[Date]

EEX5362 - Performance Modelling

Deliverable 01

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1. System Details

System: Customer support call center of a Sri Lankan telecommunications company (e.g., Dialog or Mobitel).

Description:
This system handles customer service calls for telecom subscribers, including billing inquiries, technical support, and account management. The call center operates daily from 8:00 AM to 10:00 PM and is staffed by multiple customer service agents. Calls are first routed through an Interactive Voice Response (IVR) system and then managed in a queue until an agent becomes available.

Observations About System Behavior:

- Call volume varies throughout the day, creating periods with high and low demand.
- The number of available agents may not always match the incoming call volume.
- Customers sometimes have to wait in a queue, and calls may be abandoned if waiting times are too long.
- Key metrics such as waiting time, call handling time, agent utilization, and call abandonment can be measured to evaluate performance.

Problem Statement:
Preliminary observations indicate that customers calling in the morning generally experience short wait times, while evening callers often face longer waits or dropped calls. This suggests a mismatch between staffing and demand, which affects service efficiency and customer satisfaction.

2. Performance Objectives

Primary Objective:

Minimize average customer waiting time and reduce call abandonment rates by optimizing agent allocation during different periods of the day.

Focus Areas:

1. **Identify and quantify bottlenecks in the call handling process:**
   Examine which periods of the day or system components (e.g., queues, agent availability) cause delays or long waiting times, and measure how severe these bottlenecks are.
2. **Measure agent utilization to find periods of over- or under-use:**
   Analyze how busy agents are during different time slots. This helps identify times

when agents are idle (underutilized) or overwhelmed (overutilized), which affects efficiency and service quality.

3. **Explore how staffing levels affect customer waiting times and abandonment rates:**
   Investigate how the number of agents on duty impacts how long customers wait and how often they disconnect before being served. This can guide optimal staffing decisions.
4. **Propose ways to improve system efficiency while maintaining good service quality:**
   Based on the findings, suggest strategies such as adjusting staffing schedules, introducing technology support (IVR/chatbots), or prioritizing urgent calls to reduce waiting times and improve customer satisfaction.

3. Key Performance Metrics to be Evaluated

1. **Average Queue Time (minutes):**
   Measures how long a customer waits in the queue before connecting to an agent. Lower values indicate faster service.
2. **Call Abandonment Rate (%):**
   The percentage of calls where customers disconnect before reaching an agent. High rates indicate dissatisfaction or insufficient capacity.
3. **Agent Utilization Rate (%):**
   The proportion of time agents spend actively handling calls compared to idle time. Helps assess whether resources are used efficiently.
4. **Service Level (percentage of calls answered within target time):**
   Measures how effectively the call center meets its target response time (e.g., 80% of calls answered within 20 seconds). Higher percentages indicate better performance.