



Exploring Customer Churn:

Patterns, prediction and prevention

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PROJECT OUTLINE

- **SKYLINE COMM** is a leading European telecommunications company est. six years ago with a mission to transform connectivity across the continent. The company operates an extensive LTE network with comprehensive coverage across all major regions, ensuring seamless connectivity for millions of customers.
- Problem statement defined is **curb churn of customers** because it is more expensive to acquire a new customer than to keep your existing once leaving

FOCUS AREAS

- Monitor churn rate over time
 - Track percentage of customers who cancel subscription over time period
- Analyse customer profile those who churn
 - Identify the key attributes and customer behaviours that lead discontinuation of service
 - Segmentation based on these characteristics
- Identify Key Features for Churn Predicted by the Model
 - Determine the primary drivers of churn as identified by the predictive model.
 - Focus retention efforts on the most influential factors.

DATA INFO

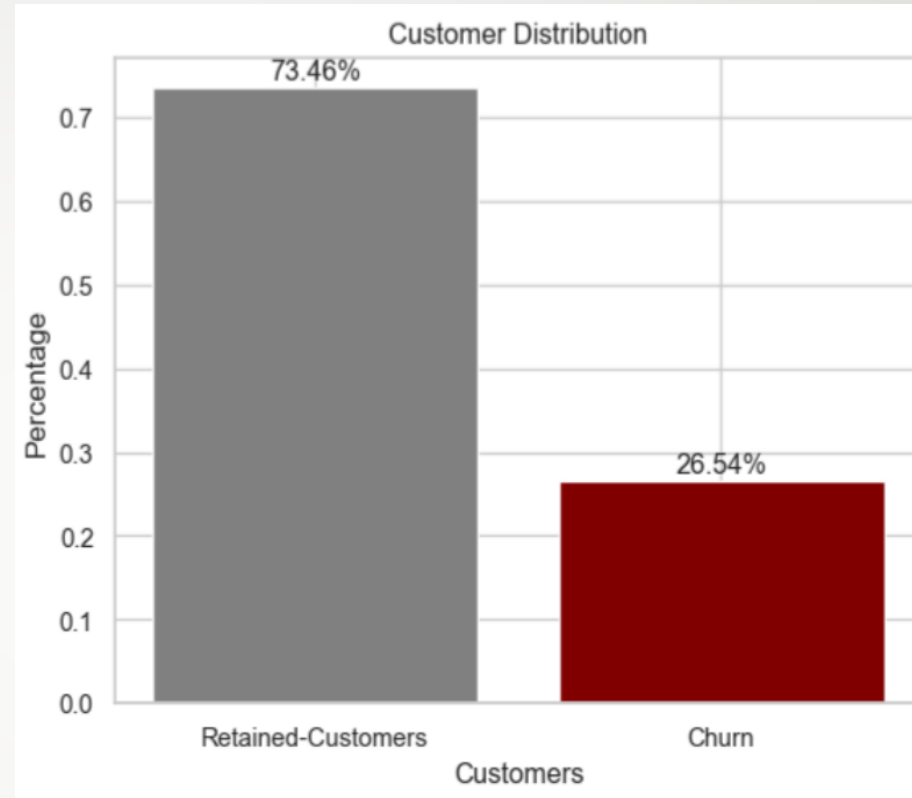
Source: IBM Sample dataset

- Demographics
 - Gender
 - Other: Senior citizen, partners, dependents
- Services
 - Phone lines: Multiple lines
 - Internet services: Online security, backup, device protection, Tech support , Streaming movies , Streaming TV
- Account type
 - Tenure
 - Contract type: monthly, 1-yr., 2-yr.
 - Paperless billing
 - Payment method : mailed check, electronic check, credit card (auto), bank transfer (auto)

Focus area: 1

CHURN RATE

% of customers who cancel subscription



- 26.5% or nearly 1866 customers opted for other company services in span of 6 years

Focus area: 2

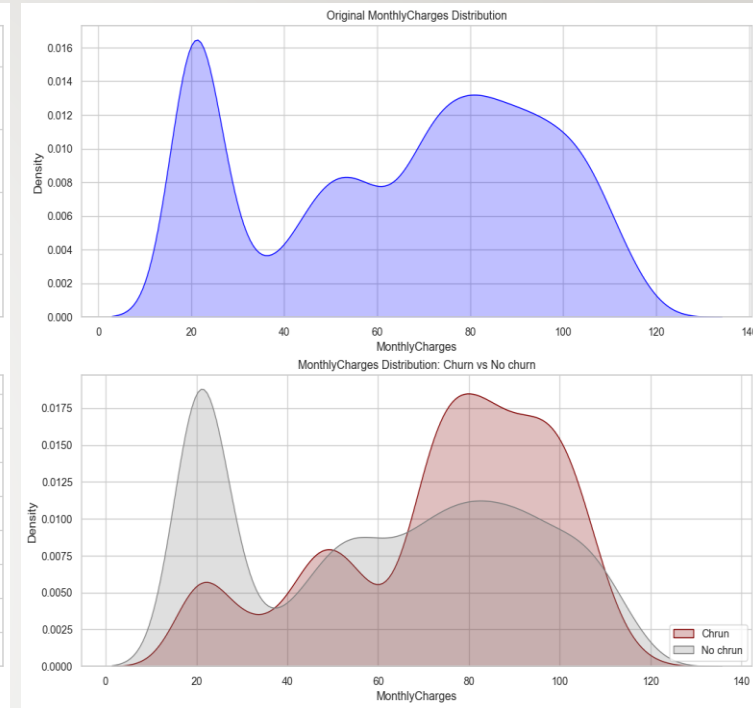
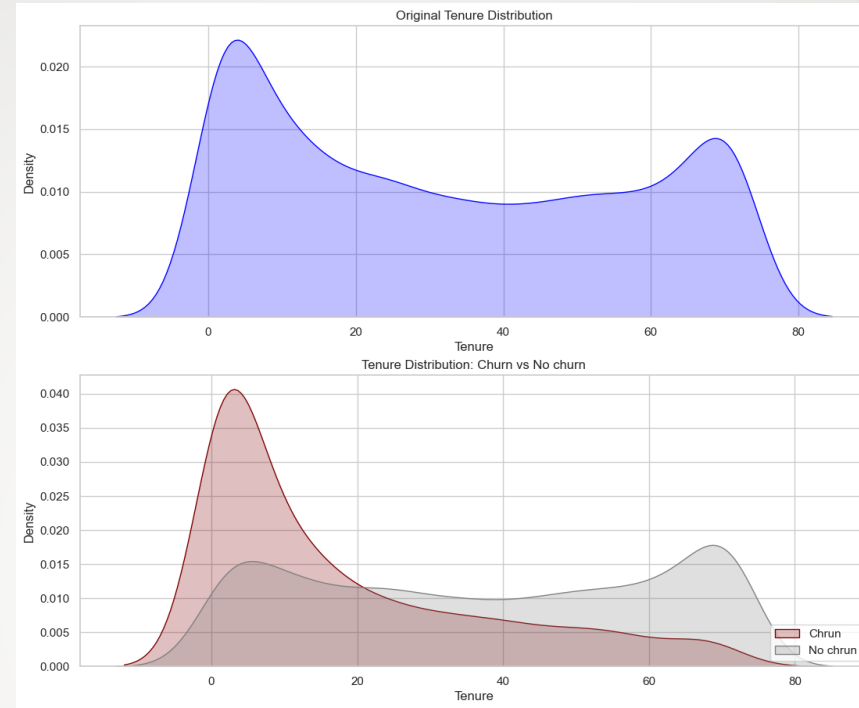
CUSTOMER PROFILE ANALYSIS

Characteristics of customers who
churn

- Demographics :
 - Are singles : No partners (64.2%) and dependents (82.5)
- Account information :
 - Monthly contract (82%)
 - opt **paperless billing** (74.9%) using **electronic check** (57.3%)
- Usage Services :
 - preferred **Fibre optic type Internet service**
 - W/o online Tech support, backup and security, Streaming TV, streaming movies

CUSTOMER PROFILE ANALYSIS

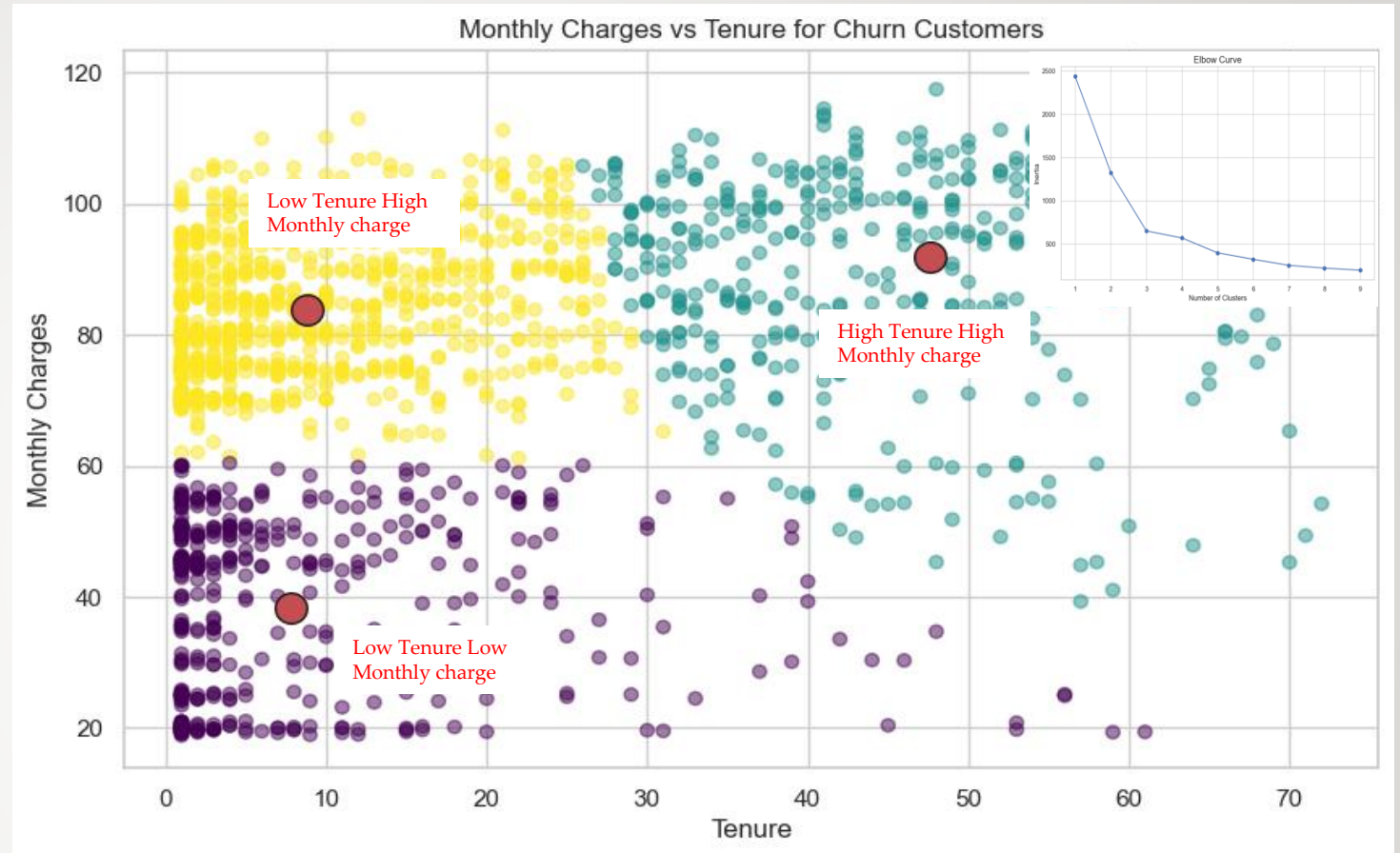
Tenure and Monthly charges
distribution



- Churn customers have mainly < 12 month contract
- Churn customers have monthly contract $> \$65$ monthly

CUSTOMER SEGMENTATION

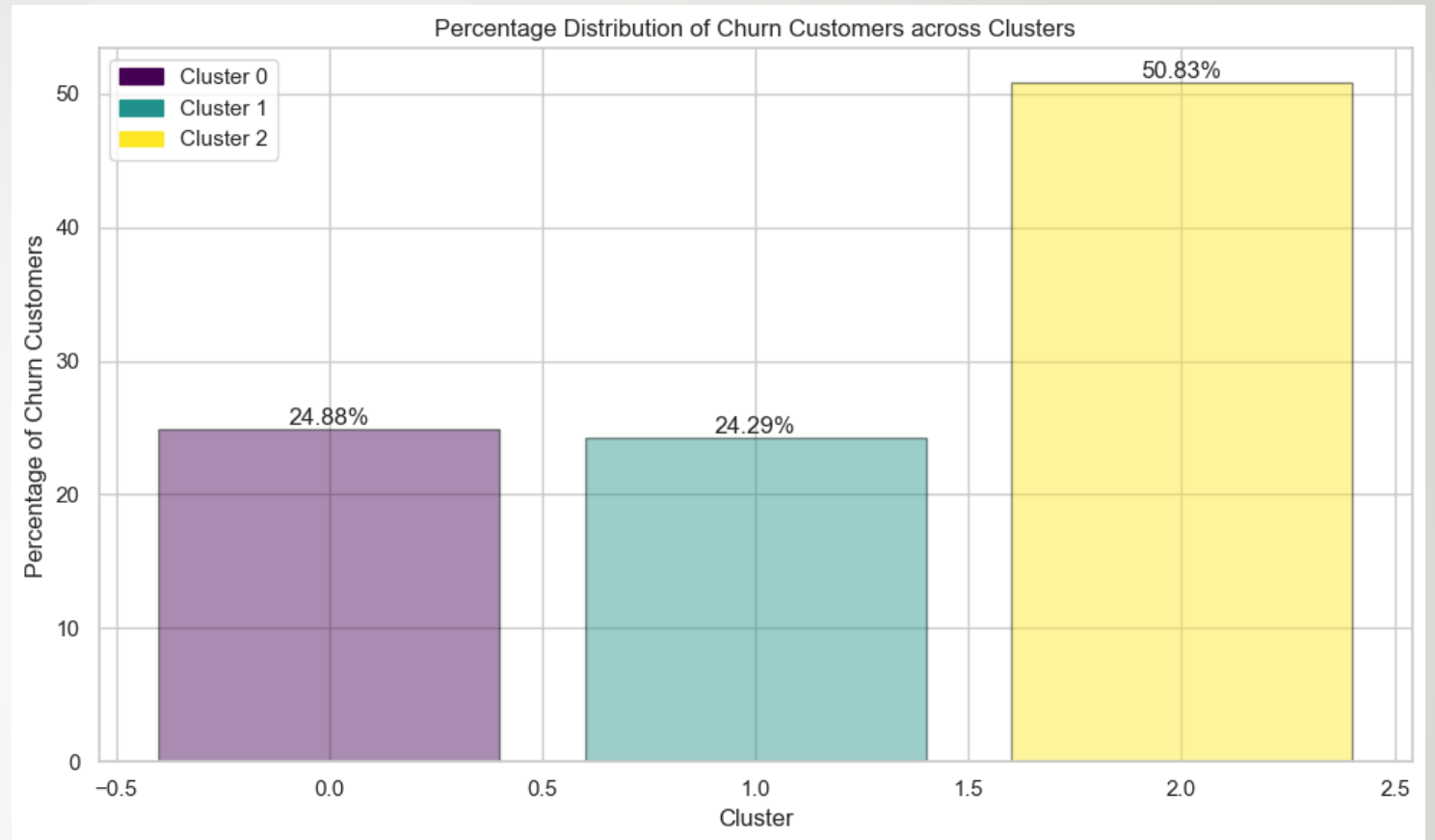
Monthly charges vs Tenure over customer churn



- K-means clustering to cluster customers
- Elbow method for ideal cluster determination

CUSTOMER SEGMENTATION

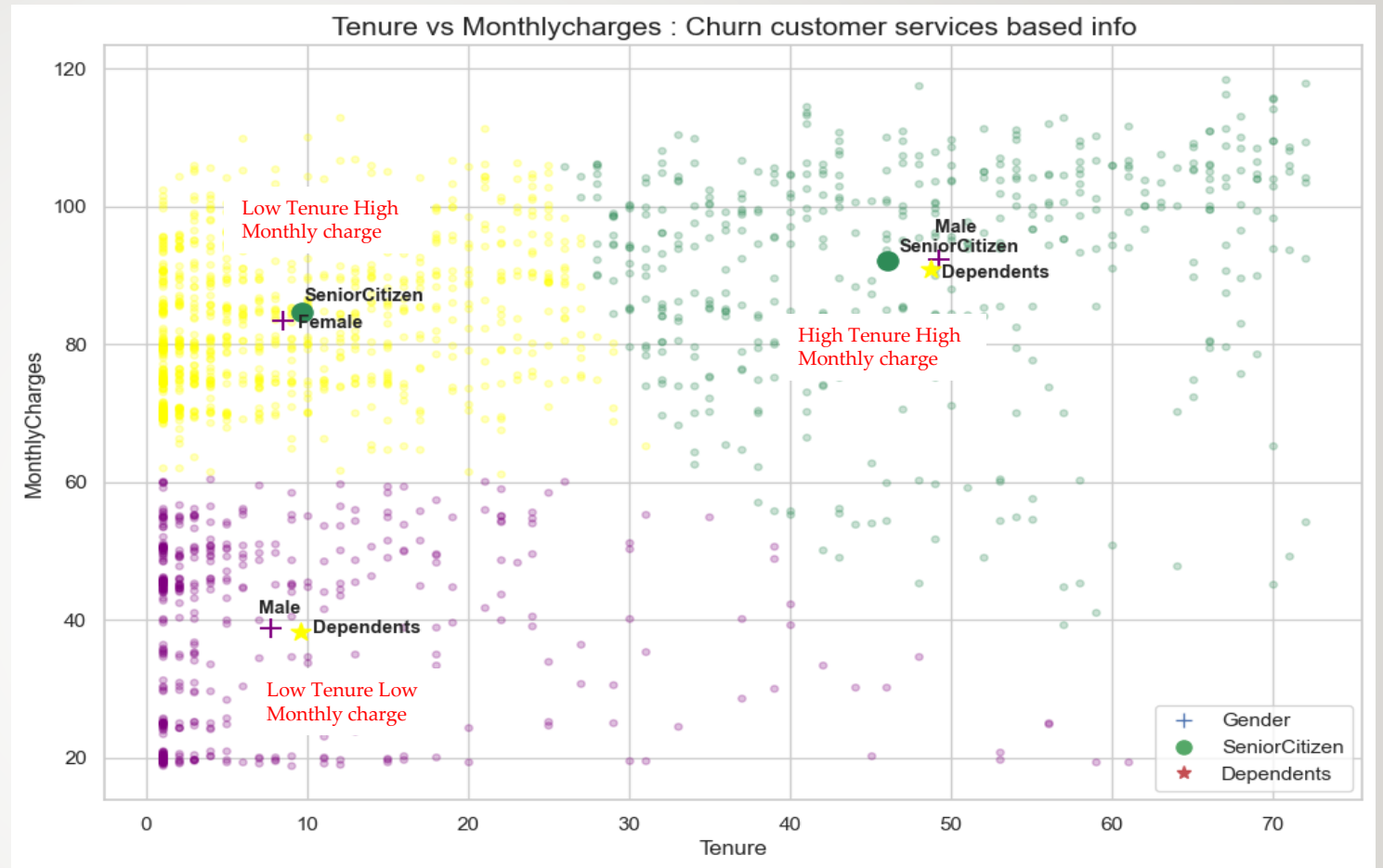
% of customers churn across clusters



- Nearly 50% customer churn belong to low tenure and high monthly charges group

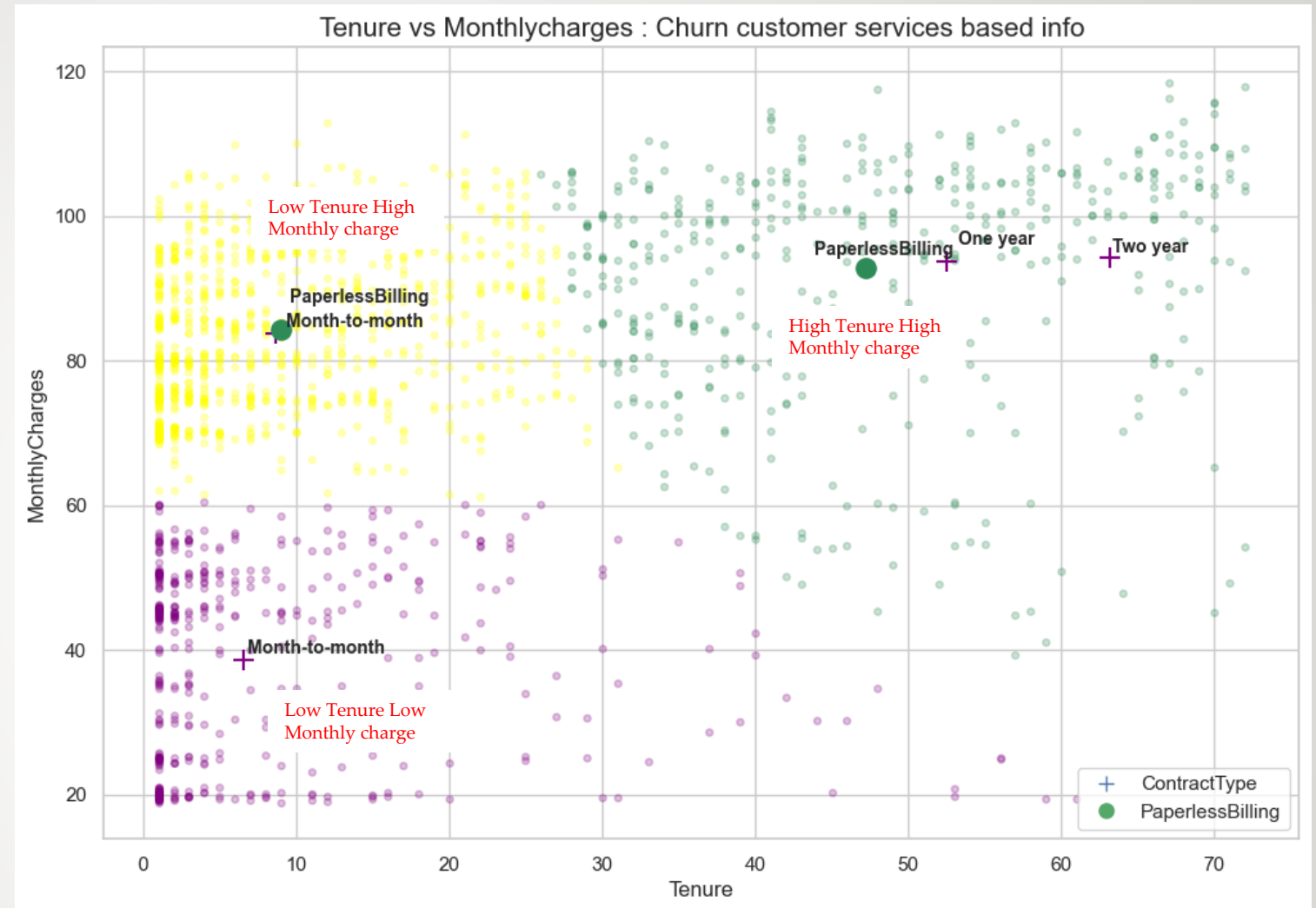
CUSTOMER SEGMENTATION

based on demographics



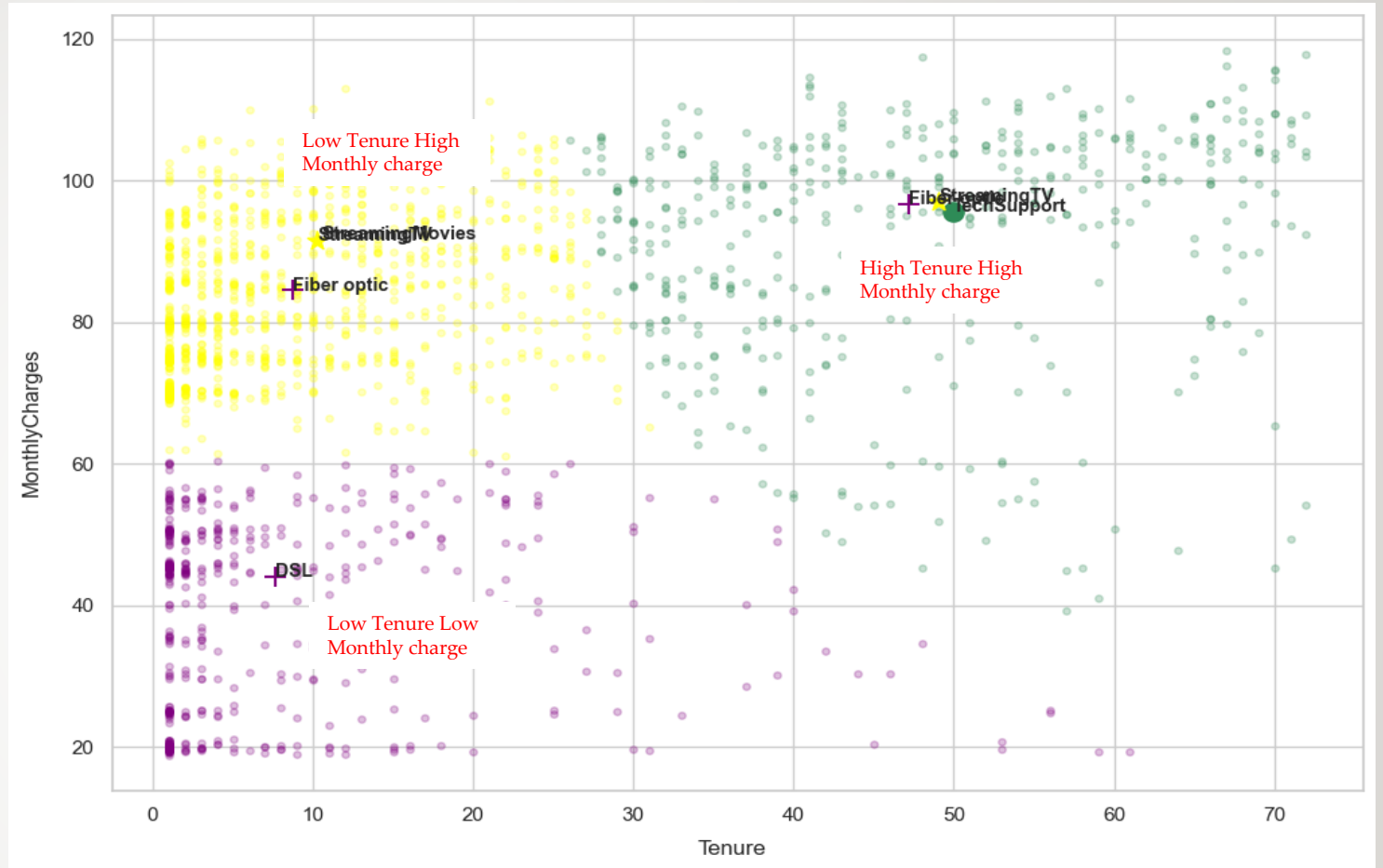
CUSTOMER SEGMENTATION

based on account info



CUSTOMER SEGMENTATION

based on services



Focus area: 3

MODEL PREDICTION

Identify key features

CATEGORICAL DATA

- Data preprocessing
 - Train-test split
 - Class imbalance
- Model Selection
 - Gradient boosting
 - Logistic Regression
 - KNN
 - Random Forest
 - ADABooster

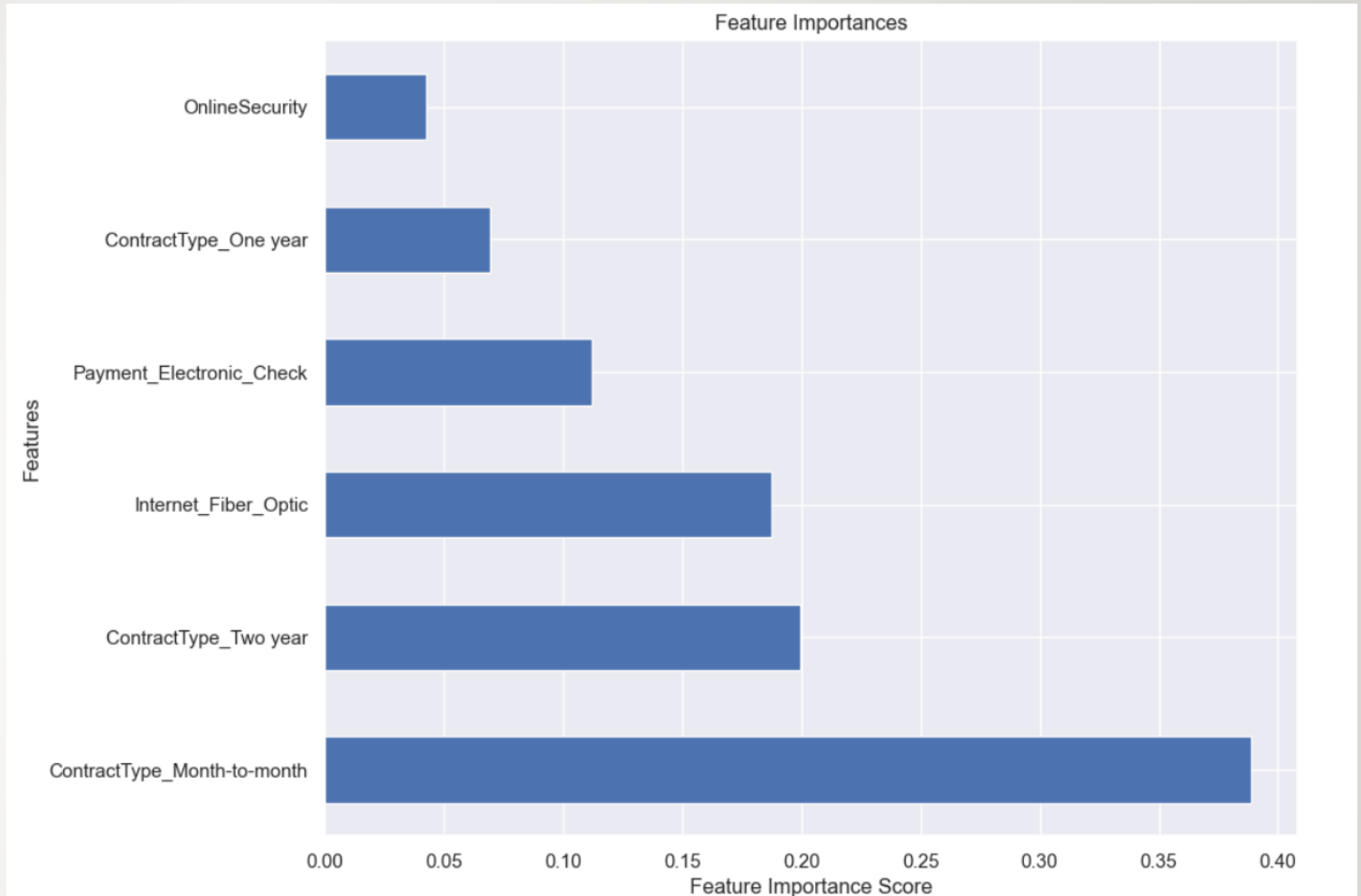
MODEL PREDICTION

Identify key features

- Upon comparing the model performance:
 - Random forest was the best method among the selected models with **74% accuracy** (ROC AUC score: 0.743)
 - After several tries with **Grid search model**, estimated optimal “depth” is 7, and “n-estimators” is 100.

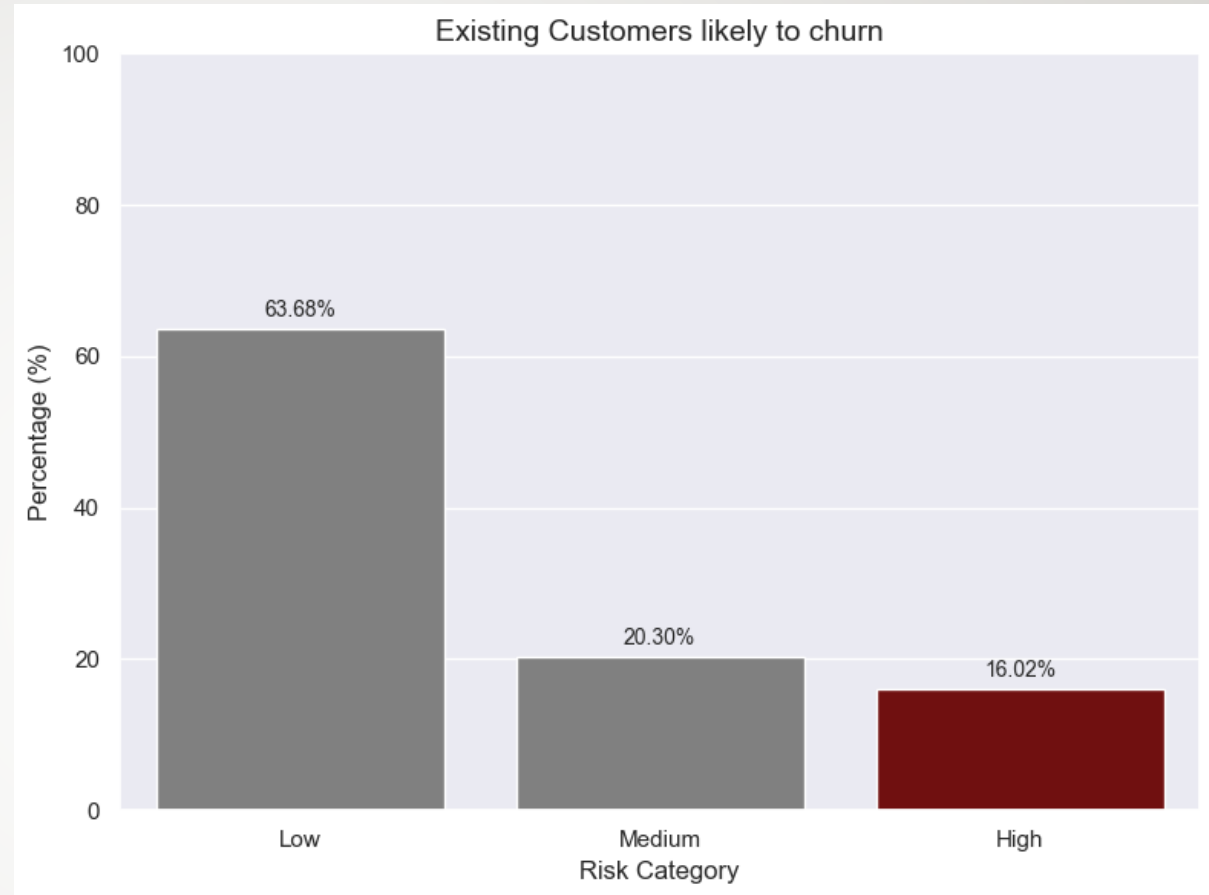
MODEL PREDICTION

Identify key features



MODEL PREDICTION

Prevention of existing customers
from churn



- Focus strategies on retain 16% of existing customers from churn

CONCLUSION

How can the company prevent customer churn in coming year

- Promote retention strategies
 - Customise personalized plan for singles to enhance retention.
 - Review pricing strategies to match perceived value for customers paying high monthly charges for low tenure period.
- Focus on Service Enhancement
 - Continuously improve optic fibre internet service reliability and speed.
 - Ensure consistent service quality to meet customer expectations.



THANK YOU...