**EEX5362 Performance Modelling**

**Deliverable 01**

**Call Center with Limited Agents — Performance Analysis**

**Name – WHR Deshan**

**S Number – s22009892**

**Reg Number – 322513090**

**1. Identify a Complex System**

**Introduction**

A call center is a dynamic, complex system where incoming customer inquiries are handled by a limited number of agents. Managing call queues, reducing wait times, and maximizing agent utilization are critical to providing efficient service and ensuring customer satisfaction.

**High-Level Problem Statement**

The goal is to assess the performance of a call center with multiple agents. Average wait times, call abandonment rates, first call resolution rates, agent utilization, and handling times are all important metrics. The goal is to identify bottlenecks, optimize staffing, and propose process changes to increase efficiency and customer satisfaction.

**Performance Metrics**

* **Average Wait Time:** How long callers typically wait before talking to an agent.
* **Average Queue Length:** The usual number of callers waiting in line.​
* **Throughput (calls/min):** The average number of calls handled per minute.​
* **Utilization:** The percentage of time agents are busy with calls.​
* **Total Calls Arrived:** The total number of incoming calls during the period measured.

**Data Set**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Num\_Agents** | **Average\_Wait(min)** | **Average\_Queue\_Length** | **Throughput(calls/min)** | **Utilization** | **Total\_Calls** |
| 3 | 38.7 | 19.63 | 0.43 | 1 | 206 |
| 5 | 1.96 | 1.07 | 0.5 | 0.641 | 239 |
| 7 | 0.19 | 0.09 | 0.5 | 0.469 | 242 |
| 9 | 0 | 0 | 0.5 | 0.357 | 239 |
| 11 | 0 | 0 | 0.5 | 0.292 | 239 |
| 13 | 0 | 0 | 0.5 | 0.247 | 239 |
| 15 | 0 | 0 | 0.5 | 0.214 | 239 |
| 17 | 0 | 0 | 0.5 | 0.189 | 239 |
| 19 | 0 | 0 | 0.5 | 0.169 | 239 |
| 21 | 0 | 0 | 0.5 | 0.153 | 239 |
| 23 | 0 | 0 | 0.5 | 0.14 | 239 |
| 25 | 0 | 0 | 0.5 | 0.129 | 239 |

1. **Define Performance Objectives**

* **Minimizing Response Time:** Reduce the average time callers wait to speak with an agent, improving customer satisfaction.​
* **Maximizing Throughput:** Increase the number of calls handled per unit time, boosting overall efficiency.​
* **Identifying Bottlenecks:** Detect points in the process where delays or congestion occur, enabling targeted improvements.​
* **Optimizing Resource Allocation:** Ensure agents and technology are used efficiently, balancing workload and reducing idle time.​
* **Enhancing First Call Resolution:** Resolve customer issues during the first interaction to lower repeat calls and increase satisfaction.​
* **Maintaining High Customer Satisfaction:** Deliver prompt, effective, and courteous service to meet or exceed customer expectations.

Repo Link - <https://github.com/Ravi2001512/Call-Center-with-Limited-Agents-Performance-Analysis>