

Pens and Printers

PRACTICAL EXAM PRODUCT SALES

Presented by: Phuong-Anh Vu Thi



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CASE STUDY

New Product Sales Methods

- Email: Customers in this group received an email when the product line was launched, and a further email three weeks later. This required very little work for the team.
- Call: Customers in this group were called by a member of the sales team. On average members of the team were on the phone for around thirty minutes per customer.
- Email and call: Customers in this group were first sent the product information email, then called a week later by the sales team to talk about their needs and how this new product may support their work. The email required little work from the team, the call was around ten minutes per customer.



QUESTIONS

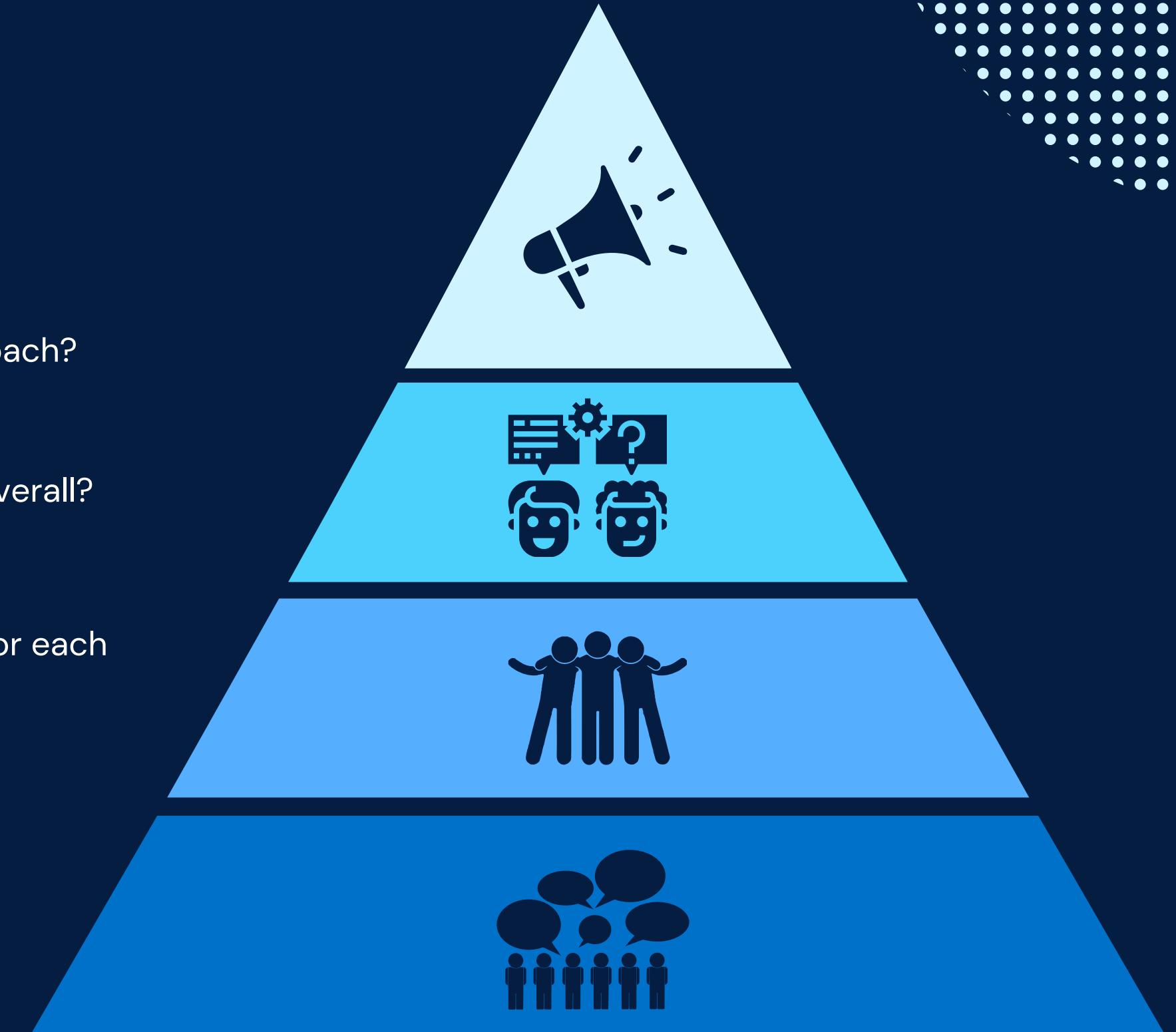
The sales team need to know:

01 How many customers were there for each approach?

02 What does the spread of the revenue look like overall?
And for each method?

03 Was there any difference in revenue over time for each
of the methods?

04 Based on the data, which method would you
recommend continuing to use?



DATA VALIDATION

	week	sales_method	customer_id	nb_sold	revenue	years_as_customer	nb_site_visits	state
0	2	Email	2e72d641-95ac-497b-bbf8-4861764a7097	10	97.13	0	24	Arizona
1	6	Email + Call	3998a98d-70f5-44f7-942e-789bb8ad2fe7	15	225.47	1	28	Kansas
2	5	Call	d1de9884-8059-4065-b10f-86eef57e4a44	11	52.55	6	26	Wisconsin
3	4	Email	78aa75a4-ffeb-4817-b1d0-2f030783c5d7	11	97.13	3	25	Indiana
4	3	Email	10e6d446-10a5-42e5-8210-1b5438f70922	9	90.49	0	28	Illinois

sales_method

There were entries that included "em + call" and "email" which I substituted the originally given values of "Email + Call" and "Email" for respectively.

revenue

There were 1,074 missing values. They are replaced by average revenue grouped by sale methods (Email, Call, Email + Call).

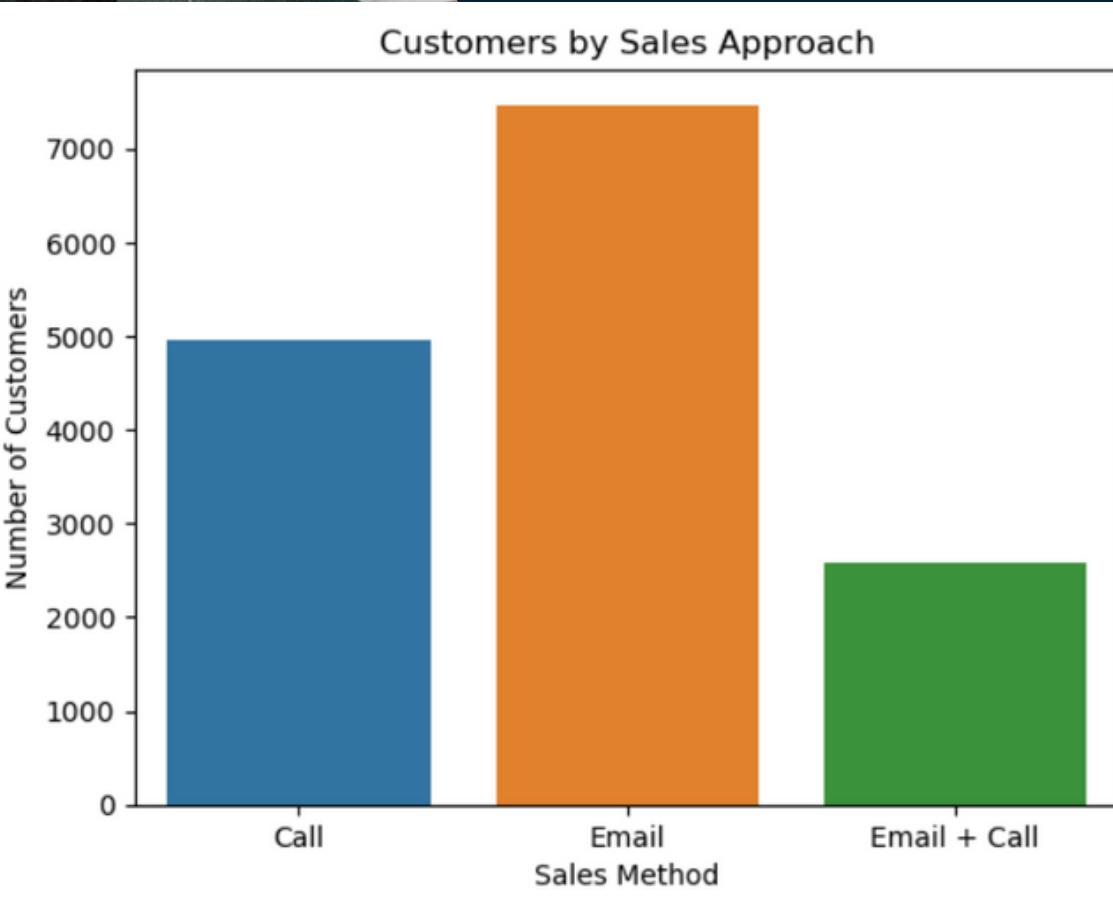
years_as_customer

Since the company is established in 1984 so those with values of 47 & 63 in this column, needed to be removed.

EDA - QUESTION 1

How many customers were there for each approach?

```
sales_method  
Email      7465  
Call       4961  
Email + Call 2572  
Name: count, dtype: int64
```

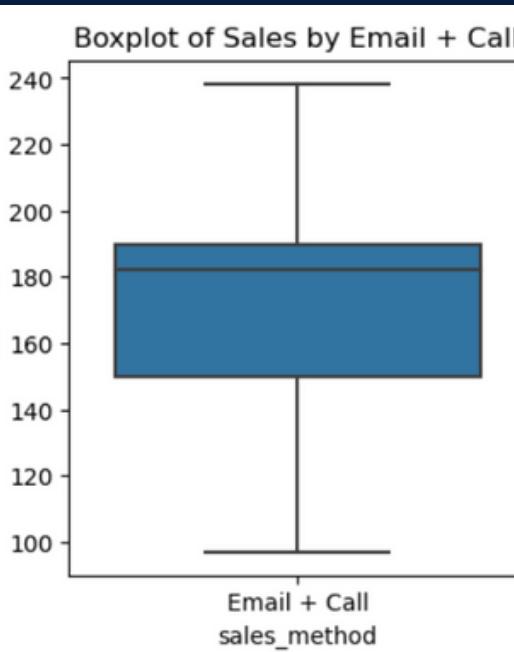
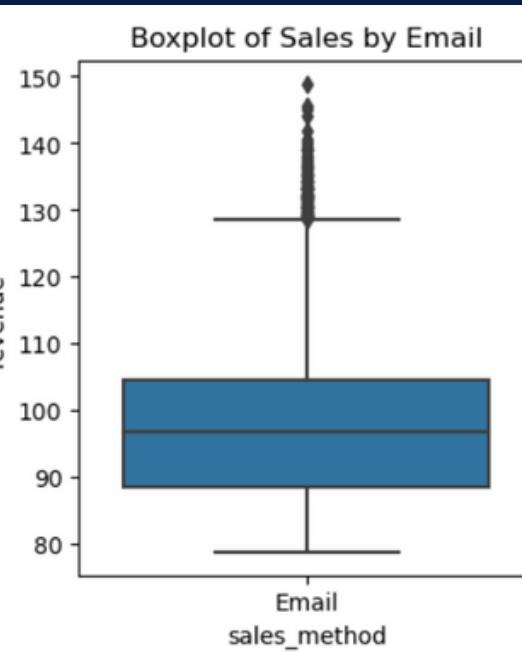
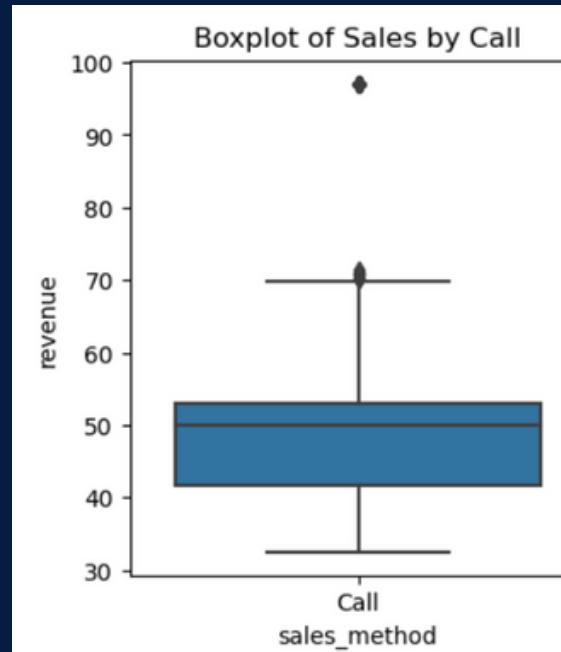
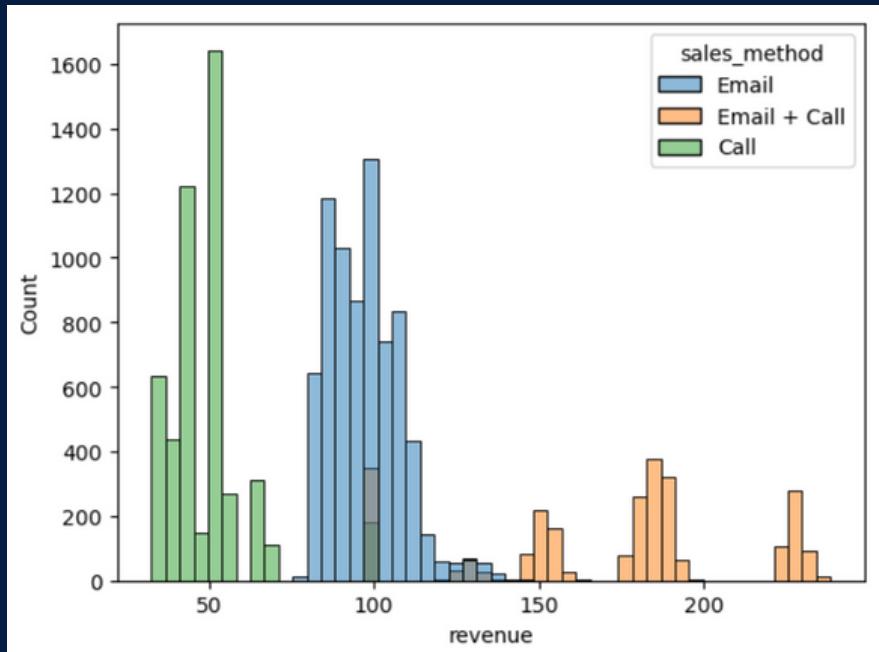
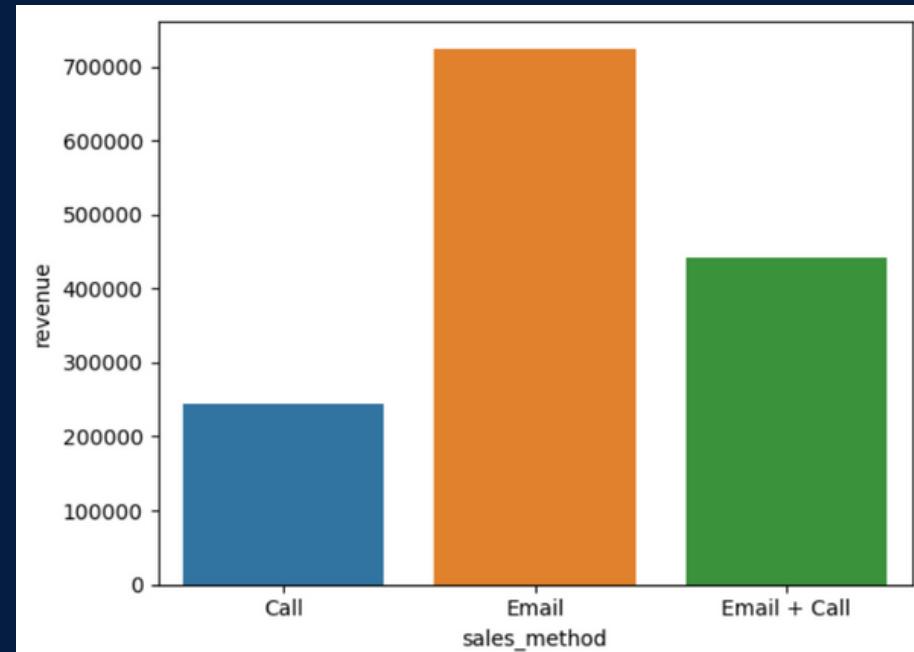


After calculating and plot the number of customers for each sale method, we can see that:

- Email is the sale method attract biggest number of customers (7465).
- Call is in the second position among 3 method (4961).
- Email + Call attracts smallest number of customers (2572).

EDA - QUESTION 2

What does the spread of the revenue look like overall? And for each method?



Look at the above chart, we can see that:

- Email continues to attract the biggest revenue.
- Although, "Email + Call" is the smallest customer group, it shows better revenue compared to Call.
- In the bottom of the list is Call with smallest revenue.

We also see that:

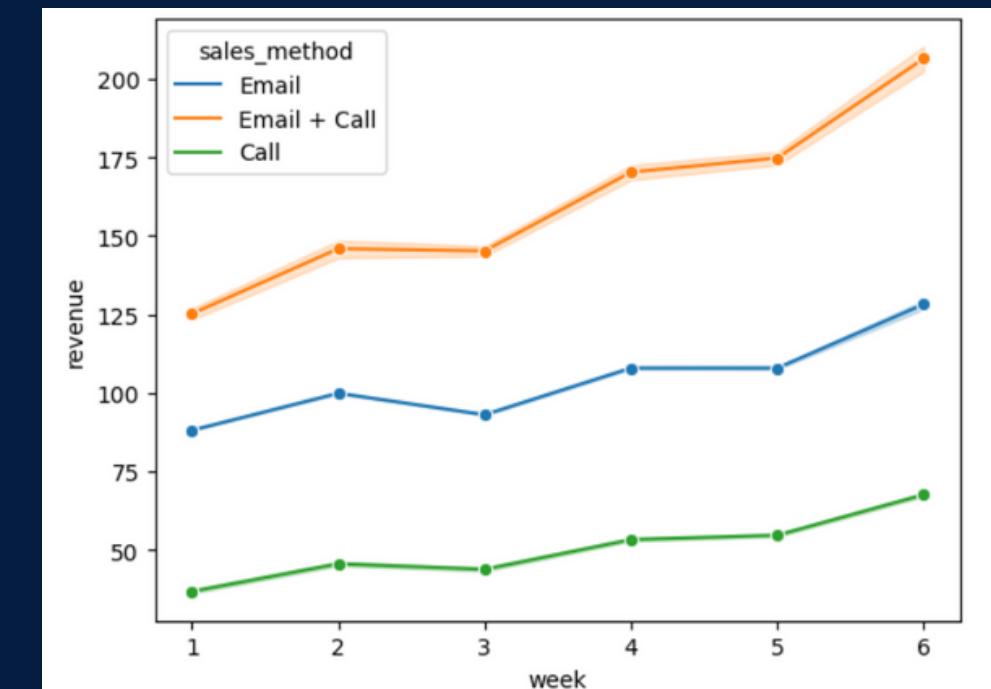
- "Email + Call" have their revenue distributing in a higher value range (from about 100 - 240).
- Email records middle range (from about 80 - 150).
- Call records lowest range (from about 32 - 70).

This can be explained why "Email + Call" attracts smallest number of customers but still brings about revenue much more Call.

EDA - QUESTION 3

Was there any difference in revenue over time for each of the methods?

Overall, all three methods have increasing trend in revenue over time. However, "Email + Call" shows the biggest magnitude of increase and highest values of revenue. Following that is Email, then Call. These lines indicates a significant difference between revenue values over time of each method.

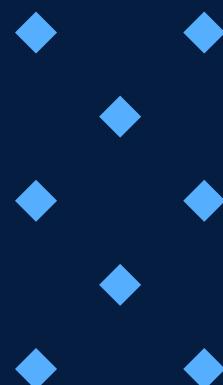


EDA - QUESTION 4

Which method would I recommend you continue to use?

Based on the data and above charts, I have some recommendations for the sale method that you should use:

- Call method proves the weakest records in both number of customers and revenue. In addition, this method cost much time from the sales team. So that, it's better to focus on the other methods.
- Email show the best records in both number of customers and revenue. This is also the method requires least effort from the sales team. So that, it's can be considered for further using. However, the average value of each order from these method is quite low, then we have to think about the way to upgrade this method.
- Email + Call shows to be the strongest method in yielding revenue. Although the number of customers agree to order after being supported by this method is small, but they buy more. This leads to the recommendation for continuing to use this method. However, you also need to find out which customer group is the most suitable with this method to optimize the cost of time of the sales team.



BUSINESS METRICS

Revenue by method

revenue	
sales_method	
Call	245093.55
Email	725059.33
Email + Call	442155.06

Products sold by method

		sum		
sales_method	Call	Email	Email + Call	
week				
1	5366	24573	1281	
2	7088	14942	2016	
3	7456	10678	3594	
4	10249	11736	5960	
5	11129	8117	9817	
6	5889	2583	8776	

Number of customers of each method

count			
sales_method	Call	Email	Email + Call
week			
1	758	2815	148
2	805	1485	200
3	902	1150	359
4	1004	1075	495
5	1044	743	787
6	448	197	583

Average revenue by method

sales_method	mean			median		
	Call	Email	Email + Call	Call	Email	Email + Call
week						
1	36.817309	88.143204	125.246892	35.230	86.880	128.145
2	45.597416	99.920215	145.965000	43.520	98.830	153.625
3	43.846663	93.085383	145.227549	41.545	92.115	149.670
4	53.312600	107.948298	170.339919	51.340	107.630	180.080
5	54.704904	107.942463	174.829924	53.040	107.610	186.680
6	67.617522	128.227563	206.482710	66.070	129.870	226.790

Summary & Recommendations

After EDA & suggesting some business metrics for this sale problem of sales team, I have some summaries and recommendation:

- Among three methods, "**Call**" is the weakest in both revenue and number of customers. "**Email**" is still the best method with highest number of customers, revenue, and lowest time consuming. "**Email + Call**" shows potential to be suitable with customers buy higher value orders. Therefore, **it's much better to focus on "Email" and "Email + Call" methods.**
- Overall, "**Email**" is the most effective with shortest time and biggest results. **The sales team can use it on a large scale, with many kinds of customers.** However, in the long term, **investing in "Call + Email" may lead to excellent sales performance, as it brings about very competitive revenue, especially when they have competitors in the market.**
- Sales team can continue with "**Email**" and "**Email + Call**" methods for their further activities with better results. However, they may **need more observations with these two methods to gain deeper insights about these two.** Furthermore, they can learn from data that which customer segments are the most suitable for which method. For example, "**Email + Call**" method may suitable with customers who like buying high-end products.
- Finally, the sales team **should use 4 metrics I have proposed for future observation** of these three methods. By comparing these weekly, they can easily spark the differences and follow the trend of each method to adapt quickly with the customers as well as the market.

Thanks for your attention!