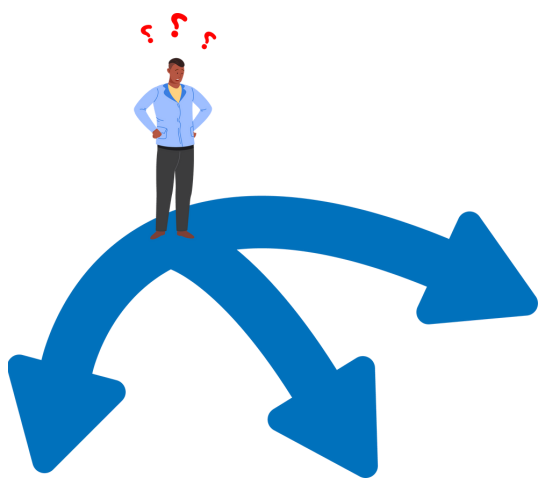


CHURN PREDICTION IN TELECOM INDUSTRY



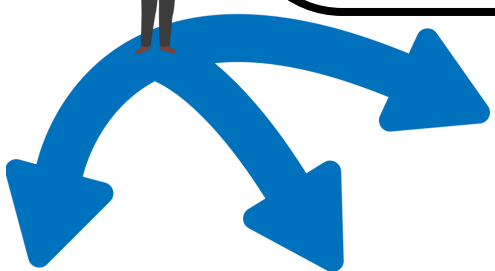
**PRESENTED TO:
MR. ARUN SINGH PUNDIR**

**PRESENTED BY:-
NIKHIL TANEJA(102103529)
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What is Churn?

- Churn: The phenomenon of customers discontinuing their services with a telecom provider.
- Churn prediction: The use of data and analytics to identify customers at risk of leaving a telecom service.
- Goal: Reduce churn by targeting at-risk customers with retention strategies.
- Understanding and predicting churn is crucial for reducing customer attrition rates and improving business performance.



Importance of Churn Prediction

- Churn prediction helps telecom companies minimize revenue loss by identifying customers who are likely to churn.
- Customer-Satisfaction: Implementing proactive retention strategies, companies can improve customer satisfaction and retain valuable subscribers.
- Revenue Retention: Reducing churn means retaining revenue and increasing profitability.
- Data-Driven Decision Making: Telecom companies can make data-driven decisions to improve services.



Traditional Methods vs Machine Learning

- **Traditional methods for churn prediction, such as rule-based systems and statistical models have limitations in handling large datasets and complex patterns.**
- **Machine learning offers better accuracy and scalability, enabling deeper analysis of customer behavior.**
- **Along with this Machine learning algorithms provide automation, real-time analysis and personalized predictions.**
- **However, the choice between these approaches depends on factors like data availability, company resources, and specific business needs.**

Machine Learning Algorithms used in our Project

Decision Tree

- Versatile and easy to interpret.
- They can handle both numerical and categorical data, making them suitable for churn prediction.

Logistic Regression

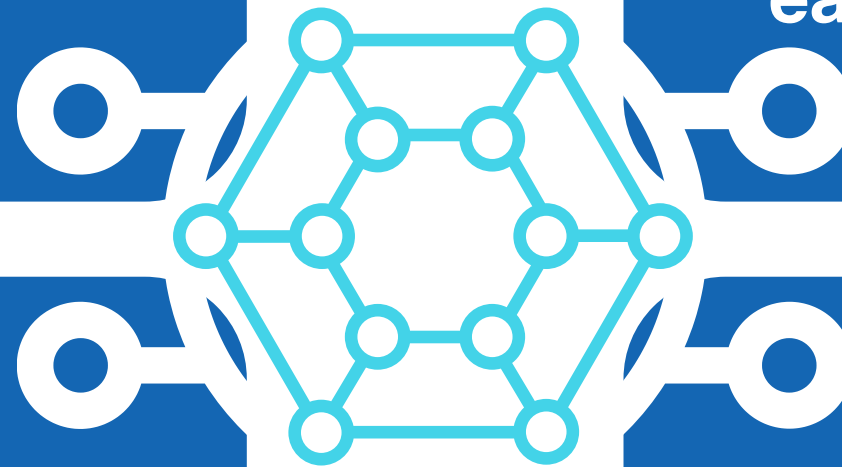
- Models the probability of churn based on independent variables.
- It provides insights into the impact of each predictor on churn probability.

Random Forest

- Combines multiple decision trees to improve prediction accuracy.
- It handles high-dimensional feature spaces and provides feature importance rankings.

Support Vector Machines

- Classify customers into churn or non-churn groups by maximizing the margin b/w decision boundaries.
- They work well with complex data patterns



Evaluation and Performance Metrics

1

Confusion Matrix:-

- A confusion matrix shows the performance of a churn prediction model by comparing predicted and actual churn status.

ACTUAL VALUES		
PREDICTED VALUES	TP	FP
	FN	TN

2

Accuracy, Precision, Recall, and F1-Score:-

- These metrics assess the model's overall performance, precision in identifying churners, recall in capturing all churners, and their harmonic mean.



Evaluation and Performance Metrics

- This image consists of our Evaluation Parameters and corresponding result with respect to these parameters after using Random Forest Classifier technique
- After performing resampling we are getting an accuracy of 94.2% approximately.

```
[ ] model_rf_smote.fit(xr_train1,yr_train1)
```

```
RandomForestClassifier  
RandomForestClassifier(max_depth=6, min_samples_leaf=8, random_state=42)
```

```
[ ] yr_predict1 = model_rf_smote.predict(xr_test1)
```

```
[ ] model_score_r1 = model_rf_smote.score(xr_test1, yr_test1)
```

```
print(model_score_r1)  
print(metrics.classification_report(yr_test1, yr_predict1))
```

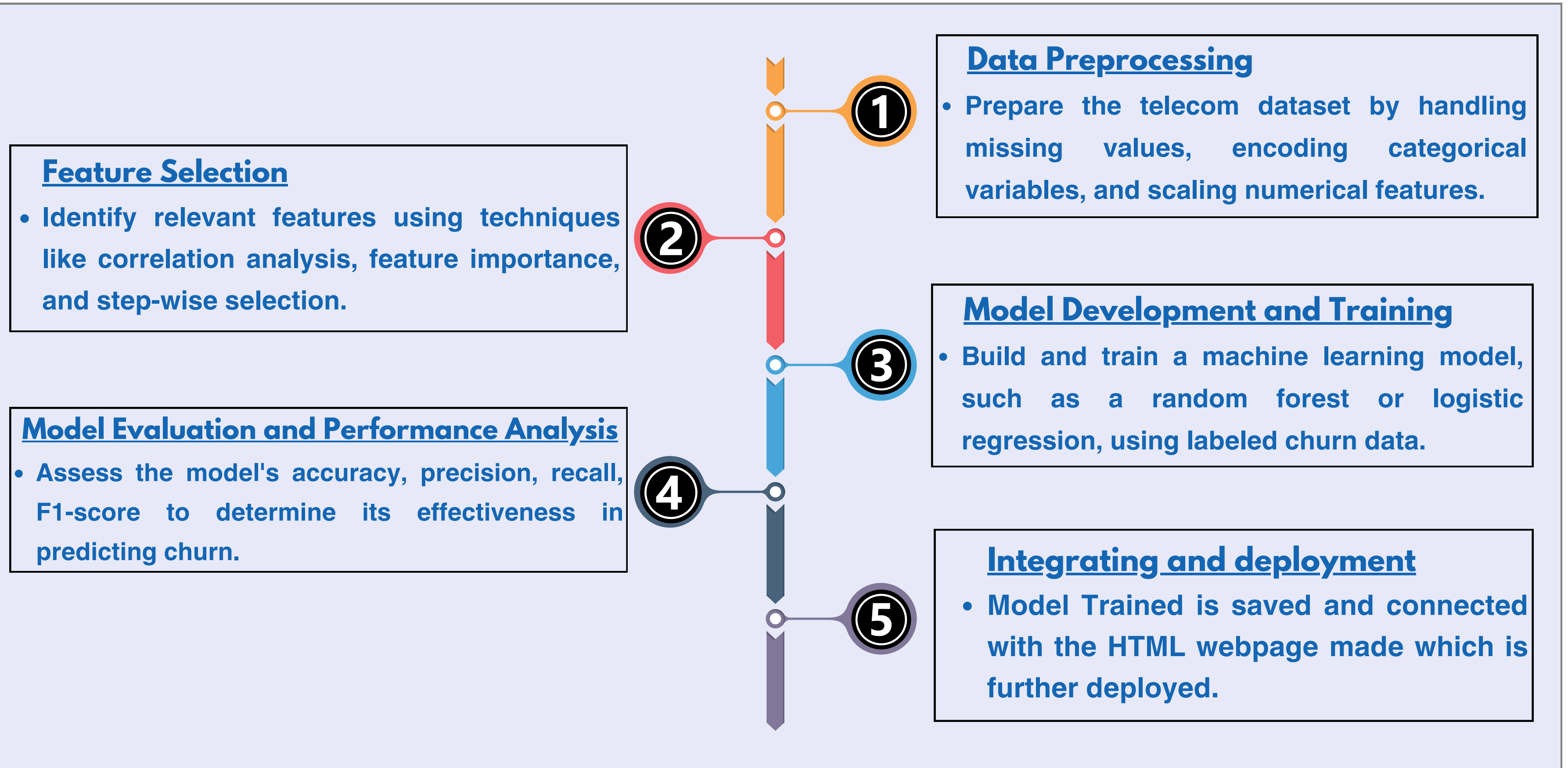
```
0.941722972972973
```

	precision	recall	f1-score	support
0	0.95	0.91	0.93	528
1	0.93	0.96	0.95	656
accuracy			0.94	1184
macro avg	0.94	0.94	0.94	1184
weighted avg	0.94	0.94	0.94	1184

```
[ ] print(metrics.confusion_matrix(yr_test1, yr_predict1))
```

```
[[482  46]  
 [ 23 633]]
```


Case Study: Churn Prediction





**THANK
YOU!**

