



SERVICE DESK TICKET ANALYSIS USING MACHINE LEARNING

SUBMITTED BY:
MOHAMMED MOINUDDIN.

MAY,2025

ABSTRACT

PROBLEM STATEMENT:

Service Desk Ticket Analysis Using Machine Learning is a comprehensive, multi-task project designed to improve IT service management (ITSM) operations by embedding predictive capabilities into service desk workflows. Its really helpful in saving time and manual effort. It mainly focuses on four core prediction tasks:

APPROACH:

1. High-Priority Ticket Prediction:

Predicts whether a ticket will escalate to a Priority 1 or 2 incident using **binary classification models** like **Logistic Regression**, **Random Forest**, and **XGBoost**.

2. Incident Volume Forecasting:

Uses **time-series forecasting models** like **ARIMA** to predict future incident volumes and support proactive staffing and capacity planning.

3. Automated Classification of Tickets:

Employs **multi-class classification models** like **Naive Bayes**, **Random Forest**, and **XGBoost** to automatically assign tickets to categories or departments.

4. RFC and Misconfiguration Risk Prediction:

Estimates the likelihood that a ticket will result in an RFC or misconfiguration using **classification algorithms** including **Logistic Regression** and **XGBoost**, with a focus on **risk-based prediction**.

[Dataset Link](#)

ADVANTAGES:

- **Increased Operational Efficiency:** Automates classification and prioritization. Which reduces the manual effort of analysing the priority of the tickets and classifying them.
- **Proactive Planning:** Forecasting supports better resource allocation. Future tickets will be predicted to ease the process and avoid any sudden shortage of resources.
- **Improved SLA Compliance:** Early identification of high-impact tickets reduces resolution times.
- **Scalability:** Models can easily scale with growing ticket volumes. The models are Highly scalable and are reliable , accurate and efficient .
- **Insight-Driven ITSM:** Uses data to inform decisions rather than intuition alone. As data is a the key we use the provided dataset with many various features to train , test and evaluate our models .

DISADVANTAGES:

- **Model Drift:** Periodic retraining required due to evolving ticket patterns or processes.
- **Data Quality Sensitivity:** Incomplete or noisy data impacts model performance.
- **Complexity in Deployment:** Integrating multiple models into ITSM systems can be technically challenging.
- **Interpretability:** Some models (e.g., XGBoost) may require explainability tools (e.g., SHAP) to understand predictions.
- **Class Imbalance:** Low occurrence of critical tickets or RFCs may require oversampling or advanced techniques.

SUMMARY

By combining traditional statistical models with modern machine learning techniques, this project enables a more intelligent, proactive, and scalable approach to managing IT service tickets. Each task addresses a key challenge in service desk operations, and together they form an integrated framework to support data-driven ITSM.