

Leveraging and Enhancing Trust in Artificial Intelligence within IT Service Management (ITSM) Methodologies

Research Methodology in Computer Science (AI800)

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Date: April 2026

Abstract

The rapid integration of Artificial Intelligence (AI) into Information Technology Service Management (ITSM) methodologies has introduced both significant opportunities and critical challenges. While AI technologies demonstrably improve operational efficiency through automated incident management, predictive analytics, and intelligent service desk support, a persistent and fundamental challenge remains: the establishment and maintenance of trust in AI systems among ITSM stakeholders.

This research proposal addresses two interrelated dimensions of AI in ITSM. First, it examines the technical and operational contributions of AI across key ITSM domains, including anomaly detection, ticket classification, virtual support agents, and proactive problem management. Second, and more critically, it investigates the trust, transparency, and ethical governance challenges that impede the broader organizational adoption of AI-driven ITSM solutions.

Drawing upon an extended literature review of sixteen studies spanning 2018 to 2026 and employing a mixed-methods research approach, this proposal outlines a comprehensive framework designed to enhance both AI performance and stakeholder trust in ITSM environments. The expected outcomes include an evidence-based trust framework, actionable recommendations for ITSM practitioners, and a contribution to the academic discourse on ethical AI deployment in service management.

Keywords: Artificial Intelligence, ITSM, Trust, Explainable AI (XAI), AIOps, Algorithmic Bias, Service Automation, Ethical AI Framework

Chapter 1: Introduction and Background

1.1 Introduction

In an era where digital infrastructure underpins virtually every organizational function, Information Technology Service Management (ITSM) has emerged as a critical discipline ensuring the reliable delivery and continuous improvement of IT services. The integration of Artificial Intelligence (AI) into ITSM represents one of the most transformative developments in modern IT management, promising to automate repetitive tasks, predict service disruptions before they occur, and deliver intelligent, personalized user experiences at unprecedented scale.

However, the accelerated adoption of AI in ITSM is accompanied by a set of challenges that threaten to undermine its transformative potential. Chief among these is the issue of trust. As AI systems take on increasingly consequential roles in incident resolution, change management, and service level agreement compliance, stakeholders — from frontline IT technicians to senior service managers — must be able to understand, predict, and rely upon AI-driven decisions. The opaque nature of many advanced AI models, commonly referred to as the 'black box' problem, renders their decision-making processes difficult to interpret, thereby eroding organizational confidence and impeding adoption.

This research proposal seeks to address this challenge holistically by examining both the operational benefits of AI in ITSM and the trust frameworks required to sustain its responsible and effective deployment. By synthesizing insights from recent literature and proposing a structured mixed-methods investigation, this research aims to develop a comprehensive framework that enhances trust in AI-ITSM integration across technological, ethical, and organizational dimensions.

1.2 Background

1.2.1 The Evolution of AI in ITSM

Artificial Intelligence has evolved from a theoretical concept in the mid-twentieth century into an essential component of contemporary ITSM practice. Following several cycles of technological optimism and stagnation — the so-called 'AI winters' — the field has entered a period of sustained advancement driven by increased computational power, the proliferation of big data, and breakthroughs in machine learning, particularly deep neural networks. These developments have enabled AI systems to exceed human performance in specific, well-defined ITSM tasks, including automated ticket triage, predictive failure detection, and conversational service desk support.

The emergence of AI for IT Operations (AIOps) represents a particularly significant milestone, integrating AI and machine learning directly into IT operational workflows to enable real-time event correlation, anomaly detection, and automated remediation. Contemporary ITSM platforms increasingly embed AI capabilities as core features rather than optional add-ons, reflecting the technology's maturation and the industry's growing dependence on data-driven operational intelligence.

1.2.2 Trust and Transparency Challenges

Despite these advances, the widespread adoption of AI in ITSM is constrained by significant trust and transparency deficits. Trust in AI systems is multidimensional, encompassing reliability, safety, fairness, interpretability, and accountability. The opacity inherent in complex models, particularly those based on deep learning architectures, makes it difficult for users and administrators to understand why a particular recommendation was generated or why a specific action was taken.

This challenge is especially acute in high-stakes ITSM domains — such as incident management, service continuity, and regulatory compliance — where unintelligible AI decisions can have serious operational and legal consequences. Scholars including Reddy (2022) and Zhang and Lu (2021) have systematically documented these challenges, highlighting the urgent need for explainability frameworks and governance mechanisms that can make AI systems more transparent and accountable to their stakeholders.

Furthermore, as regulatory bodies worldwide intensify their scrutiny of AI-driven systems, the capacity to demonstrate ethical grounding and decision-making transparency is becoming not merely a competitive advantage but a legal and compliance necessity.

1.3 Problem Statement

The integration of Artificial Intelligence into ITSM methodologies represents a paradigm shift in how organizations plan, deliver, and manage IT services. AI-driven tools offer demonstrable improvements in operational efficiency, incident prediction accuracy, and user satisfaction. However, realizing the full transformative potential of these technologies is critically hindered by a persistent deficit in stakeholder trust.

The 'black box' nature of advanced AI models, as comprehensively documented by Reddy (2022) and Zhang and Lu (2021), creates fundamental accountability gaps. When AI systems make autonomous decisions in high-stakes ITSM contexts — such as prioritizing a critical incident, triggering an automated remediation procedure, or routing a service request — the inability of responsible parties to interpret or explain the reasoning behind these decisions erodes both individual confidence and organizational trust. Existing approaches, including explainable AI (XAI) frameworks, have been criticized for their limitations and inconsistencies (Ghassemi et al., 2022), leaving a significant gap in the literature regarding robust, validated solutions for the ITSM context.

Concurrently, broader ethical concerns surrounding algorithmic bias, data privacy, and lack of governance structures compound these challenges, particularly as AI systems increasingly influence consequential decisions affecting employees, customers, and organizational operations. The problem is further exacerbated by the rapid pace of AI development, which consistently outpaces the establishment of adequate ethical and regulatory frameworks.

This research addresses the critical need for a comprehensive, empirically validated framework that systematically enhances trust in AI systems within ITSM environments, while providing practical and actionable guidance for diverse stakeholder communities.

1.4 Research Objectives

This study aims to achieve the following research objectives:

1. To comprehensively analyze AI-driven tools and techniques currently deployed in ITSM environments, evaluating their demonstrated impact on service quality, operational efficiency, and user satisfaction.
2. To systematically identify and examine the key challenges and limitations — technical, ethical, legal, and organizational — that impede the effective and trustworthy integration of AI within ITSM frameworks.
3. To critically evaluate existing solutions for enhancing AI transparency and explainability in ITSM, including explainable AI (XAI) frameworks, identifying their strengths, limitations, and opportunities for improvement.
4. To investigate stakeholder perceptions of AI trustworthiness in ITSM through qualitative interviews and quantitative surveys, generating empirically grounded insights into trust determinants and barriers.
5. To develop and validate a novel, comprehensive framework for enhancing trust in AI-ITSM integration, incorporating technological, ethical, and governance dimensions, and providing actionable guidance for ITSM practitioners and policymakers.
6. To identify emerging trends and future research directions in AI-powered ITSM, informing the evolving academic and professional discourse on responsible AI deployment in service management contexts.

1.5 Research Scope

This research is scoped to address the following specific areas:

- **Analysis of AI Applications in ITSM:** The study focuses on key AI-driven domains within ITSM, including incident management, service desk automation, predictive analytics, ticket classification, and problem management, with particular attention to high-stakes operational contexts.
- **Trust and Transparency Challenges:** The research concentrates on identifying and analyzing the specific mechanisms through which trust deficits arise in AI-ITSM integration, including algorithmic opacity, bias, accountability gaps, and the limitations of current explainability approaches.
- **Evaluation of Existing Solutions:** The scope includes a systematic assessment of existing explainable AI frameworks, ethical AI guidelines, and governance mechanisms as applied to ITSM environments, evaluating their effectiveness and practical limitations.
- **Stakeholder Perspectives:** The research encompasses diverse ITSM stakeholder communities, including IT service managers, frontline technicians, end users, AI developers, and organizational policymakers.
- **Framework Development and Validation:** The development and validation of a novel trust enhancement framework constitutes a central deliverable, assessed

through expert review and stakeholder feedback across varied ITSM application contexts.

- Temporal Scope: The literature review spans 2018 to 2026, with emphasis on studies published from 2020 onwards to ensure relevance to the current state of AI technology and ITSM practice.

Chapter 2: Literature Review

This literature review synthesizes findings from sixteen studies examining AI applications and trust dynamics in ITSM contexts, spanning the period from 2018 to 2026. The review is organized around two thematic clusters: the foundational studies on AI performance and integration in ITSM (six studies from Assignment 1), the extended studies on trust and governance (six studies from Assignment 2), and four newly added studies addressing contemporary developments.

2.1 AI Performance and Integration in ITSM

Smith et al. (2025) investigate the integration of AI for IT Operations (AIOps) within ITSM frameworks, developing a prototype for predictive anomaly detection using real-time telemetry data. Their experimental results demonstrate that the system successfully predicted 85% of server failures prior to occurrence, significantly reducing system downtime. However, the implementation demands high computational resources and complex integration pathways with legacy infrastructure, limiting its immediate applicability in resource-constrained environments.

Jones and Lee (2024) evaluate the effectiveness of Natural Language Processing (NLP) in resolving Level 0 support tickets through AI-powered virtual agents. Their case study reveals that automating routine requests — such as password resets and account queries — improved service resolution speed by 60% and increased user satisfaction scores. Notably, however, the chatbot system struggled with ambiguous user queries, requiring human intervention in approximately 20% of cases, underscoring the persistent limitations of current NLP capabilities in handling linguistic complexity.

Brown et al. (2025) propose a machine learning model based on Support Vector Machines (SVM) for the automated classification and routing of incoming IT service tickets. The model achieved 92% routing accuracy, substantially reducing the manual triage burden on service desk teams. A critical limitation identified was the model's strong dependence on the quality and completeness of historical training data, raising concerns about generalizability across organizations with inconsistent data management practices.

Wang et al. (2024) examine proactive problem management through the application of predictive analytics to historical incident data. Their big data analytics approach achieved a 30% reduction in total monthly incident volume by identifying recurring root causes before they manifest as major service disruptions. The study's principal limitation is its retrospective design, which lacks a real-time implementation framework, constraining its operational applicability.

Garcia (2025) conducts a qualitative investigation into the ethical and governance challenges associated with AI-driven decision-making in IT service delivery. The study identifies 'algorithmic bias' and 'lack of transparency' as the most significant barriers to organizational trust in AI systems. Despite its valuable contributions to the governance discourse, the study remains entirely theoretical, offering no technical mitigation strategies for the biases it identifies.

Miller (2026) explores an 'Augmented Intelligence' model in which AI serves as a co-pilot for service desk technicians, providing real-time recommendations and contextual intelligence. The study demonstrates that combining human expertise with AI-generated insights achieves higher resolution accuracy than either approach in isolation. A notable limitation is the steep learning curve associated with effective utilization of AI tools, which may reduce short-term productivity gains during organizational onboarding.

2.2 Trust, Transparency, and Governance in AI-ITSM

Smith and Patel (2018) provide a foundational examination of AI's role in ITSM through a systematic review of case studies, establishing that AI substantively improves service delivery while identifying significant integration barriers. The absence of large-scale empirical validation data represents a key limitation of this early work.

Liu and Kumar (2019) conduct a systematic review of over 50 publications on machine learning applications in IT operations, revealing efficiency gains through enhanced predictive maintenance capabilities while highlighting significant data privacy concerns. The study's theoretical orientation, without real-world validation, limits the immediate applicability of its recommendations.

Ahmed and Zhang (2020) examine AI-based automation in ITSM processes through experimental designs in simulated environments. Their findings indicate reduced incident response times alongside notable transparency challenges. The study's small sample size and absence of ethical analysis constrain the generalizability of its conclusions.

Wang and Thomas (2021) investigate predictive analytics in ITSM using quantitative industry survey data, reporting improved user satisfaction scores associated with AI-driven service management. Potential response biases inherent in self-reported survey data constitute the primary methodological limitation.

Kim and Lopez (2022) focus specifically on chatbot-driven ITSM through user experience trials, finding enhanced interaction quality alongside persistent trust deficits attributable to system opacity. The tool-specific scope limits the generalizability of findings across the broader ITSM landscape.

Brown and Nair (2023) employ scenario planning and foresight methods to explore the future trajectory of AI in ITSM, predicting significant developments in AI governance and service automation. The speculative nature of the methodology, without grounding in contemporaneous data, represents its principal limitation.

2.3 Additional Recent Studies (2024-2026)

Gillespie et al. (2025) present findings from a comprehensive global KPMG study on trust, attitudes, and AI usage across multiple sectors. Employing a mixed-methods approach combining quantitative surveys with qualitative interviews, the study reveals that over half of respondents across industry sectors distrust AI in service management contexts, primarily due to transparency deficits. Encouragingly, trust levels demonstrably increase when organizations implement transparent ethical frameworks. The principal limitation is the potential for self-reporting bias in survey responses.

itsm.tools (2025) publishes an industry-based analysis titled 'The State of AI in ITSM (Mid-2025),' drawing on survey data from over 500 organizations. The report reveals a meaningful disparity in trust levels between paid AI capabilities and free tools, emphasizing the need for verifiable, auditable AI solutions in ITSM deployments. The report's primary limitation is its orientation toward tool vendors, introducing the potential for commercial bias in its findings.

Stanford HAI (2025) presents its annual AI Index Report, aggregating global data sets on AI's impact across diverse sectors including service operations. The report finds that 49% of surveyed organizations report cost savings attributable to AI in ITSM, while simultaneously identifying persistent trust gaps — particularly in supply chain integration contexts. The report's broad organizational scope provides limited depth on ITSM-specific trust dynamics.

Zhou et al. (2025), publishing in the *Journal of Computer Information Systems*, employ structural equation modeling on survey data from ITSM users to examine how trust and privacy risk influence AI-enabled service continuance. Their findings demonstrate that performance expectancy and social influence are significant positive predictors of both trust and continued AI service usage. The cross-sectional study design precludes longitudinal insights into how these relationships evolve over time.

2.4 Synthesis Matrix

The following table consolidates the key attributes of all sixteen studies reviewed:

Study Title	Authors & Year	Methodology	Key Findings	Weaknesses	Focus Area
AIOps in ITSM	Smith et al. (2025)	Experimental	85% prediction of server failures	High integration complexity	Automation
Virtual Support Agents	Jones & Lee (2024)	Case Study	60% faster resolution for Level 0 tasks	Struggle with query ambiguity	User Experience
Ticket Classification	Brown et al. (2025)	ML (SVM)	92% routing accuracy achieved	Dependent on data quality	Automation
Proactive Management	Wang et al. (2024)	Big Data Analytics	30% reduction in incident volume	Lacks real-time application	Analytics
AI Governance	Garcia (2025)	Qualitative	Identified bias and transparency risks	Purely theoretical study	Ethics & Trust
Human-AI Copilot	Miller (2026)	User Study	Higher accuracy through collaboration	Steep learning curve for staff	Collaboration
AI Evolution in ITSM	Smith & Patel (2018)	Systematic review	Improves delivery, integration barriers	Lack of empirical data	Integration
ML in IT Operations	Liu & Kumar (2019)	Publication analysis	Efficiency gains, privacy concerns	Theoretical focus	ML Applications
AI Automation	Ahmed & Zhang (2020)	Simulations	Reduced response times; transparency issues	Small sample size	Automation
Predictive Analytics	Wang & Thomas (2021)	Surveys	Improved user satisfaction	Response bias	Analytics
Chatbots in ITSM	Kim & Lopez (2022)	User trials	Enhanced interactions, trust gaps	Tool-specific	User Experience
Future of AI in ITSM	Brown & Nair (2023)	Scenario planning	AI governance trends identified	Speculative, no current data	Governance
Global AI Trust	Gillespie et al. (2025)	Surveys/interviews	Over half distrust AI in	Self-report bias	Trust

Study Title	Authors & Year	Methodology	Key Findings	Weaknesses	Focus Area
			services; ethics help		
State of AI in ITSM	itsm.tools (2025)	Industry surveys	Higher trust in paid AI tools	Vendor bias	Trust
AI Index Report	Stanford HAI (2025)	Data aggregation	49% report cost savings; trust gaps remain	Broad scope	Analytics
AI-Enabled Service Continuance	Zhou et al. (2025)	SEM on surveys	Trust and privacy risk influence continuance	No longitudinal data	Trust

2.5 Comparative Analysis and Key Themes

Analysis of the sixteen studies reveals several consistent thematic patterns and productive tensions that inform the research framework proposed in this study.

A foundational consensus across the literature is that AI technologies deliver measurable, significant improvements in ITSM efficiency. Quantitative performance metrics reported across studies — 85% predictive accuracy for server failures, 92% ticket routing precision, 60% improvement in service resolution speed, and 30% reduction in incident volume — collectively establish AI's value proposition in ITSM beyond reasonable doubt.

However, a fundamental tension exists between the push for full automation and the imperative for human oversight. Studies such as Smith et al. (2025) and Wang et al. (2024) advocate for zero-touch, self-healing ITSM environments, while Garcia (2025), Miller (2026), and Gillespie et al. (2025) argue compellingly that human oversight is indispensable for maintaining trust, managing ethical complexity, and handling decision scenarios that exceed the bounded competence of current AI systems.

A significant gap in the current literature is the insufficient attention to cost-benefit analysis of AI implementation, the heavy reliance on simulated or controlled research environments that may not reflect the 'noisy' conditions of real-world IT operations, and the limited longitudinal research tracking how trust dynamics evolve as AI systems mature within organizational contexts.

Chapter 3: Research Methodology and Expected Outcomes

3.1 Research Methodology

This research adopts a mixed-methods approach, integrating qualitative and quantitative methodologies to comprehensively investigate AI trust dynamics in ITSM. The mixed-methods design is selected for its capacity to triangulate findings across complementary epistemological traditions, thereby generating more robust, nuanced, and actionable insights than either approach could provide in isolation. The research is structured across four sequential phases:

Phase 1: Extended Literature Review

The initial phase establishes a comprehensive theoretical and empirical foundation through systematic review of sixteen academic and industry studies spanning 2018 to 2026. This review maps the current state of AI deployment in ITSM, identifies established findings regarding performance outcomes and trust challenges, and delineates critical gaps in the existing knowledge base. The synthesis matrix developed in Chapter 2 provides the organizational scaffold for this analytical work and directly informs the design of subsequent research phases.

Phase 2: Qualitative Research

The second phase employs semi-structured in-depth interviews with purposively selected ITSM professionals, AI system developers, service managers, and organizational policymakers. This qualitative strand is designed to generate rich, contextually nuanced insights into the lived experiences of AI trust dynamics in practice. Interview protocols will be developed iteratively, informed by the literature review findings, and refined through pilot testing. Thematic analysis will be applied to interview transcripts, with coding frameworks validated through researcher triangulation. An initial target sample of twenty to thirty participants across diverse organizational contexts and industry sectors is anticipated.

Phase 3: Quantitative Research

The third phase deploys a structured survey instrument to a broader population of ITSM stakeholders, enabling statistically generalizable quantification of trust perceptions, adoption barriers, and the perceived effectiveness of existing transparency mechanisms. Drawing on validated scale items from the reviewed literature — including constructs from Zhou et al. (2025) on performance expectancy and privacy risk — the survey will be distributed digitally to ITSM professionals across multiple industry sectors. Structural equation modeling (SEM) will be employed for data analysis, consistent with established methodological practice in the field. A minimum sample size of two hundred and fifty valid responses is targeted to ensure adequate statistical power.

Phase 4: Framework Development and Validation

The final phase synthesizes insights from all preceding phases to develop a novel, comprehensive trust enhancement framework for AI-ITSM integration. The framework will be structured around three interlocking dimensions: technical transparency measures (including XAI implementation guidelines), ethical governance protocols (addressing bias mitigation and accountability mechanisms), and organizational change management strategies (supporting stakeholder adoption and competency development). Framework validation will be conducted through structured expert review panels comprising ITSM practitioners, AI researchers, and ethics specialists, followed by iterative refinement based on expert feedback.

3.2 Ethical Considerations

All research activities will strictly adhere to established ethical standards for academic research. Participation in interviews and surveys will be entirely voluntary, with full informed consent obtained from all participants prior to data collection. Participant anonymity and data confidentiality will be maintained throughout the research process and in all publications. Research data will be stored securely in accordance with applicable data protection regulations. The research protocol will be submitted for institutional ethics review and approval prior to commencement of primary data collection.

3.3 Limitations

The primary anticipated limitations of this research include potential constraints on sample size and diversity, which may affect the generalizability of qualitative findings to all ITSM organizational contexts. Self-reporting biases inherent in both interview and survey data collection methods may influence the accuracy of perceived trust assessments. The cross-sectional design of the quantitative phase precludes longitudinal examination of how trust dynamics evolve as AI systems mature within organizational deployments. Finally, the rapid pace of AI development may render specific technical recommendations partially outdated as the technology landscape continues to evolve.

3.4 Expected Outcomes

This research is expected to generate the following substantive contributions:

- **A Comprehensive Analysis of Trust Challenges:** A rigorous, empirically grounded examination of the technical, ethical, and organizational factors that create trust deficits in AI-ITSM integration, providing a foundation for targeted intervention strategies.
- **Critical Evaluation of Existing Solutions:** A systematic assessment of the strengths and limitations of current explainability frameworks and governance mechanisms in addressing ITSM trust challenges, identifying critical gaps and opportunities for improvement.
- **A Novel Trust Enhancement Framework:** An innovative, validated framework providing comprehensive and actionable guidelines for achieving trustworthy AI deployment in ITSM environments, incorporating technical, ethical, and organizational dimensions.
- **Practical Recommendations for Stakeholders:** Targeted, evidence-based recommendations for ITSM managers, AI developers, organizational leaders, and policymakers seeking to enhance AI adoption and trust in service management contexts.
- **Contribution to Academic Discourse:** A significant enrichment of the academic literature on AI ethics, explainability, and governance within the specific and understudied context of ITSM, advancing theoretical understanding of human-AI trust dynamics in professional service environments.
- **Foundation for Future Research:** Identification of productive new research questions addressing the evolving challenges of AI maturation, longitudinal trust development, and cross-cultural variations in AI acceptance within ITSM contexts.

3.5 Gantt Chart

The following timeline illustrates the planned research activities and their expected durations:

Task	Feb	Mar	Apr	May	Jun	Jul
Literature Review						
Survey Design						
Survey Distribution						
Registration of Responses						
Survey Analysis						
Interview Design						
Case Study Interviews						
Case Study Analysis						
Framework Development						
Draft Final Report						
Final Report Submission						

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