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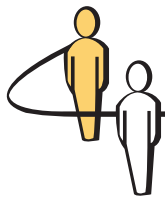
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Case

MotherLand Air: Using Experiential Learning to Teach Revenue Management Concepts

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Background

MotherLand Air is dedicated to the betterment of the working man, with original operating principles based on the strong political beliefs of its founder, Al Niemi. Al started this airline for the selfless purpose of exposing Dallasites to the glories of communist ideals. His own vacation in North Korea convinced him that the communist economic system held ultimate truths, and he reasoned that his colleagues would be likewise convinced if only they would visit the motherland. Consequently, he leased a Boeing 747 and initiated direct service from Dallas to Pyongyang three days a week.

Al was philosophically against such capitalist notions as differential pricing for customers. He believed that all comrades were equal and should pay the same fare. Consequently, MotherLand Air was started as a one-price airline offering round-trip service for \$400. Unfortunately, his 400-seat 747 was flying at far less than capacity on most trips and MotherLand Air was highly unprofitable. (The airline was financed by Russian underworld figures, so a lack of profitability could crush more than Al's spirit.)

Al was stunned that more travelers did not desire the icy North Korean air in their lungs, but he knew he had to adapt or shut down. He began to see wisdom in the old saying: "all people are equal, but some are more equal than others." Accordingly, he tried to salvage MotherLand by differential pricing. He segmented his customers into three different categories:

"capitalist pig class," i.e., business flyers (who paid full coach fare), "comrade class," i.e., discount ticket buyers, and "party member class," i.e., deep discount ticket buyers. Based on length of stay, etc., he charged \$1,000 for business class, \$400 for discount tickets, and \$100 for deep discount tickets.

This move improved his revenue significantly: He typically sold 30 to 50 full-fare seats, 70 to 100 discount seats, and 100 to 150 deep discount seats on each trip.

Unfortunately, even with his new pricing scheme he was still unable to attain profitability, but a solution became clear. Because his 747 was never full, he negotiated a change in his lease for a much cheaper and more fuel efficient 100-seat McDonnell-Douglas DC-9 (Model 30) that would allow him to become profitable (fun facts: operating costs per hour for a Boeing 747, \$5,905; DC-9-30, \$1,658).

At this point, however, he is in need of assistance. He could fill his planes with deep discount and discount flyers, but that would be unprofitable. Furthermore, he had no experience with overbooking policies and was unsure whether he wanted to pursue one. Consequently, Al is in need of expert service operations consulting to maximize revenue.

You must provide advice to Comrade Al concerning overbooking, seating allocation, and pricing to the three classes of passengers. Your plans will be tested in an interactive session in class.

Figure 1 Decision Templates

Flight	Group name:	Weeks away from takeoff											No shows		
		24	20	16	12	8	7	6	5	4	3	2		1	
Price	Full														
	Disc.														
	Deep disc.														
Price effects on reservations	Full														
	Disc.														
Policy	Full													120	
	Disc.													50	
	Deep disc.													0	
Booking revenues	Disc.														
	Deep disc.														
	Revenue														
	Overbooking penalty														
	Profit														

Seating Allocation

Seating allocation must come in a “nested” form. For example, in Figure 1, no deep discount; up to 50 discount and deep discount; and up to 120 full-fare, discount, and deep discount seats are set aside six months prior to departure. Implicitly, for a 100-seat plane, this allocation contains 20 overbooked seats.

Demand history from 40 flights on the larger planes is contained on Figures 2 and 3, and is available in a data file. For example, observation 1 in Figure 2 shows that 5 reservations were obtained 6 months before the flight, 6 reservations were obtained 5 months before the flight, etc., and of the 53 reservations in the system the week before the flight, 34 passengers actually boarded the plane. Demand history for the deep discount tickets is not necessary—100% of them are taken as soon as they are offered.

The demand history can be used to determine booking curves for each class of passenger. Developing booking curves predicts the eventual number of reservations just prior to boarding.

Figure 2 Full Coach Fare History, Net Reservation Activity

Obs.	Boarded	Weeks from event							Months from event					
		1	2	3	4	5	6	7	2	3	4	5	6	
1	34	53	51	37	28	23	16	15	13	8	9	6	5	
2	26	40	40	29	18	16	14	12	10	6	7	5	5	
3	27	42	39	30	22	15	15	13	10	7	6	6	4	
4	36	43	40	28	21	17	11	10	11	6	6	5	4	
5	37	40	39	32	16	13	15	9	8	7	6	4	5	
6	49	61	56	40	28	24	22	16	14	11	10	9	7	
7	60	62	55	43	28	23	17	15	13	10	10	8	6	
8	39	50	47	38	22	17	14	14	13	11	8	7	6	
9	54	60	60	41	29	23	19	14	15	12	9	9	6	
10	59	61	54	48	28	21	20	17	13	13	10	8	6	
11	56	71	69	51	34	30	24	19	16	13	12	9	7	
12	52	65	61	45	33	27	18	16	14	13	11	8	6	
13	22	32	27	27	14	12	8	7	8	5	4	4	3	
14	51	63	63	42	28	23	20	19	14	11	11	8	6	
15	56	61	56	47	31	21	17	16	14	13	10	9	6	
16	56	64	62	43	30	22	22	18	13	14	11	9	6	
17	23	33	28	22	17	13	8	8	9	7	5	4	3	
18	46	51	45	40	26	21	18	15	11	10	8	7	6	
19	52	58	54	44	28	22	19	14	14	11	10	8	6	
20	49	58	57	46	29	20	15	14	12	11	9	7	6	
21	42	58	59	41	26	23	16	16	14	12	10	7	5	
22	55	68	68	46	30	29	22	17	14	12	12	8	6	
23	21	35	34	24	16	13	13	11	9	8	6	4	3	
24	39	42	40	27	23	14	16	10	8	8	6	6	5	
25	39	41	38	27	21	16	13	11	10	8	7	6	4	
26	26	37	36	29	16	14	9	11	7	8	6	4	5	
27	54	72	70	52	32	28	19	20	16	15	11	9	8	
28	41	43	37	34	19	17	12	11	11	8	7	6	4	
29	44	50	45	38	26	21	16	12	11	10	8	7	5	
30	21	37	39	23	19	12	14	11	7	6	6	5	4	
31	58	68	68	49	34	27	24	18	16	13	11	8	8	
32	37	52	53	35	23	21	15	13	13	11	9	6	5	
33	59	77	76	56	40	32	23	21	17	13	13	11	9	
34	47	64	63	47	31	26	19	19	15	12	11	8	5	
35	53	58	54	42	29	24	21	14	14	12	9	8	5	
36	43	43	43	34	21	18	12	13	9	8	7	5	3	
37	39	50	44	40	26	20	14	14	11	8	8	7	5	
38	29	35	29	23	20	11	9	11	6	7	5	4	4	
39	33	42	37	34	18	17	13	11	10	7	7	5	4	
40	40	56	51	38	29	23	15	14	14	12	8	7	7	

Figure 3 Discount Fare History, Net Reservation Activity

Obs.	Boarded	Weeks from event							Months from event					
		1	2	3	4	5	6	7	2	3	4	5	6	
1	87	88	90	92	90	84	76	71	59	47	36	24	14	
2	81	85	87	88	87	81	75	67	60	46	34	21	12	
3	65	70	71	73	70	69	67	62	53	41	29	22	16	
4	57	57	58	59	62	58	55	47	38	31	23	16	11	
5	94	99	101	103	104	101	97	87	73	56	40	27	14	
6	69	73	74	76	77	77	71	62	52	39	31	19	14	
7	91	95	97	99	98	97	90	83	70	59	44	30	20	
8	67	71	72	74	75	74	66	57	50	40	28	22	14	
9	66	70	71	73	75	72	68	63	53	40	33	23	13	
10	73	73	74	76	78	73	71	64	54	42	29	18	14	
11	82	84	86	87	88	83	79	69	59	50	40	27	15	
12	82	85	87	88	86	85	80	71	62	50	36	25	13	
13	101	106	108	110	113	108	101	89	77	64	51	38	23	
14	102	106	108	110	108	105	98	88	74	59	42	32	16	
15	97	102	104	106	103	99	94	85	71	55	43	28	19	
16	61	66	67	69	67	65	61	56	48	36	29	21	11	
17	68	70	71	73	73	70	63	54	48	41	30	20	15	
18	86	88	90	92	93	90	87	81	66	52	41	29	18	
19	91	97	99	101	104	99	93	86	73	57	45	32	18	
20	100	105	107	109	110	108	100	88	77	63	49	33	17	
21	82	82	84	85	84	79	72	64	57	43	31	23	12	
22	90	91	93	95	96	90	82	76	62	49	36	26	17	
23	82	86	88	89	89	85	81	70	59	49	35	26	13	
24	74	79	81	82	83	79	71	61	55	44	33	20	12	
25	104	107	109	111	114	111	105	97	81	67	53	38	24	
26	63	69	70	72	74	70	62	53	43	34	23	19	12	
27	89	93	95	97	100	95	88	81	70	56	43	27	15	
28	65	69	70	72	75	72	66	56	47	38	31	24	17	
29	67	69	70	72	74	73	66	56	45	36	25	18	9	
30	104	105	107	109	111	108	100	89	74	57	45	31	17	
31	103	106	108	110	108	102	92	84	73	57	40	25	15	
32	80	86	88	89	87	86	78	71	61	51	40	27	19	
33	61	65	66	68	69	66	59	54	45	34	24	18	9	
34	65	65	66	68	65	64	60	52	42	34	25	19	13	
35	76	79	81	82	83	82	76	71	63	50	35	26	16	
36	66	68	69	71	68	64	62	53	48	40	30	21	13	
37	97	98	100	102	103	99	93	81	68	55	40	25	15	
38	98	101	103	105	107	105	100	88	76	63	48	34	23	
39	100	101	103	105	104	102	95	85	71	57	44	32	21	
40	105	111	113	115	114	110	104	93	79	65	50	32	19	

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The costs involved in overbooking depend on the number of people not seated for the flight. The revenue from the ticket sales is subtracted (for simplicity, assume revenue of \$1,000 for each person not seated), and AI estimates the per-passenger penalty cost of leaving passengers stranded as $\$200 \cdot (\text{number stranded squared})$. So leaving 1 person stranded costs \$200, two people costs \$800, three people, \$1,800, etc.

Pricing

Currently, ticket prices start at \$1,000, \$400, and \$100 for the three fare classes. Prices can be raised by 10%

to \$1,100 or \$440, lowering demand by 15%, or prices can be lowered by 10% to \$900 or \$360, increasing demand by 15%. Prices on deep discount tickets cannot be changed.

Conduct of Play

Your group must indicate a policy prior to receiving any reservations. Once all policies are in, the reservation information for the six-month out time frame will be given. At this point, you may alter your policies. Iterations of receiving reservation information and altering policies proceed until plane departure, as depicted in Figure 1.