

# Intelligent Assistant for Solution Design Report - Technical Meeting

## Summary

The technical meeting addressed critical issues faced by customer support operations. Attendees highlighted long wait times due to inefficient ticket routing, outdated knowledge base articles with poor search functionality, manual and error-prone ticket categorization, frequent system outages without adequate monitoring tools, slow incident response processes, and the lack of structured analysis in handling customer feedback. The group proposed implementing AI-driven solutions such as an automated ticket classification system and NLP for feedback analysis to streamline operations and improve service quality.

## Key Points

- Long wait times due to inefficient ticket routing
- Outdated knowledge base articles and subpar search functionality
- Manual ticket categorization leading to misclassification
- Frequent system outages (three major in two months)
- Slow incident response processes with lack of real-time alerts
- Inadequate structured analysis of customer feedback

## Action Items

None

## Problem Statement 1

Customers are experiencing long wait times due to inefficient routing of support tickets, causing high-priority issues to get lost in the backlog. The current ticketing system needs improvement to ensure cases are routed correctly and promptly.

Our knowledge base is outdated, with many customers raising redundant tickets that could be resolved through self-service. Additionally, the search functionality is poor, making it difficult for users to find relevant articles. Ticket categorization is done manually by agents, leading to misclassification and delays in processing. There is a need for an AI-driven system to improve accuracy.

We have experienced frequent system outages (three major in two months), which are not handled proactively due to inadequate monitoring tools. The engineering team needs better real-time alerts to address critical service failures quickly. Customer feedback collection exists but lacks structured analysis, leading to lost valuable insights and no actionable data for improving services.

## Solution Design for Problem Statement 1

### Efficient Ticket Routing

To address the issue of long wait times due to inefficient routing, we propose implementing an AI-driven ticket classification system that can automatically categorize tickets based on predefined criteria. This will ensure that high-priority issues are routed promptly and efficiently. We will use TensorFlow or PyTorch for building the machine learning model that can learn from historical data to predict and route tickets accurately.

### Enhanced Knowledge Base

To improve the search functionality of the knowledge base, we suggest integrating NLP capabilities using libraries like spaCy or NLTK. These tools can help in understanding user queries better and providing relevant articles more effectively. We will also consider using PyPDF2 for reliable text extraction from PDF documents to update and analyze existing knowledge base articles.

### Automated Ticket Categorization

Currently, ticket categorization is done manually by agents, leading to misclassification and delays. To automate this process, we propose developing a machine learning model that can classify tickets accurately based on their content and context. This will help in reducing the workload for support agents and ensuring faster resolution of customer issues.

### Proactive Monitoring Tools

To address frequent system outages, we need better monitoring tools to provide real-time alerts to the engineering team. OpenCV can be used for robust image processing in visualizing the status of critical components. We will implement a system that sends real-time alerts when any critical service failure is detected, allowing immediate action to be taken.

### Structured Analysis of Customer Feedback

For structured analysis of customer feedback, we propose using TensorFlow or PyTorch to build a model that can analyze textual data and flag recurring issues. This will help in identifying common pain points and areas for improvement in our services.

## Technology Stack for Problem Statement 1

- **TensorFlow/PyTorch:** Chosen for their robust machine learning capabilities, suitable for building models that can classify tickets accurately based on content and context.
- **spaCy/NLTK:** Selected for NLP functionalities to enhance search functionality of the knowledge base by better understanding user queries.
- **PyPDF2:** Used for extracting text from PDF documents to update and analyze existing knowledge base articles.
- **OpenCV:** Chosen for its robust image manipulation capabilities suitable for visualizing the status of critical components in monitoring tools.

## Challenges for Problem Statement 1

### Data Quality

Ensuring high-quality data is crucial for training machine learning models. Poor data quality can lead to inaccurate classifications and misrouting of tickets. We need a robust data cleaning process to ensure that the input data is accurate and consistent.

### False Positives/Negatives in Ticket Classification

Implementing an AI-driven ticket classification system carries the risk of false positives or negatives, which could result in either incorrectly classifying tickets or missing critical issues. We will address this by continuously monitoring model performance and making necessary adjustments to improve accuracy.

### Convincing Stakeholders for Investment

Convincing stakeholders of the need for more investment in monitoring tools and incident response processes can be challenging. We will present a business case that highlights the potential cost savings and improved customer

satisfaction resulting from better ticket routing, knowledge base search, and proactive monitoring.

By addressing these challenges, we can effectively implement the proposed solutions to significantly improve our customer support operations.