Case Study – Rep Attrition

Prepared for FIUBA

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Impact where it matters.

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Problem scenario

One of our **pharmaceutical clients** has requested our consulting services as it is facing an “attrition problem” with their sales representatives and would like to have early indications of who is likely to depart the organization to ensure efficient business continuance. The client has collected various data points on each of their reps pertaining to 3 broad categories:

1. Rep Profile
2. Management Info
3. Performance Info

Our client **Sales Department** has also provided tags for reps who were with the organization (“Existing”) and those who departed voluntarily (“Terminated”) for two successive quarters and would like to Estimate the tags (“Existing”/ “Terminated”) for the upcoming quarter based on the current employee information and past departure patterns.

Develop an approach to identify which variables have the greatest influence on whether an employee is going to submit and try to Estimate “type” for sales reps in the “*SUBMISSION*” file

Datasets

Employee_ID	Type	Department	Area	Region_Lat	Region_Long	Legal_Entity	Product	Title	Gender	Marital_Status	prev_emplr_tenure	Home_Work_Match	Age	Quart_Tenure
193852	Terminate	Dept-2	Area-12	38.03706	114.4687	Entity-1	Product-2	Grade-7	M	Single	1.86		24.51198	2.633333333
193857	Existing	Dept-3	Other	32.06171	118.7632	Entity-4	Product-1	Grade-8	F	Marr.	2.59		29.94114	2.855555556
194063	Existing	Dept-3	Other	36.66853	117.0204	Entity-4	Product-21	Grade-7	F	Marr.	0.36	1	28.50103	2.744444444
194065	Existing	Dept-4	Area-16	30.26744	120.1528	Entity-3	Product-17	Grade-7	M	Single	3.35		27.61944	2.677777778
194069	Existing	Dept-4	Area-16	30.26744	120.1528	Entity-3	Product-17	Grade-7	F	Marr.	0.45		28.01369	2.677777778
194092	Terminate	Dept-4	Area-19	30.65165	104.0759	Entity-3	Product-20	Grade-4	M	Marr.	0.31	1	29.86174	0.833333333
194096	Terminate	Dept-4	Area-19	30.65165	104.0759	Entity-3	Product-20	Grade-7	M	Single	2.36	1	28.73101	2.455555556

Type

Employee Profile: Q*_Emp.csv

Employee_ID	Unique Employee ID (Numeric)
Type	Current employment status (Categorical: “Existing”/ “Terminated”)
Department	Assigned department (Categorical)
Area	Assigned business territory (Categorical)
Region_Lat	residence Latitude (Numeric)
Region_Long	residence Latitude (Numeric)
Legal_Entity	Assigned legal entity (Categorical)
Product	Assigned product line (Categorical)
Title	Current title (Categorical)
Gender	M/F (Categorical)
Marital_Status	Married/Single (Categorical)
prev_emplr_tenure	Tenure in years with previous employer, if applicable (Numeric)
Home_Work_Match	Flag indicating work and residence location are same (Binary: 0/1)
Age	Current age (Numeric)
Quart_Tenure	Tenure with the current employer in quarters (1 year = 4 quarters) (Numeric)

Datasets

Employee_ID	Mgr_Geo_Match	Mgr_Avg_SY	Mgr_Avg_SY_T	Mgr_Avg_SY_E	Mgr_Termination_Rate	Mgr_Title
193852	1	1.771506849	0	1.771506849	0	Grade-M5
193857	1	2.062465753	3.247945205	1.272146119	0.4	Grade-M5
194063	1	1.127853881	0	1.127853881	0	Grade-M5
194065	1	0.712876712	0.638356164	0.731506849	0.2	Grade-M5
194069	1	0.226027397	0	0.226027397	0	Grade-M5
194092	1	0.42283105	0.42283105	0	1	Grade-M5
194096	0	0.360547945	0	0.360547945	0	Grade-M5
194139	0	1.126027397	0	1.126027397	0	Grade-M8
194141	1	0.757990868	0	0.757990868	0	Grade-M8

Manager Details: Q*_Mgr.csv

Employee_ID	Unique Employee ID (Numeric)
Mgr_Geo_Match	Flag indicating match of employee and manager work location (Binary: 0/1)
Mgr_Avg_SY	Average tenure of employees under assigned manager (Numeric)
Mgr_Avg_SY_T	Average tenure of terminated employees under assigned manager (Numeric)
Mgr_Avg_SY_E	Average tenure of existing employees under assigned manager (Numeric)
Mgr_Termination_Rate	Ratio of termination count to overall *reportee* count for the assigned manager(Numeric)
Mgr_Title	Title of the assigned manager (Categorical)

Datasets

Employee_ID	incentiveQ_1	incentiveQ1_Q2	incentiveQ2_Q3	incentiveQ1_Q3	salesQ_1	salesQ1_Q2	salesQ2_Q3	salesQ1_Q3	targetQ_1	targetQ1_Q2	targetQ2_Q3	targetQ1_Q3
193852	6810	0.486465252	14001	6811	223074	1.180612707	188948.5	223075	204000	1.439966265	141670.68	204001
193857	16895	1.126324912	15001	16896	1276800	1.251668007	1020079.6	1276801	1199280	0.788659355	1520657.8	1199281
194063	0	8.16E-05	12251	1	112480	0.833360252	134972.84	112481	342000	0.49431739	691865.2	342001
194065	7712.032	0.514167855	15001	7713.032	325066.41	325067.41	1	325067.41	276190.73	276191.73	1	276191.73
194069	6519.856	0.434694754	15001	6520.856	161504.97	161505.97	1	161505.97	156684	156685	1	156685
194092	0	0.00019996	5001	1	0	1	1	1	0	1	1	1
194096	4600	0.353895854	13001	4601	211866.44	39.33231352	5386.6	211867.44	168718.23	3.319082708	50833.09	168719.23
194139	7043.33	0.503130491	14001	7044.33	249283	0.464321053	536878.52	249284	260505	0.451271063	577271.67	260506
194141	18050	1.289265052	14001	18051	555579	0.780001096	712281.05	555580	531152	0.766885141	692610.89	531153

Performance Details: Q*_Perf.csv

Employee_ID	Unique Employee ID (Numeric)
incentiveQ_1	Incentive offered in past quarter
incentiveQ1_Q2	Ratio of incentives offered in 1 and 2 quarters ago (Categorical)
incentiveQ2_Q3	Ratio of incentives offered in 2 and 3 quarters ago (Categorical)
incentiveQ1_Q3	Ratio of incentives offered in 1 and 3 quarters ago (Numeric)
salesQ_1	Sales achieved in past quarter (Numeric)
salesQ1_Q2	Ratio of sales achieved in 1 and 2 quarters ago (Categorical)
salesQ2_Q3	Ratio of sales achieved in 2 and 3 quarters ago (Categorical)
salesQ1_Q3	Ratio of sales achieved in 1 and 3 quarters ago (Categorical)
targetQ_1	Target assigned in past quarter (Categorical)
targetQ1_Q2	Ratio of target assigned in 1 and 2 quarters ago (Categorical)
targetQ2_Q3	Ratio of target assigned in 2 and 3 quarters ago (Numeric)
targetQ1_Q3	Ratio of target assigned in 1 and 3 quarters ago (Binary: 0/1)

You will have 48 hours to identify most important KPIs, most influential variables and Estimate “type” for sales reps in the “SUBMISSION” dataset

Use the datasets to create dashboards

Identify variables that influence “Type” for sales reps

Identify potential “terminated” sales reps

Who are you?	Who is your client?
A management & strategy consulting firm	Pharmaceutical company – Sales Department Director

Exercise

1) **KPI:** Please identify the most important KPIs to understand the “attrition problem”.
2) **Dashboard:** Build a dashboard showing the KPIs. You can use the software that you have knowledge about. Consider using either Tableau or PowerBI.
3) **Estimate “type”:** Update the “Q3_SUBMISSION” dataset with your Estimated “Type” for rep

“Q3_Submission.csv” File Structure

Employee	Type
193852	
193857	
194063	
194065	
194069	
194092	
194096	
194139	
194141	

- Estimate tags *(“Existing”/ “Terminated”)* in this column

Submissions

Please submit following Items:

- Dashboard: Power BI, Tableau
- Presentation: 3-minute video
- Estimation: Excel *Q3_SUBMISSION*
- Any supporting information

Submit information:

- FILL IN WITH SUBMIT INFO

FIUBA contact information:

- FILL IN WITH CONTACT INFO

Good Luck!

Appendix

Here you can find some resources that can help you solve the different sections:

Excel functions:

Function VLookUp: https://goo.gl/5JVuy9

Function IF: https://goo.gl/QPecz3

Function Switch: https://goo.gl/JzWrdB

Pivot tables:

Create and analyze data: https://goo.gl/3j7Wym

Create a report using pivot tables: https://goo.gl/k51Kmc

Use segmentation and dynamic graphs: https://goo.gl/vuUqfC

Dataset approach

1) ***Quality checks performed / Errors found***: Please report any potential errors / inaccuracies in the dataset.

2) ***Data preprocessing steps:*** *P*erform the necessary data read and modifications. Please provide potential data aggregations / transformations performed including quality checks.

3) ***Key observations / Trends:*** Please provide any information on your key observations / insights from the datasets, what patterns and challenges you see in the data.