



# SKY HACK

# 2024

UNITED AIRLINES

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# Team Name And Members

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# Problem Statement

United Airlines is focused on improving its call center operations to enhance customer service. However, challenges remain in optimizing key metrics such as Average Handle Time (AHT) and Average Speed to Answer (AST), leading to prolonged call durations and customer dissatisfaction.

This analysis aims to identify the drivers behind long AHT and AST, uncover inefficiencies, and propose data-driven strategies for improvement. By addressing these challenges, United Airlines seeks to enhance call resolution times and provide faster, more efficient service to its customers.



# OBJECTIVE

- **Analyze Call Center Performance:** Investigate AHT and AST to identify inefficiencies.
- **Determine Key Drivers:** Uncover factors contributing to extended call durations.
- **Enhance Customer Satisfaction:** Propose strategies to reduce escalations and improve customer experience.
- **Streamline Operations:** Provide recommendations to optimize resource allocation and resolution times.

# DATA DESCRIPTION



**calls.csv:** Call metadata (e.g., call times, agent IDs)

**customers\_data.csv:** Customer data (e.g., loyalty status).

**sentiment\_statistics.csv:** Customer and agent sentiment analysis

**call\_reason.csv:** Primary reasons for customer calls.

# Exploratory Data Analysis

## Key finding from Analysis

### Key factors impacting AHT and AST



#### Tone Influence:

Calm and polite tones reduce AHT, while angry/frustrated tones increase it, suggesting agent training can help.

#### Complex Call Types:

Complex calls like "Checkout" have higher AHT, while frequent calls like "IRROPS" are handled more efficiently.

#### Call Volume vs. Efficiency:

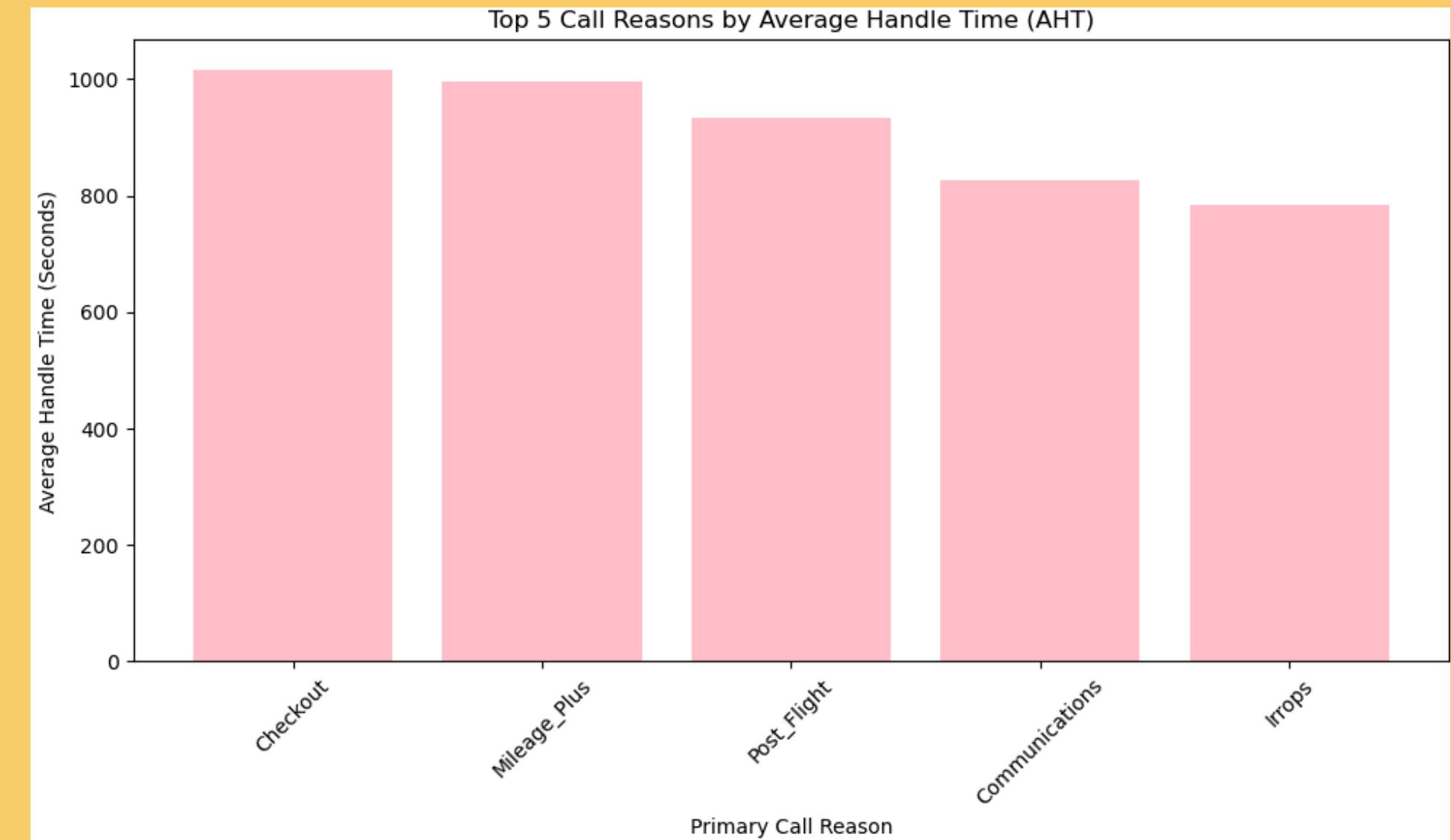
High-volume calls with lower AHT, like "Voluntary Change," could benefit from automation to ease agent workload.

# Top 5 Call Reasons by Average Handle Time (AHT)



## Key Insights:

- Checkout and Mileage Plus issues take the longest to resolve, with an average handle time of over 1000 seconds.
- Post-Flight inquiries also contribute significantly to longer calls, indicating complex post-travel concerns.
- Communications and Irrops (Irregular Operations) round out the top 5, though they have slightly shorter handle times, around 850-950 seconds.

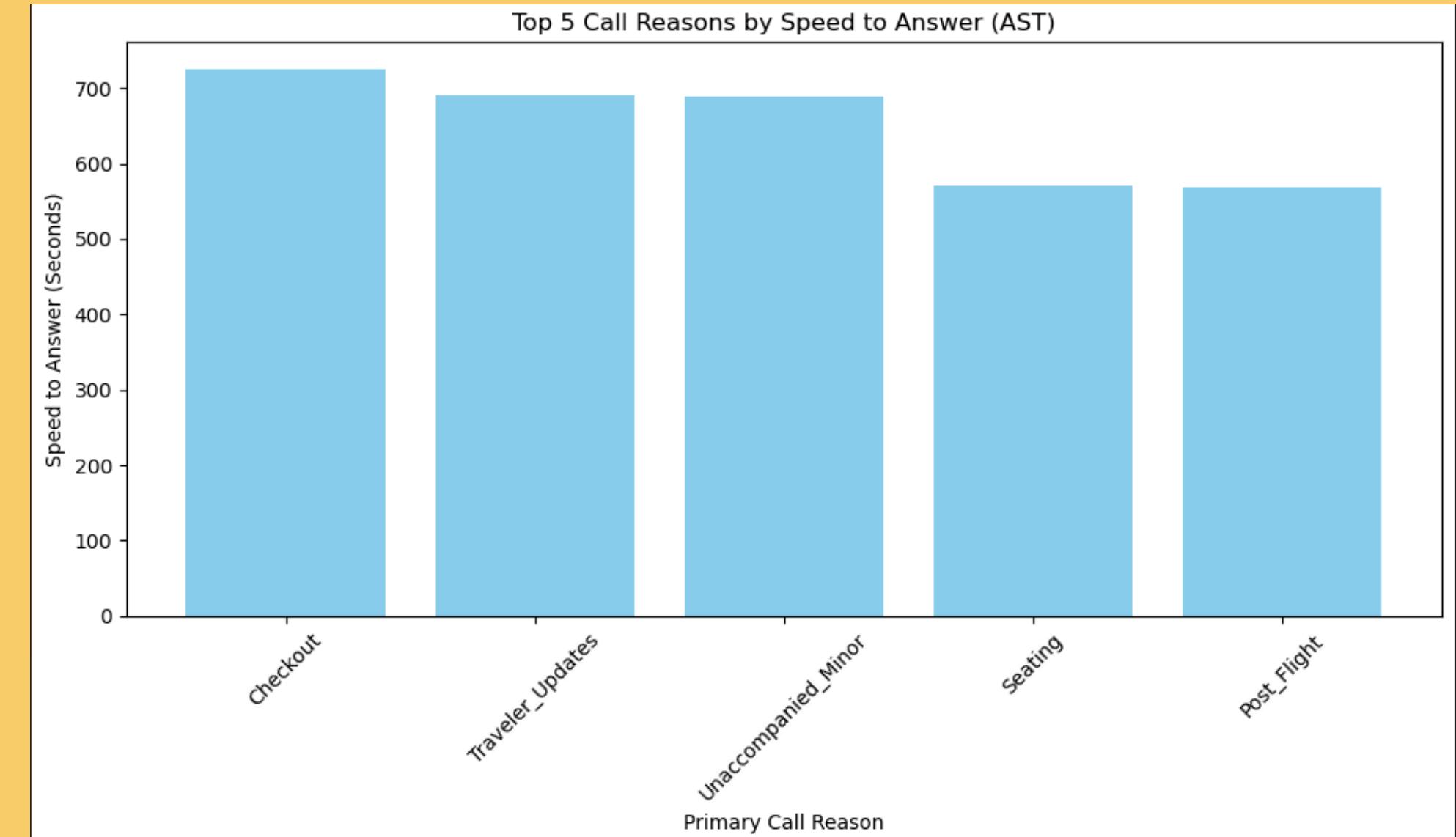


# Top 5 Call Reasons by Speed to Answer (AST)



## Key Insights:

- Checkout calls have the longest Speed to Answer (AST) at over 700 seconds, indicating a significant delay in agent response.
- Traveler Updates and Unaccompanied Minor categories also experience high AST, nearing 700 seconds, reflecting similar delays.
- Seating and Post-Flight issues follow closely, with response times still exceeding 600 seconds, indicating room for improvement in these areas.

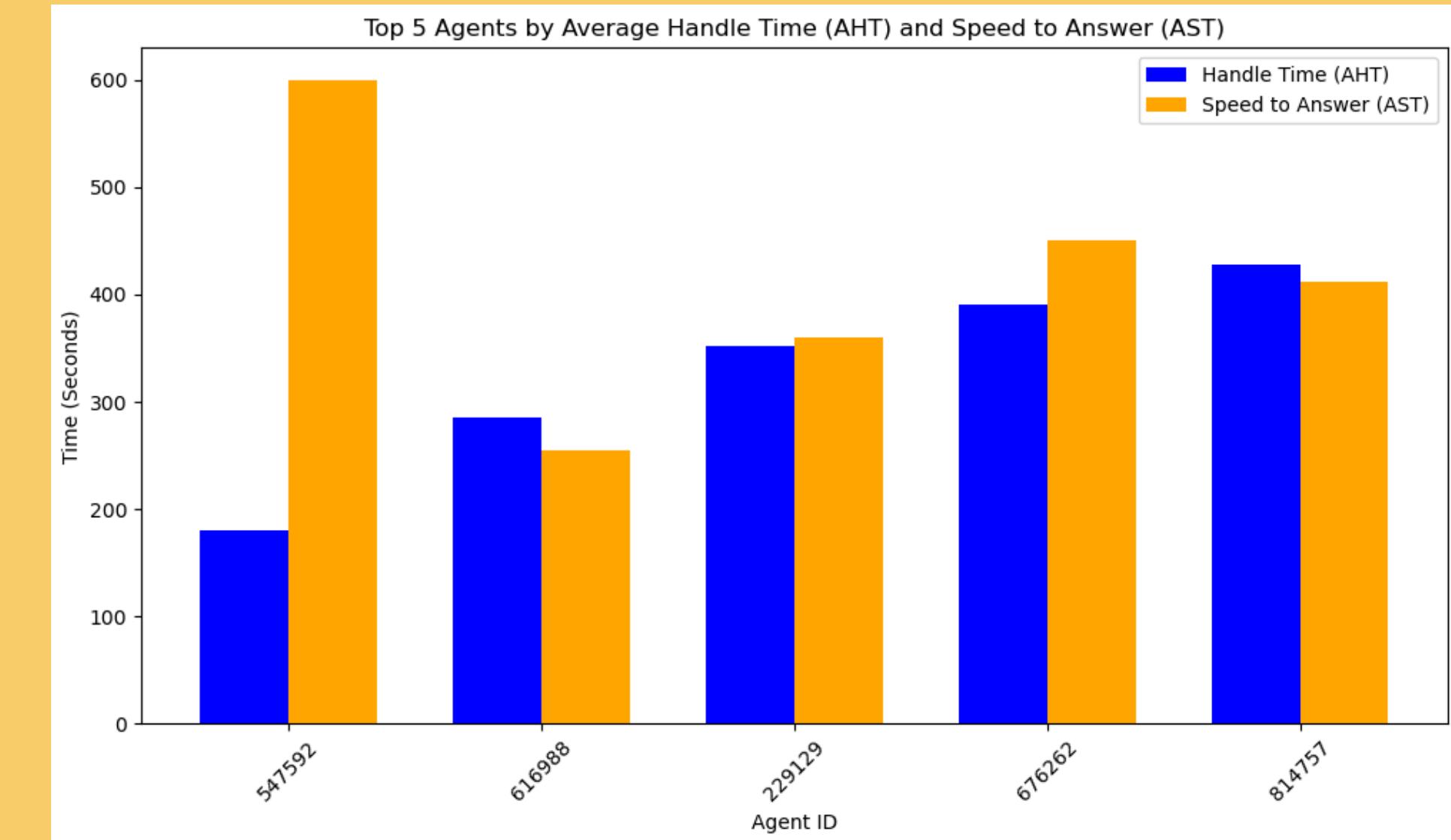


# Top 5 Agents by Average Handle Time (AHT) and Speed to Answer (AST)



## Key Insights:

- Agent 541592 has the longest AST (600+ seconds) but resolves calls quickly with a short AHT.
- Agent 676262 shows both high AHT and AST, indicating potential inefficiencies.
- Agent 616988 has balanced performance with lower AST and AHT.
- Significant variation in performance suggests opportunities for targeted training.



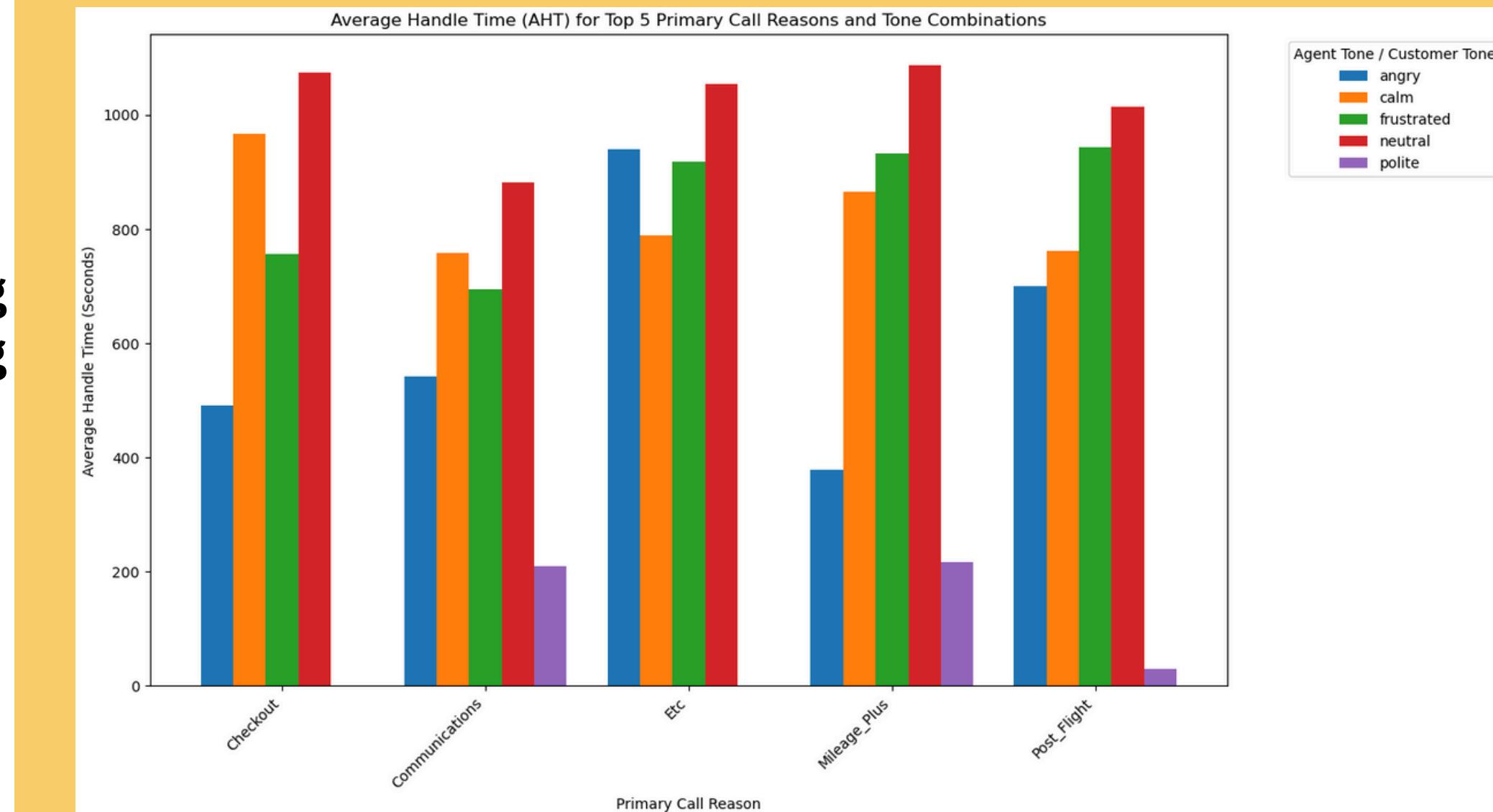
# Average Handle Time (AHT) for Top 5 Primary Call Reasons and Tone Combinations



## Key Insights:

- Checkout and Mileage Plus have the highest AHT, especially with neutral and frustrated tones.
- Communications and Post-Flight show varying AHT, with frustrated and neutral tones leading to longer durations.
- Polite and calm tones correlate with shorter AHT, while angry and frustrated tones extend call times.

Frustrated and neutral tones consistently result in longer AHT across all call reasons.

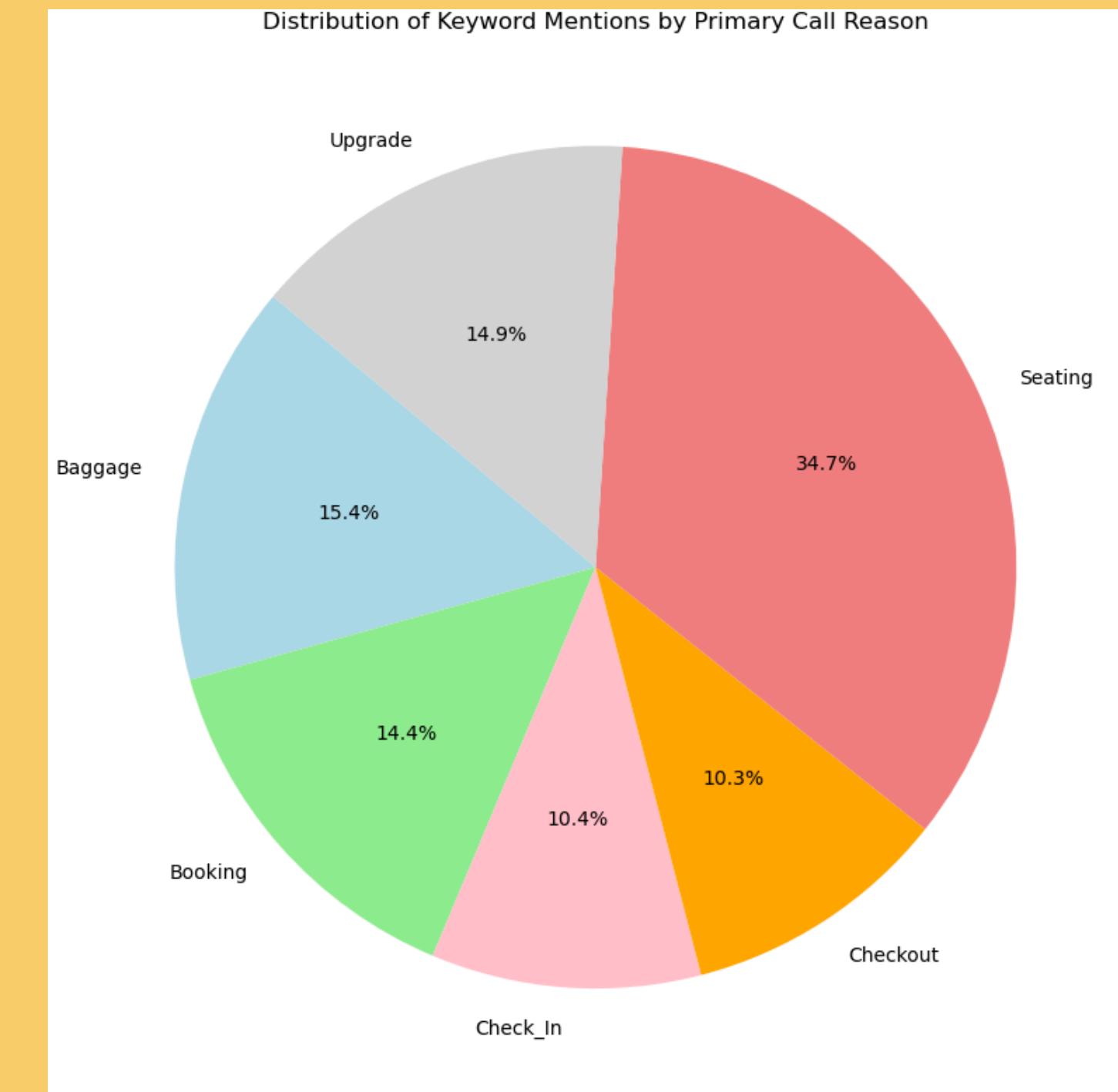


# Distribution of Keyword Mentions by Primary Call Reason



## Key Insights:

Seating has the highest keyword mentions (34.7%), reflecting frequent seat-related queries. Baggage follows at 15.4%, with Upgrade and Booking around 14-15%. Check-In and Checkout represent ~10% each, suggesting potential for self-service tools to reduce escalations.



# Current Workload vs Potential IVR Automation by Call Reason



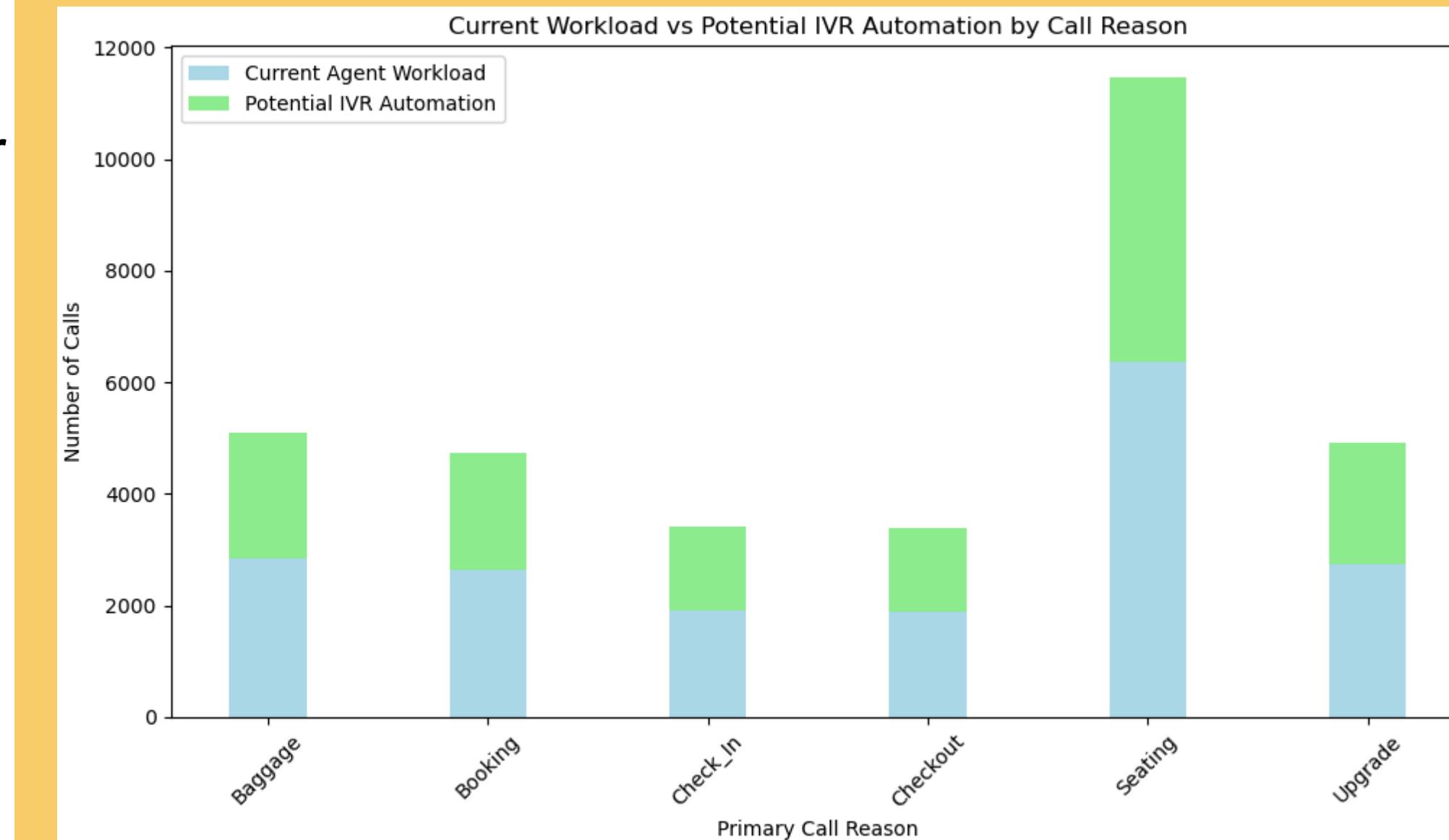
## Key Insights:

Seating calls have the highest workload, with over 10,000 calls, and 80% could be automated.

Baggage and Booking offer 50% automation potential via self-service tools.

Check-In and Checkout have smaller workloads but still provide room for automation.

Upgrade calls show moderate automation potential, with routine queries managed through IVR



# Average Handle Time (AHT) by Elite Level

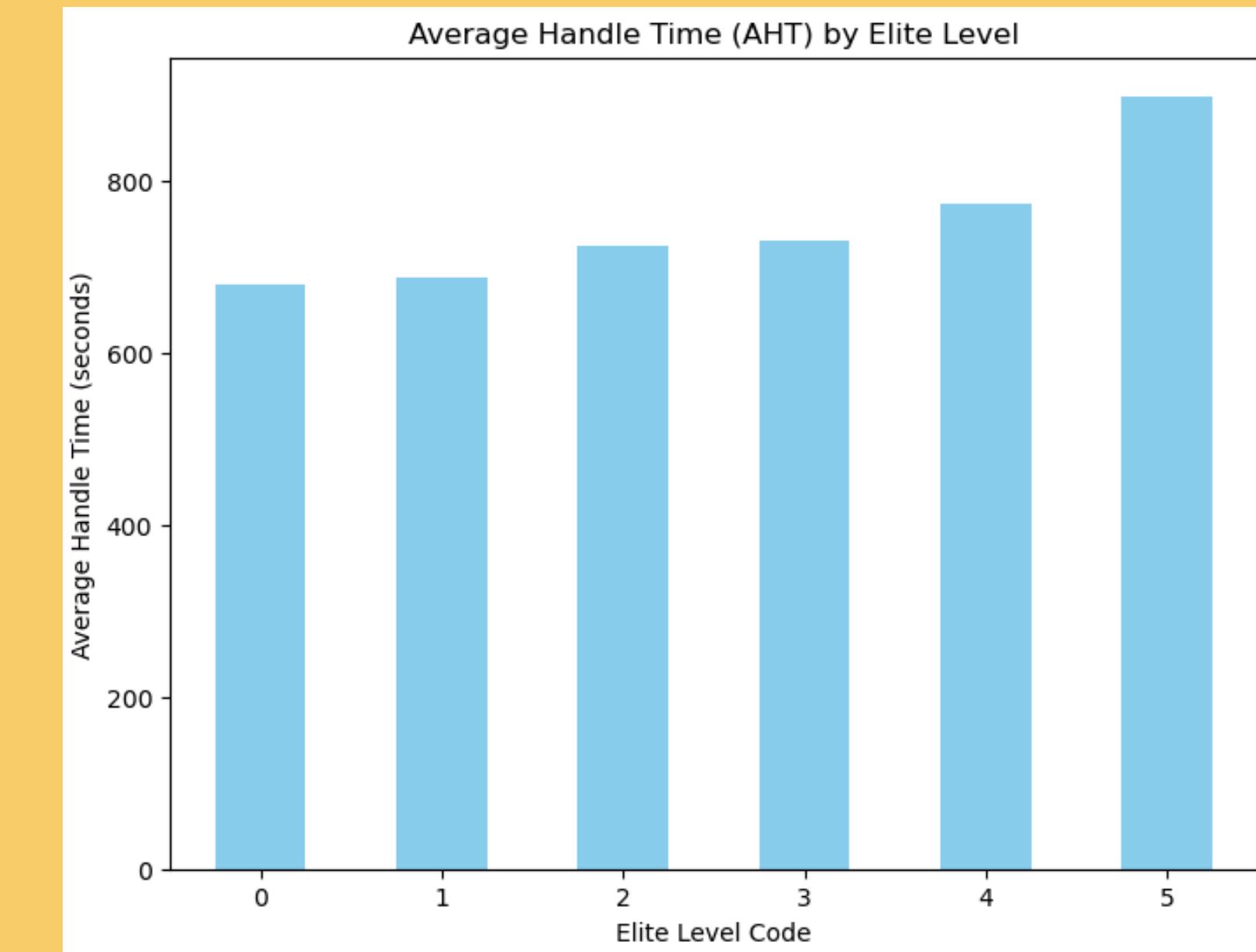


## Key Insights:

Elite Level 5 customers have the highest AHT, over 850 seconds, indicating more personalized service.

AHT increases with elite status, showing a direct correlation between loyalty level and call duration.

Non-elite and lower-level customers (Levels 0-2) have shorter handling times, around 650-700 seconds.



# Customer Tone Distribution by Elite Level

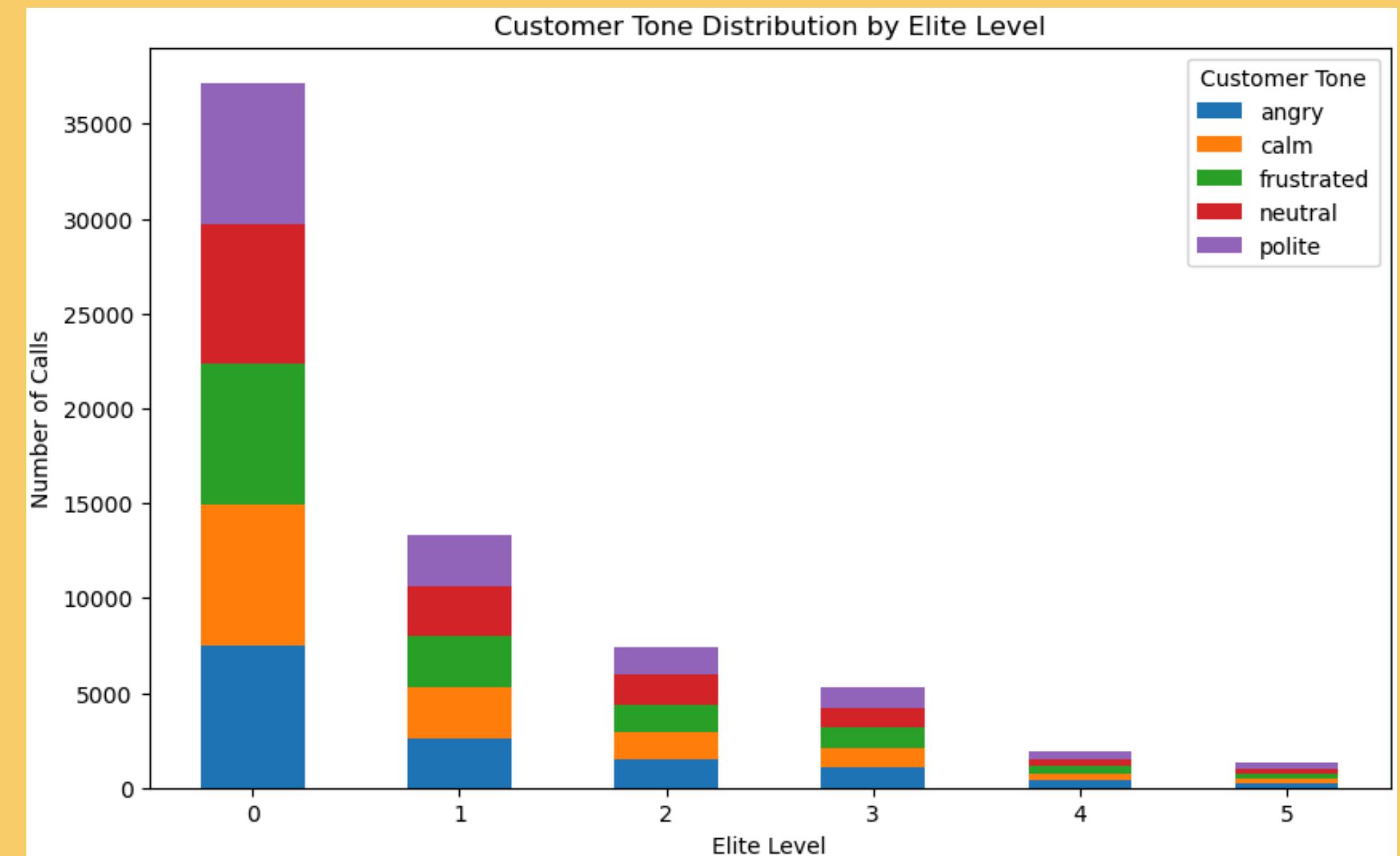


## Key Insights:

**Non-elite customers (Level 0) exhibit the most negative tones (angry, frustrated), with over 35,000 calls, indicating higher dissatisfaction in this group.**

**As elite level increases, the proportion of polite and calm tones rises, while negative tones decrease.**

**Elite Levels 4 and 5 show the smallest volume of calls but with more neutral and polite interactions, suggesting greater satisfaction among higher-tier customers.**



# Recommendations

## Improving Call Handling Efficiency

### **Focus on Reducing AHT for Checkout and Mileage Plus Calls**

**Insight 1:** These call types have the highest Average Handle Time (AHT), especially with neutral and frustrated tones.

**Recommendation:** Streamline workflows, provide targeted training, and introduce automation to reduce handling times for these call reasons.  
**Address Frustrated and Neutral Tones:**

### **Address Frustrated and Neutral Tones:**

**Insight 2:** Calls involving frustrated and neutral customers increase AHT across all call types.

**Recommendation:** Implement agent soft skills training to better handle frustrated customers and explore sentiment-based routing to prioritize calm/polite customers for faster resolutions.



# Recommendations

## Optimizing Agent Performance and Response Times



### Targeted Training for Agents with High AST and AHT:

**Insight 3:** Agents like 676262 have both high AST and AHT, indicating inefficiencies in handling calls.

**Recommendation:** Provide specialized coaching and use performance tracking tools to help these agents improve both response and resolution times.

Balanced Agent Performers as Role Models

### Balanced Agent Performers as Role Models:

**Insight 4:** Calls involving frustrated and neutral customers increase AHT across all call types. Agents like 616988 demonstrate balanced AHT and AST performance.

**Recommendation:** Use top-performing agents as benchmarks or trainers for others struggling with efficiency..

# Recommendations

## Leveraging IVR and Self-Service to Reduce Agent Workload



### Expand IVR for Common Call Reasons:

**Insight 5:** Seating, Baggage, and Booking are ideal candidates for automation due to the high volume of inquiries.

**Recommendation:** Expand self-service and IVR capabilities to reduce agent workload by up to 80%.

### Implement Sentiment-Based IVR Routing:

**Insight 6:** Calls with frustrated or angry customers take longer to handle.

**Recommendation:** Use IVR sentiment analysis to route frustrated customers to experienced agents while directing calm tones to self-service or quicker resolutions.