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Business Analysis Case Study

Jan 31, 2023

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Subject

- Data was related to direct marketing campaigns of a Portuguese banking institution.
- The marketing campaigns were based on phone calls.
- More than one contact with the same client was required to determine if the product (bank term deposit) would be subscribed (yes) or not (no).

A term deposit is a fixed-term investment that involves depositing money into an account at a financial institution.



Objective

- Identify the factors contributing to **subscription** and provide recommendations for future campaigns to attract more potential participants.



Data Used

- File: bank-full.csv, bank-additional-full.csv
- Source:
<http://archive.ics.uci.edu/ml/datasets/Bank+Marketing#>
- Period covered: from May 2008 to November 2010
- Samples used: 86,399 (45,211 + 41,188)
- Attributes used: 12



Input Variables: X

1. Age (numeric)	2. Marital (categorical): Marital status	3. Job (categorical): Type of job	4. Education (categorical)
5. Housing, 6. Loan (categorical): Has housing loan? Has personal loan?	7. Contact (categorical): The communication type used	8. Month (categorical): The month where the contact occurred.	9. Duration (numeric): The duration of the contact, measured in seconds
10. Previous Contact (numeric): Number of contacts made with this client in previous campaigns before the current one		11. Previous Outcome (categorical): The outcome of the previous marketing campaign	

12. Output Variable: Y = Subscription / No subscription (binary)



Method

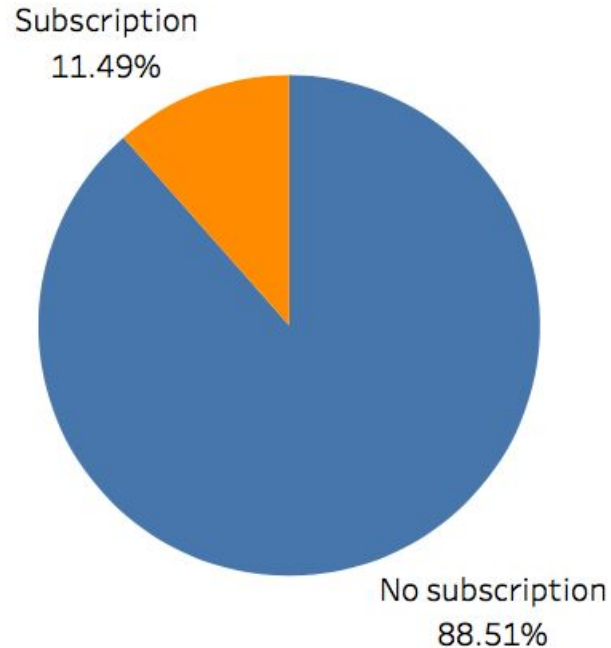
- 1. Combined two datasets in **BigQuery**.
- 2. Calculated the correlation coefficients between Duration and Result (Y) in **Python**.
- 3. Created the graphs in **Tableau Public** to determine which attributes lead to a higher possibility of Yes.





Analysis & Findings (Y = Subscription / No subscription)

“On average, 11.49% will subscribe (yes) to a term deposit.”



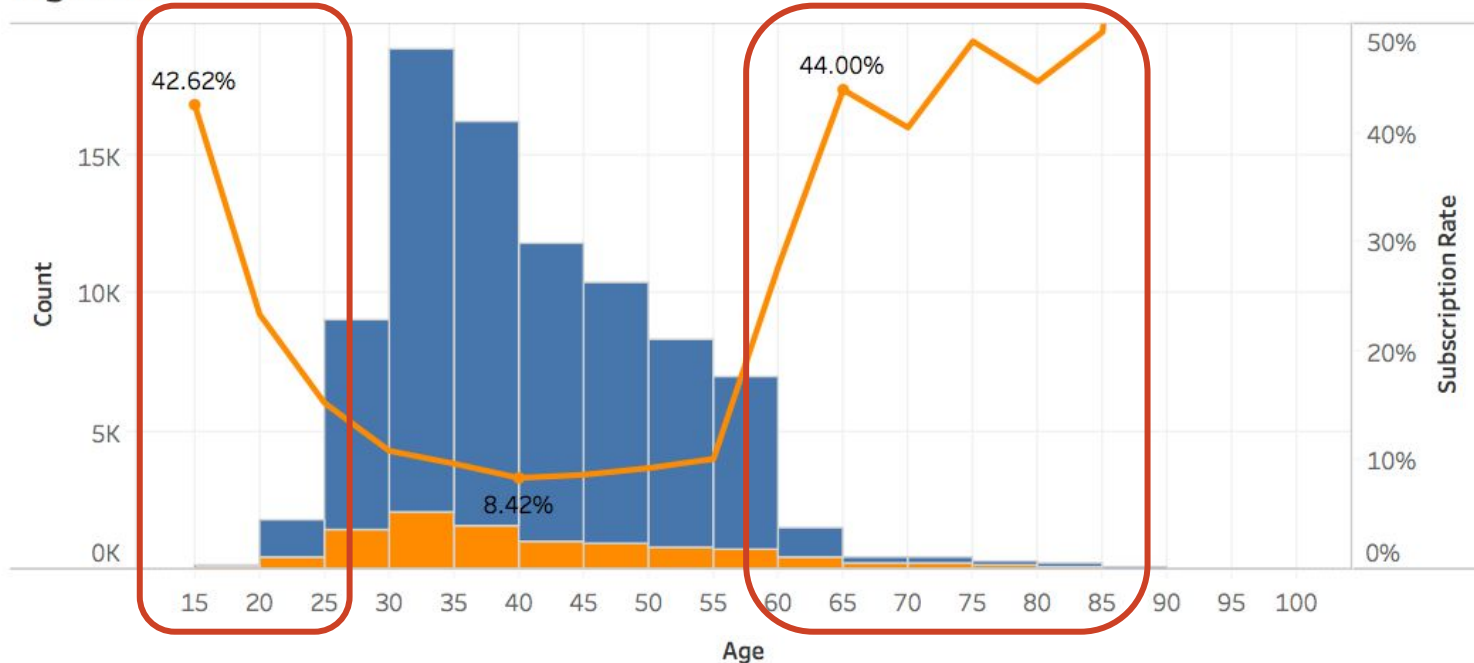
Bank client data:

1.

Analysis & Findings (Age)

“People **below 25 or above 60** are more likely to subscribe.”

Age Distribution

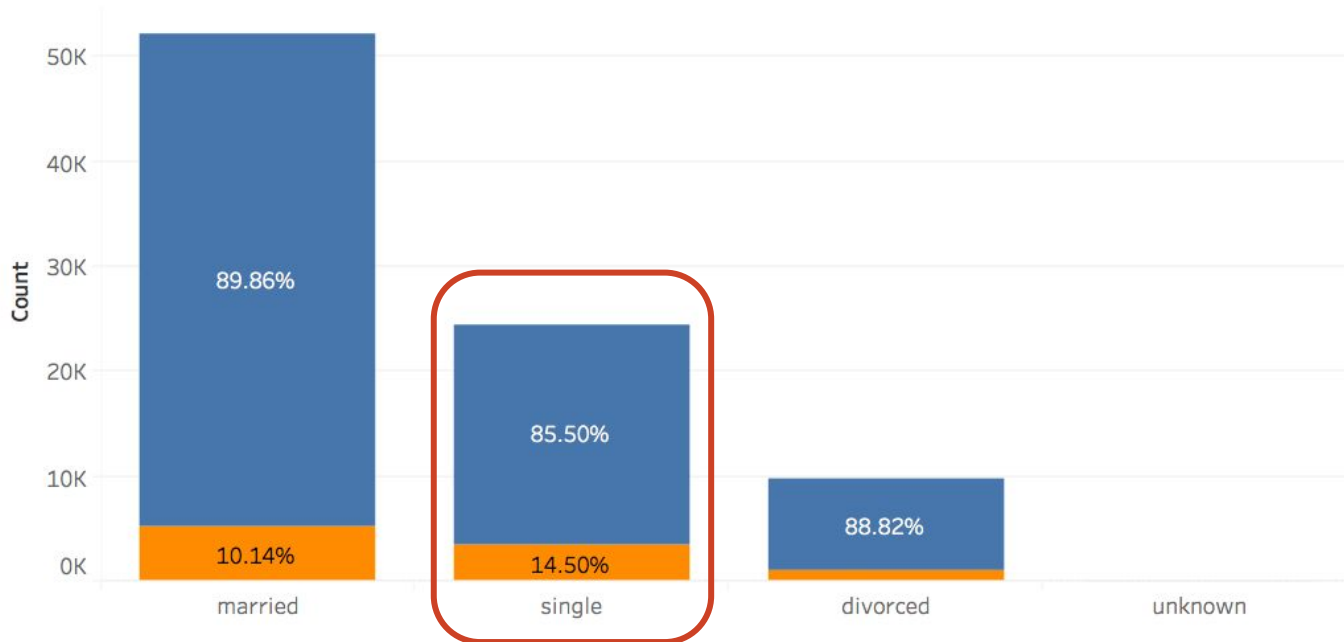


Bank client data: Analysis & Findings (Marital)

2.

“Single people are more likely to subscribe.”

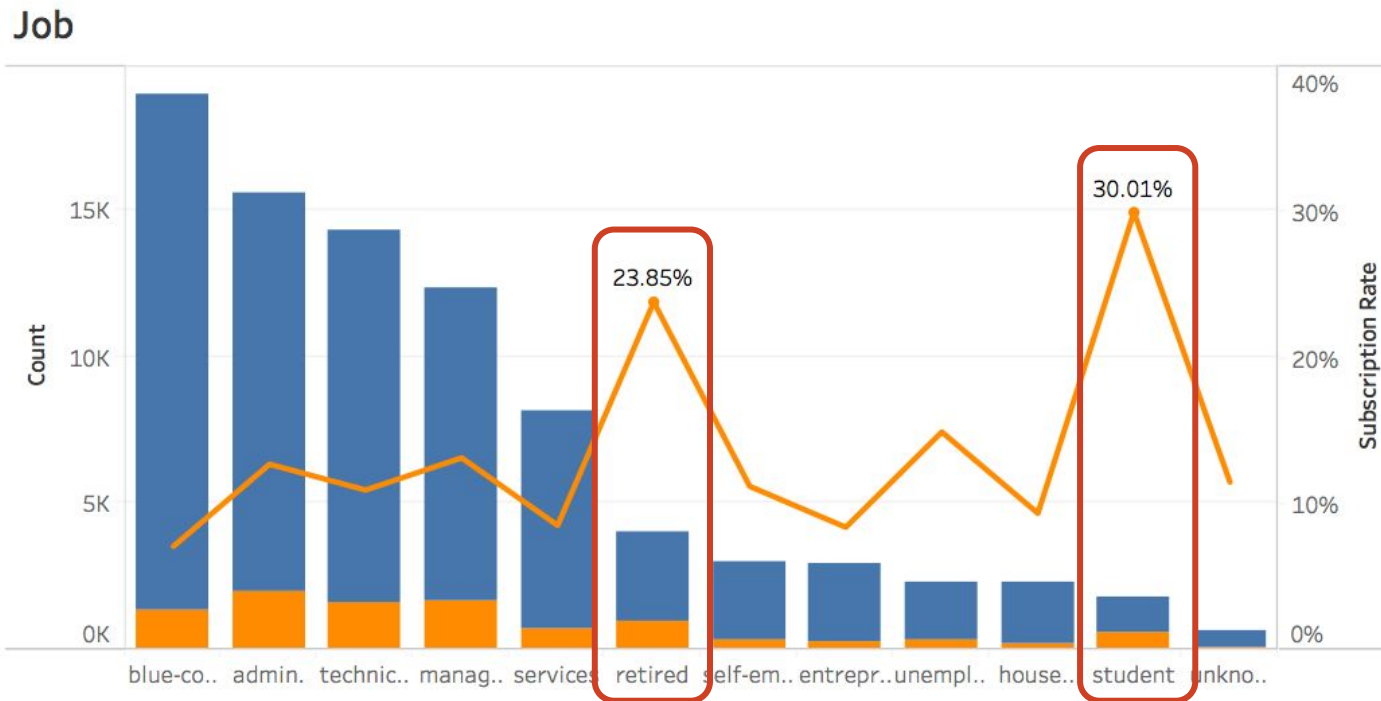
Marital



3.

Bank client data: Analysis & Findings (Job)

“Retired individuals or students are more likely to subscribe.”

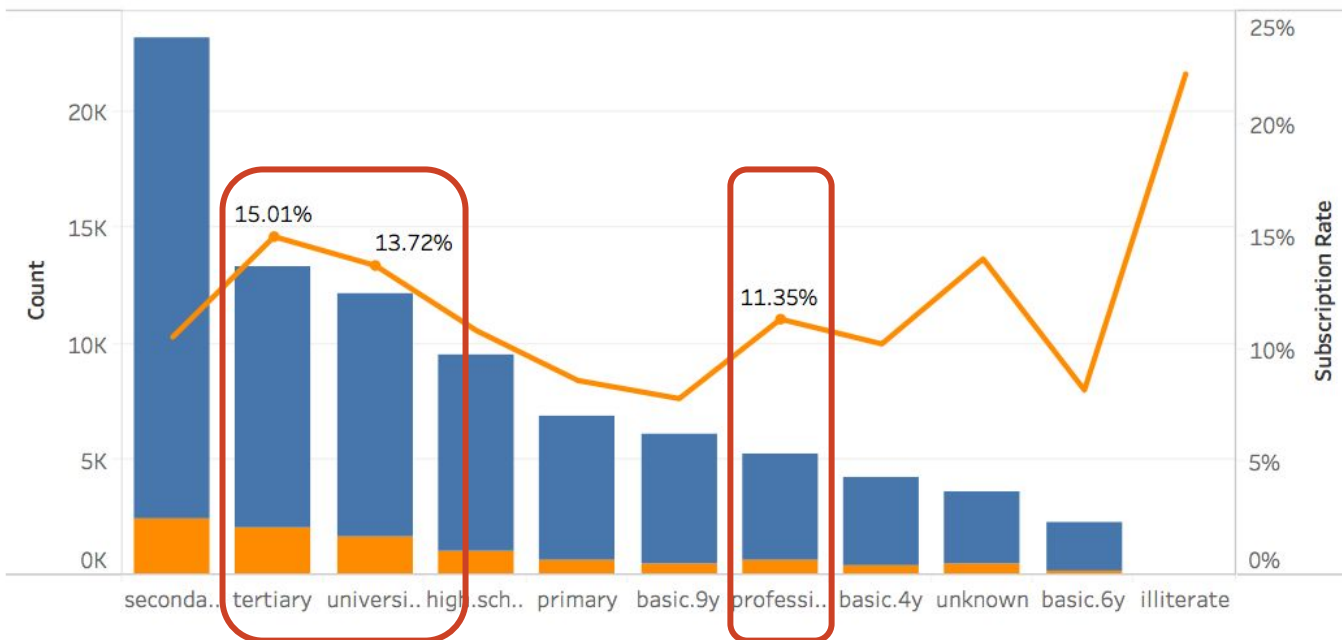


4.

Bank client data: Analysis & Findings (Education)

“Individuals with tertiary education, university degrees, or professional courses are slightly more likely to subscribe.”

Education

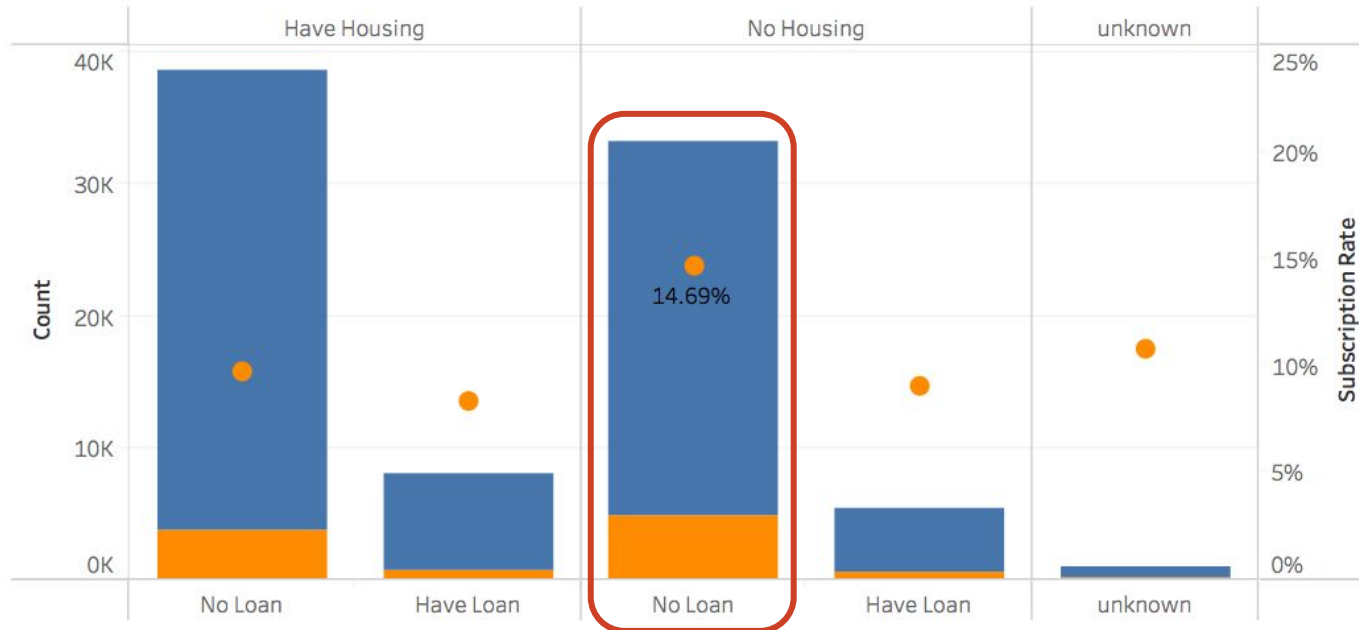


Bank client data:

5. Analysis & Findings (Housing, Loan)

“Individuals without housing or loans are more likely to subscribe.”

Housing, Loan



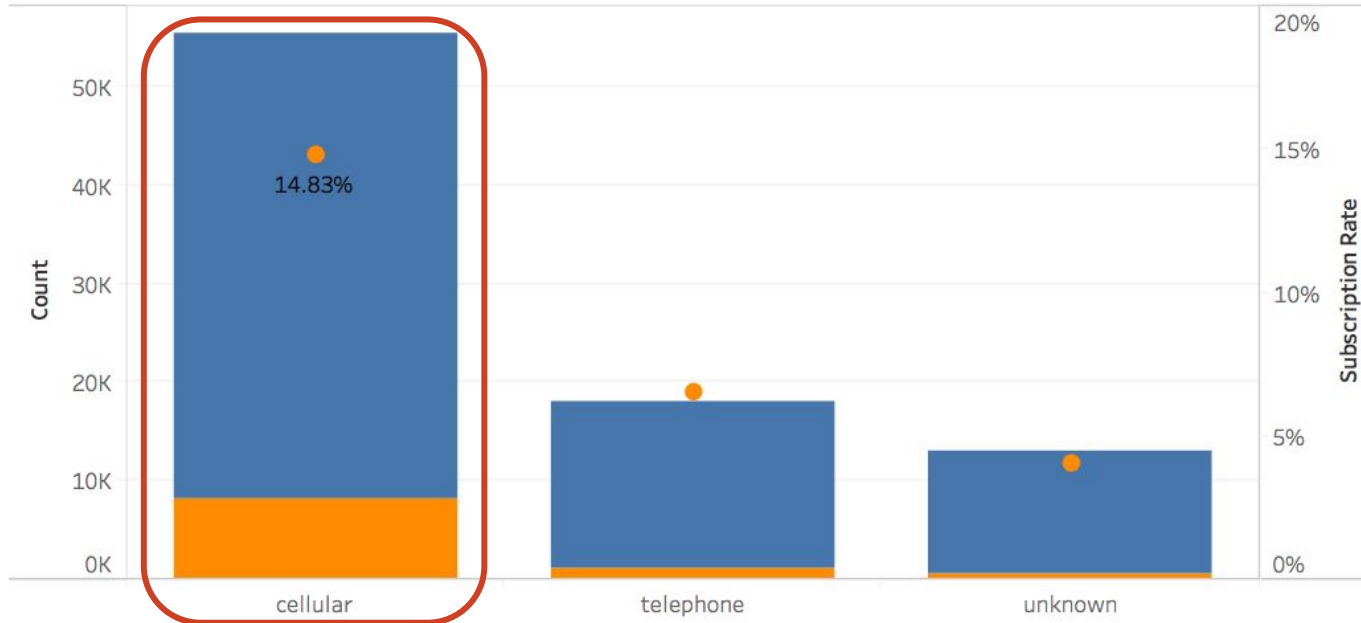
Bank client data:

6.

Analysis & Findings (Contact)

“The subscription rate is higher when contacted by cellular.”

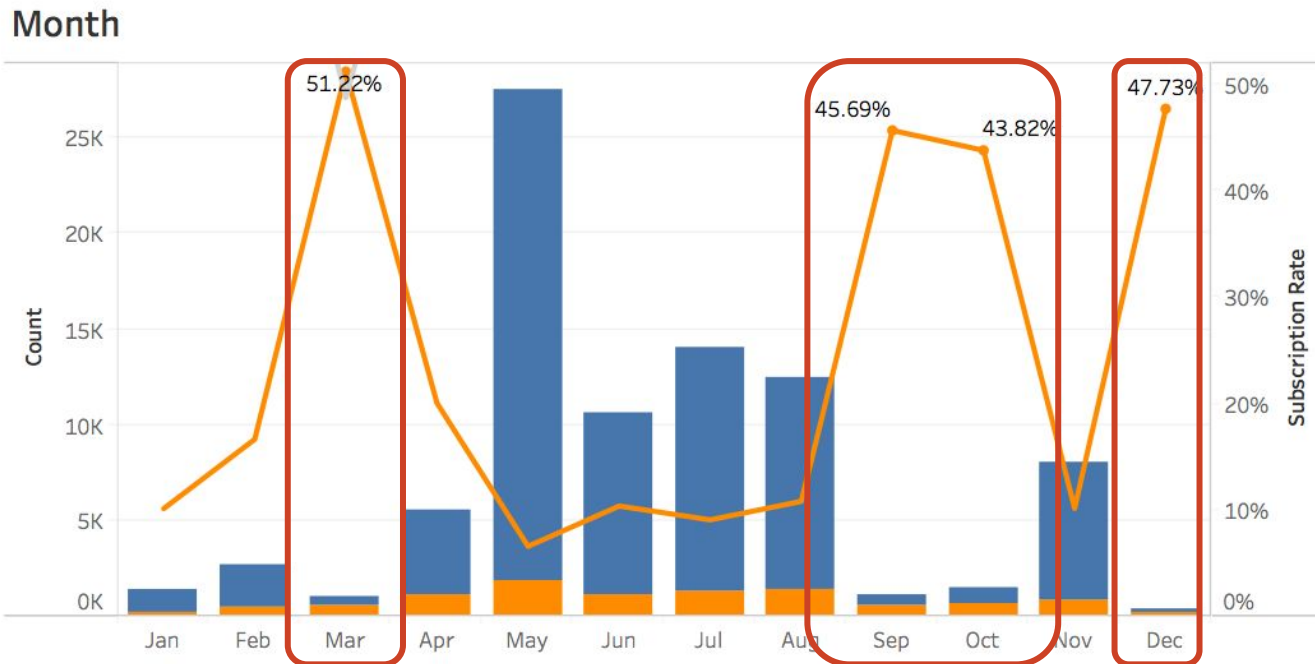
Contact



7.

Last contact: Analysis & Findings (Month)

“Fewer samples exist in March, September, October and December. However, their subscription rates are high, indicating a need for additional investigation in these months.”

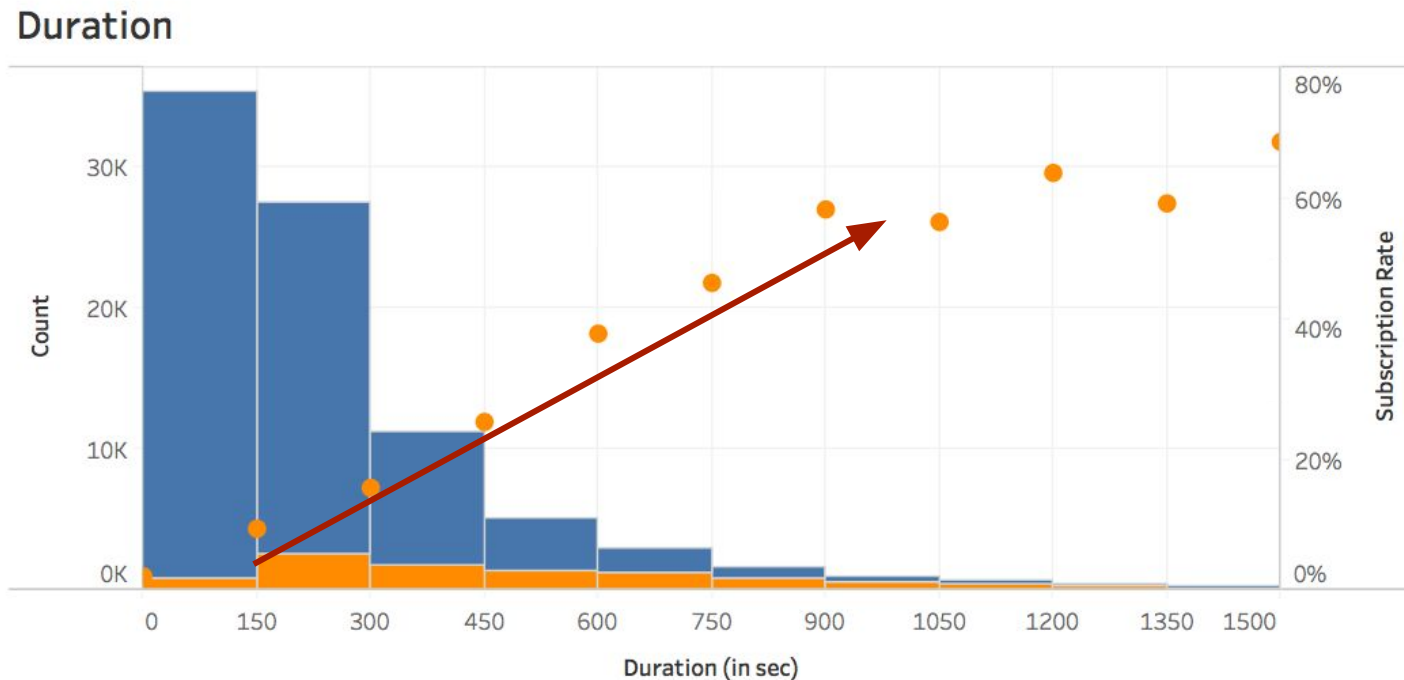


8.

Last contact: Analysis & Findings (Duration)

“A longer duration of the contact leads to a better subscription rate.”

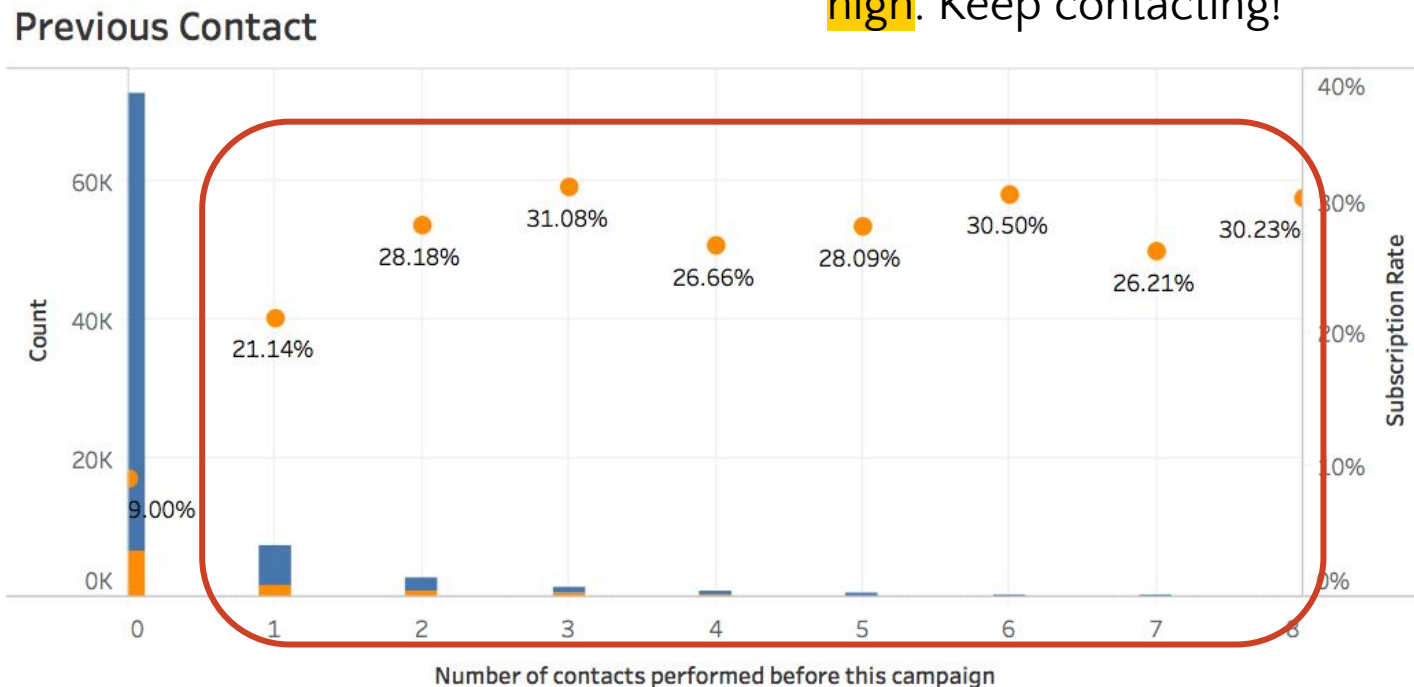
Correlation coefficient: 0.4



9.

Before the campaign: Analysis & Findings (Previous Contact)

“Without any contact before the campaign, a low subscription rate results; one or more contacts are all high. Keep contacting!”

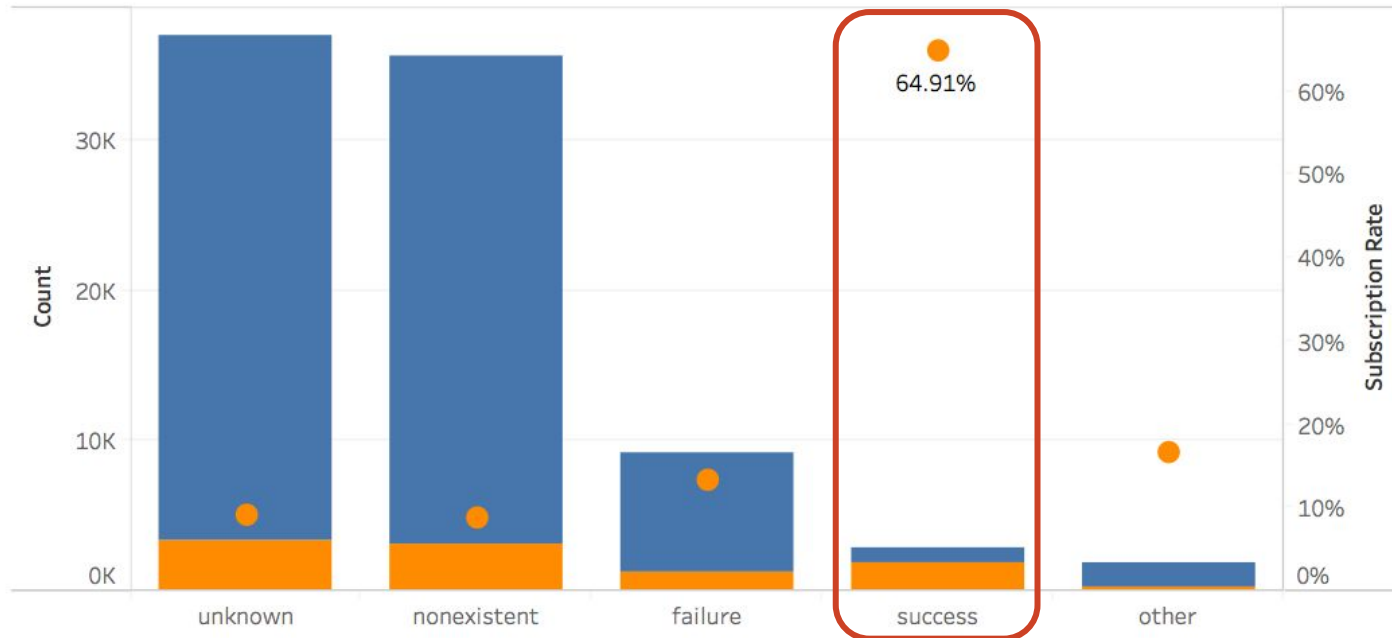


10.

Before the campaign: Analysis & Findings (Previous Outcome)

“If the previous outcome was **successful**, the subscription rate is as high as 64.91%.”

Previous Outcome





Recommendations

- **Bank client data:** Launch campaigns targeting individuals with the following characteristics: young, retired, still studying, higher education, single, no housing or loan.
- **Last contact:** Reach out to them by mobile, especially in March, September, October, and December. Extend the conversation whenever possible.
- **Before the campaign:** Retaining existing successful clients is crucial, but also attempt to reconnect with past contacts.



Thanks!

Any questions ?