Operations & Logistics Management in Air Transportation

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M.Sc. Program

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Case Study:

Preferred Customer Service at U.S. Airways

Learning Objectives

- Primary:
  - To understand multi-channel queuing systems
    - Queuing trade-offs in the call center operations.
    - Important metric: average waiting time
      - Enhance competitive advantage
      - But higher cost of personnel
  - Minimize personnel cost for desired level of service
- Secondary:
  - Modeling in decision making
  - Review queuing assumptions
  - Apply OR techniques

U.S. Airways: Background

- Formed through a series of M&A
- Bankruptcies:
  - 2002 following 9/11 and closure of Washington-Reagan Airport
  - 2004 due to high CASM
- Restructuring: 2004;
- Merger with America West: 2005
- 2011: 32,000 employees, 3,300 flights, 640 a/c, 230 destinations
- By 2011 off-shored call center operations (Manila, San Salvador, and Mexico City) brought back to the U.S. (Tempe, AZ; Winston-Salem, NC; and Reno, NV).
  - Contractually committed to bring back jobs

BACKGROUND

- In late 2011, Donna Kostelic, Reservation Director of the East Region, said:
  - "As you know, the process of repatriating the call center operations, as per the union agreement, is progressing satisfactorily and will be completed by October's end. I believe this is a great opportunity for us to rethink the way we serve our preferred customers. I plan to propose a specialized Preferred Customer Desk to improve both the quality and the speed of service to this small but important customer segment. I think the Winston-Salem center may be the ideal location for this desk."
- Other reservation managers were mostly enthusiastic and supportive

PREFERRED CUSTOMERS

- Important segment
- Agents identified several components:
  - Competence in providing accurate and credible information;
  - Courteous and polite interaction with the caller;
  - Communication skills to convey the required information efficiently and
  - Avoiding unduly long hold times before the call was answered.
- Solution:
  - Better agent selection, hiring
  - Improve training

OBJECTIVE

- Company's target: average wait time of 45 seconds
- Improve to 30 seconds or less for the preferred customers

CALL CENTER OPERATIONS

- Call processing:
  - Interactive Voice Response (IVR) determines the type of the call
  - Intelligent Call Monitoring (ICM) system routes the call
- Agents:
  - All trained to process basic U.S. and Canada itineraries
  - Specialized: groups, international itineraries, and others
- Winston-Salem Center:
  - 5 Reservations Managers, support managers each 30 agents
  - 800 full and part-time agents

CALL CENTER OPERATIONS

- Scheduling:
  - Based on forecasts (call volume is predictable but yet random)
  - Based on queuing theory
  - Consultation with managers and the union
  - Shifts: predetermined, spaced 30 minutes apart

SHIFT TYPE	ID	START	STOP	PBRK1	UBRK2	PBRK3	M	T	W	R	F	Y	S
5x8	11	05:00	13:30	06:30	08:30	11:15	M	T	W	R	–	–	S
5x8	12	05:00	13:30	06:30	08:30	11:15	M	T	W	R	F	–	–
5x8	13	05:00	13:30	06:45	08:30	10:30	M	–	–	R	F	Y	S

CALL CENTER OPERATIONS

- Agents' work is repetitive and monotonous
- Could lead to mental fatigue and job stress
- Insufficient staffing:
  - long wait times,
  - escalate stress levels and irritability
  - lower job satisfaction
  - less cordial and helpful to the customers.
- Agreement with union: 2X15min + 1X30min breaks

CALL CENTER OPERATIONS

- "It is not generally possible for us to achieve 100 percent agent utilization or completely eliminate waiting (hold) times. Using fewer agents to improve utilization will lengthen customer hold times and contribute to increased stress for the agents, thus causing callers to feel rushed and adversely affecting perceived quality of the service. So, deciding on the appropriate number of agents and their shifts is not an easy task."
- The negative consequence of this effect on the more loyal preferred customers could be even more serious.

CALL CENTER OPERATIONS

- perceived customer service quality is an important metric:
  - Websites: Skytrax, Webflyer …
  - Publications: the New York Times and U.S. News…

WebFlyer

key:
White table cells are our ratings.
Gray table cells are member ratings.

Program		Overall Rating	Earning Ability	Award Choices	Partnerships	Elite-Level	Rules & Conditions	Service Support	Online Services
Turkish Airlines Miles and Smiles 20 ratings	You rate it	**7.21**	8.00	7.00	7.00	7.00	8.00	7.00	6.50
		6.27	7.25	5.8	6.9	6.6	5.65	5.5	6.25
US Airways Dividend Miles 788 ratings	You rate it	**7.57**	8.00	7.50	8.00	8.50	7.50	7.00	6.50
		4.64	4.95	4.50	4.73	4.85	4.23	4.66	4.56

PREFERRED CUSTOMER PROGRAM

- Award programs are complex

Round trip destinations	Cabin	Off-peak	Low	Medium	High
Within and between the continental U.S. (including AK) and Canada	Coach First	N/A	25,000 50,000	40,000 80,000	60,000 100,000
Between the continental U.S. or Canada and the Caribbean	Coach First	25,000 50,000	35,000 60,000	60,000 100,000	80,000 140,000
Between the continental U.S. or Canada and Mexico or Central America	Coach First	N/A	35,000 60,000	60,000 100,000	80,000 140,000
Between North America and Hawaii	Coach First	N/A	40,000 70,000	65,000 135,000	90,000 180,000
Between North America or Hawaii and South America	Coach Business	35,000 60,000	60,000 100,000	90,000 200,000	125,000 350,000
Between North America or Hawaii and Europe	Coach Business	35,000 60,000	60,000 100,000	90,000 200,000	125,000 350,000
Between North America or Hawaii and the Middle East	Coach Business	N/A	80,000 120,000	120,000 180,000	160,000 240,000

U.S. Airways GOAwards Travel Chart

U.S. Airways Off-Peak Award Travel Chart

Round-trip destinations	Off-peak eligibility dates	Coach	First Class or Business Class
Within and between the continental U.S. (including AK) or Canada and the Caribbean	September 1–30	25,000	50,000
Between North America or Hawaii and South America	2011 May 1–31 & October 1–31 2012 March 1–31 & May 1–31	35,000	60,000
Between North America or Hawaii and Europe	January 15–February 28	35,000	60,000

Preparing a Proposal for a Preferred Customer Service Desk

- Objective:
  - Prepare a proposal for a preferred customer service desk
  - Consider the average target hold time of 45 seconds
  - Investigate implications of a 30 seconds target
  - Explore whether the use of part-time agents (four-hour shifts) would be advisable (expensive training, but scheduling flexibility)
- Idea:
  - Instead of fixed breaks as per contract with union
  - Switch to 4-1-4 and let these “elite” agents trade
- Assumptions:
  - $14/hour plus 25 percent for benefits

DATA ON AVERAGE HANDLE TIMES OF PREFERRED CUSTOMER CALLS

- 1440 half-hour periods during a 30-day period
- First 10 half-hour blocks:

From	To	Frequency
0	25	1
25.01	50	1
50.01	75	6
75.01	100	10
100.01	125	11
125.01	150	13
150.01	175	14
175.01	200	27
200.01	225	34

- What does it look like? (plot)

Distribution of Average Preferred Customer Call Volumes

Hour	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
0:00	7.3	7.3	8.5	7.2	8.2	14.3	7.8
1:00	9.8	18.3	11.5	10.8	10.0	12.3	9.6
2:00	14.8	26.5	17.5	27.4	21.4	28.0	12.0
3:00	20.5	46.5	31.5	40.8	32.6	45.5	24.0
4:00	42.0	68.8	58.0	78.8	65.8	78.0	47.0

- Some variations from one day of the week to another
  - schedule for a whole week? (implying 168 scheduling periods = 24 hours x seven days)
  - Simply explore the economic effects? (based on the average call volumes expected during a typical day of the week)

SIMPLIFIED EXAMPLES

- Within your groups, examine your own phone calls.
- Draw a histogram/frequency distribution depicting the lengths of your phone calls.

SIMPLIFIED EXAMPLES

- Assume the centre operates 8am-8pm
- Employees work 6 hrs each (assume no breaks)
- Assume each hour they handle 100 calls.
- Create a trade-off table showing how service measure changes as a function of the number of agents.
  - What is the minimum # of agents required?
  - How many agents are required to guarantee 2 min waiting time (on avg.)
  - How many agents are required to improve the waiting time to 1 min (on avg.)
- Assume average call duration is 6.5 minutes

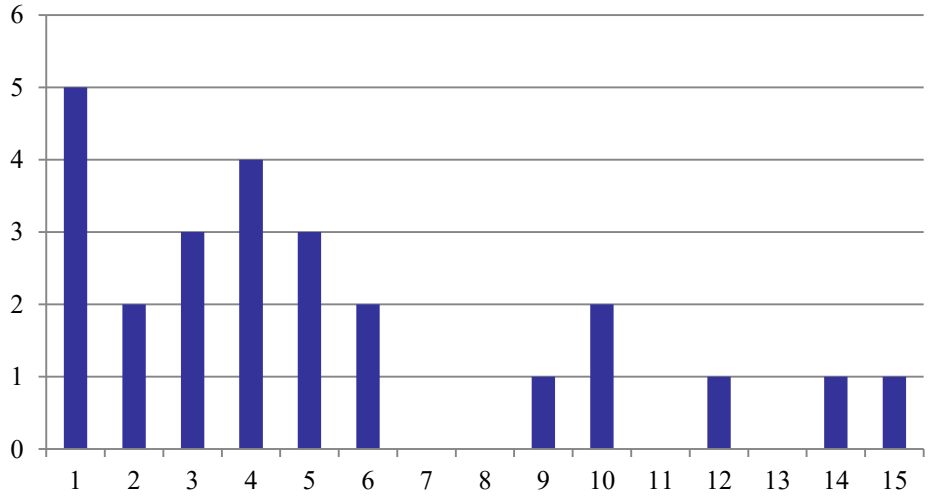
SIMPLIFIED EXAMPLES

- How the results change if arrivals vary over the day?

hour	avg # of calls/hr
8-9	50
9-10	60
10-11	80
11-12	90
12-13	100
13-14	120
14-15	100
15-16	40
16-17	40
17-18	40
18-19	60
19-20	80

BLOCK AVERAGES

- Assume we track the duration of calls:
- Draw a histogram



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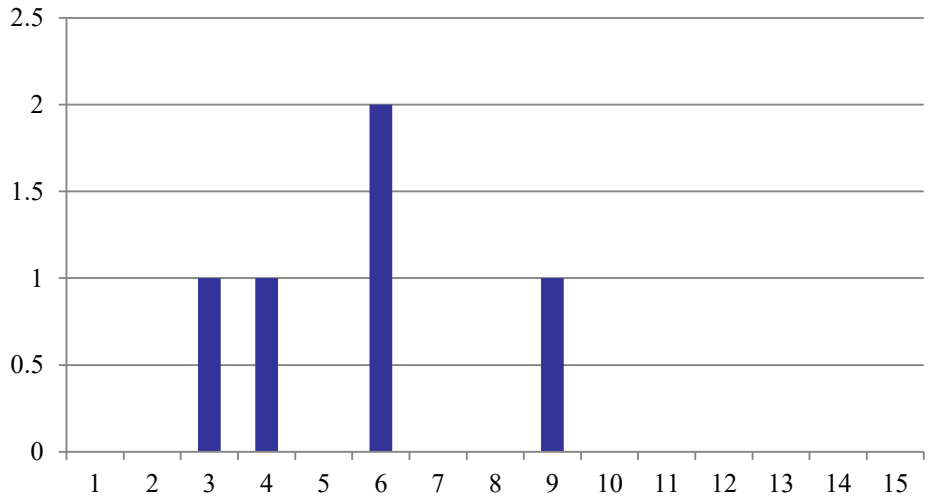
BLOCK AVERAGES

- Assume we track the duration of calls:
- Each hour we receive 5 calls.
- We take the average call during each hour
- Draw a histogram



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6	5.2
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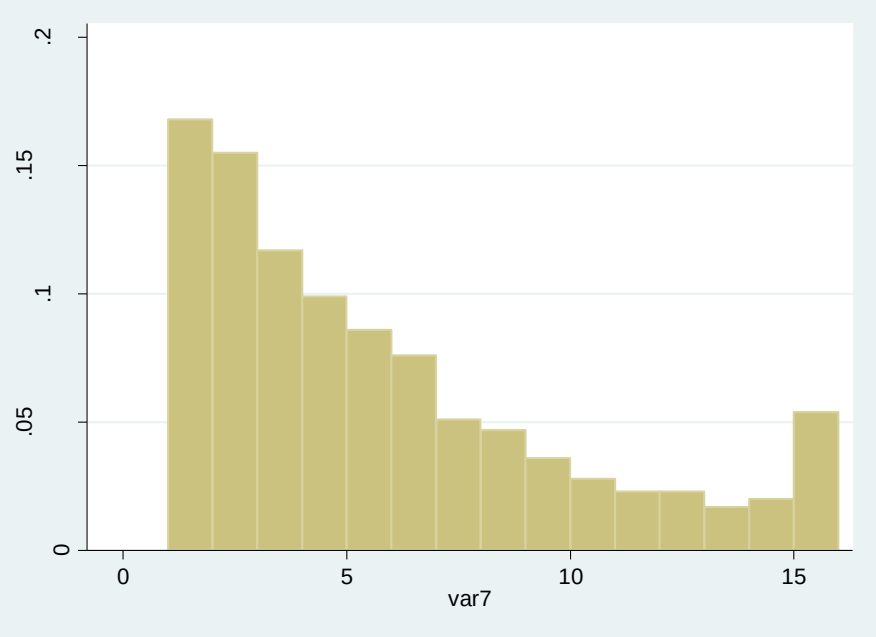
6	
2	
3	
2	2.8
1	
5	
1	
5	
4	3.2

SIMPLIFIED EXAMPLES

- How would you schedule the agents over the day?
  - If the customers arrive at a steady rate
  - If they arrive at different rates during the day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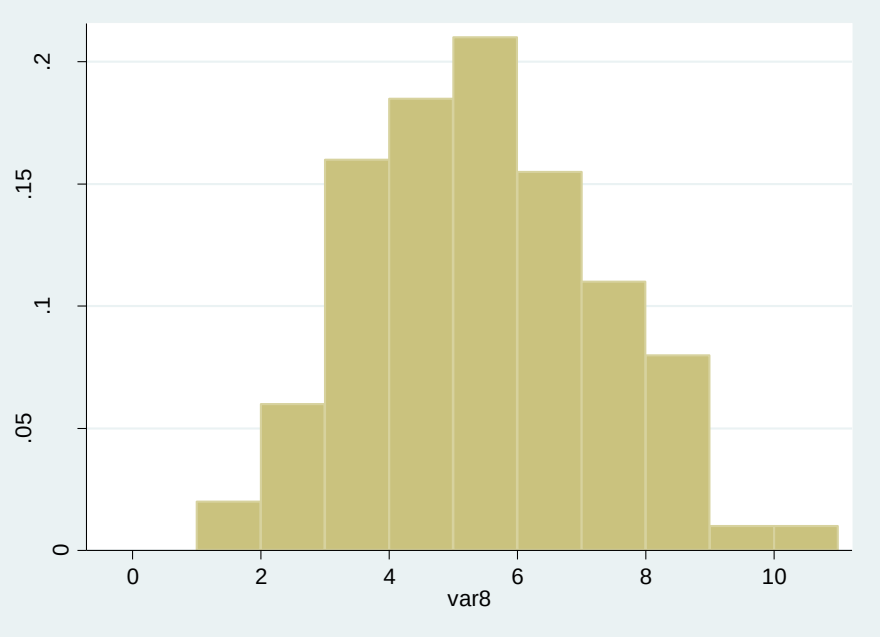
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