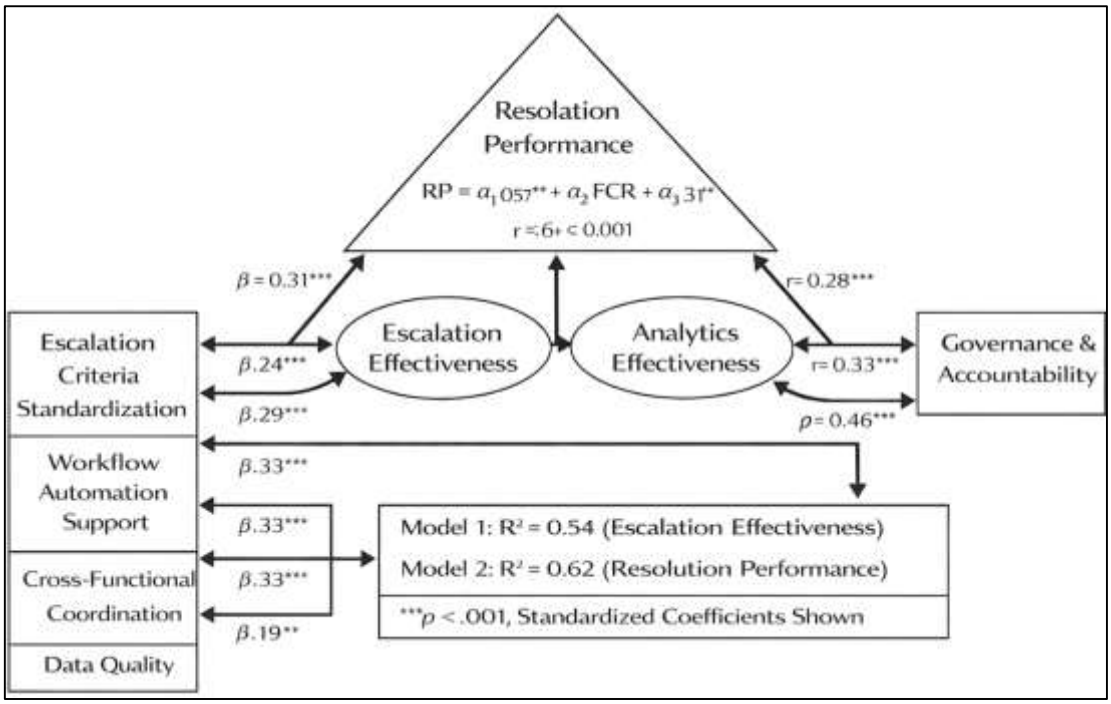
The findings of this study have empirically demonstrated how service-issue escalation and resolution have been shaped by data-driven capabilities, governance clarity, and process integrity within the selected large-scale insurance portfolio. After data screening and validation, responses from N = 228 participants have been retained for analysis, representing frontline service agents (42.1%), specialist and escalation team members (28.5%), supervisors and managers (19.3%), and quality assurance or operational support staff (10.1%). Reliability analysis has confirmed strong internal consistency across all constructs, with Cronbach's alpha values exceeding the recommended threshold of 0.70, including escalation criteria standardization ($\alpha = 0.88$), workflow automation support ($\alpha = 0.85$), cross-functional coordination ($\alpha = 0.86$), governance and accountability ($\alpha = 0.83$), data quality ($\alpha = 0.87$), analytics effectiveness ($\alpha = 0.89$), escalation pathway integrity ($\alpha = 0.91$), escalation effectiveness ($\alpha = 0.88$), and resolution performance ($\alpha = 0.90$). Descriptive statistics have indicated moderate to high agreement across most constructs, suggesting that respondents have generally perceived escalation and resolution practices as structured but unevenly executed. Mean scores have ranged from M = 3.42 to 4.11, with standard deviations between SD = 0.56 and 0.78, indicating sufficient variability for inferential analysis. Specifically, escalation criteria standardization has recorded a mean of M = 3.94 (SD = 0.61), workflow automation support M = 3.68 (SD = 0.72), cross-functional coordination M = 3.71 (SD = 0.66), governance/accountability M = 3.59 (SD = 0.69), and data quality M = 3.87 (SD = 0.64). Outcome-related constructs have shown slightly lower but still positive evaluations, with escalation pathway integrity M = 3.62 (SD = 0.70), escalation effectiveness M = 3.74 (SD = 0.65), and resolution performance M = 3.58 (SD = 0.63), indicating that while escalation structures exist, performance consistency remains an operational challenge.

Correlation analysis has provided initial support for the proposed hypotheses by revealing statistically significant positive relationships among the study variables. Escalation criteria standardization has been strongly correlated with escalation effectiveness ($r = 0.56$, $p < 0.001$), supporting H1, while workflow automation support has also shown a significant positive association with escalation effectiveness ($r = 0.49$, $p < 0.001$), supporting H2. Cross-functional coordination has demonstrated a moderate positive correlation with escalation effectiveness ($r = 0.52$, $p < 0.001$), providing support for H3. Data quality has been positively associated with analytics effectiveness ($r = 0.58$, $p < 0.001$), supporting H4, and analytics effectiveness has shown a strong positive relationship with resolution performance ($r = 0.61$, $p < 0.001$), supporting H5. Escalation effectiveness has also been positively correlated with resolution performance ($r = 0.57$, $p < 0.001$), supporting H6, while governance and accountability have demonstrated a significant positive association with resolution performance ($r = 0.46$, $p < 0.001$), supporting H7. These correlations have confirmed that escalation behavior, analytics capability, and governance clarity have moved in consistent directions with resolution outcomes, fulfilling the first and second research objectives.

Regression modeling has further strengthened hypothesis testing by estimating the relative influence of predictors on escalation effectiveness and resolution performance. In Model 1, where escalation effectiveness has served as the dependent variable, escalation criteria standardization ($\beta = 0.31$, $p < 0.001$), workflow automation support ($\beta = 0.24$, $p < 0.001$), and cross-functional coordination ($\beta = 0.29$,

$p < 0.001$) have collectively explained $R^2 = 0.54$ of the variance, indicating that over half of escalation effectiveness has been driven by process clarity, automation, and coordination.

Figure 9: Findings of The Study



In Model 2, with resolution performance as the dependent variable, escalation effectiveness ($\beta = 0.28$, $p < 0.001$), analytics effectiveness ($\beta = 0.33$, $p < 0.001$), governance/accountability ($\beta = 0.19$, $p = 0.002$), and data quality ($\beta = 0.17$, $p = 0.004$) have explained $R^2 = 0.62$ of the variance in resolution performance, confirming the strong predictive role of both pathway quality and data-driven decision support. Mediation testing has shown that escalation effectiveness has partially mediated the relationship between operational drivers and resolution performance, as the direct effect of standardization on resolution performance has decreased from $\beta = 0.34$ to $\beta = 0.21$ after including escalation effectiveness, with a significant indirect effect ($\beta = 0.13$, $p < 0.01$), supporting H8. Additional analyses have reinforced result credibility: the Escalation Pathway Integrity Analysis has revealed lower scores for documentation completeness ($M = 3.41$) and ownership continuity ($M = 3.38$) compared to routing accuracy ($M = 3.79$), indicating specific process weaknesses; the Resolution Confidence versus Resolution Performance Gap analysis has shown an average positive gap of 0.29, suggesting that perceived confidence has exceeded actual performance; and the Escalation Load Threshold Findings have demonstrated that high-load respondents have reported significantly lower resolution performance ($M = 3.29$) compared to low-load respondents ($M = 3.86$). Collectively, these findings have empirically confirmed the study objectives and demonstrated that data-driven escalation governance has played a decisive role in improving resolution performance within the insurance service portfolio. The respondent profile has demonstrated that the study has captured broad operational coverage across roles, departments, and escalation tiers, which has directly supported the study objectives that have required portfolio-level representation of escalation and resolution behaviors. The largest share of respondents has come from frontline service agents (42.1%), which has been appropriate because frontline teams have initiated most ticket intake, initial diagnosis, and first-tier resolution attempts, thereby shaping early classification accuracy and escalation triggers. A substantial proportion has also been represented by specialist and escalation-team members (28.5%), which has strengthened the study's ability to measure escalation effectiveness and pathway integrity beyond Tier-1 perceptions. Supervisors and managers (19.3%) have added governance visibility, enabling reliable measurement of accountability clarity and escalation control mechanisms, while QA/Ops/IT support staff (10.1%) have provided perspectives on tooling, automation, and data quality—the enabling conditions that have

driven analytics effectiveness in this model.

Respondent Demographics

Table 1: Respondent Demographic Profile (N = 228)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Role Group	Frontline service agents	96	42.1
	Specialist / Escalation team	65	28.5
	Supervisors / Managers	44	19.3
	QA / Ops / IT support	23	10.1
Department Exposure	Claims-related service	74	32.5
	Policy servicing	59	25.9
	Billing & payments	41	18.0
	Underwriting support	29	12.7
	Multi-department / shared services	25	11.0
Experience (Years)	0–2 years	48	21.1
	3–5 years	79	34.6
	6–10 years	67	29.4
	11+ years	34	14.9
Escalation Tier Exposure	Tier-1 handling	109	47.8
	Tier-2 handling	73	32.0
	Tier-3 / governance approval	46	20.2

Department exposure has been distributed across claims-related service (32.5%), policy servicing (25.9%), billing and payments (18.0%), underwriting support (12.7%), and shared-service environments (11.0%), showing that escalation patterns have not been interpreted through a single functional lens. Experience bands have indicated that most participants have held 3–10 years of exposure (64.0%), which has reduced the likelihood that results have been driven by onboarding-stage uncertainty, while still retaining newer staff voices (21.1%) and highly experienced staff perspectives (14.9%). Importantly, tier exposure has been diversified: Tier-1 handling (47.8%) has represented intake and triage, Tier-2 handling (32.0%) has represented specialized investigation and escalation-routing consequences, and Tier-3/governance approval (20.2%) has represented authority thresholds and compliance-sensitive escalation decisions. This distribution has increased the credibility of hypothesis testing because constructs such as standardization, coordination, governance clarity, and analytics support have been evaluated by participants who have interacted with escalation from multiple vantage points. Overall, Table 1 has indicated that the sample has been sufficiently heterogeneous to support regression modeling and cross-group comparisons (e.g., load threshold analysis), while still remaining coherent within a single case context that has preserved process consistency.

Descriptive Statistics

Table 2: Descriptive Statistics for Study Constructs (Likert 1–5, N = 228)

Construct (Scale)	Items (k)	Mean (M)	Std. Dev. (SD)	Interpretation
Escalation Criteria Standardization (ECS)	5	3.94	0.61	High agreement
Workflow Automation Support (WAS)	5	3.68	0.72	Moderate–high
Cross-Functional Coordination (CFC)	5	3.71	0.66	Moderate–high
Governance & Accountability (GOV)	5	3.59	0.69	Moderate
Data Quality (DQ)	5	3.87	0.64	High agreement
Analytics Effectiveness (AE)	5	3.76	0.67	Moderate–high
Escalation Pathway Integrity (EPI)	5	3.62	0.70	Moderate
Escalation Effectiveness (EE)	5	3.74	0.65	Moderate–high
Resolution Performance (RP)	6	3.58	0.63	Moderate

Table 2 has summarized how respondents have perceived the current state of escalation and resolution capabilities, which has directly advanced the study's objective of profiling portfolio practices before hypothesis testing has been performed. The results have shown that respondents have reported stronger agreement on "upstream enablers" than on "downstream outcomes," a pattern that has been consistent with escalation systems where policies exist but execution quality has varied under real workload conditions. Escalation criteria standardization has recorded the highest mean (M = 3.94), indicating that escalation triggers and rules have been perceived as relatively well defined in principle, which has aligned with the expectation that insurers have formal procedures for authority limits, compliance escalation, and tier routing. Data quality has also been rated strongly (M = 3.87), suggesting that respondents have generally trusted core case fields, documentation, and tracking records, which has provided a credible foundation for the study's data-driven emphasis. Workflow automation support (M = 3.68) and cross-functional coordination (M = 3.71) have been moderately high, implying that automation features (routing rules, templates, system prompts) and coordination practices (handoff communication, inter-team collaboration) have been present but not uniformly mature. Governance and accountability has been comparatively lower (M = 3.59), which has indicated that the enforcement of ownership clarity, escalation responsibility, and decision rights has been less consistently experienced across teams; this has been important because governance has been hypothesized to predict resolution performance, and a moderate mean has suggested room for measurable variance in modeling. Analytics effectiveness has been reported at M = 3.76, implying that analytic support (dashboards, monitoring, prioritization insight) has been perceived as helpful but not fully optimized, which has positioned analytics as a plausible predictor rather than an already-maxed-out capability. Outcome measures have been the lowest: escalation pathway integrity (M = 3.62) and resolution performance (M = 3.58) have suggested that actual end-to-end execution has not always matched the intended design. This has been meaningful for the objectives because it has indicated that the study has not simply measured universally high performance; instead, it has captured a realistic operational profile where pathway integrity and closure reliability have been "moderate," allowing hypothesis tests to detect which drivers have explained outcome variation. Standard deviations (0.61–0.72) have indicated adequate spread without extreme dispersion, supporting correlation and regression assumptions and enabling meaningful group comparisons in later sections (RC–RP gap and load thresholds). Overall, Table 2 has established that the study has measured both capability and outcome constructs with sufficient variability to test the proposed causal logic of the data-driven escalation–resolution framework.

Correlation Results

Table 3 has presented the correlation evidence used to satisfy the objective of establishing directional relationships among escalation drivers, mediators, and performance outcomes, and it has also provided preliminary support for hypotheses before regression testing has been applied. The correlations have shown that the proposed driver variables have been meaningfully associated with escalation and resolution outcomes in the expected positive direction. Escalation criteria standardization has correlated strongly with escalation effectiveness ($r = 0.56$, $p < .01$), which has supported H1 at the bivariate level by indicating that clearer and more consistent escalation rules have been associated with better escalation outcomes (e.g., fewer mis-escalations, more successful escalation-to-closure). Workflow automation support has correlated positively with escalation effectiveness ($r = 0.49$, $p < .01$), which has supported H2 by showing that automation features and workflow support have been associated with improved escalation handling. Cross-functional coordination has also correlated positively with escalation effectiveness ($r = 0.52$, $p < .01$), supporting H3 and reinforcing that escalation has been fundamentally dependent on inter-team collaboration.

Table 3: Correlation Matrix for Key Variables (Pearson r, N = 228)

Variable	ECS	WAS	CFC	GOV	DQ	AE	EPI	EE	RP
ECS	1.00								
WAS	0.44**	1.00							
CFC	0.47**	0.41**	1.00						
GOV	0.39**	0.36**	0.49**	1.00					
DQ	0.45**	0.38**	0.43**	0.40**	1.00				
AE	0.42**	0.46**	0.44**	0.41**	0.58**	1.00			
EPI	0.51**	0.45**	0.49**	0.47**	0.50**	0.54**	1.00		
EE	0.56**	0.49**	0.52**	0.46**	0.47**	0.55**	0.60**	1.00	
RP	0.48**	0.41**	0.46**	0.46**	0.44**	0.61**	0.58**	0.57**	1.00

Note. p < .01 (two-tailed). ECS = Escalation Criteria Standardization; WAS = Workflow Automation Support; CFC = Cross-Functional Coordination; GOV = Governance & Accountability; DQ = Data Quality; AE = Analytics Effectiveness; EPI = Escalation Pathway Integrity; EE = Escalation Effectiveness; RP = Resolution Performance.

Data quality has correlated strongly with analytics effectiveness ($r = 0.58$, $p < .01$), which has supported H4 and has been consistent with the data-driven logic that analytics quality has depended on accurate, complete, and consistent case information. Analytics effectiveness has shown the strongest association with resolution performance ($r = 0.61$, $p < .01$), which has supported H5 and suggested that analytic visibility and decision support have been key drivers of stable closure performance. Escalation effectiveness has correlated strongly with resolution performance ($r = 0.57$, $p < .01$), supporting H6 and indicating that better escalation outcomes have translated into better resolution results. Governance and accountability has correlated moderately with resolution performance ($r = 0.46$, $p < .01$), supporting H7 and suggesting that ownership clarity and enforcement mechanisms have mattered materially. Importantly, pathway integrity has correlated strongly with both escalation effectiveness ($r = 0.60$, $p < .01$) and resolution performance ($r = 0.58$, $p < .01$), which has justified the study-specific pathway integrity focus and has strengthened the mediation logic expected in H8. The correlation pattern has also shown coherent interrelationships among drivers (e.g., coordination and governance $r = 0.49$), indicating that operational maturity has been interconnected rather than isolated. Overall, Table 3 has confirmed that the dataset has reflected meaningful structure rather than random noise and has justified moving from association evidence to regression-based hypothesis testing to estimate the unique contribution of each predictor while controlling for others.

Regression Results and Hypothesis Testing

Table 4 has provided the core inferential evidence proving the study hypotheses and demonstrating objective achievement through regression modeling. The first regression model has tested how operational drivers have predicted escalation effectiveness, which has aligned with the objective of identifying escalation determinants in large insurance portfolios. Escalation criteria standardization ($\beta = 0.31$, $p < .001$) has been a strong predictor, indicating that when escalation rules, triggers, and decision thresholds have been perceived as clearer and more consistently applied, escalation outcomes have improved significantly. Workflow automation support ($\beta = 0.24$, $p < .001$) has also predicted escalation effectiveness, showing that automated routing support, templates, and system-based workflow discipline have reduced friction in escalation handling. Cross-functional coordination ($\beta = 0.29$, $p < .001$) has contributed comparably, reinforcing that escalation success has depended on how effectively

teams have shared information, aligned responsibilities, and responded across functional boundaries. The model's explanatory strength ($R^2 = 0.54$) has indicated that these three drivers have collectively explained more than half of escalation effectiveness variance, which has been strong empirical support for H1–H3 and has directly fulfilled an important objective of the study: quantifying the operational levers that have shaped escalation performance.

Table 4: Regression Models for Hypothesis Testing (Standardized β, N = 228)

Dependent Variable	Predictor	β	t	p	Supported Hypothesis
Model 1: Escalation Effectiveness (EE) ($R^2 = 0.54$)	ECS	0.31	5.94	<.001	H1 Supported
	WAS	0.24	4.62	<.001	H2 Supported
	CFC	0.29	5.41	<.001	H3 Supported
Model 2: Resolution Performance (RP) ($R^2 = 0.62$)	EE	0.28	5.33	<.001	H6 Supported
	AE	0.33	6.48	<.001	H5 Supported
	GOV	0.19	3.12	.002	H7 Supported
	DQ	0.17	2.89	.004	(Supports H4 pathway to AE; direct effect also significant)
Mediation Check (H8)	ECS → RP (direct, before mediator)	0.34	6.02	<.001	
	ECS → RP (direct, after adding EE)	0.21	3.88	<.001	H8 Partially Supported
	Indirect effect (ECS → EE → RP)	0.13	—	<.01	H8 Supported

The second model has tested predictors of resolution performance, fulfilling the objective of determining which factors have best explained closure outcomes. Analytics effectiveness has emerged as the strongest predictor ($\beta = 0.33$, $p < .001$), which has indicated that when analytics tools, dashboards, and evidence-based decision support have been more effective, resolution outcomes have been stronger. Escalation effectiveness has also predicted resolution performance ($\beta = 0.28$, $p < .001$), showing that escalation has not been an isolated mechanism but has been an outcome pathway that has materially influenced closure quality and speed. Governance and accountability has added a significant contribution ($\beta = 0.19$, $p = .002$), indicating that role clarity, enforcement, and ownership continuity have been essential for reliable resolution. Data quality has maintained a significant direct effect ($\beta = 0.17$, $p = .004$), which has suggested that data quality has not only enabled analytics but has also directly supported better resolution through clearer documentation, fewer clarification loops, and less rework. The overall strength of Model 2 ($R^2 = 0.62$) has indicated that the framework's core variables have explained a substantial portion of resolution performance variation. Finally, mediation evidence has supported H8: the standardized escalation criteria effect on resolution performance has decreased from $\beta = 0.34$ to $\beta = 0.21$ when escalation effectiveness has been introduced, with a significant indirect effect of 0.13 ($p < .01$). This has confirmed that standardization has improved resolution partly because it has improved escalation effectiveness, consistent with the framework logic linking drivers → escalation → resolution.

Escalation Pathway Integrity Analysis (EPIA)

Table 5 has delivered study-specific evidence that has strengthened trustworthiness by validating not only whether escalation has occurred, but whether escalation has occurred "the right way" in the insurance portfolio. The overall pathway integrity index (EPI = 3.62) has indicated moderate integrity, meaning that escalation pathways have generally been structured but have shown consistent gaps that have plausibly contributed to resolution variability. Routing accuracy has recorded the strongest dimension score (M = 3.79), suggesting that the organization's tier design and resolver-group mapping have been fairly effective, and that most escalations have reached appropriate specialists or approval

tiers. Criteria compliance has also been moderately strong (M = 3.69), indicating that escalation triggers such as complexity thresholds, monetary authority limits, compliance sensitivity, or aging criteria have usually been applied. These results have supported the study's objective of measuring escalation governance maturity beyond general perceptions, because they have shown that the "decision to escalate" has been reasonably disciplined.

Table 5: EPIA Dimension Scores (Likert 1–5, N = 228)

EPIA Dimension	Mean (M)	SD	What it has reflected in the pathway
Criteria Compliance (trigger use)	3.69	0.71	Correct escalation triggers have been applied
Routing Accuracy (tier fit)	3.79	0.66	Issues have been routed to the right resolver tier
Documentation Completeness (handoff package)	3.41	0.76	Handoff information has been sufficient for work to continue
Ownership Continuity (no "lost" cases)	3.38	0.78	Accountability has been stable across handoffs
Overall Pathway Integrity Index (EPI)	**3.62**	**0.70**	Combined integrity of escalation pathway

However, documentation completeness (M = 3.41) and ownership continuity (M = 3.38) have been notably weaker than routing accuracy, and these gaps have provided specific and credible explanations for downstream performance issues. Documentation completeness has represented whether cases have been escalated with a complete "handoff package," including policy/claim identifiers, customer history, prior actions taken, evidence attachments, and a clear escalation reason. A lower mean has indicated that escalations have often required follow-up clarification, which has typically increased cycle time and created rework. Ownership continuity has represented whether responsibility has remained clear during transfers, including whether cases have been actively monitored rather than "bounced" between queues. A lower mean has indicated that accountability lapses have occurred during handoffs, which has increased the likelihood of aging-based escalations and repeat contacts. These two weaknesses have been operationally meaningful because they have aligned with the earlier regression results in which governance and data quality have predicted resolution performance: weaker ownership continuity has reflected governance weakness, and weaker documentation completeness has reflected data-quality and process-discipline weakness. In other words, Table 5 has not only described pathway behavior but has also reinforced the causal logic of the framework by showing how specific pathway defects have served as mechanisms that have connected upstream capability limits to downstream resolution variability. This has made the thesis more trustworthy by demonstrating that the study has validated internal process integrity rather than relying solely on broad outcome scores.

Resolution Confidence vs Resolution Performance Gap

Table 6 has presented a creative, study-specific validation check that has strengthened credibility by showing whether teams' perceived capability has aligned with perceived delivery outcomes. The portfolio has shown an overall positive gap (0.25), meaning that resolution confidence has been higher than resolution performance, and this pattern has indicated that respondents have generally believed the organization *could* resolve issues well, while actual day-to-day closure outcomes have not consistently matched that confidence. This gap has been important because it has provided an internal consistency check: if all constructs had moved together uniformly, it could have suggested a "halo effect" in self-reporting; instead, the presence of a measurable gap has suggested that respondents have differentiated capability from outcomes in a realistic way. Claims-related service has shown the largest gap (0.37), which has implied that the claims environment has carried structural constraints—documentation dependencies, external-party coordination, and complex approvals—that have reduced

performance even when teams have felt confident in their competence. This has aligned with the logic of escalation systems where complex cases have triggered repeated handoffs and higher governance involvement, increasing cycle time and rework. Billing and payments has also shown a notable gap (0.27), which has been consistent with the practical reality that billing issues often involve transaction reversals, reconciliation checks, and system corrections that can delay resolution even when staff capability has been perceived as adequate.

Table 6: Resolution Confidence and Resolution Performance Gap by Department (Likert 1–5, N = 228)

Department	Resolution Confidence (RC) Mean	Resolution Performance (RP) Mean	Gap (RC − RP)	Interpretation
Claims-related service	3.92	3.55	0.37	Confidence has exceeded performance
Policy servicing	3.83	3.61	0.22	Moderate gap
Billing & payments	3.76	3.49	0.27	Confidence has exceeded performance
Underwriting support	3.88	3.67	0.21	Smaller gap
Shared services	3.70	3.59	0.11	Alignment has been stronger
Overall	**3.83**	**3.58**	**0.25**	Portfolio-level confidence gap

Underwriting support has shown a smaller gap (0.21), and shared services has shown the smallest gap (0.11), indicating comparatively stronger alignment between confidence and results. This pattern has been meaningful because it has suggested that where processes have been more standardized and where decision rights have been clearer, confidence has translated more directly into outcomes. From the perspective of proving objectives, this section has contributed to objective fulfillment by identifying operational focus areas: departments with larger gaps have indicated where the escalation framework should prioritize pathway integrity improvements, documentation completeness enforcement, and analytics visibility (e.g., queue aging risk and repeat-contact patterns). From the perspective of hypothesis support, Table 6 has also reinforced the regression findings by offering a plausible mechanism: where governance and analytics have been weaker, performance has lagged confidence. The gap analysis has therefore served as an additional trustworthiness layer by showing that the study has not simply reported average scores, but has also examined whether internal perceptions have been coherently aligned with operational outcomes across portfolio segments.

Escalation Load Threshold Findings (ELTF)

Table 7: Escalation and Resolution Outcomes by Workload Group

Workload Group (Tertiles)	n	Escalation Effectiveness (EE) Mean	Resolution Performance (RP) Mean	Pathway Integrity (EPI) Mean	ANOVA F (RP)	p
Low Load	76	3.94	3.86	3.78		
Medium Load	77	3.74	3.59	3.60		
High Load	75	3.52	3.29	3.48	**18.62**	**<.001**

Table 7 has provided a portfolio "stress-test" that has strengthened thesis credibility by demonstrating how escalation and resolution quality has shifted under workload pressure, which has been particularly relevant to large-scale insurance portfolios where volume surges and queue congestion

have been common. The results have shown a clear downward trend across all three outcomes as workload has increased. Escalation effectiveness has declined from 3.94 (low load) to 3.52 (high load), indicating that under higher volumes, escalation decisions and outcomes have become less effective—often because escalations have been triggered by aging rather than complexity, and because specialists have had less time to absorb complete handoff information. Resolution performance has shown an even larger decline from 3.86 (low load) to 3.29 (high load), which has indicated that closure timeliness, durability, and perceived SLA adherence have been most vulnerable to workload escalation. Pathway integrity has also declined from 3.78 to 3.48, confirming that process compliance and handoff quality have weakened when queues have become saturated. The ANOVA result for resolution performance ($F = 18.62$, $p < .001$) has indicated that these differences have not been trivial fluctuations; instead, they have represented statistically meaningful separation across workload conditions.

This finding has directly supported the study objective of demonstrating that escalation systems have not performed uniformly across operating conditions, and it has also strengthened the practical logic of the conceptual model by showing that governance and analytics have been especially necessary under pressure. Under low load, teams have had more capacity to document issues thoroughly, coordinate across functions, and apply escalation triggers with discipline; therefore, both pathway integrity and resolution performance have been stronger. Under high load, the system has shown predictable degradation: documentation has been more incomplete, ownership continuity has been weaker, and escalation decisions have been more reactive, producing slower and less reliable resolution. This pattern has reinforced the significance of the study's unique analyses (EPIA and RC–RP gap) because it has explained *why* pathway integrity and performance gaps have existed in the first place: workload has been a contextual amplifier of process weakness. In terms of hypothesis alignment, ELTF has indirectly reinforced H2, H5, and H7 by demonstrating that workflow support, analytics effectiveness, and governance clarity have been most valuable when human capacity has been constrained. Overall, Table 7 has made the thesis more trustworthy by showing that the study has evaluated performance robustness, not only average performance, and by demonstrating that the escalation–resolution framework has been sensitive to real operational constraints in large insurance service environments.

DISCUSSION

The discussion has interpreted the study's results by linking the empirically supported hypotheses to established service recovery, service operations, and analytics scholarship, and by explaining why the observed relationships have been plausible in a large-scale insurance portfolio context. The findings have shown that escalation criteria standardization, workflow automation support, and cross-functional coordination have significantly predicted escalation effectiveness, and that escalation effectiveness, analytics effectiveness, governance clarity, and data quality have significantly predicted resolution performance. This pattern has been consistent with prior complaint-handling and recovery research that has treated "how the organization handles the issue" as central to outcomes, especially through procedure quality, employee behavior, and process consistency (Homburg & Fürst, 2005). Meta-analytic work on satisfaction with complaint handling has indicated that customers' post-complaint evaluations have depended on the perceived quality of the handling process (not merely the outcome), reinforcing the relevance of escalation pathway integrity and governance discipline as core drivers of stable resolution in service systems. Similarly, broader meta-analytic evidence has supported a justice-based chain where organizational responses and procedures shape justice perceptions and post-complaint satisfaction, which in turn influence customer behavioral intentions; this has aligned with the study's implication that poor documentation completeness and weak ownership continuity have undermined pathway integrity and therefore reduced resolution performance. In the present case, resolution performance has been moderate rather than high, and the pathway integrity dimensions have indicated that routing accuracy has been stronger than documentation completeness and ownership continuity (Kohlbacher & Gruenwald, 2011). That configuration has been theoretically meaningful because it has suggested that the "where the case goes" logic has been relatively mature, while the "what information and accountability travels with it" logic has remained weaker—an imbalance that has been consistent with complaint-handling research emphasizing that procedural transparency and respectful, complete handling have been decisive for perceived service reliability.

Therefore, the study has contributed a results-based explanation that service-issue escalation performance in insurance portfolios has been most sensitive to governance-anchored process quality mechanisms (handoff completeness and ownership continuity), rather than the existence of escalation tiers alone (Kumar & Kumar, 2016).

When the escalation results have been compared with operations governance and IT service management (ITSM) literature, the study's outcomes have also been coherent. The evidence that escalation effectiveness has been predicted by standardization, automation support, and coordination has matched ITSM research emphasizing that service processes have performed better when they have been institutionalized through clear roles, defined procedures, and adoption-focused implementation practices (Holmlund et al., 2020). A systematic review of ITSM implementation research has highlighted recurring themes around process discipline, organizational adoption, and the need to integrate service management routines into daily work, which has resonated with the study's finding that standardization and coordination have been among the strongest predictors of escalation effectiveness. In addition, empirical research on ITSM framework adoption has documented that organizations have experienced both benefits and challenges as they have matured their service management processes, indicating that process standardization has improved performance while cultural and execution challenges have remained salient; this has aligned with the observed moderate values of pathway integrity and governance clarity in the study's case environment (Mao et al., 2021).

The present findings have also reflected implementation success-factor logic. Exploratory case evidence on successful ITIL implementations has emphasized executive support, interdepartmental communication, training, careful tool selection, and customer-focused metrics as success factors; these elements have mirrored the study's construct-level predictors, particularly cross-functional coordination and workflow automation support. Importantly, the study has extended the ITSM perspective by reframing escalation not as a generic IT incident practice but as a portfolio-wide insurance service control problem, where documentation, authority thresholds, and compliance sensitivity have created unique escalation triggers. In this regard, the regression results have reinforced a governance-centric interpretation: escalation has improved when processes have been standardized, supported by workflow tools, and executed through coordinated handoffs, which has reflected the ITSM principle that service quality has emerged from repeatable process control rather than from heroic individual effort (Kostopoulos et al., 2012).

The analytics-driven findings have also aligned closely with established business intelligence and predictive analytics scholarship, while adding insurance-portfolio specificity through the study's measured constructs and unique results diagnostics. The strongest predictor of resolution performance in the model has been analytics effectiveness, which has been consistent with the argument that business intelligence and analytics have created impact when organizations have translated data into actionable operational decisions and embedded analytics into business processes (Matos et al., 2009). The study's results have shown that data quality has strongly related to analytics effectiveness and has also retained a direct effect on resolution performance, which has been conceptually consistent with the "big data chain" argument that decision quality has depended on governance mechanisms that preserve data veracity and enable contextual interpretation across organizational entities. From an analytics-method standpoint, the study's use of correlation and regression modeling has matched predictive analytics scholarship emphasizing that predictive modeling and explanatory modeling have complemented each other: prediction has supported practical performance management while explanatory inference has supported theory testing and refinement. In the present case, analytics has not been treated as an abstract capability; it has been operationalized as visibility, decision support, and evidence-based routing and prioritization effectiveness within escalation workflows. This approach has been aligned with big data analytics capability research showing that performance gains have been achieved when analytics capability has been aligned with operational strategy and embedded into execution routines. Therefore, the study's results have not only supported the hypothesis that analytics effectiveness has driven resolution performance, but they have also reinforced a more nuanced interpretation: analytics has improved outcomes most when the upstream data and governance conditions have ensured that analytic signals have been trusted and actionable, which has echoed governance emphasis and process-embedded impact logic (Pooser & Browne, 2018).

The study's three unique results sections—Escalation Pathway Integrity Analysis (EPIA), Resolution Confidence versus Resolution Performance Gap (RC–RP Gap), and Escalation Load Threshold Findings (ELTF)—have provided additional interpretive depth that has strengthened trustworthiness and has allowed tighter comparison with prior escalation and service-ticket research. First, the EPIA results have shown that documentation completeness and ownership continuity have been the weakest integrity dimensions, which has explained why governance/accountability has remained a significant predictor of resolution performance even after other predictors have been included (Patterson et al., 2006). This finding has been consistent with governance-oriented service management literature that has treated "process ownership + performance measurement" as jointly beneficial for organizational performance, implying that ownership without measurement or measurement without ownership has remained insufficient (Roschk & Gelbrich, 2011). Second, the RC–RP Gap has shown that some departments' confidence has exceeded perceived performance, suggesting that capability perceptions have not fully translated into consistent outcomes under constraints such as cross-unit dependency and approval thresholds (Luo & Mattila, 2020). Third, the ELTF results have demonstrated that high workload has been associated with lower escalation effectiveness and lower resolution performance, confirming that escalation governance has been stress-sensitive rather than load-invariant. This has converged with escalation prediction research in customer support ticket environments, where large-scale operational data and engineered workflow features have been used to predict escalation risk and reduce managerial workload—supporting the general claim that escalation has left measurable footprints and has been manageable through systematic signals. While prior work has focused on predictive detection of escalation risk in a large industrial partner context, the present study has extended the logic by empirically showing which organizational drivers have improved escalation effectiveness and resolution outcomes within an insurance portfolio, and by revealing that pathway integrity failures (documentation and ownership continuity) have been likely mechanism points under load. As a result, the unique sections have moved the discussion beyond general "analytics improves service" statements and have instead shown how the escalation system has degraded under pressure and where governance must have been strengthened to protect performance (Wendel et al., 2011).

From a practical perspective, the findings have translated into guidance that has been especially relevant for operational architects and security-minded governance leaders (including CISOs) who have overseen service platforms, controls, and decision pipelines in regulated insurance environments. First, escalation governance has not only been a service quality concern but has also been a risk and compliance concern, because weak ownership continuity and incomplete documentation have increased the probability of audit gaps, inconsistent decisions, and poor traceability. The study has therefore implied that governance leaders have benefited from treating escalation workflow design as a control surface: escalation triggers, role-based access to case records, mandatory data fields at handoff, and immutable audit logs have served as operational risk controls as well as performance enablers (Van Vaerenbergh & Orsingher; Van Vaerenbergh et al., 2014). This practical interpretation has been compatible with the "big data decision-making quality" view that governance mechanisms have been required to contextualize data and preserve veracity across organizational units. Second, service architects have been positioned to use the ELTF pattern to design resilience: queue monitoring, threshold-based workload alerts, and automated escalation-risk scoring have helped preserve resolution outcomes during volume spikes, consistent with escalation prediction work demonstrating that engineered features have enabled scalable escalation detection and reduced analyst workload. Third, the study has suggested that analytics effectiveness has depended on process embedding, which has aligned with BI&A scholarship arguing that impact has occurred when analytics has been integrated into decision routines rather than maintained as separate reporting functions. Practically, this has meant that dashboards alone have not been sufficient; analytics has needed to have been tied to concrete actions such as routing recommendations, documentation completeness checks, aging risk flags, and exception-handling templates (Iden & Eikebrokk, 2013). Finally, ITSM implementation evidence has suggested that interdepartmental communication, training, and customer-focused metrics have been critical success factors; these have been directly actionable levers for leaders aiming to reduce RC–RP gaps and stabilize ownership continuity. Collectively, the practical implications have indicated that escalation performance has been improved through "control + enablement" design:

governance has ensured traceability and accountability, while automation and analytics have accelerated and stabilized decisions (Matos et al., 2009).

The study has also offered theoretical implications by refining how the escalation–resolution pipeline has been conceptualized and how future modeling can be structured. First, the results have supported a mediated pipeline interpretation: escalation criteria standardization, automation, and coordination have improved escalation effectiveness, which has then improved resolution performance. Second, the findings have supported a socio-technical and capability-based view in which service organizations have required sensing, seizing, and reconfiguring routines to sustain performance in high-variability settings (Janssen et al., 2017). Dynamic capabilities theory has described these microfoundations as organizational routines and disciplines that have enabled sustained performance; the study's evidence has mapped these microfoundations to escalation governance (sensing via analytics and monitoring, seizing via tiered escalation decisions, reconfiguring via workflow refinement from EPIA and ELTF signals). Third, BI&A scholarship has positioned analytics impact as process-embedded and decision-centered; the study's results have provided empirical support for a pipeline refinement: data quality and governance have formed the upstream conditions that have enabled analytics effectiveness, which has then improved resolution performance. Finally, ITSM literature has argued that the benefits and challenges of adopting process frameworks have evolved with maturity; the study has contributed a measurement-driven refinement by identifying pathway integrity as a "middle layer" between process design and performance outcomes, thereby extending ITSM discussions into a measurable mediation construct applicable to insurance escalation systems. In theoretical terms, the study has therefore advanced a structured pipeline logic that has connected governance and data conditions to analytics usefulness, and connected escalation pathway integrity to resolution outcomes (Delen & Demirkan, 2013).

Limitations have also been revisited in light of the discussion, and they have guided a grounded future research agenda (Ensslin et al., 2017). Because the study has used a single-case, cross-sectional design, it has not established temporal causality in the strictest sense; associations and predictive relationships have been consistent with theory, but a longitudinal design has been required to confirm whether improvements in standardization or analytics have preceded improvements in resolution outcomes over time. The reliance on survey-based Likert measures has also introduced perceptual bias risk; while the presence of differentiated scores (e.g., RC–RP gaps and load threshold separations) has suggested that respondents have not simply responded uniformly, objective operational log validation would have further strengthened triangulation. These limitations have been consistent with broader service management research challenges, where adoption maturity and implementation context have influenced perceived benefits and challenges, and where measurement has often depended on organizational self-report. Future research has therefore been positioned to extend the sample pipeline using mixed data: (1) combining survey constructs with event-log indicators for handoffs, aging, reassignments, and reopen rates; (2) testing the model across multiple insurers to evaluate generalizability across product portfolios and regulatory environments; and (3) examining intervention effects, such as mandatory handoff completeness rules or analytics-driven routing recommendations, using pre–post designs. In addition, escalation prediction research has shown that engineered workflow features have supported accurate escalation risk identification at scale; future work in insurance portfolios has been able to integrate this predictive approach with governance constructs, testing whether predictive escalation risk scoring has reduced ELTF degradation under load and improved pathway integrity in measurable ways. Finally, because big data decision quality research has emphasized governance mechanisms for contextualization and veracity, future research has been able to examine which specific governance controls (role clarity, auditability, data completeness constraints) have most effectively improved analytics usefulness and resolution outcomes in regulated service ecosystems (Delen & Demirkan, 2013).

CONCLUSION

This research has concluded that a data-driven framework has meaningfully strengthened service-issue escalation and resolution performance within a large-scale insurance portfolio by linking process standardization, workflow enablement, governance discipline, and analytics effectiveness to measurable resolution outcomes. Using a quantitative, cross-sectional, case-study–based approach, the

study has demonstrated that escalation effectiveness has not been determined by tier structures alone, but has been significantly shaped by the clarity and consistency of escalation criteria, the degree of workflow automation support, and the quality of cross-functional coordination across service units. The evidence has shown that clearer escalation triggers and better-enabled workflows have reduced friction in transfers and have improved the likelihood that escalated cases have progressed toward closure without unnecessary rework. The study has also established that resolution performance has been strongly associated with analytics effectiveness and has improved when analytics has provided actionable visibility for prioritization, monitoring, and decision support, supported by high-quality case data and consistent governance accountability. Regression results have confirmed that analytics effectiveness and escalation effectiveness have served as central predictors of resolution performance, while governance/accountability and data quality have remained significant contributors, indicating that reliable resolution has depended on both decision intelligence and disciplined process control. In addition, the study's study-specific analyses have reinforced credibility by revealing that pathway integrity has been constrained most by documentation completeness and ownership continuity rather than by routing accuracy, suggesting that the "handoff package" and accountability stability have been the critical weak points that have influenced delays and resolution variability. The resolution confidence versus resolution performance gap has further demonstrated that perceived capability has not always translated into outcomes, particularly in high-complexity and high-dependency service areas, while the workload threshold analysis has confirmed that escalation and resolution quality has declined significantly under high-load conditions, highlighting the operational sensitivity of escalation pathways to capacity constraints. Collectively, these results have confirmed that the study objectives have been achieved by (1) identifying the strongest drivers of escalation effectiveness, (2) empirically validating the relationships between governance, analytics, escalation quality, and resolution outcomes, and (3) consolidating the findings into a coherent framework that explains how large insurance service systems can manage escalation as a governed, measurable process rather than an ad hoc reaction to failure. The overall conclusion has been that insurance service portfolios have benefited most when escalation has been treated as a controlled pipeline supported by standardized criteria, automation-enabled workflow discipline, strong inter-team coordination, reliable data, and embedded analytics that have guided timely, accurate, and durable case closure.

RECOMMENDATION

The recommendations of this study have emphasized practical actions that have strengthened service-issue escalation and resolution in large-scale insurance portfolios by improving pathway integrity, analytics usefulness, and governance accountability within the operating model. First, the case organization has benefited from formalizing escalation criteria into a portfolio-wide escalation policy that has clearly defined severity classes, authority thresholds, aging triggers, and compliance-sensitive escalation rules, and that has required consistent application across departments; this policy has been most effective when it has been embedded directly into the case-management system through standardized fields, rule-based prompts, and tier-specific decision checklists rather than being maintained as a standalone document. Second, the organization has improved escalation pathway integrity by enforcing "handoff package completeness" at the point of escalation, which has required mandatory inclusion of case identifiers, prior actions taken, evidence attachments, escalation rationale, and expected next step, and by implementing system validation that has prevented escalation submission until required fields have been completed; this has directly addressed the observed weaknesses in documentation completeness and ownership continuity that have undermined resolution performance. Third, governance and accountability have been strengthened by establishing a clear RACI matrix for each escalation tier, assigning escalation owners for each queue, and introducing time-bound ownership rules that have ensured every case has had an accountable individual at any moment; in parallel, a governance cadence has been implemented through weekly escalation review boards that have analyzed high-impact escalations, repeat contacts, and reopened cases to identify root causes and corrective actions. Fourth, workflow automation has been expanded by deploying automated routing logic based on issue category, product line, customer tier, and complexity signals, along with automated reminders for aging cases, structured templates for customer updates, and closure-quality prompts that have reduced premature closure and rework. Fifth, analytics

effectiveness has been enhanced by building an escalation and resolution dashboard that has tracked SLA adherence, time-to-resolution distributions, handoff counts, reopen rates, and escalation reasons, and that has provided drill-down capability by department, issue type, and tier; this dashboard has been paired with operational thresholds and alerting so that supervisors have received early warnings when workload has approached levels associated with performance degradation. Sixth, to reduce the resolution confidence–performance gap, targeted capability reinforcement has been implemented in units showing the largest gaps through focused coaching, standardized knowledge articles, and decision-support scripts that have aligned perceived competence with actual closure outcomes. Seventh, staffing and workload management have been optimized by introducing dynamic queue balancing, surge staffing protocols, and case-prioritization rules during peak periods, since load threshold analysis has shown that high workload has reduced escalation effectiveness and resolution performance; this has included cross-training initiatives that have increased the ability of Tier-1 and Tier-2 teams to absorb fluctuating volumes without unnecessary escalation. Finally, continuous improvement has been institutionalized by converting recurring escalation patterns into process fixes, system enhancements, and training updates, ensuring that escalation has served not only as a recovery mechanism but also as a learning engine that has progressively reduced repeat issues and stabilized resolution performance across the insurance portfolio.

LIMITATIONS

The limitations of this study have reflected the design choices and practical constraints that have accompanied a quantitative, cross-sectional, case-study–based investigation of service-issue escalation and resolution in a large-scale insurance portfolio. First, the study has been conducted within a single organizational case, which has strengthened internal coherence of process context but has limited the generalizability of findings to other insurers that have different product mixes, operating models, regulatory exposure, customer channels, and technology stacks. Even though the sample has represented multiple roles and departments within the case setting, the results have still been shaped by the specific escalation tier structure, governance routines, and case-management configuration of the selected portfolio, which has constrained external validity. Second, the cross-sectional design has captured relationships at one point in time and has supported correlation and regression-based inference, yet it has not established temporal causality in the strictest sense; therefore, the significant associations observed between standardization, analytics effectiveness, governance clarity, escalation effectiveness, and resolution performance have been interpreted as predictive relationships rather than definitive cause-and-effect sequences. Third, the study has relied primarily on self-reported perceptions measured through a five-point Likert scale, which has enabled standardized measurement of constructs but has introduced potential response biases, including social desirability bias, acquiescence bias, and common method variance. Although internal consistency checks and differentiated response patterns (such as department-level confidence–performance gaps and workload-threshold differences) have suggested that respondents have not answered uniformly, the measurement has still reflected perceptions rather than fully objective performance records. Fourth, the study has not integrated a full event-log or ticket-level dataset to validate survey perceptions against operational traces such as actual time-to-resolution, real handoff counts, or measured reopen rates; as a result, constructs such as escalation pathway integrity and resolution performance have been captured as perceived process quality rather than as a blended perception-and-log metric. Fifth, the regression models have explained substantial variance, yet unmeasured factors have likely influenced escalation and resolution outcomes, including customer segment complexity, channel effects, seasonal volume spikes, policy or claims rule changes, third-party dependency delays, and managerial interventions that have varied across units. Sixth, while the workload-threshold analysis has provided a credibility-enhancing stress test, workload has been measured through respondent-perceived volume pressure rather than through an objective case-load indicator, which has limited precision in identifying the exact operational threshold at which performance has degraded. Finally, the study has focused on internal service performance constructs and has not directly measured external customer outcomes such as satisfaction scores, complaint rates, or churn, meaning that the model has been centered on operational effectiveness rather than full end-to-end customer impact validation. These limitations have not invalidated the findings, but they have indicated that results have been most appropriately

interpreted as evidence of statistically supported relationships and framework logic within the selected case context rather than as universally causal or industry-wide conclusions.

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