MAN 256 Intro to Managment Science
Fall 2023
Call Center Staffing Assignment

You are consulting for a bank call center, where you are asked to develop a staffing plan to make sure they fulfill their service requirements. Each customer is directed to one of General, Card Services, Mortgage, Collections. The expected demand for each service is estimated at half hour intervals and provided to you by the bank ("Call Center Data" in the spreadsheet). Each type of call has a dedicated staff, and the average call takes 143 seconds for each type of call. The hourly wages for the call center staff is $22 per hour.

The bank is considering implementing a Cross-selling Technology Initiative (CTI). CTI software is assumed to cost $7,500 annually for the software, plus $675 per seat (agent) per year for licensing. Moreover, the installation of the system would cost an additional $2,500 for integration into the bank's current service processing system and $2,500 for the installation of a peripheral gateway. Moreover, the bank would need to acquire professional services from SAP at $80 per hour for 20 days to oversee the system initialization. CTI would allow the call center staff to sell following additional products, with the indicated additional profits (benchmarked from a competitor):

Product	Average Net Profit/month/unit ($)	Average Monthly Volume
Direct New Auto Loan	362	2,960
Direct Used Auto Loan	284	17,569
Visa Classic	160	746
Visa Gold	392	2,078
Master Card	152	380

Please feel free to make your own assumptions about the demand and benefits from cross-sales.

For these questions you may assume that the arrival process is Poisson, and that service times are exponentially distributed. You should also assume that blocking and abandonment are not an issue. Ignore Saturdays, focusing instead only on week days, with 20 working days per month. The spreadsheet provided can help you forecast the arrival rates, develop the minimum number of agents required to make the service requirements of the bank, and then schedule the agents accordingly. Clearly state any other assumptions that you make. Please limit your report to 5 pages including appendices and references (details of your analysis can be placed in an appendix).

1.Develop minimum cost staffing plans for each of the four call centers. Your plan for each site should:

- make sure that there are enough people on hand during each half-hour to meet the company's 60-second average speed of answer (ASA) requirement (i.e., the average waiting time before a call is answered);
- have all employees work 8-hour shifts; and,
- allow each shift to start only on the hour.

You may use the template for the queueing simulations and the sample LP scheduling model provided in the spreadsheet.

2. As an alternative, suppose the bank considered 4-hour shifts that start on the hour? What is the effect of this plan on staffing levels and costs? Would you recommend this option?

For the following questions, assume an 8-hour shift:

3.Consider the General Call Center. In order to make the call center more responsive, suppose the ASA requirement is reduced to 10 seconds. What is the effect of this change on staffing requirements and costs?

4. Let's go back to the 60-second ASA requirement. Assume that if the cross selling proposal is implemented at the General Call Center the average call length will increase to 5 minutes. What is the effect of this proposal on staffing levels and costs? What cross-sell capture ratio will make this a cost effective proposition?

5. Now consider consolidating the four call centers into a single one, with no cross-selling or CTI. Assuming a 60 second ASA requirement as before, what is the effect of this option on staffing levels and costs? What explains the resulting differences? Would you recommend this solution?

I will show you the details of how to use the spreadsheets in a dedicated class session on November 28th. You can start working on the assignment, e.g. form groups, go through the spreadsheet and start working on the model, before that.

This will be a group assignment. Each group should be 3-4 people. You are responsible for forming your own groups, but let us know if you cannot, and we will connect you with others in the same situation. Each group should submit a report (capped at 5 pages per group as indicated above), excluding an appendix where you can include additional tables, graphs etc (e.g. balance sheets for your economic analysis, your staffing plan), and well as an excel sheet clearly showing your work.

DEADLINES:

1. Please email me at canberk.ucel@bilkent.edu.tr with your finalized groups by November 30, midnight Ankara time. We will have a Q&A session the following day. If you have trouble finding a group you can email our TA Dilara at dilara.aksoy@ug.bilkent.edu.tr **before November 30** so we can put you in touch with other students in similar situation.

2. Please submit your spreadsheet clearly showing your work as well as your report by December 7, midnight Ankara time. You can submit via email to our TA Koray at koray.karadag@ug.bilkent.edu.tr. No late submissions will be accepted unless you have an emergency or let me know in well in advance (2-3 days), e.g. if you have other conflicting deadlines.