MODELING & EVALUATION

Model Evaluation

ROC Curve Comparison
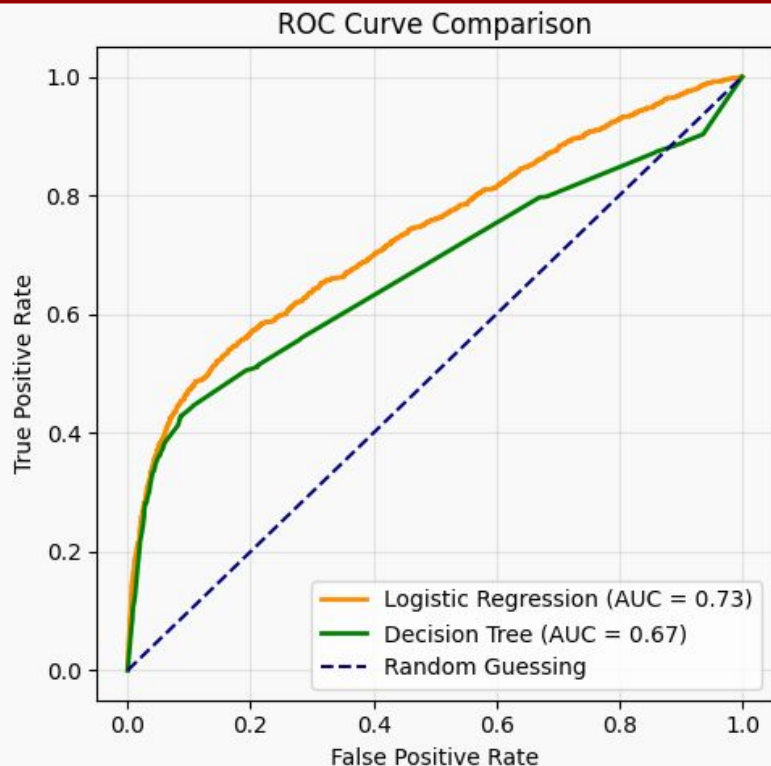
Metric	Logistic Regression	Decision Tree
Accuracy	81.5%	**85.96%** ✅
Precision	0.305	**0.381** ✅
Recall	**0.522** ✅	0.426
F1-score	0.385	**0.402** ✅
AUC	**0.734** ✅	0.672

→ Logistic Regression shows better separation ability.

Model Recommendation

★ **Logistic Regression:**

- Stronger in Recall & AUC → Better at covering buyers

- Key features focus on customer interaction status (contact history, previous campaign outcomes)

★ **Decision Tree:**

- Stronger in Accuracy & Precision → Better at identifying high-potential customers

- Key features combine customer interaction status and customer demographics (age, education, job type) → Offers more intuitive prediction logic

→ **Recommended Model: Decision Tree — preferred for targeting potential buyers effectively**
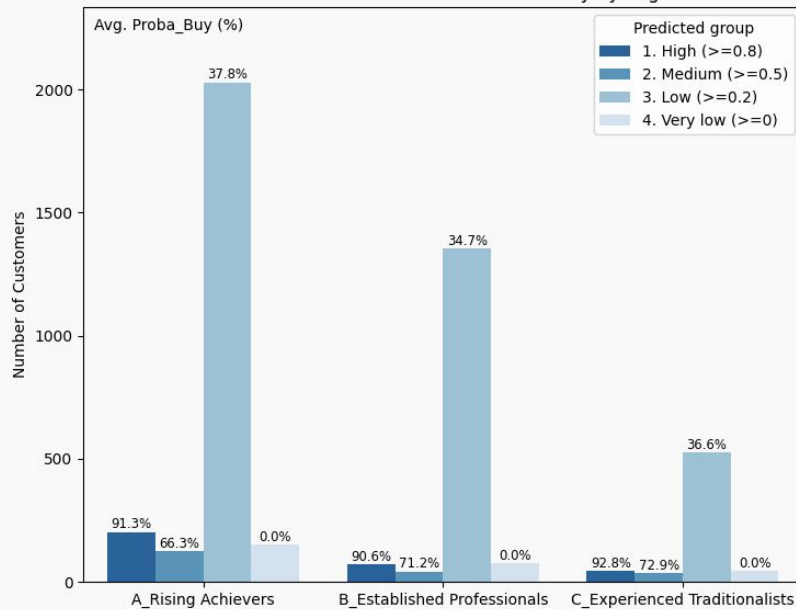
KEY FINDINGS & RECOMMENDATIONS

Applying the Predictive Model to Test Data

★ **Assumption:** This analysis is based on **a bank marketing** campaign targeting **term deposit** subscriptions. The campaign is designed for **long-term objectives** and aims to **optimize resource allocation**.

★ **Description:**

- The test dataset was categorized into the 3 customer segments and apply the predictive model to estimate purchase probabilities:

    + Segment A_Rising Achievers: 2509 customers

    + Segment B_Established Professionals: 1543 customers

    + Segment C_Experienced Traditionalists: 652 customers

    + Unassigned: 6767 customers

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Distribution of Predicted Purchase Probability by Segment | Probability Buy Distribution by Segment and Predicted Group
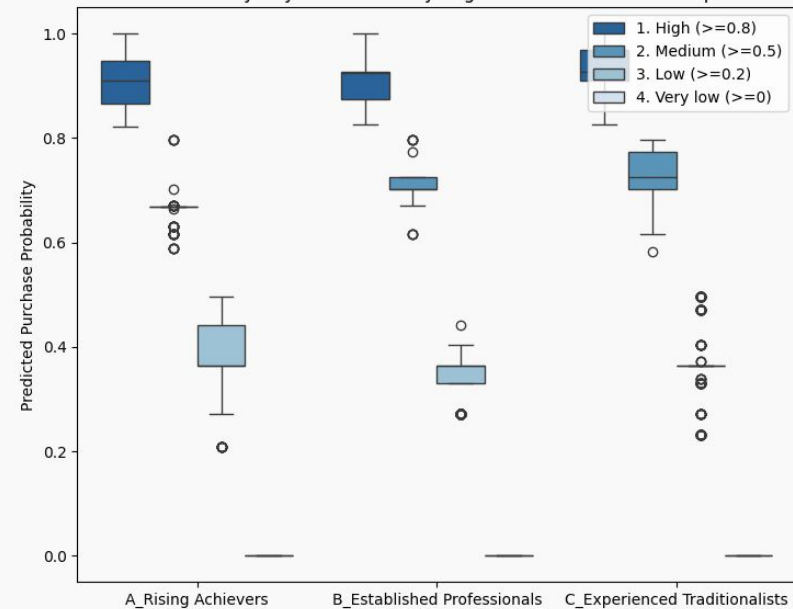
- + **High group (90–93%):** Very high predicted rate. The model distinguishes clearly, strong concentration in prediction accuracy. → Should be prioritized as the primary target for campaign efforts
- + **Medium group (66–72%):** Variable purchase rate by segment. The model's classification is moderately dispersed. → Should have tailored and personalized messaging, promising group if resources allow
- + **Low group (34–38%):** Low predicted rate. The model doesn't clearly distinguish, predictions are still a bit noisy. → Should be nurtured slowly or excluded
- + **Very low (0%):** No purchase likelihood. The model distinguishes clearly → Should not pursuing

Tailored Messaging & Channel Guide

	Segment A *Rising Achievers*	Segment B *Established Professionals*	Segment C *Experienced Traditionalists*
Customer Demographics	Age: 26–35 Job: admin, technician, blue-collar, services Status: single, married Education: university, high school, basic.9y	Age: 36–50 Job: admin, technician, blue-collar, services Status: married Education: university, high school, basic.9y	Age: 51–60 Job: admin, blue-collar, retired, technician, management Status: married Education: university, high school, basic.4y
Key Messaging	- Financial freedom - Competitive interest rates - Flexible short-term options	- Highlight long-term goals - Financial security - Risk-free growth	- Safety - Stable interest rates - Direct customer support
Suggested Channels	- Digital campaigns - In-app notifications - Social media ads	- Email marketing - Direct consultation - Loyalty/member programs	- Phone consultations - In-branch brochures - Exclusive customer seminars

Interaction Strategy by Customer Probability Segment

High (0.8 - 1) Direct offers to trigger purchase	Medium (0.5 - 0.8) Personalized content, nurturing engagement	Low (0.2 - 0.5) Light nurturing, exclude if necessary	Very low (0 - 0.2) Maintain brand awareness only
Phone call *(can be based on the optimal customer interaction analysis discussed above)*			
Strongly recommended — effective for quick conversion	Recommended selectively — use for personalized guidance	Not prioritized — phone calls are not cost-effective here	Not recommended — little to no return from calling efforts
Email / Messaging			
Direct offers, strong call-to-action messages	Personalized messaging based on profile and behavior	Occasional brand-focused emails — maintain light connection	Inspirational, community-oriented content — avoid sales pitch

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Advertising / Retargeting			
Targeted ads with clear CTA to drive conversions	Behavioral retargeting with tailored messaging	Optional light retargeting — nurture gently	Not recommended — low ROI for ad spend
Chatbot / Automated Assistance			
Conversion-focused — order placement, offer activation	Quick answers, informative guidance, support logic	Light touchpoint — minimal resources needed	Not necessary — avoid deploying chatbot resources here