

# Task 2: Customer Support Ticket Analysis – Future Interns

---

## Objective Summary

The purpose of this task was to analyze a dataset of customer support tickets to uncover frequent issues, evaluate efficiency in response and resolution, and suggest actionable improvements. Python was used for the analysis, leveraging libraries such as **Pandas**, **Matplotlib**, **Seaborn**, and **NLTK**.

## Data Points Analyzed

The following key data fields were used in the analysis:

- Customer Issue Descriptions
- Ticket Urgency Level
- Channel Through Which Ticket Was Submitted
- Initial Response Time
- Total Resolution Duration
- Customer Feedback Ratings

## Insights & Analysis

### 1. Text Mining of Support Descriptions

- Cleaned and tokenized the text in support tickets, removing common stopwords and punctuation.
- Identified high-frequency terms such as *login*, *reset*, *refund*, and *delay*.
- These terms pointed to common customer concerns around **authentication** and **payment issues**.

### 2. Response & Resolution Time Metrics

- Calculated resolution time using the difference between first response and total resolution time.
- Highlighted tickets exceeding **24-hour resolution windows**.
- Delays were more frequent in low-priority and email-based tickets.

### 3. Priority-Based Ticket Trends

- **Critical priority** tickets were generally resolved quickly but made up a large portion of the workload.
- **Low-priority** tickets were frequently delayed, indicating a mismatch in resource allocation.
- Suggested optimization in agent assignment based on ticket priority.

### 4. Support Channel Evaluation

- **Social media** had the quickest average response time.

- **Email** was the slowest in both response and resolution.
- Differences in response performance suggest the need for consistent service across channels.

## 5. Customer Experience Ratings

- Analyzed satisfaction ratings to measure customer sentiment.
- Lower scores correlated with tickets that had delayed responses or were marked low-priority.

## Strategic Suggestions

To enhance customer support performance, the following improvements are recommended:

- **Automate** responses for repetitive issues like login and password recovery.
- **Redistribute workload** dynamically to manage high-volume periods effectively.
- **Improve email handling** through prioritization tools or automation workflows.
- **Implement smart routing** using NLP to assign tickets based on detected keywords.

## Visual Exploration Highlights

The analysis was supported by the following visualizations:

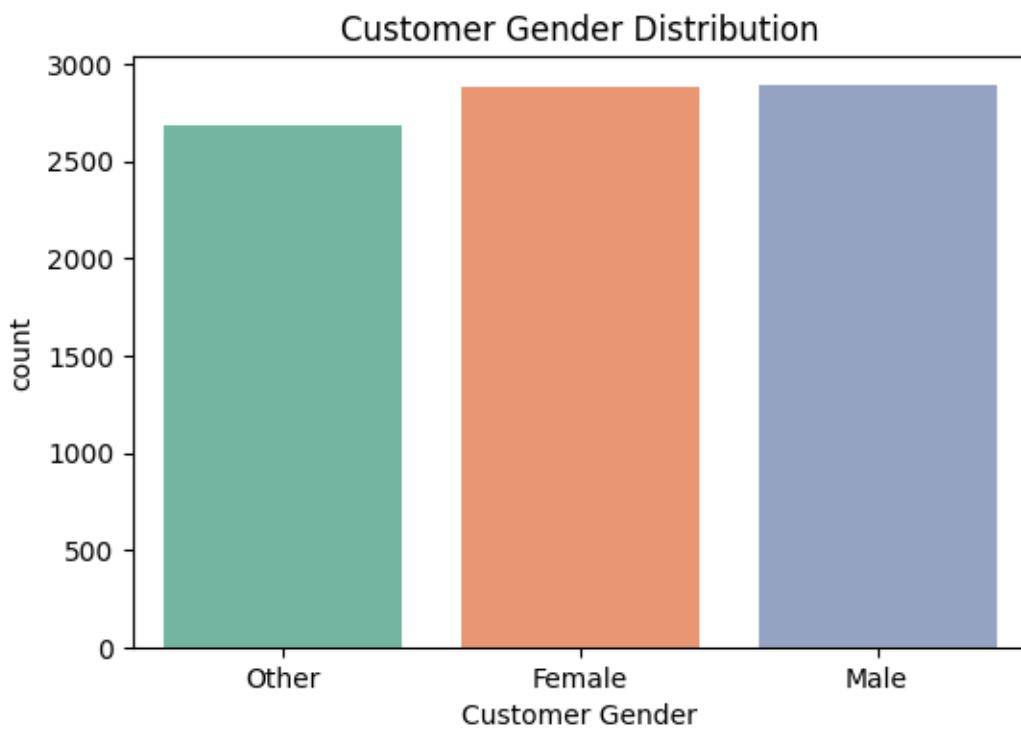
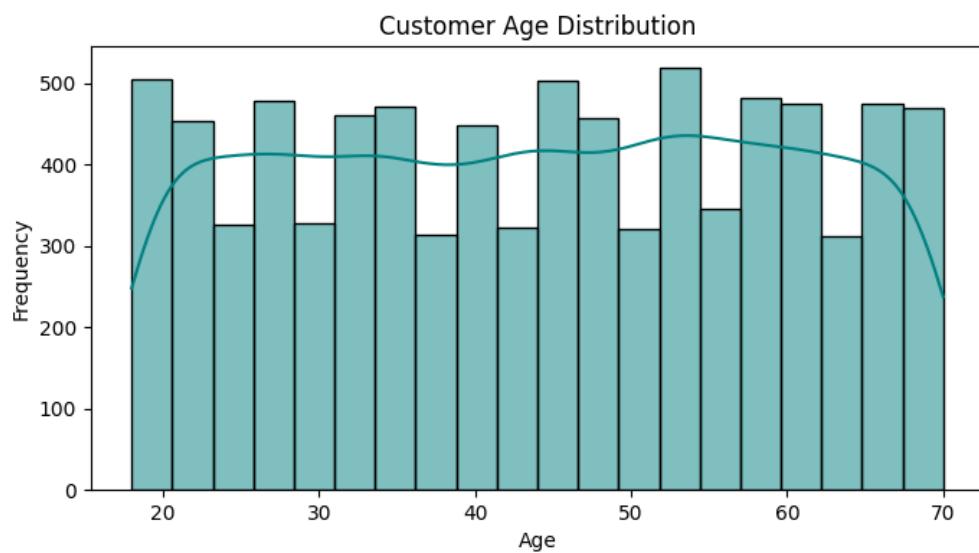
- Ticket Volume by Priority Level
- Most Frequent Keywords in Ticket Descriptions
- Average Resolution Time by Channel
- Customer Satisfaction Score Distribution
- Channel vs. Ticket Priority Heatmap

## Tools & Techniques

The analysis was supported by the following visualizations:

- Ticket Volume by Priority Level
- Most Frequent Keywords in Ticket Descriptions
- Average Resolution Time by Channel

- Customer Satisfaction Score Distribution
- Channel vs. Ticket Priority Heatmap



Time to Resolution Distribution

