MS3111 Data Analytics with
Excel VBA Proposal

Team Member:

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Background and Source data:

AB Insurance Ltd is a newly established company in 2020. In order to analyse the insurance sales situation and evaluate the agents' working performance, the company decided to record every transaction daily and update it yearly. There are 3 source workbooks with different purpose:

1. Product sales workbook

It mainly records what kind of products have been sold in 2023 with the detailed date, selling unit and selling price. There is a total of 200 invoices, followed by the Sales Number.

Sales No.	Date	Product Category	Selling Unit	Selling Price
1	6/1/2023	Travel insurance	2	4432
2	6/1/2023	Health insurance	3	12483
3	10/1/2023	Life insurance	2	918
4	11/1/2023	Health insurance	3	13224

2. Agent Sales workbook

Here are the company's two groups of insurance agents in 2023 sales records, a total of two groups divided into A team and B team. Each group have 5 members, and we have a total of 10 agents. They are Alex, Ben, Candy, Danny, and Eason from the A team and Filex, Gary, Henry, Irene, and Jenny from the B team. The company keep a detailed record of each transaction's date, agent name, team, selling price and commission rate, respectively.

Sales No.	Date	Agent Name	Team	Selling Price	Commision(%)
1	6/1/2023	Eason	A	4432	35%
2	6/1/2023	Candy	A	12483	20%
3	10/1/2023	Henry	B	918	30%
4	11/1/2023	Eason	A	13224	20%
5	12/1/2023	Irene	B	10986	35%

Different commission rates for different product types:

- Life insurance (30%)
- Accident insurance (25%)
- Health insurance (20%)
- Travel insurance (35%)
- Vehicle insurance (15%)

3. Agent working performance workbook

As an insurance company, in addition to finding new business opportunities, ensuring that our customers continue to purchase our old policies is also an important indicator of how well our agent is doing. Hence, this workbook records the number of new cases set up, and the number of old policed collapsed in 2023. In case to evaluate the agent working, the data record follows the date, agent name, agent's team and the specific number of new and collapsed cases.

Date	Name	Team	No. of New Case	No. of Collapsed Case
1/1/2023	Eason	A	2	
1/1/2023	Candy	A	3	
1/6/2023	Henry	B	2	
22/10/2023	Eason	A		4
23/10/2023	Gary	B		3
24/10/2023	Eason	A		2

Data Manipulation:

A new Excel workbook called 'Analysis Workbook' is created to store manipulated data. In the 'Combined Data' worksheet, relevant data will be extracted from the three source data workbooks mentioned in the previous section, with those duplicate entries or columns removed.

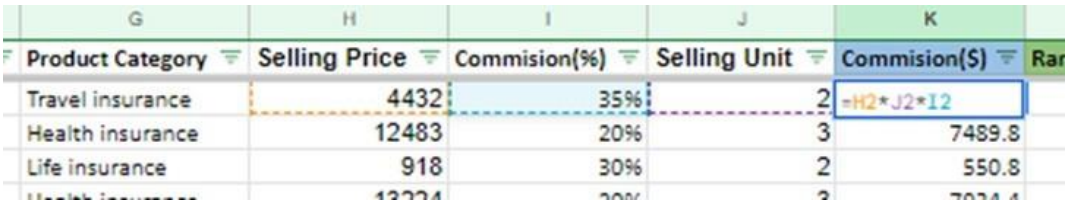
	A	B	E	F	G	H	I	J	O
1	Date	Sales No.	Agent Name	Team	Product Category	Selling Price	Commision(%)	Selling Unit	No. of Collapsed case
2	1/6/2023	1	Eason	A	Travel insurance	4432	35%	2	
3	1/6/2023	2	Candy	A	Health insurance	12483	20%	3	
4	1/10/2023	3	Henry	B	Life insurance	918	30%	2	
5	1/11/2023	4	Eason	A	Health insurance	13224	20%	3	
6	1/12/2023	5	Irene	B	Travel insurance	10986	35%	3	

For further analysis, some columns are newly expended and computed.

The 'Month' and 'Quarter' columns display the month and quarter of the insurance transaction, respectively, according to the data in the 'Date' column.

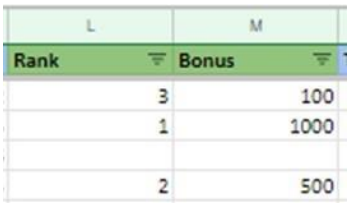
	Date	Sales No.	Month	Quater	A
2	1/6/2023	1	6	2	E
3	1/6/2023	2	6	2	C
4	1/10/2023	3	10	4	H
5	1/11/2023	4	11	4	E
6	1/12/2023	5	12	4	I

As a different commission rate is assigned to each product category, a column named 'Commission($)' is computed to show how much the representing agent could gain from the transaction. The amount is calculated by multiplying the selling price, selling unit, and the commission rate, referred to as ' =H2*J2*I2' in Excel.



	G	H	I	J	K	
	Product Category	Selling Price	Commision(%)	Selling Unit	Commision($)	Ran
	Travel insurance	4432	35%	2	=H2*J2*I2	
	Health insurance	12483	20%	3	7489.8	
	Life insurance	918	30%	2	550.8	

Each sales agent is assigned a monthly sales performance ranking by summing up each sales agent's calculated insurance sales per month (more details are provided in the next section). The ' Rank ' column shows each month's top 3 sales agents. The top 3 sales agents will receive bonuses of 1,000, 500, and 100, respectively, displayed in the "Bonus" column.



	L	M
	Rank	Bonus
	3	100
	1	1000
	2	500

The 'Total commission' column is the sum of the sales commission and the bonus added. In Excel, '=K2+M2'.

	K	L	M	N	
	Commision($)	Rank	Bonus	Total commissio	N
4	13792			13792	
2	1712.2	3	100	1812.2	
3	8676.45	1	1000	9676.45	
3	17526.6			17526.6	
3	17769.15	2	500	18269.15	

The 'Margin' column shows the overall margin of each transaction, computed by subtracting the total commission from the selling price. In Excel, '=H2-N2'.

Selling Price	Commision(%)	Selling Unit	Commision($)	Rank	Bonus	Total commissio	No. of Collapsed case	Margin
4432	35%	2	3102.4			3102.4		=H2-N2
12483	20%	3	7489.8			7489.8		4993.2
918	30%	2	550.8			550.8		367.2
13224	20%	3	7934.4	3	100	8034.4		5189.6

Analysis Workbook & Report Workbook:

1. Sales Analysis (Monthly and Quarterly) worksheet

Month	Quarter	Product Category	Selling unit	Monthly Sales	Quartely sales	commission	Monthly Margin	Quaterly Margin	Quaterly Commission
January	1	4(Travel,Health,Life,Vehicle)	33	155745		70940.75	83204.25		
Feburary	1	5(Travel,Health,Life,Vehicle,Accident)	55	280784		185388.75	93795.25		
March	1	5(Travel,Health,Life,Vehicle,Accident)	42	132046	568575	99616.65	30829.35	207828.85	355946.15

There are different columns for different datasets. Month and Quarter columns represent the timeslot of the sales. The product category column represents the types of insurance sold on the period of time. We have used the "sum if" function in excel to generate the selling unit for the total number of every month. The selling unit times the selling price of the product will equal the column of Monthly sales. We used the "sum" function in excel to generate a Quarterly sales column by adding up the data of Monthly sales for every four months. Moreover, the "commission" column of the workbook has used the "sum if" function to generate the data from the Combine Data worksheet. The Quarterly Commission columns are produced by using the "sum" function of Excel to add up the commission for every four months. Finally, we have the column of monthly margin and quarterly margin respectively. It calculates the difference between monthly sales and the commission and minus the fixed cost $1600.

The Sales Analysis (Monthly and Quarterly) contains crucial data pertaining to the sales performance of insurance products over specific time periods. The Month and Quarter columns provide a breakdown of sales figures on a monthly and quarterly basis, allowing for detailed analysis of sales trends and patterns. The Product Category column categorizes the different types of insurance products sold, offering insights into the demand and popularity of each category. The utilization of the "sum if" function in Excel to calculate selling units and monthly sales enables a comprehensive overview of the volume and revenue generated from each product category.

Moreover, the Commission column in the workbook reflects the commissions earned by sales representatives for selling insurance products, drawing data from the Combine Data Worksheet to ensure accuracy and consistency. This commission data is aggregated into the Quarterly Commission column, providing visibility into the earnings of sales personnel over a quarterly time frame.

Furthermore, the Monthly Margin and Quarterly Margin columns play a critical role in determining the profitability of the sales operations. By subtracting the total commission and fixed costs from the monthly and quarterly sales figures, these metrics offer valuable insights into the financial performance and efficiency of the sales activities. The comprehensive data presented in this workbook serves as a valuable tool for assessing sales performance, identifying opportunities for growth, and making informed business decisions.

Figures 1 (a) and 1(b) in the Report Workbook present a visual representation of the monthly sales and commissions for the year 2023. The line graphs in both figures exhibit a strikingly similar pattern, suggesting a direct relationship between sales and commissions. This correlation indicates that as sales increase or decrease, there is a corresponding impact on the commission earned by sales representatives. The alignment in the shape of the sales and commission lines signifies a consistent and proportional change between these two variables over the course of the year.

This direct variation relationship between sales and commissions has significant implications for the financial performance of the business. The interplay between these two critical metrics not only influences revenue generation but also affects the overall profitability and margin of the company. Figure 3 further illustrates the impact of this relationship on the monthly margin, which is calculated as the difference between sales, commission, and the fixed cost of $1600.

The observed fluctuations in the monthly margin can be attributed to the dynamic nature of sales and commission figures. Changes in sales volume, commission rates, or operating expenses can directly influence the monthly margin, shaping the financial health and viability of the business. These fluctuations may provide valuable insights into the efficiency of sales

operations, the effectiveness of commission structures, and the overall cost management strategies employed by the company.

Based on the direct variation relationship between sales and commissions showcased in Figures 1 and 2, one hypothesis could suggest that a strategic increase in sales efforts could lead to a corresponding rise in commission earnings, contributing to improved profitability. Conversely, a decline in sales performance may result in lower commission income, potentially leading to tighter profit margins. These findings underscore the intricate interplay between sales, commissions, and margins in shaping the financial performance of the business.

Figure 1(a):

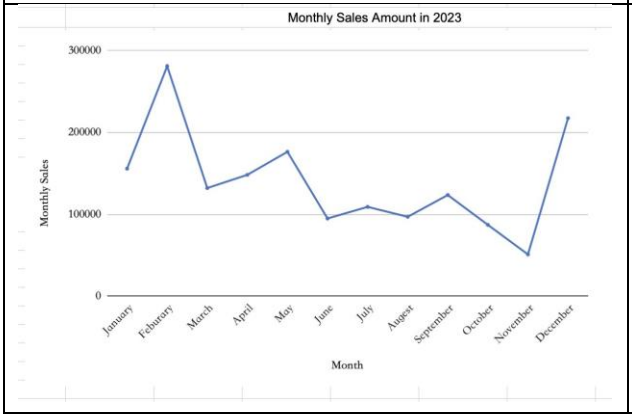


Figure 1(b):

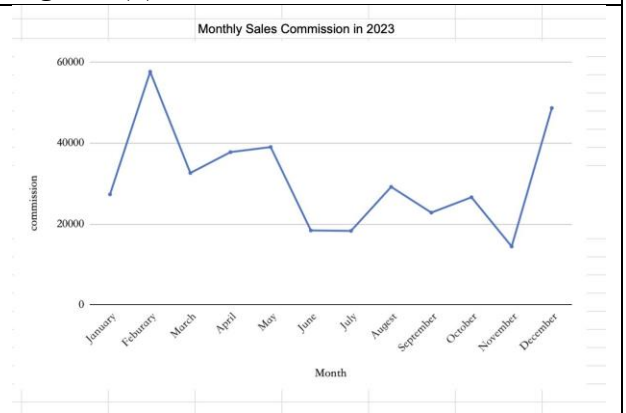
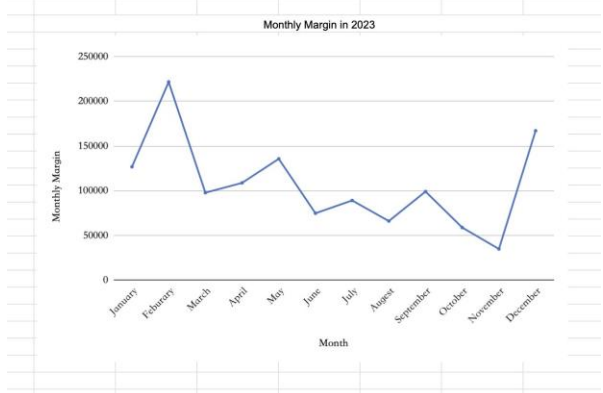


Figure 2:

Summary statistics about the monthly margin		Summary statistics about the monthly sal
Mean	106750.7958	139409.4167
Mode	1358	1940
Median	98480.425	127790.5
SD	51008.46684	62757.26217

Figure 3:



2. Sales Analysis (Product Category) worksheet

Sales Amount		Month											
		January	Feburary	March	April	May	June	July	August	September	October	November	December
Product Category	Travel insurance	10510	62040	52537	59655	39932	4432	0	63276	11445	56737	26208	67394
	Health insurance	14172	56018	35580	52585	77964	54972	30437	q	31729	22729	13224	40309
	Life insurance	6962	875	1377	5666	3260	2712	1933	1644	2714	5754	3827	1891
	Vehicle insurance	123047	160363	39477	28991	53202	31399	75485	0	77647	0	4542	105009
	Accident insurance	1054	1488	3075	1283	1932	1360	1219	2612	0	1896	3214	2718
	Monthly Total	155745	280784	132046	148180	176290	94875	109074	67532	123535	87116	51015	217321
	Quaterly Total		568575			419345			300141			355452	

Sales Unit													
		January	Feburary	March	April	May	June	July	August	September	October	November	December
Product Category	Travel insurance	2	20	14	13	18	2	0	18	5	15	7	15
	Health insurance	21	41	8	15	14	12	5	5	6	5	3	10
	Life insurance	22	31	3	12	8	11	4	3	9	16	9	5
	Vehicle insurance	27	15	6	5	7	3	6	0	7	0	1	11
	Accident insurance	24	26	11	7	11	8	7	11	0	7	14	13
	Monthly Total	96	133	42	52	58	36	22	37	27	43	34	54
	Quarterly Total		271			146			86			131	

The worksheet is to provide a comprehensive overview of sales performance for different types of insurance products on a monthly basis. By utilizing the "sum if" function in Excel, the workbook accurately calculates the sales amount and sales unit for each type of insurance, including Travel insurance, Health insurance, Life insurance, Vehicle insurance, and Accident insurance.

The Sales Amount column displays the total sales amount for each type of insurance product for a specific month, allowing for a clear comparison between different product categories. This data can be used to track sales trends, monitor performance, and identify areas for improvement in sales strategies.

Similarly, the Sales Unit column showcases the total number of cases or transactions completed for each type of insurance product within a month. This information is valuable for understanding customer demand, evaluating business growth, and making informed decisions on resource allocation.

To sum up, the Sales Analysis (Product Category) serves as a valuable tool for analyzing sales performance, identifying key trends, and making strategic decisions to drive business success in the insurance industry.

Figures 4 and 5 in Report Workbook depict the sales amount and sales unit data for a distinct month, presenting a visual representation of the distribution of sales among various types of insurance products. Through the utilization of pie charts, the data is effectively segmented to display the relative percentages of each insurance category, enabling a straightforward comparative analysis between the different types. By visually illustrating the proportions of sales attributed to each type of insurance, stakeholders are provided with a simplified and easily interpretable overview of the sales distribution. This graphical representation facilitates a comprehensive assessment of the variations in sales performance across the diverse insurance categories, offering valuable insights into the comparative success and contribution of each product type to the overall sales volume and number of units sold. The use of pie

charts in presenting the sales amount and sales unit data serves to streamline the analysis process, enabling stakeholders to swiftly discern the relative performance of different insurance categories and make well-informed decisions based on the distribution of sales in the depicted month.

Figure 4:

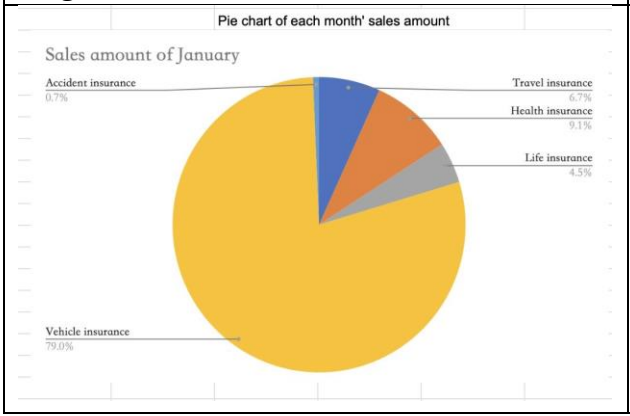
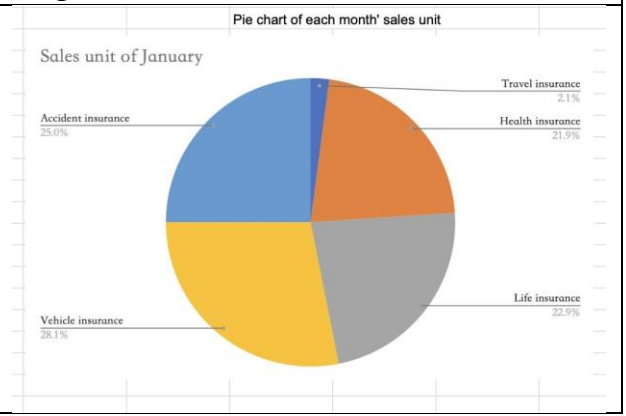


Figure 5:



3.Agent performance analysis (Commission) worksheet

Rank for Each Month

	January		February		March	
1	Candy	8987.85	Danny	14903.5	Filex	10551.9
2	Alex	5441.5	Filex	14005.8	Gary	9802.45
3	Jenny	5358.6	Irene	8218.5	Eason	5239.85
4	Danny	3678.5	Jenny	6956.3	Danny	3529.75
5	Filex	2996.4	Eason	5418.45	Alex	3029.4

	January	Feburary	March
Alex	11329	0	9088.2
Ben	0	7321.6	1450.5
Candy	27546.75	0	0
Danny	7357	47805	13873.75
Eason	2882.4	12648.75	17099.95
Filex	5830.8	46820.5	31655.7
Gary	0	17772.8	26407.05
Henry	0	0	41.5
Irene	0	32649.9	0
Jenny	15994.8	20370.2	0
Total	70940.75	185388.75	99616.65
Team A total	49115.15	67775.35	41512.4
Team B Total	21825.6	117613.4	58104.25
Team A Quartely		158402.9	
Team B Quartely		197543.25	

From this worksheet, we can generate charts like Figures 6 and 7 in Report Workbook which depict the total sales commission for Team A and Team B for a distinct month. Figure 8 depicts the top 5 sales agents for a distinct month. Analyzing performance helps determine whether the existing commission structure effectively incentivizes agents to achieve organizational goals. Commission analysis helps evaluate the performance of

individual agents. This evaluation is crucial for providing feedback, setting performance targets, and making decisions regarding promotions or changes in responsibilities. Each bar might represent an individual agent, and the height of the bar could represent.

various performance indicators We have used the “sum if” function in Excel to generate the commission for the total number of every month and find out the top 5 agents in each month.

Figure 6:

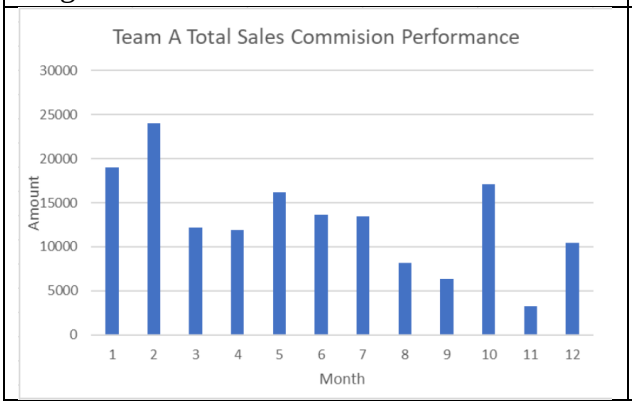


Figure 7:

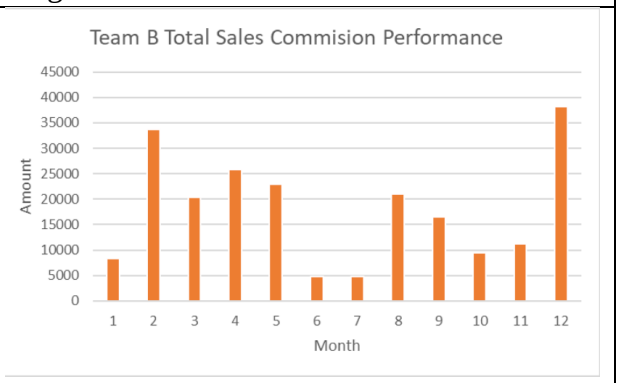
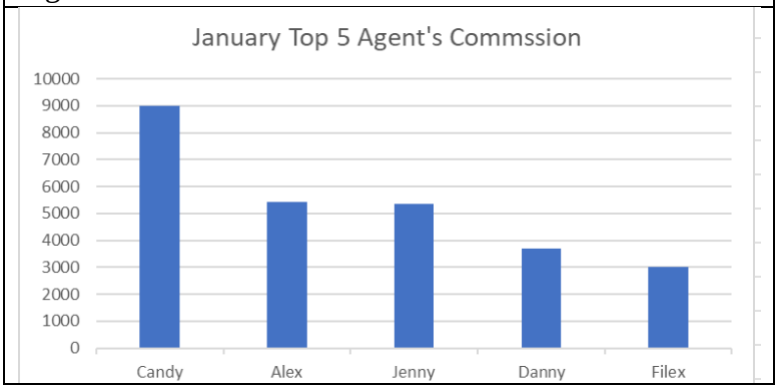


Figure 8:



4.Case Persistency Worksheet

Case Persistency			
Name	No of new case	No. of collpased case	Case Persistency
Alex	46	14	53.33%
Ben	20	14	17.65%
Candy	49	11	63.33%
Danny	55	9	71.88%
Eason	49	11	63.33%
Filex	70	27	44.33%
Gary	41	3	86.36%
Henry	44	1	95.56%
Irene	60	17	55.84%
Jenny	59	16	57.33%
Team A total	219	59	57.55%
Team B Total	274	64	62.13%

The Case Persistency column is a new computation with equation "(No. of New Case – No. of collapsed case) / (No. of New Case + No. of collapsed case)". Figure 9 and Figure 10 depict the case distribution among the new cases and collapse. Through the utilization of pie charts, the data is effectively segmented to display the relative percentages of each team.

In the context of insurance, the concepts of case distribution, new cases, collapse, and the use of bar charts for agent performance visualization can be applied in various ways to enhance efficiency, track workload, and provide insights.

Figure 9:

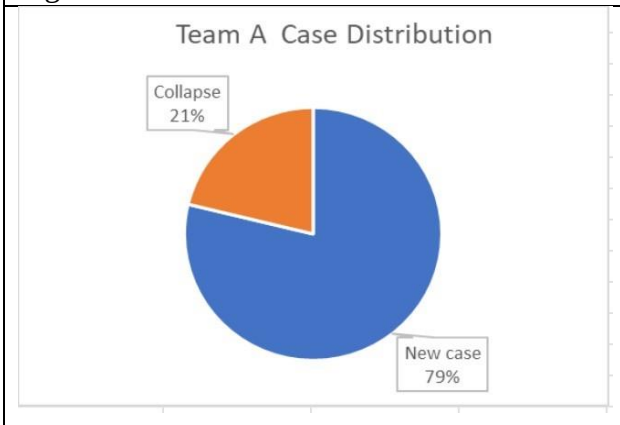


Figure 10: