ISM-E3003 Operations and Supply Chain Analytics, 2024

Group Assignment 1

You will complete this assignment in your assigned groups of 4-5 people. You will complete both the second group assignment (Supply Chain Game) with the same group.

Deliverables

You will produce an analytics report to AdvisoryEdge, the company from the interview in Lecture 1. You can refer to the lecture recording for the interview.

You should submit your report on MyCourses by 7 November. See below for more details.

Value from analytics

Following your interview, AdvisoryEdge has provided you with sample data with an open-ended goal of assessing whether there is an analytics opportunity for the company, and if so, deriving proof-of-concept analytics insights from it. You must deliver a short memorandum to the Director of Sales and CEO demonstrating these insights. The company would ideally like to see concrete suggestions on what they could do to improve things. They have also specifically asked you to critically assess any potential action you may suggest.

You are free to apply any analytics methods you know. However, you do not need to necessarily use the most sophisticated method possible, but rather find the right method (or methods) to provide useful information to the company. Relatively simple methods often provide powerful and interpretable results. A selection of prudently developed visuals is almost always valuable.

As a reminder from the interview, AdvisoryEdge is struggling with call no-shows, leading to inefficient staffing. The company currently schedules four representatives to take calls in an hourly slot and eight calls, i.e., half an hour per call. The company has provided suggestive numbers on its costs and profits: a sales representative is paid 20 USD per hour and can handle two customers per hour, which is the current scheduling strategy. The reps can be hired for flexible time periods. The Director of Sales believes that the expected revenue of a customer who answers a call is around 110 USD. A Beginner level plan yields an expected revenue of around 50 USD, Intermediate level 100 USD, and Advanced 200 USD.

Data for the assignment are in the file assignment_1_data.csv. The file contains historical data on whether customers answered calls, what plan they purchased as a

result, as well as other customer characteristics. The variables are described in the Appendix below.

Please note that you do not necessarily need to use all the information provided.

Report

Your main report should be a short memorandum of no more than 3 pages in PDF format, focused on convincing the Director of Sales and CEO of the value (if any) of the analytics opportunity.

You may include appendices of up to 7 pages for a total length of up to 10 pages. You do not have to provide the code, if any, you have used to produce the results.

Your report will be evaluated both on the quality of the analysis and the quality of the presentation of the document and clarity of writing.

The first page of your report should include the names of all group members as well as a statement about their percentage contributions to the assignment. For example: “all group members contributed equally,” or “N.N contributed 60% and M.M contributed 40%.”

Any group member with a zero percent contribution will not receive marks for the assignment.

Using AI

You may use AI tools to generate Python code to work on data, estimate models, or produce visualizations. You may not use AI tools to write your report.

Appendix: data description

Variable name	Description	Variable type	Code description
ANSWERED	Customer response	Binary	0: customer did not answer scheduled call 1: customer answered scheduled call
INCOME	Customer income (in USD)	Numerical	
FEMALE	Customer gender	Binary	0: female 1: male
AGE	Customer age in years	Numerical	
JOB	Nature of job	Binary	0: unemployed 1: entry level position 2: midlevel position 3: management/self-employed/highly qualified position
NUM_DEPENDENTS	Number of people for whom liable to provide maintenance	Numerical	
RENT	Customer rents	Binary	0: no 1: yes
OWN_RES	Customer owns residence	Binary	0: no 1: yes
NEW_CAR	Recent new car purchase	Binary	New car purchase in last 6 months: 0: no 1: yes
CHK_ACCT	Checking account status	Categorical	0: no checking account 1: < 200 USD 2: 200 < ... < 2000 USD 3: > 2000 USD
SAV_ACCT	Average balance in savings account	Categorical	0: no savings account 1: < 500 USD 2: 500 < ... < 2000 USD 3: > 2000 USD
NUM_ACCTS	Number of accounts customer has	Numerical	
MOBILE	Mobile phone	Binary	0: customer provided non-mobile number for follow-up call 1: customer provided mobile number for follow-up call

PRODUCT	Type of product customer purchased after conversation with salesperson	Categorical	0: customer did not answer call 1: customer answered but did not purchase product 2: customer answerd and purchased Beginner plan 3: customer answered and purchased Intermediate plan 4: customer answered and purchased Advanced plan