

# Project Workflow

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## 1. Investigate and Understand



Problem comprehension and review of state-of-the-art techniques for churn prediction.

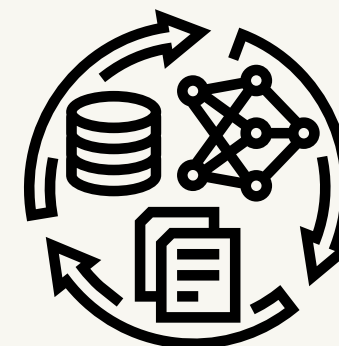


Understanding the data, and validating initial hypothesis.

## 2. Model Train

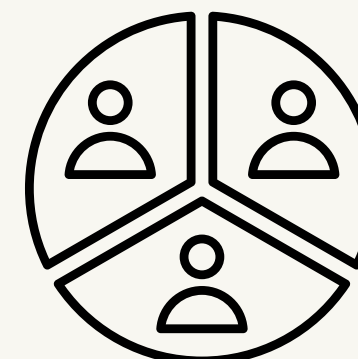


Data cleaning, feature engineering and data pre-processing.

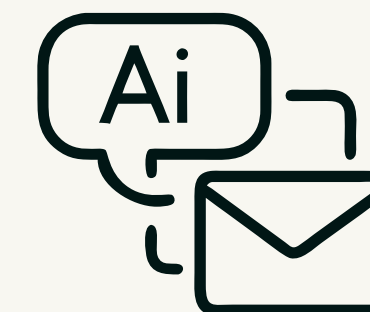


Model training and evaluation of multiple techniques.

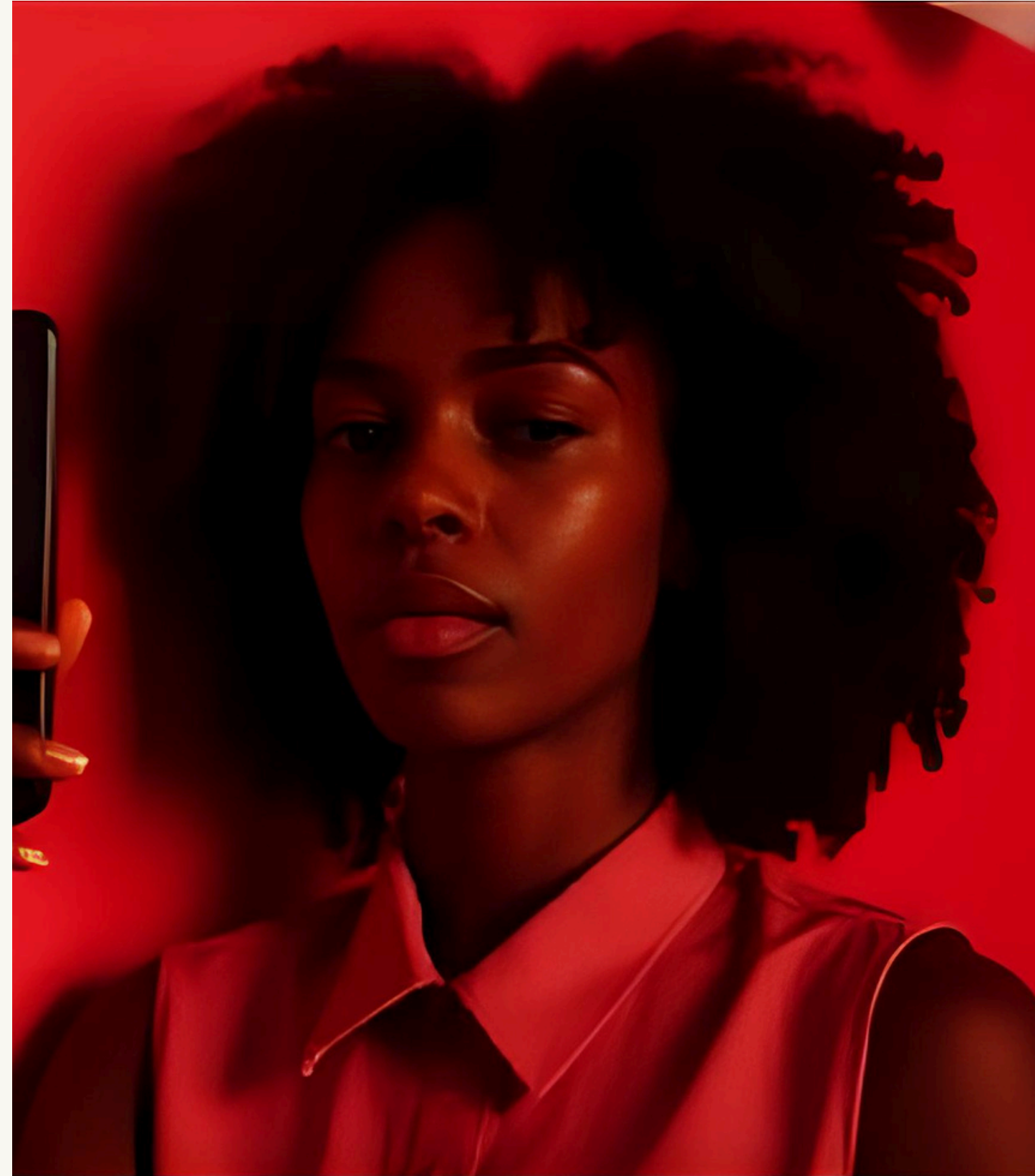
## 3. Personalise and Automate



Understanding churn drivers and building loyalty profiles.



Personalised marketing automation with LLMs.



# Stay with me

## From Prediction to Personalisation with AI

A Proof-of-Concept for  **vodafone**





## **What's happening?**

Vodafone is facing significant revenue leakage due to customer churn.

## **What I'm proposing today**

An end-to-end system that connects prediction to intelligent and automated action.

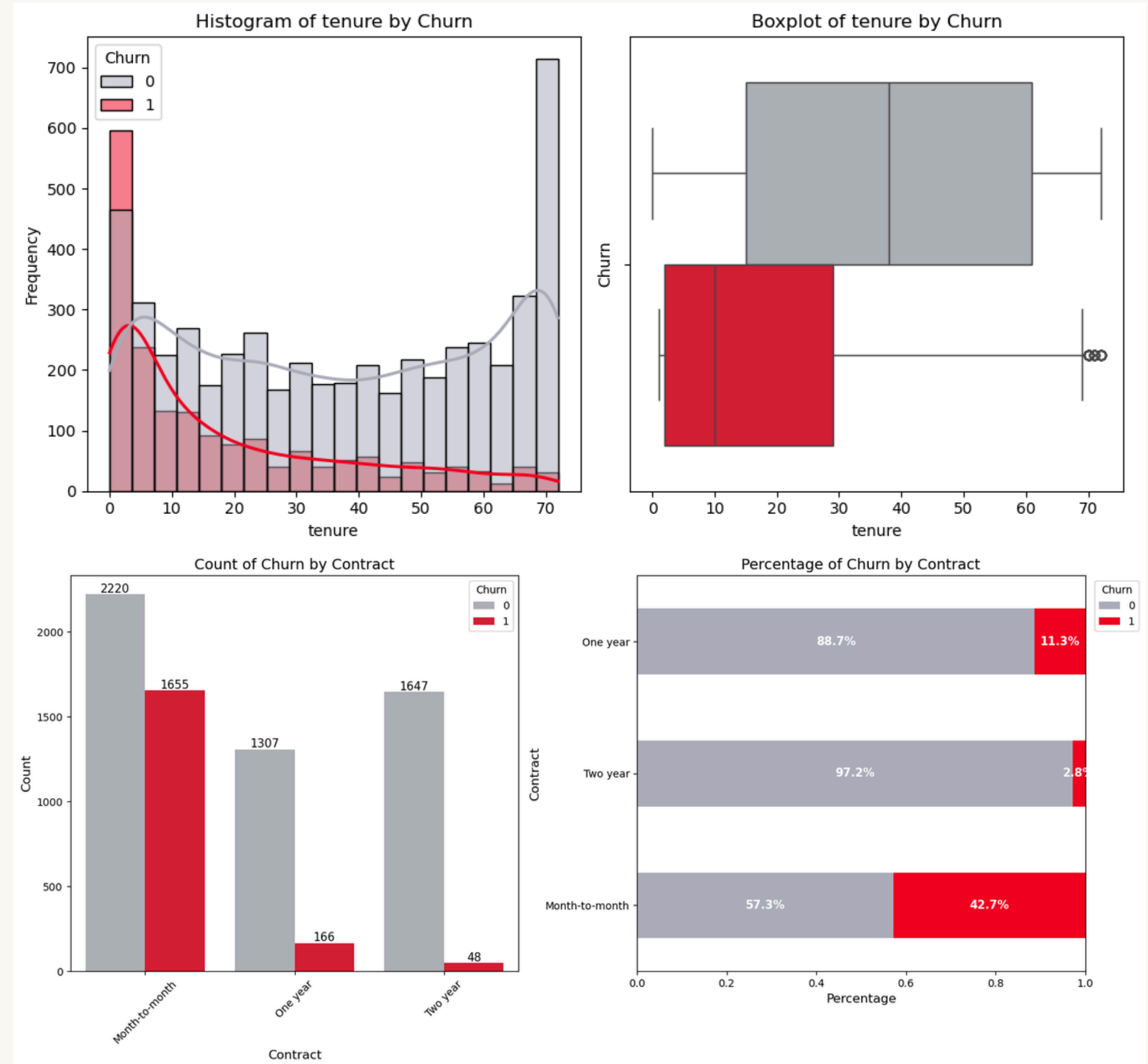
# The information provides us with relevant initial clues.

## General Overview

- 7043 customer records.
- Class imbalance (~73/27).
- 18 client attributes.
  - Service-related
  - Contract-related
  - Demographic Information
- Numerical and categorical variables.

## Main Findings

- Churn rate for customers on a month-to-month contract is dramatically higher than for those on one or two-year contracts.
- As tenure increases, churn drops significantly, indicating that long-term customers are more loyal.
- Customers who purchase additional Internet services are less likely to leave than those who do not.
- Fibre optic customers have a higher churn rate than DSL customers.

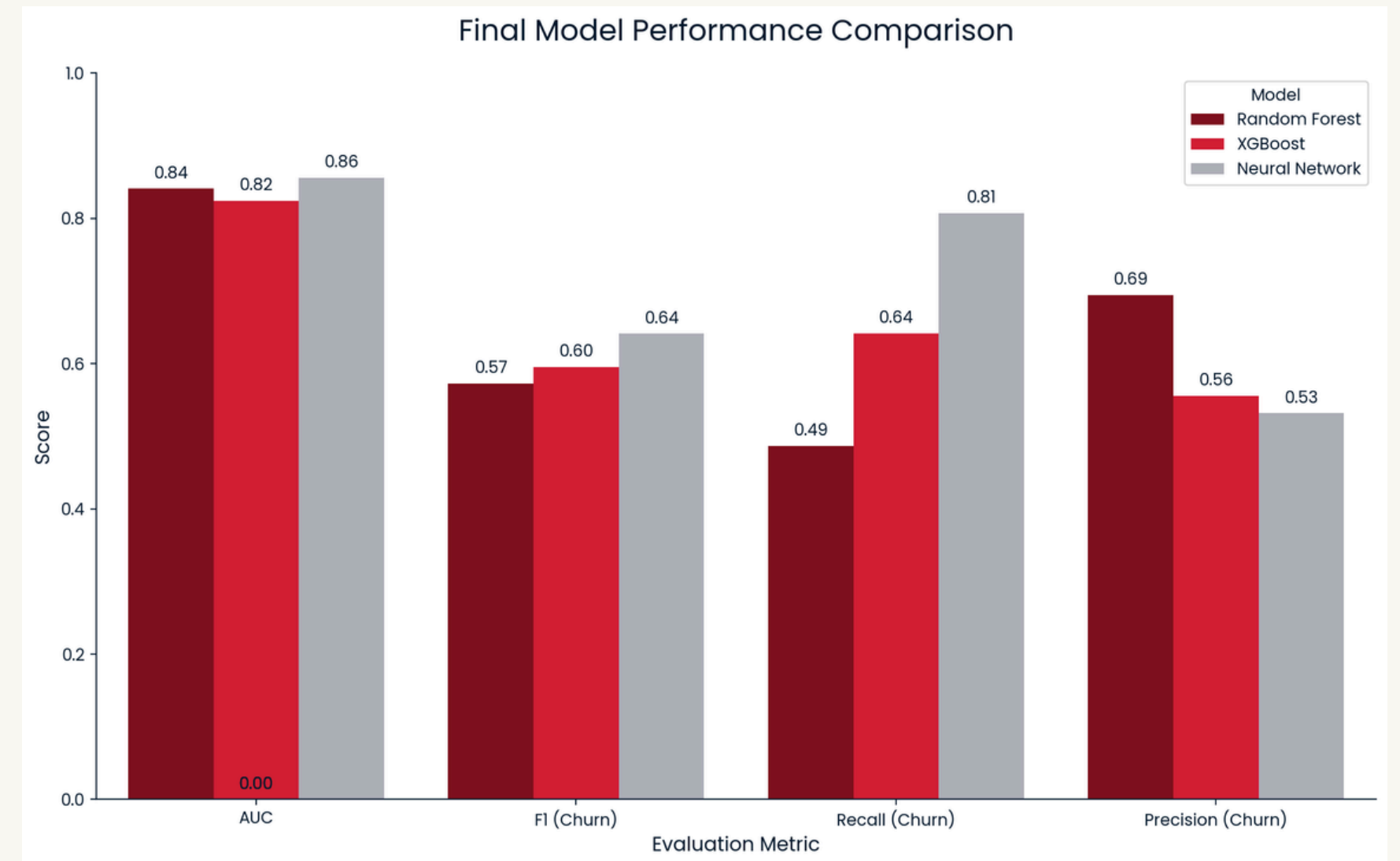






# Model Training

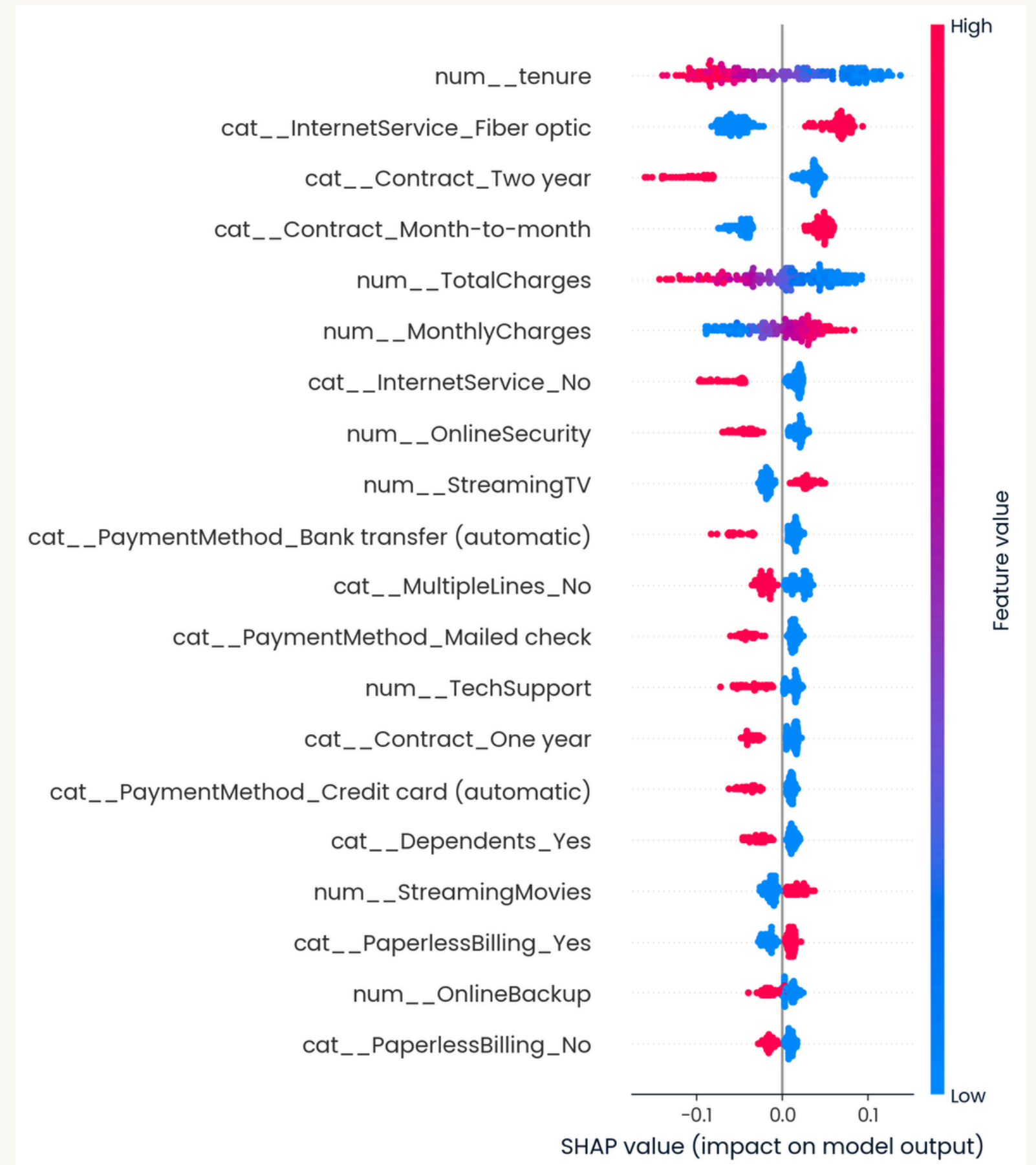
With superior overall performance, the **Neural Network** outperformed other alternatives such as XGBoost and Random Forest.



# Unlocking the "Why"

**Tenure, type of Internet service, and type of contract** are the main factors influencing the prediction.

**Long-term contracts** and **offering additional services**, such as **online security** for Internet users, usually improve retention.





# Actionable Loyalty Profiles: From Data to Strategy





# The system automatically segments customers into six distinct profiles, allowing us to move beyond one-size-fits-all marketing.

Four of these are high-risk segments requiring immediate retention actions, while two are low-risk segments representing opportunities for growth and advocacy.



## The Loyal Champion

- Primary loyalty driver: high tenure (36+ months) and/or a long-term contract.
- Best and most secure customers.



## At-Risk VIP

- Primary churn driver: high monthly charges.
- High-revenue customers, often with premium services like Fiber Optic internet.



## The Stable Customer

- They are generally satisfied, but their loyalty isn't driven by a single, powerful factor.



## The New & Uncertain

- Primary churn driver: low tenure.
- Recent customers, typically with a tenure of 12 months or less.



## General Churn Risk

- Customers at high risk of leaving for a combination of smaller, less obvious reasons.
- There is no single, dominant churn driver.



## The Freedom Seeker

- Primary churn driver: month-to-month contract.
- Customers who value flexibility and have no long-term commitment.

# Unique, persuasive emails for every at-risk customer.

Utilize a Large Language Model (Gemini) to automatically generate personalized, on-brand retention emails.



**Alex**

Uncertain customer with  
a 57% probability of  
churn.

Hi Alex,

We're reaching out to show our appreciation for you being a Vodafone customer for the past 8 months. We're always looking for ways to enhance your experience and want to share something special with you.

As a valued customer, we'd like to offer you a welcome gift: a free 3-month trial of our Premium Online Security package. This added layer of protection will help keep you safe online while you enjoy all that Vodafone has to offer.

Here's what you'll get with our Premium Online Security package:

- Enhanced protection against viruses, malware, and phishing attempts.
- Secure browsing for safer online shopping and banking.
- Protection for multiple devices.

[Click here](#) to explore your exclusive benefits and activate your free 3-month trial.

We appreciate your choice to connect with Vodafone. We're committed to providing you with the best possible service.

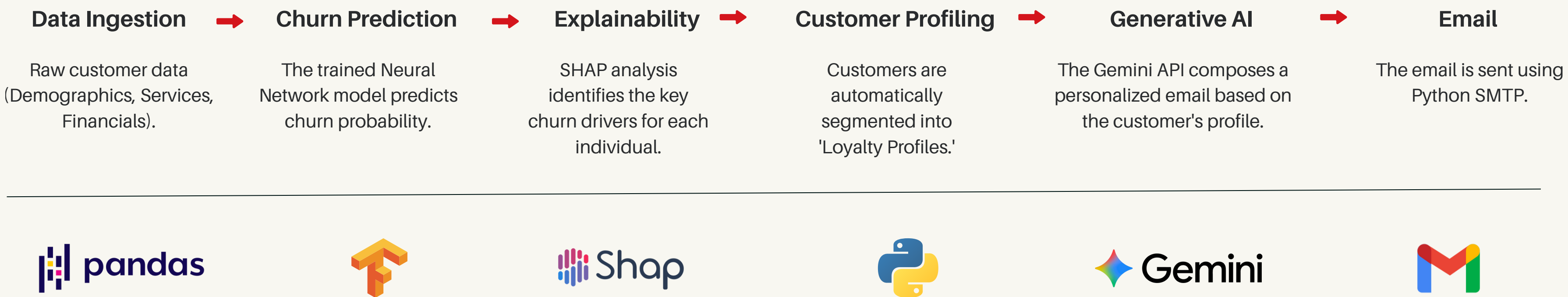
Best regards,

The Vodafone Customer Care Team



DEMO  
*Time*

# Technical Overview: The End-to-End Architecture





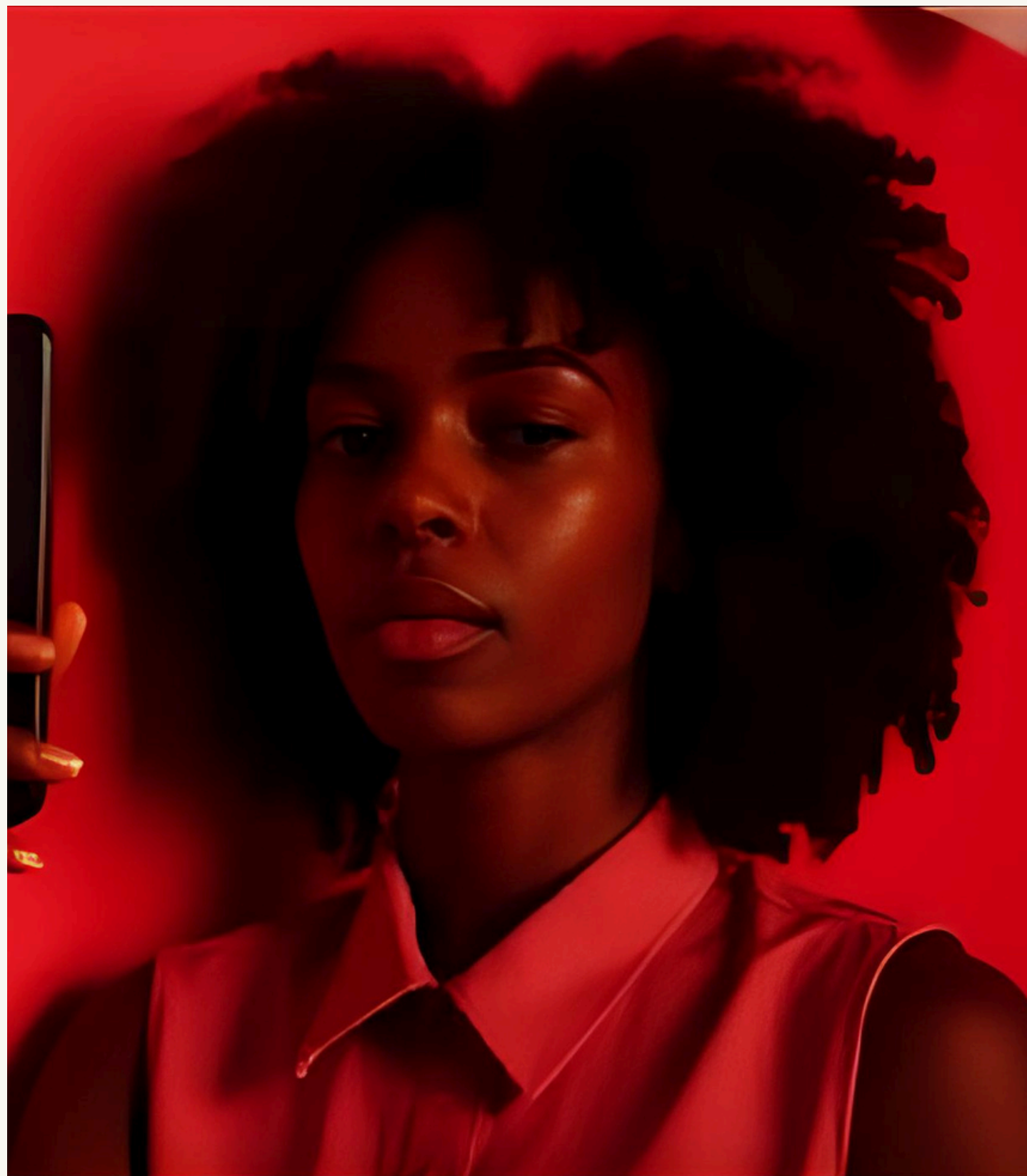
# Limitations & Next Steps



# A Future Perspective...

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- More advanced architectures, hyperparameter optimisation, and more robust feature engineering will result in better models.
- Further experimentation with other LLMS is required to validate which one best meets business objectives.
- Mixed QA between a second LLM as a judge and manual human validation to ensure functionality and that the brand image is compromised.
- A/B Test Offers: Collaborate with the marketing team to develop and test a wider range of retention offers for our AI to use.
- Full Integration: Begin the engineering work to integrate this system with the client's marketing automation platform.



# Thank you!

## From Prediction to Personalisation with AI

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By Esteban G. Russi

