

# Optimizing Concert Ticket Booking Systems: A Simulation-Based Approach

By :

Al Fitra Nur Ramadhani

202210370311264

Data Modeling & Simulation B

# Optimizing Concert Ticket Booking Systems

Key Insights into Ticket Booking System

- **Problem Statement**  
High demand during peak sales leads to long waits and cancellations.
- **Simulation-Based Approach**  
Using SimPy to analyze system performance under varying conditions.
- **Number of Servers**  
Testing configurations with 2, 4, 6, and 8 servers for performance.
- **Simulation Duration**  
The simulation runs for 480 minutes (8 hours) to gather data.
- **Sales Phases**  
Includes presale, peak, and normal phases to reflect real-world scenarios.
- **Performance Metrics Overview**  
Evaluating metrics to assess system performance during sales.
- **Total Customers**  
Measures the total number of customers participating in the simulation.
- **Customers Served (%)**  
Percentage of customers successfully served during the simulation.
- **Customers Canceled (%)**  
Tracks the cancellation rate to identify service issues.
- **Average Wait Time**  
Calculates the average wait time experienced by customers.
- **Average Service Time**  
Measures the average time taken to serve each customer.
- **Average Time in System**  
Tracks the total time customers spend in the system.
- **Average Queue Length**  
Assesses the average number of customers waiting in line.
- **Server Utilization**  
Monitors how effectively servers are utilized during sales.

# Simulation Results and Analysis Overview

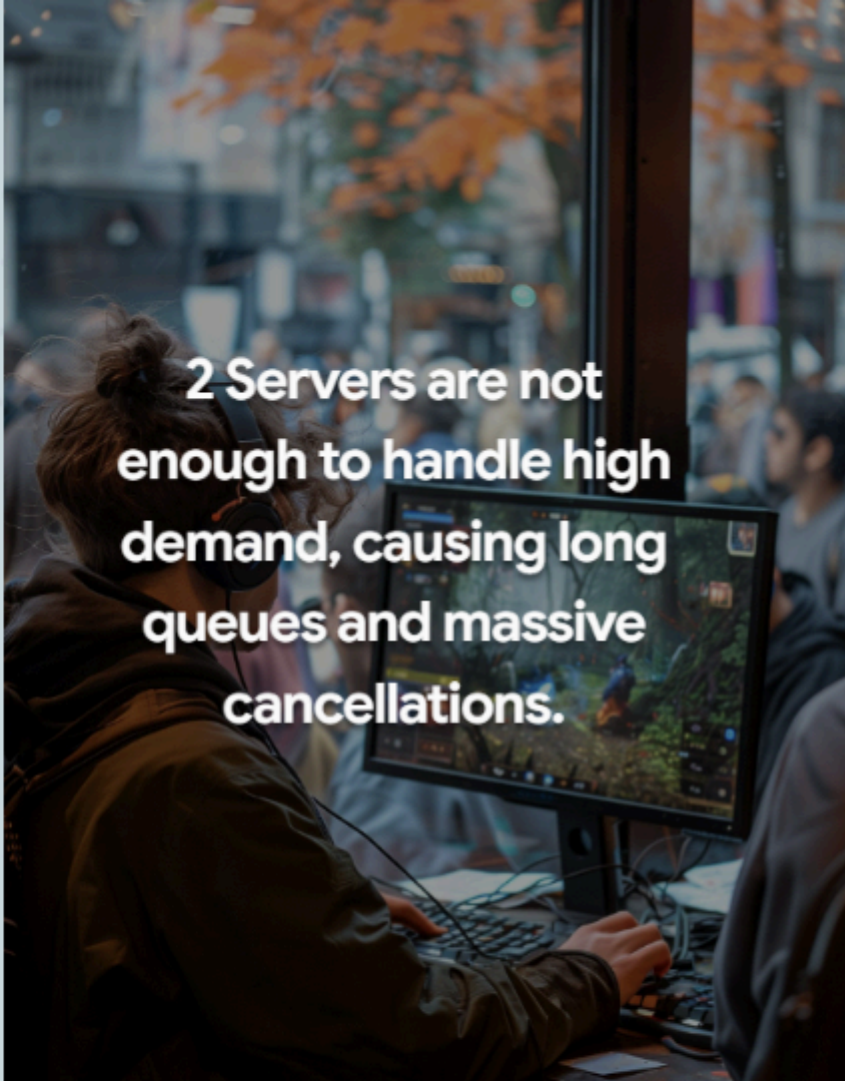
Analysis of customer service performance metrics

Number of Servers	Total Customers	Customers Served (%)	Customers Canceled (%)	Avg. Wait Time (min)	Avg. Service Time (min)	Avg. Time in System (min)	Avg. Queue Length (customers)	Server Utilization (%)
2 Servers	1171	366 (31.3%)	788 (67.3%)	11.31	2.61	13.94	26.26	99.69
4 Servers	1122	683 (60.9%)	435 (38.8%)	4.87	2.62	7.50	17.73	93.27
6 Servers	1134	857 (75.6%)	272 (24.0%)	3.54	2.64	6.20	14.78	78.68
8 Servers	1143	949 (83.0%)	191 (16.7%)	2.27	2.72	4.99	9.89	67.12

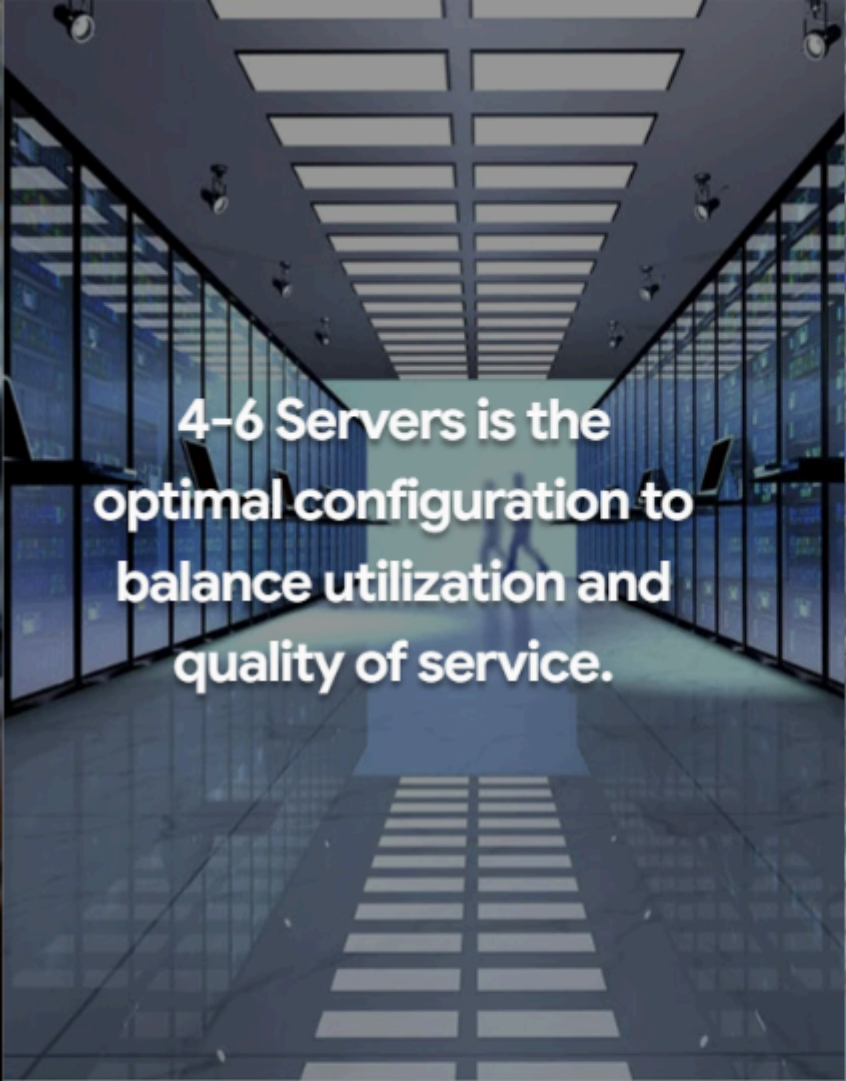


# Conclusions

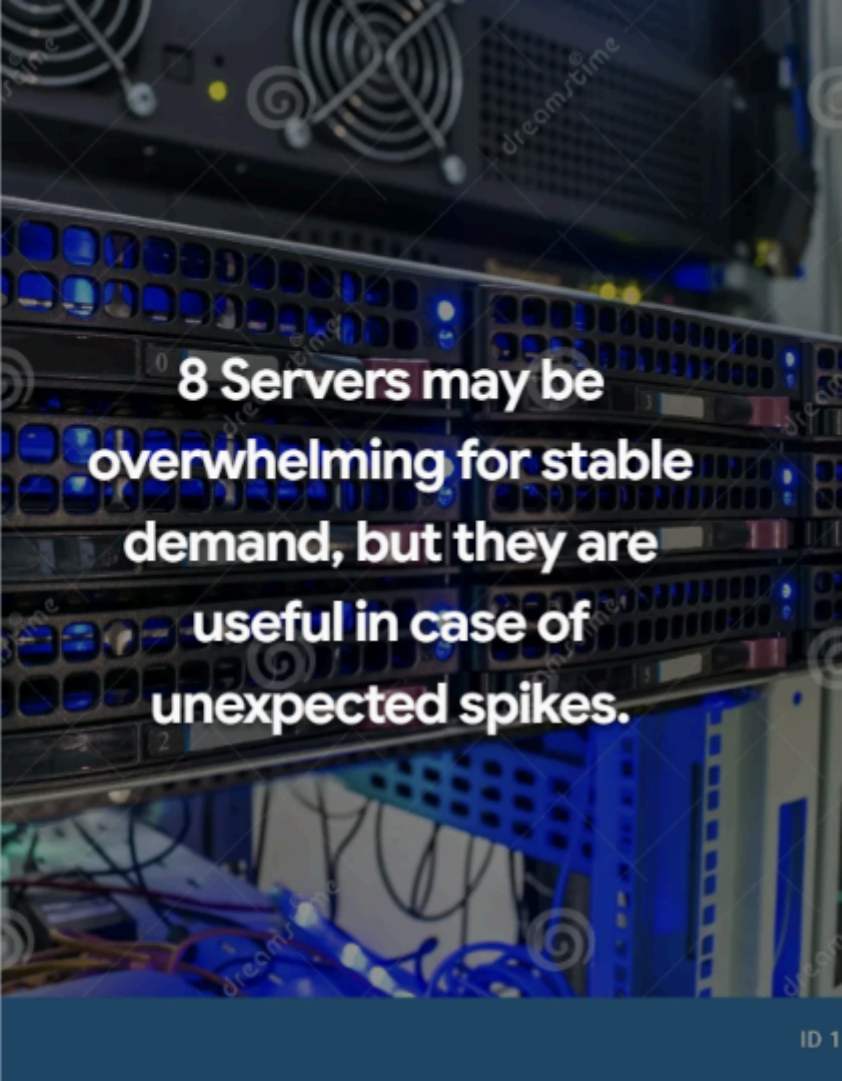
Key strategies to enhance booking performance and customer satisfaction




2 Servers are not enough to handle high demand, causing long queues and massive cancellations.




4-6 Servers is the optimal configuration to balance utilization and quality of service.



8 Servers may be overwhelming for stable demand, but they are useful in case of unexpected spikes.



The addition of servers linearly increases system capacity, but it is worth considering cost vs. benefit.



The peak phase requires the allocation of extra resources to minimize cancellations and queues.