
Can We Predict Which Customers Will Say “Yes”?

An Evidence-Based Strategy to Improve
Direct Marketing Campaign Performance

AI Engineer Juan Felipe Caicedo Castro, IC7 case of study / February 2026

The Bottom Line

11%

Current conversion
rate

70%

Potential reduction in
wasted calls

0.81+

Model ranking
accuracy (ROC-AUC)

Contents

1	The Problem in Plain English	2
2	What the Data Told Us	3
2.1	The Scale of the Challenge	3
2.2	Who Is Most Likely to Subscribe?	3
2.3	When Is the Best Time to Run a Campaign?	4
2.4	What Does <i>Not</i> Work	5
3	What the Model Can Do for the Business	7
3.1	The Power of Ranking Over Guessing	7
3.2	Model Performance, Plain Language	7
3.3	Is a 59% Catch Rate Good?	8
4	Our Recommendations	9
5	The Role of Artificial Intelligence	10
5.1	Predicting Who Will Subscribe	10
5.2	What AI Language Models <i>Can</i> Do	10
6	Summary and Next Steps	12
6.1	What We Found	12
6.2	Recommended Immediate Next Steps	12

1. The Problem in Plain English

Every year, bank marketing teams place tens of thousands of phone calls to customers, offering them the chance to open a term deposit, a savings account with a fixed interest rate and maturity date. It is a simple product, but selling it is not.

Today, roughly 9 out of every 10 calls end in a refusal.

That means the vast majority of agent time, telephony costs, and customer goodwill are consumed by contacts that generate zero revenue. Customers get called at inconvenient times, about products that do not match their situation, and the bank pays for every one of those interactions.

The Core Question

“What if we could predict, before picking up the phone, which customers are genuinely likely to say yes, and focus our entire campaign on them?”

This is exactly what this analysis set out to answer.

Using data from 41,188 real customer interactions collected over several campaign cycles by a Portuguese bank, we built a predictive model that scores every customer on their likelihood of subscribing. The results are significant.

2. What the Data Told Us

We analyzed every piece of information the bank records about its customers and their interactions. Here are the most important business findings, no formulas needed.

2.1. The Scale of the Challenge

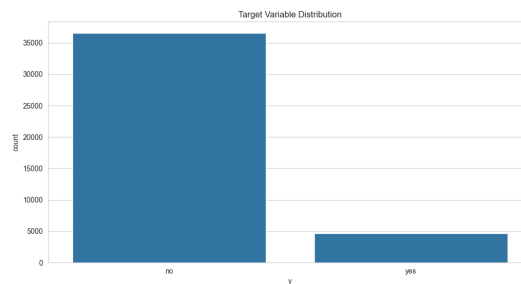


Figure 1: Out of 41,188 contacts in the dataset, only 4,640 resulted in a subscription (11.3%). The remaining 36,548 were unsuccessful calls.

This imbalance is the reason a “call everyone” approach is so costly. The good news: it also means that *identifying the right customers creates enormous leverage*.

2.2. Who Is Most Likely to Subscribe?

1. Customers who were successfully contacted before. Clients who subscribed in a previous campaign convert at dramatically higher rates in subsequent ones. They already trust the product. They are the easiest wins.

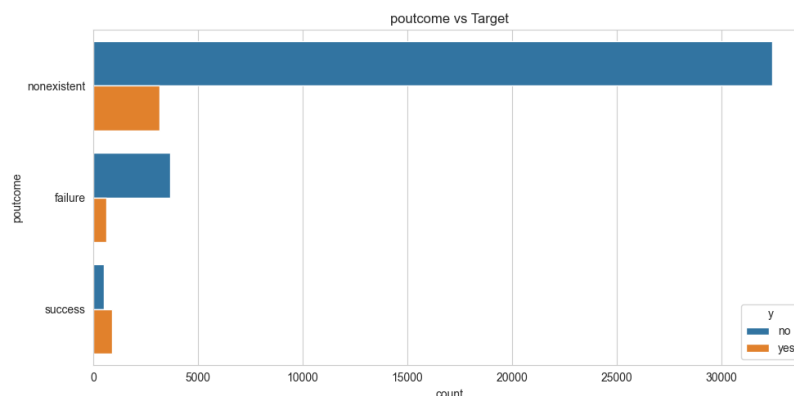


Figure 2: Previous campaign outcome vs. subscription rate. Clients with a prior successful outcome (“success”) are *far* more likely to subscribe again than those who previously refused or were never contacted.

2. Retirees and students. Despite representing a small share of the customer base, these two groups convert at rates well above average. They tend to have more flexibility with their savings and respond well to fixed-rate instruments.

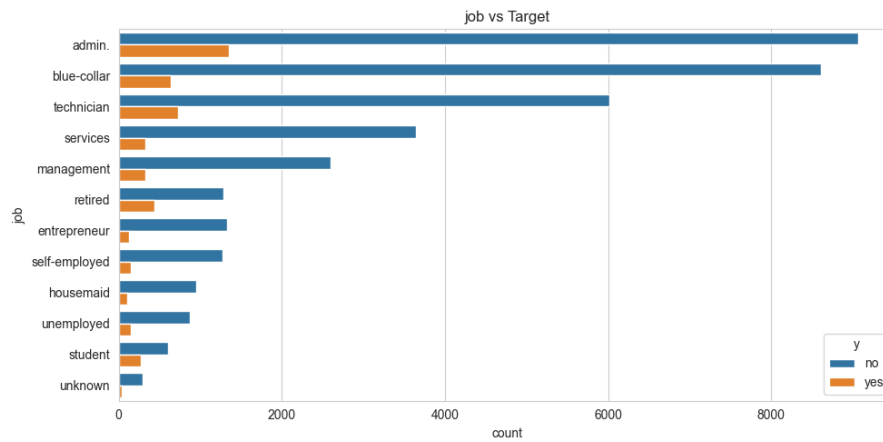


Figure 3: Subscription rate by profession. Retired and student clients show significantly higher conversion rates than the average, making them high-value targets for focused outreach.

3. Customers contacted via mobile phone. Clients reached on their cellular phone are more likely to subscribe than those reached on a landline. A simple operational change, prioritizing mobile contacts, can improve results without any additional cost.

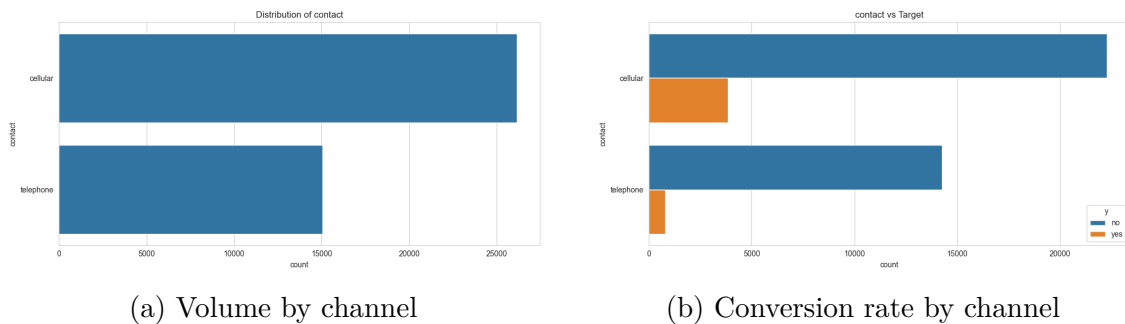


Figure 4: Mobile contacts outperform landline both in volume and in conversion rate.

2.3. When Is the Best Time to Run a Campaign?

Timing matters, a lot. The data shows that external economic conditions have a powerful influence on whether customers are open to saving.

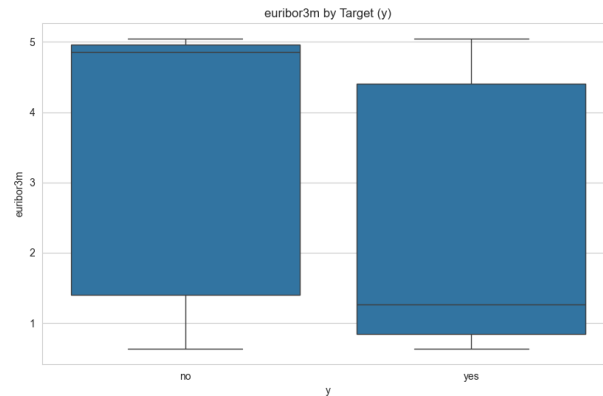


Figure 5: Euribor 3-month rate vs. subscription outcome. Customers who subscribed (“yes”) were overwhelmingly contacted during periods of low interest rates. When market rates are low, a guaranteed fixed-rate deposit becomes much more attractive.

Macro-Timing Rule of Thumb

Launch your most intensive campaigns when the Euribor 3-month rate is below 2%. When rates are high (above 4%), customers have better alternatives and are much harder to convert, save the budget.

Seasonality also matters:

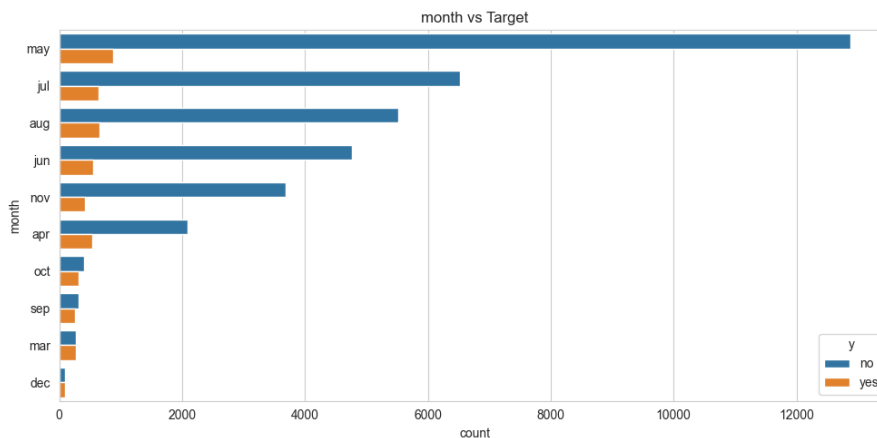


Figure 6: Subscription rate by month. March, September, October, and December are consistently the highest-converting months despite having lower call volumes, a strong signal to concentrate resources in those periods.

2.4. What Does *Not* Work

Calling the same customer too many times is counterproductive. The data consistently shows that after the third contact attempt, the probability of a subscription drops sharply. Customers who are going to say yes typically do so within the first few calls.

Repeated attempts on reluctant customers waste resources and risk damaging the relationship.

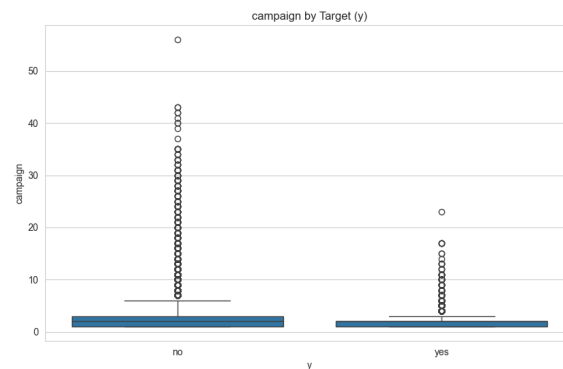


Figure 7: Number of contacts in the current campaign vs. outcome. Successful subscriptions cluster around 1–2 contact attempts. Beyond 3 calls, the additional return is minimal.

Set a hard limit of 3 call attempts per customer per campaign cycle. Customers who do not respond after 3 contacts should be removed from the active list and re-evaluated in the next campaign window.

3. What the Model Can Do for the Business

We trained an AI model to learn from all of these patterns simultaneously. Rather than a human analyst manually reviewing each customer, the model automatically assigns every customer a score from 0 to 1, representing their estimated probability of subscribing.

3.1. The Power of Ranking Over Guessing

Think of it like a ranked shortlist. Instead of working through thousands of customers at random, the call center works from the **top of the ranked list downward**.

Table 1: Estimated impact of using model-ranked calling lists

Approach	Calls required to capture most subscribers	Estimated call volume reduction
Current (unranked)	100% of the list	baseline
Model Top 30%	30% of the list	~70% fewer calls

What This Means in Practice

If your team currently makes 10,000 calls per campaign, a model-ranked approach could achieve similar conversion results with only 3,000 calls — freeing up over 7,000 agent-hours for other activities, or allowing a much smaller team to run the same campaign.

3.2. Model Performance, Plain Language

The model was tested on historical data it had never seen before. Here is what the results mean in everyday terms:

Table 2: What the model's performance numbers mean for the business

Metric	Score	Plain English meaning
Ranking accuracy	0.81 / 1.0	81% of the time, the model correctly identifies who is more likely to subscribe compared to who is not. A random guess would score 50%.
Subscribers caught	59%	If the model selects 1,000 customers, it will correctly identify 590 of the real subscribers in the list.
Precision	47%	Of every 100 customers the model flags as high priority, 47 will actually subscribe, more than 4× the baseline rate of 11%.

3.3. Is a 59% Catch Rate Good?

For context: today, without a model, calling a random customer gives you an 11% chance of a subscription. With the model's top-ranked list, that rises to 47%, a four-fold improvement in hit rate. Put differently, for every 100 calls made from the model's list, agents close approximately 4 times more deals than they would from a random list.

4. Our Recommendations

Based on the data analysis and model results, we propose the following five actions, ordered by expected impact.

Before each campaign, run every customer through the model to generate a priority score. Sort the call list by score, descending. Work from the top down. This single change is estimated to reduce cost-per-acquisition by 40–60%.

Customers who subscribed in past campaigns should always be at the top of the queue, regardless of their model score. Empirical conversion rates for this group exceed 60%. These are your easiest wins.

Track the Euribor 3-month rate. When it falls below 2%, accelerate outreach. When it exceeds 4%, reduce volume and conserve budget. This is not about waiting, it is about concentrating firepower when market conditions favor you.

Set a firm policy: no customer receives more than 3 calls per campaign. This respects the customer relationship and reallocates agent time from stubborn leads to fresh, high-probability prospects.

Once you know *who* to call (the model), use AI writing tools to prepare *what to say*. A retired customer and a young professional respond to different language and different concerns. Personalized scripts, generated automatically from the customer profile, have been shown to improve engagement and reduce the time agents spend on preparation.

5. The Role of Artificial Intelligence

A common question: “*Could we just use ChatGPT or a similar AI to do all of this?*”

Straight Answer

Not for the prediction itself, but yes, as a powerful companion for everything that happens after the prediction.

5.1. Predicting Who Will Subscribe

Predicting whether a specific customer will subscribe is a **numbers problem**: their age, their account history, the economic environment, how many times they have been called. For this kind of structured, numerical task, classic machine learning models (like the one we built) are more accurate, faster, cheaper, and more transparent than general-purpose AI language models.

Language models like ChatGPT are designed for text, they are not the right tool for scoring thousands of customer records against numerical patterns.

5.2. What AI Language Models *Can* Do

Once the model has identified the right customers, AI language tools (such as GPT, Claude, or similar) become genuinely valuable:

- Write personalized call scripts. Given a customer’s profile , age 62, retired, previously contacted in March, an AI tool can draft a tailored opening conversation in seconds. Agents review and use it, saving preparation time and improving relevance.
- Analyze why customers say no. AI can listen to (or read transcripts of) declined calls and identify the most common objections, concerns, and language patterns. This feeds directly back into improving future campaigns.
- Handle digital channels. For customers who prefer not to receive phone calls, an AI assistant can engage them via chat, answer product questions, and guide them through the subscription process — all without human involvement for routine interactions.

Table 3: Division of responsibilities between AI types

	Predictive AI (our model)	Generative AI (ChatGPT-style)
Main question	<i>Who should we call?</i>	<i>What should we say?</i>
Strength	Numerical patterns in data	Writing, summarizing, conversing
Business role	Customer ranking and prioritization	Personalization and communication
Cost	Very low per customer	Low-to-medium per interaction

The optimal strategy uses both in sequence: the predictive model selects *who to contact*; the AI writing tool decides *how to engage them*.

6. Summary and Next Steps

6.1. What We Found

- Only 11% of current contacts convert. The vast majority of campaign spend is not generating revenue.
- Predictable patterns exist. Customers who previously subscribed, retirees, and those contacted during low-interest-rate periods are significantly more likely to say yes.
- A working model is ready. Our AI model can rank all customers by likelihood of subscribing, with accuracy well above chance (81% ranking quality).
- Focusing on the top 30% could reduce call volume by 70% while maintaining conversion yield, a major efficiency gain.
- Simple rules are also powerful. Cap contacts at 3 per customer. Prioritize mobile. Focus on March, September, October, and December. Time campaigns to low Euribor periods. These changes cost nothing to implement and will deliver results immediately.

6.2. Recommended Immediate Next Steps

1. Define success thresholds. Agree in advance on what improvement in conversion rate constitutes a clear win (we suggest +3 percentage points as a minimum).
2. Assign an owner. Designate a team member responsible for integrating the model output into the CRM and preparing the ranked call lists before each campaign cycle.
3. Plan the feedback loop. Ensure that call outcomes (subscribed / declined / not reached) are systematically recorded and fed back into model retraining. The model gets better the more data it receives.

The Opportunity in One Sentence

By knowing *who* to call, *when* to call them, and *how* to engage them, this bank can convert the same number of term deposits with a fraction of the current effort, or significantly grow conversions without increasing headcount.