

# AI-Driven IT Helpdesk & Incident Resolution Analytics

## Insights Report

**Course:** IT300 – Business Intelligence

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## 1. Introduction

The increasing complexity of IT infrastructures and rising user expectations have significantly intensified the pressure on IT helpdesk operations. Organizations are increasingly adopting Artificial Intelligence (AI) to automate ticket classification, routing, and resolution in order to improve operational efficiency and service quality.

This report presents the analytical insights derived from an end-to-end Business Intelligence (BI) solution developed to evaluate IT helpdesk performance and assess the impact of AI-driven incident resolution. Using a large multilingual support ticket dataset and a dimensional star schema, the analysis focuses on ticket volumes, resolution efficiency, SLA compliance, and comparative performance between AI-resolved and human-resolved tickets.

The objective of this report is to translate dashboard findings into actionable business insights and recommendations that support data-driven decision-making in IT service management.

## 2. Overview of the Analytical Approach

The BI solution follows the full BI lifecycle:

- Data preparation and ETL to clean and enrich ticket data
- Dimensional modeling using a star schema
- KPI and time-intelligence measure development using DAX
- Dashboard visualization for exploratory and executive analysis

Key dimensions include Date, Priority, Queue, Language, and Ticket Type, while the central fact table captures ticket-level metrics such as resolution time, SLA breach status, and AI resolution indicators.

Time-based analysis was enabled through a dedicated Date dimension marked as a Date Table, allowing Month-over-Month (MoM) and Year-over-Year (YoY) trend evaluation.

## 3. Key Findings

### 3.1 Ticket Volume Trends

The analysis shows a consistent flow of IT support tickets over time, with noticeable monthly fluctuations. Ticket volume varies significantly by ticket type and priority, indicating different levels of operational demand across the helpdesk.

Month-over-Month analysis reveals periods of increased ticket volume, suggesting seasonal effects or operational events such as system upgrades or policy changes. These variations highlight the importance of capacity planning and proactive resource allocation.

#### **Why this matters:**

Understanding ticket volume trends enables IT managers to anticipate workload peaks and prevent service degradation.

### 3.2 Resolution Time Performance

The Average Resolution Time KPI indicates that most tickets are resolved within acceptable timeframes; however, resolution speed varies considerably depending on priority and resolution method.

High-priority tickets are generally resolved faster than low-priority ones, reflecting appropriate prioritization by support teams. However, a subset of tickets still experiences prolonged resolution times, contributing to SLA breaches.

**Why this matters:**

Resolution time directly impacts user satisfaction and operational credibility of the IT department.

### 3.3 SLA Compliance Analysis

SLA Breach Rate analysis shows that:

- SLA breaches are more frequent for lower-priority and complex issue categories
- Certain support queues consistently experience higher breach rates than others

This suggests uneven workload distribution and potential process inefficiencies within specific queues.

**Why this matters:**

SLA breaches expose the organization to reputational risk and reduced trust from internal or external users.

### 3.4 AI vs Human Resolution Effectiveness

A key focus of the analysis is the comparison between AI-resolved and human-resolved tickets.

Findings indicate that:

- AI-resolved tickets generally have lower average resolution times
- AI performs best on repetitive, low-complexity issues
- Human agents remain essential for complex or high-priority incidents

The AI Resolution Rate KPI shows that AI successfully handles a significant portion of total tickets, while the Average AI Confidence Score suggests reliable automated decision-making in appropriate scenarios.

### **Why this matters:**

These results validate AI as an efficiency-enhancing tool rather than a replacement for human expertise.

## **3.5 Time Intelligence Insights (MoM & YoY)**

Time-intelligence measures reveal:

- Period-over-period changes in ticket volume
- Gradual improvement in resolution performance over time
- Stabilization or reduction of SLA breach rates in later periods

This indicates that operational performance improves as AI adoption and process optimization mature.

### **Why this matters:**

Time-based analysis supports continuous improvement and long-term performance monitoring.

## **4. Business Recommendations**

Based on the analytical findings, the following recommendations are proposed:

### **1. Expand AI Automation for Suitable Ticket Types**

Increase AI usage for repetitive and low-complexity tickets where AI consistently demonstrates fast and reliable resolution.

### **2. Preserve Human Oversight for High-Complexity Issues**

Maintain human-led resolution for high-priority and complex incidents to ensure quality and SLA compliance.

### **3. Optimize Support Queue Workload Distribution**

Redistribute tickets across queues to balance workload and reduce SLA breaches in underperforming queues.

## **4. Use SLA Breach Metrics as an Early Warning System**

Leverage SLA breach trends to proactively identify operational bottlenecks before service quality degrades.

## **5. Continuously Monitor AI Confidence Scores**

Track AI confidence levels to determine where automation can be safely expanded or where model retraining is required.

## **6. Incorporate Time-Based KPIs into Management Reviews**

Use MoM and YoY KPIs in regular performance reviews to support strategic planning.

## **7. Improve Multilingual AI Support**

Enhance AI models for underperforming languages to ensure consistent service quality across regions.

## **5. Limitations**

Despite the value of the analysis, several limitations should be acknowledged:

- AI-related fields are simulated and may not fully reflect real production AI behavior
- Ticket text content was not deeply analyzed using NLP techniques
- External factors such as staffing levels and system outages were not included

## **6. Future Improvements**

Future enhancements to this BI solution may include:

- Integration of real AI model outputs and prediction logs
- Advanced text analytics and sentiment analysis on ticket descriptions
- Predictive modeling for ticket volume forecasting
- Real-time dashboards using streaming data
- Cost analysis linking ticket resolution to operational expenses

## **7. Conclusion**

This project demonstrates how a well-designed Business Intelligence solution can provide valuable insights into IT helpdesk operations and the impact of AI-driven incident resolution. By combining dimensional modeling, DAX-based KPIs, and interactive dashboards, the analysis supports informed decision-making, improved SLA compliance, and optimized resource allocation.

The findings confirm that AI, when applied strategically, enhances operational efficiency while human expertise remains critical for complex problem resolution. The proposed recommendations offer a clear roadmap for leveraging BI and AI to continuously improve IT service management performance.