



SocBiz Winter Analytics

January 2024

Reducing Customer Churn with Data Analytics : A Case Study of ZELA Telecommunications

Executive Summary

1

We have analyzed the data of a telecommunications company called **Zela**, which provides various services such as phone, internet, online security, online backup, device protection, tech support, streaming TV, and streaming movies in which **Customer Churn** is a major challenge for the Company, as it affects its revenue, profitability, and customer satisfaction.

2

We have used **Google Colab** and various Python libraries and modules, such as **pandas, numpy, matplotlib, seaborn, sklearn**, etc., to perform data preprocessing, exploratory data analysis and **logistic regression model** as our main machine learning algorithm to predict customer churn and identify the most important features that influence churn.

3

Customer churn insights: The dataset reveals the key factors and patterns that influence customer churn, showing **higher churn rates** among customers with no online security(**20.61%**), no online backup(**17.22%**), no device protection(**17.06%**), no tech support(**20.29%**),no streaming TV(**13.35%**) or movies(**13.16%**), lower tenure ,lower total charges, and higher monthly charges.

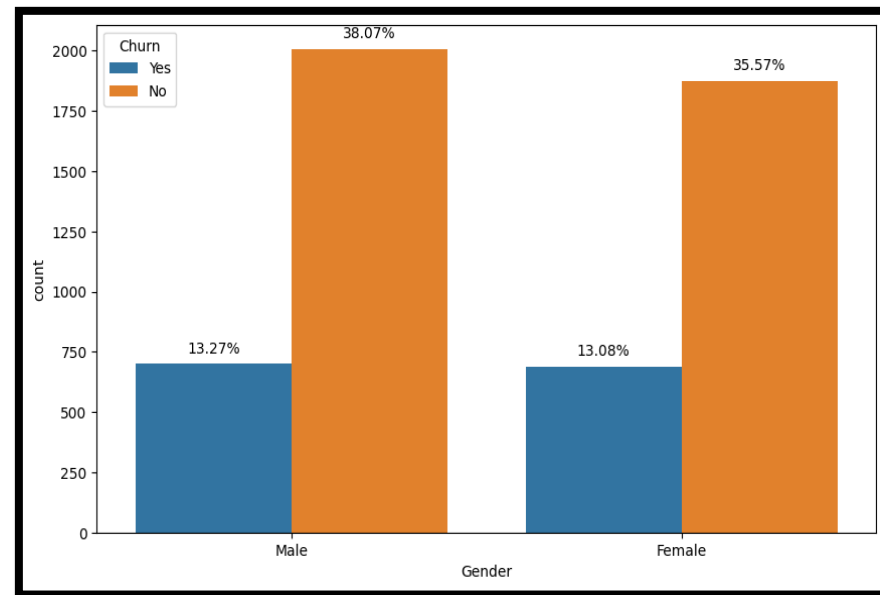
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Random forest classifier and Logistic Regression model were used to predict customer churn rate, the logistic regression model had higher accuracy(81.04%),Recall(0.90) and f1score(0.88) compared to Random Forest Classifier

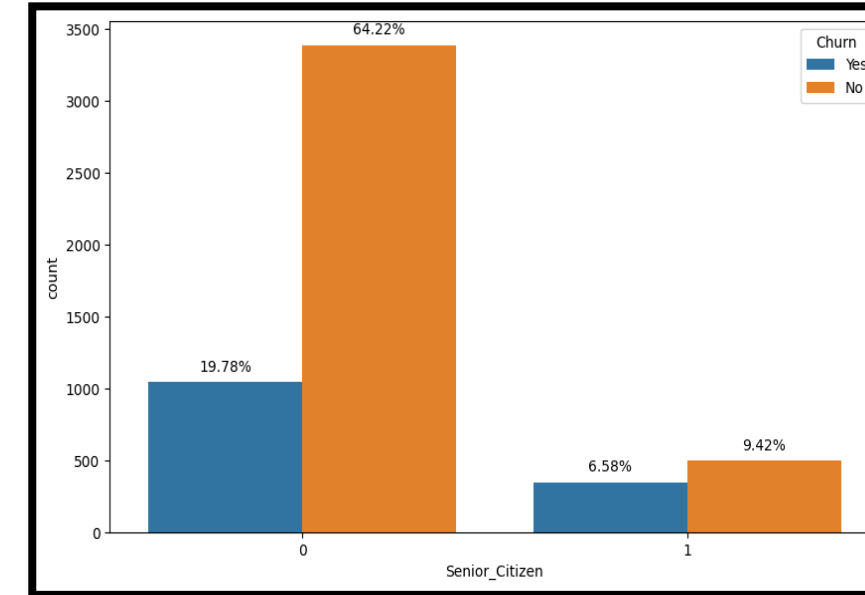
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Data-Driven and Customer-Centric Strategies to Reduce Customer Churn in Zela Telecommunication

Customer Churn Insights: A Comprehensive Analysis of Gender, Age, Partner, and Dependents

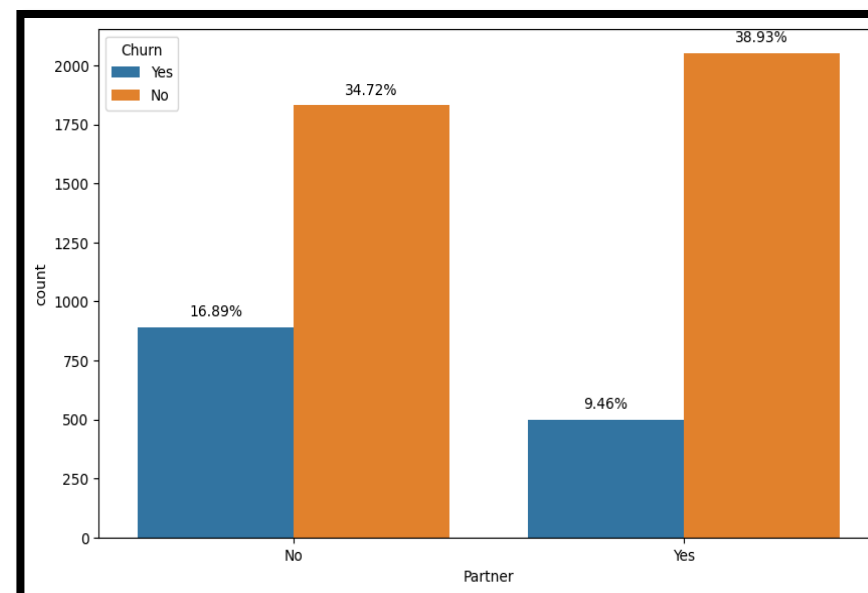


Customers without partners (No, **16.89%**) churn more than those with partners (Yes, **9.46%**). Possible reasons: Customers without a partner may lack social or emotional support from their family or friends, and may feel lonely or isolated

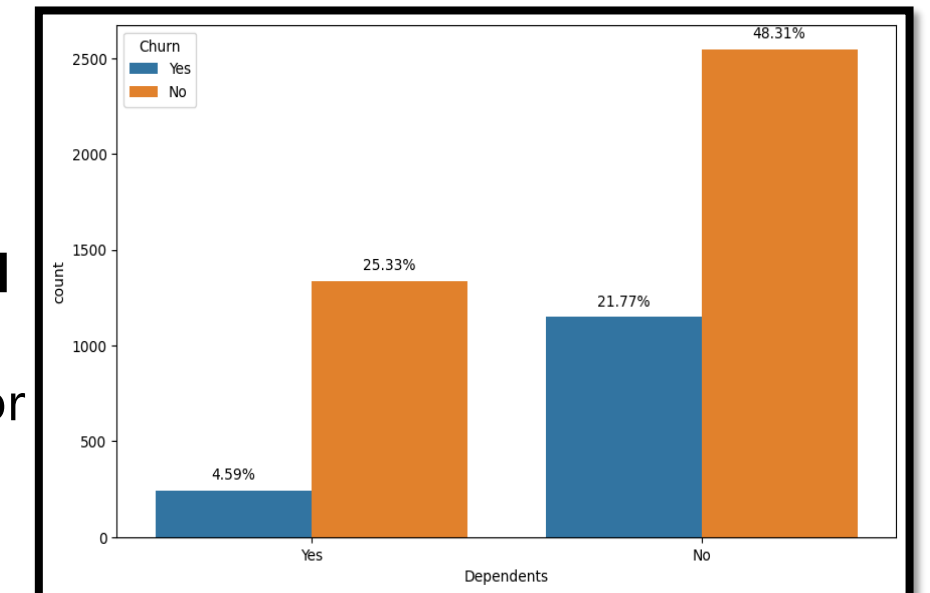


Customers without partners (No, **16.89%**) churn more than those with partners (Yes, **9.46%**). Possible reasons include the potential lack of social or emotional support among customers without partners, leading to feelings of loneliness or isolation

Similar churn rates exist between male (**13.27%**) and female (**13.08%**) customers, suggesting gender has no notable impact. Possible reasons include a **gender-neutral service** and other factors influencing churn more than gender.



Senior citizens (**16%**) avail fewer services compared to non-senior citizens, as shown in the graph. Possible reasons include **reduced interest, awareness, or unmet needs/preferences** among senior citizens regarding the provider's services.

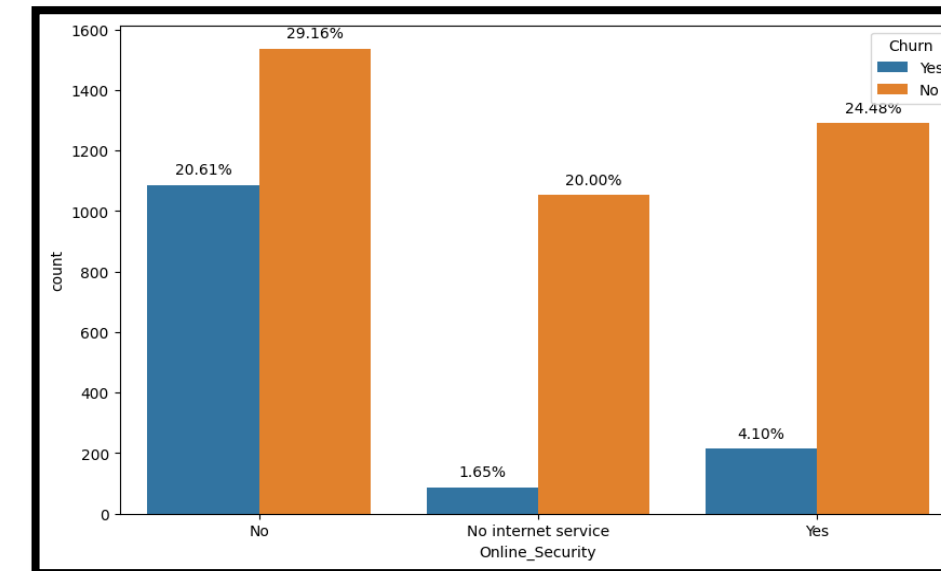
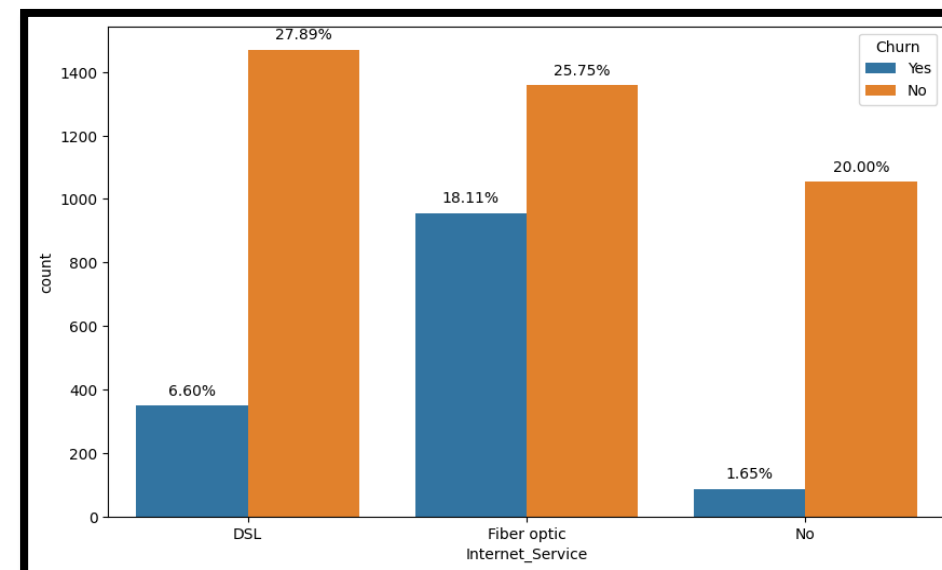
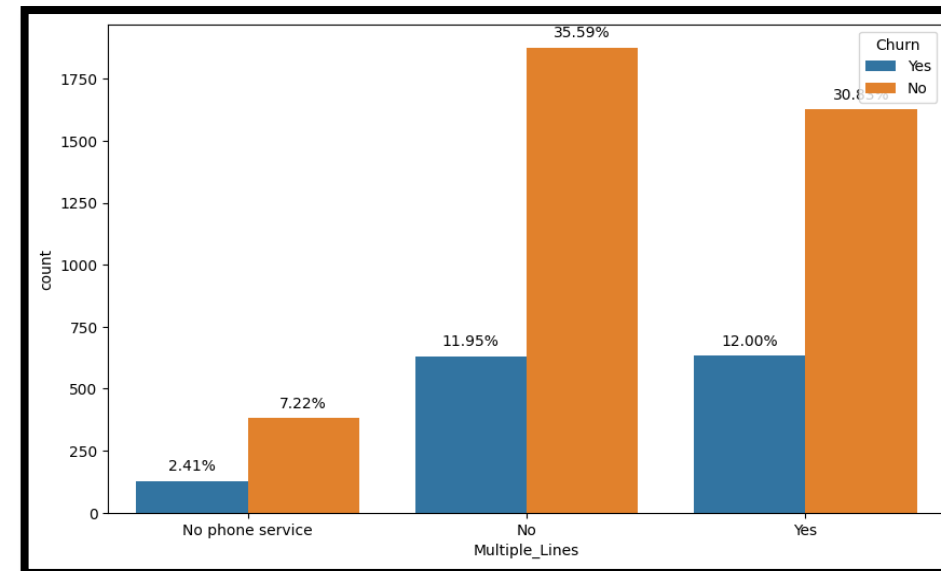
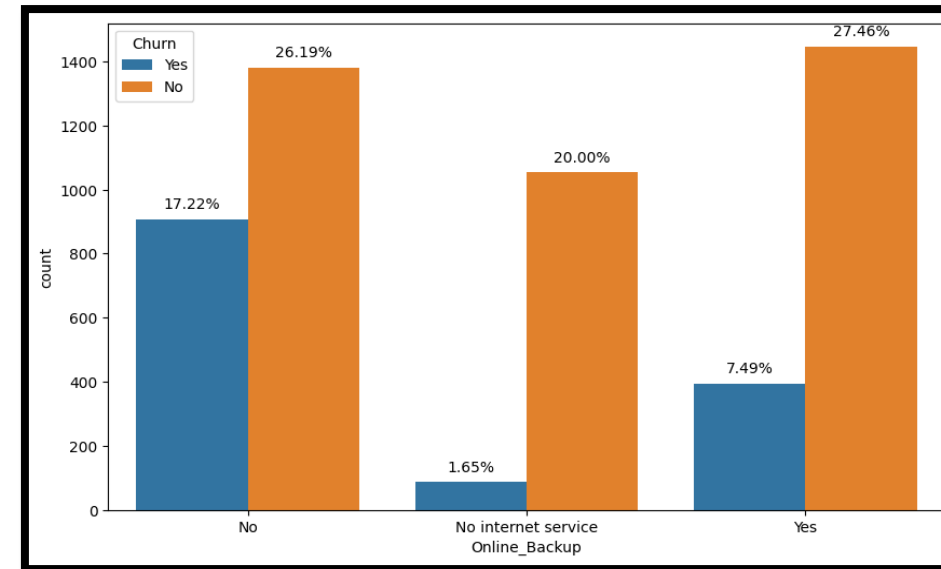


Why Customers Stay or Leave: The Impact of Online Security, Backup, Internet Service, Multiple Lines, and Fiber Optics

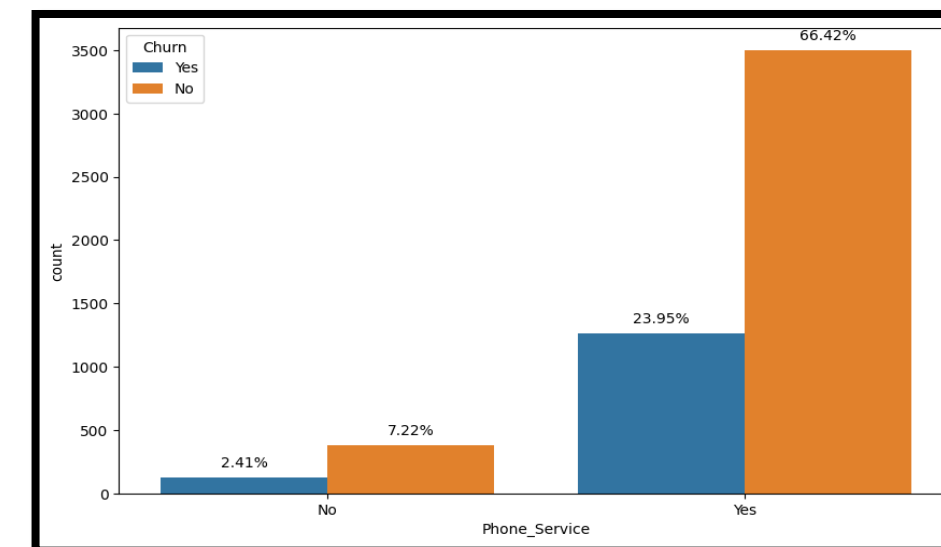
Customers without online backup service (**17.22%**) are more likely to churn compared to those with online backup (**7.49%**) or no internet service (**1.65%**). This highlights the importance of online backup for customer retention, possibly due to the **higher risk of data loss**

Customers with phone service have a higher churn rate at **23.95%**, implying potential dissatisfaction with the service or the availability of more competitive options from other providers.

Fiber optic users (**18.11%**) churn more than DSL users (**6.6%**) or those without internet (**1.65%**). Possible reasons include higher costs or issues with service quality, like slow speed and poor customer support

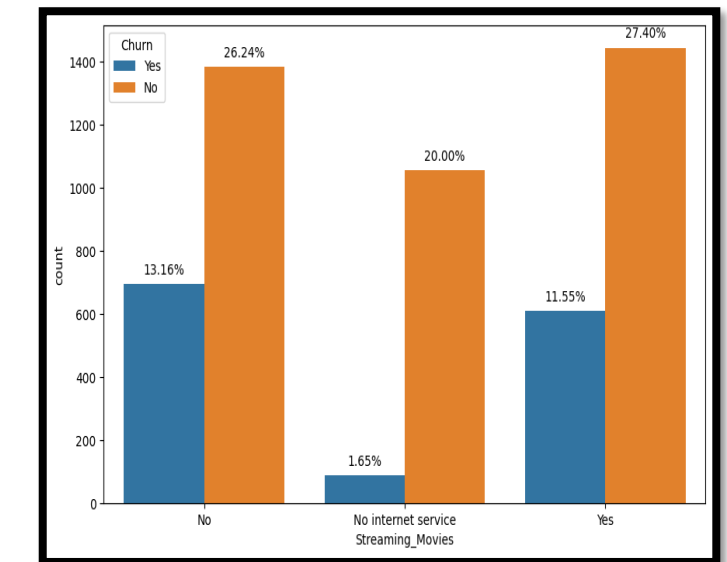
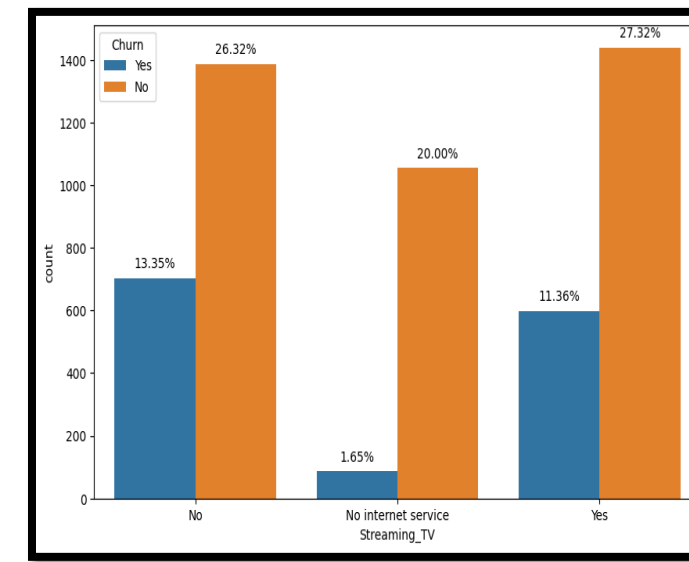
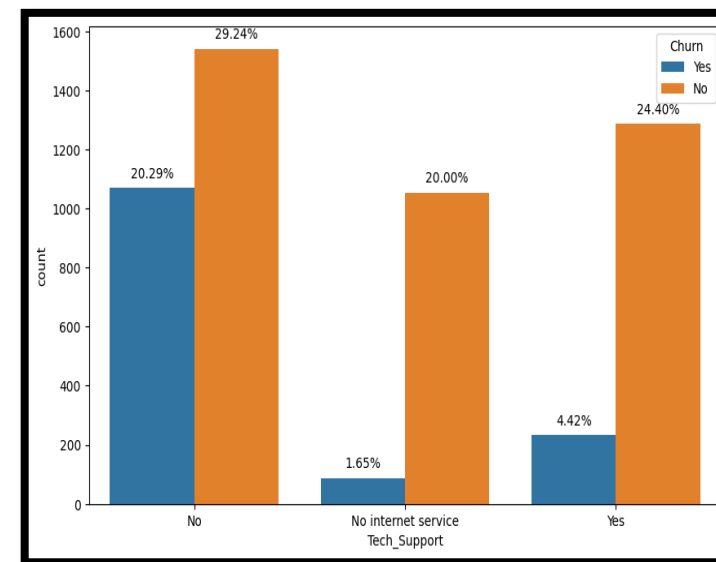
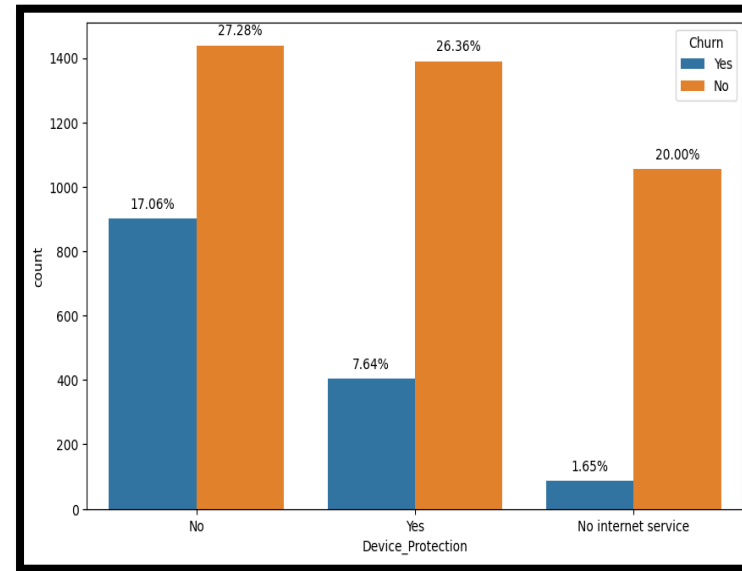


The churn rate is highest for customers without online security at **20.61%**, indicating its significance for customer retention. Possible reasons include a higher risk of cyberattacks and potential concerns about lower quality or reliability.

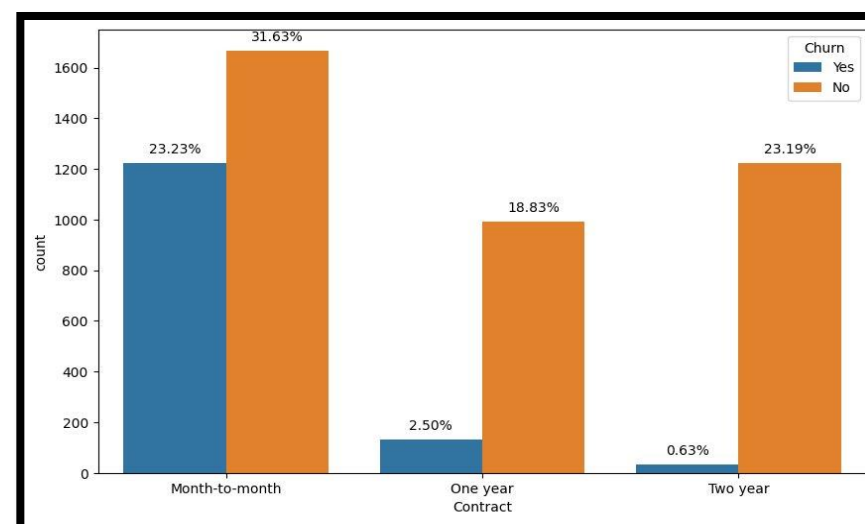


Churn rates are almost equal for customers with (**12%**) and without multiple lines (**11.95%**), but higher than those without phone services (**2.41%**). This suggests that having multiple lines has a minimal effect on customer churn, and other factors may be more crucial.

Analyzing Customer Churn: The Impact of Services and Payment Methods



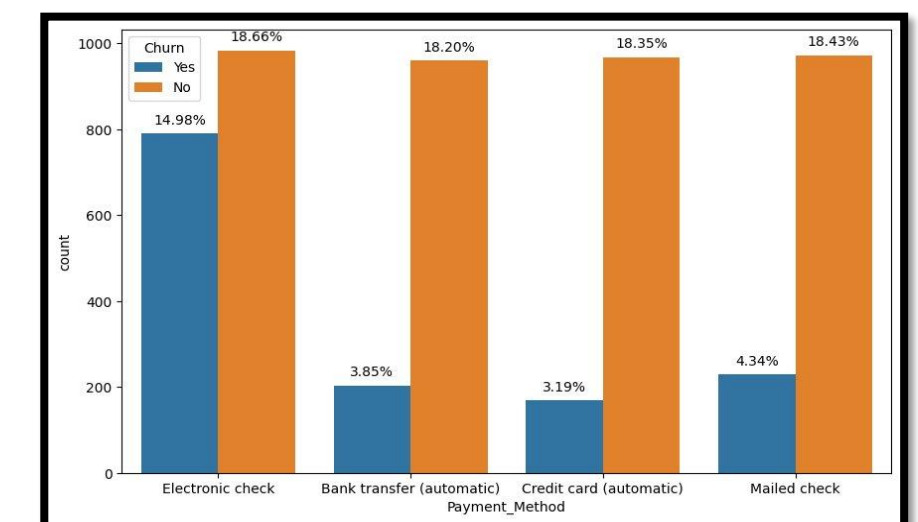
- The graphs show that customers who do not have these services are more likely to churn than those who have them or have no internet service, as indicated by the higher percentages of orange bars for the “No” categories.
- The graphs suggest that these services are important factors for customer retention, and customers who lack them may feel insecure, frustrated, or dissatisfied with the service



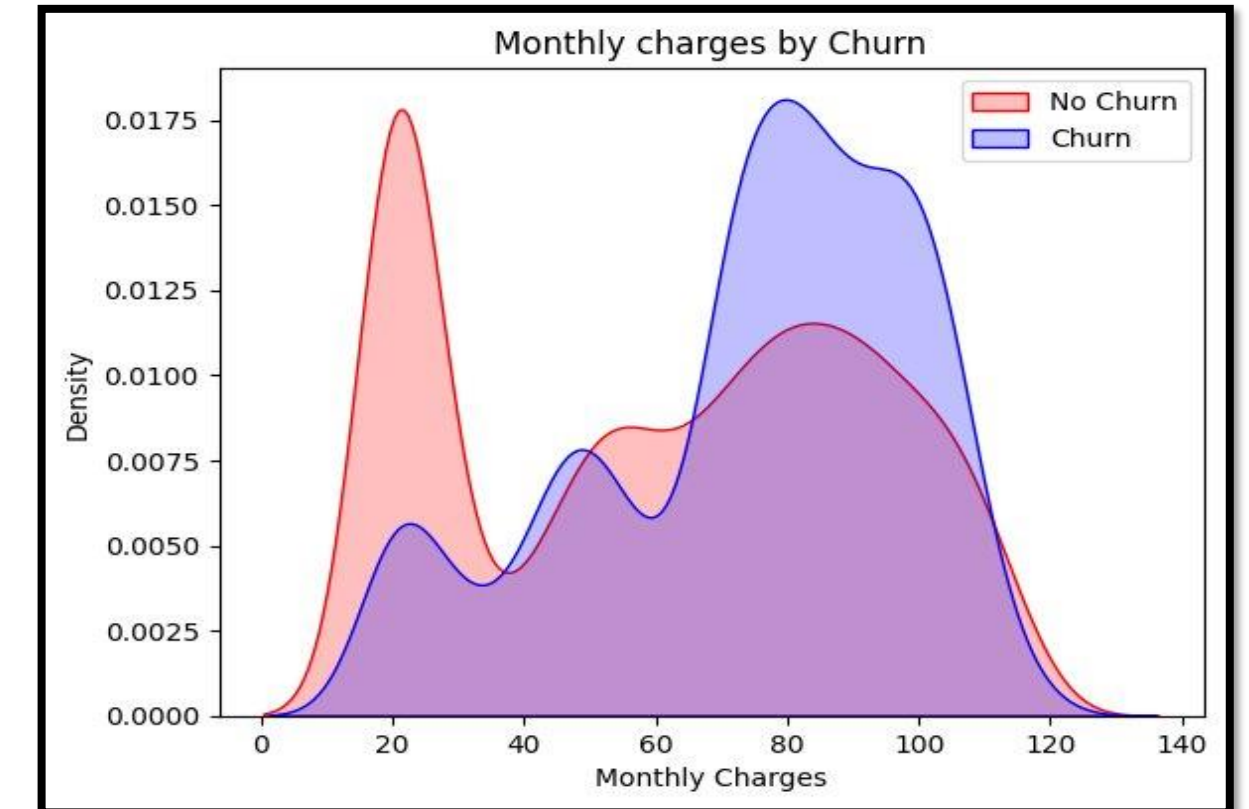
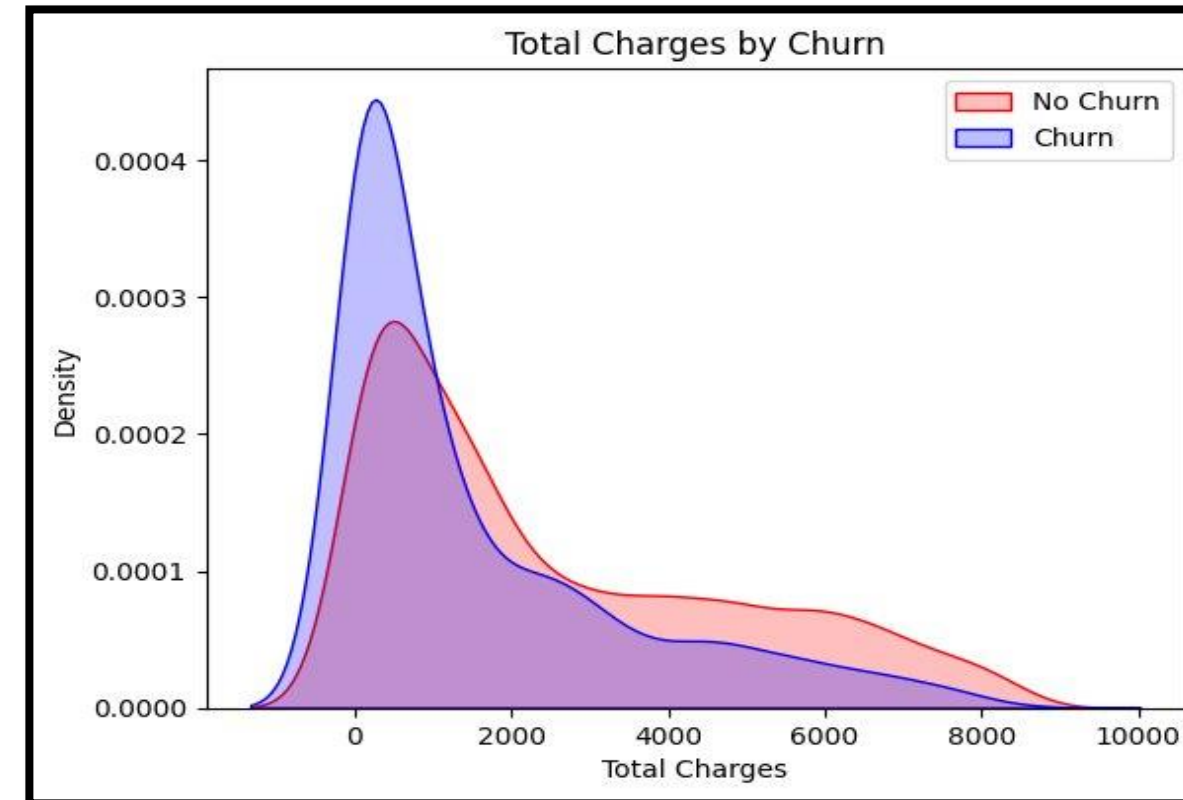
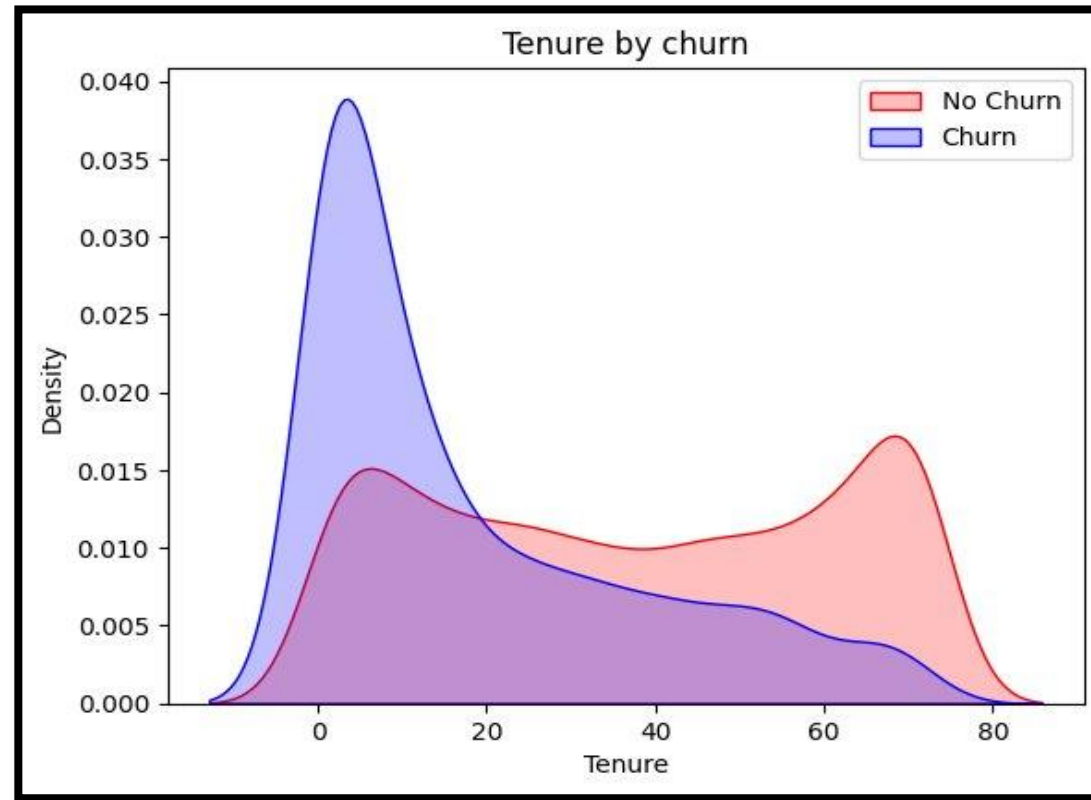
The graph shows that customers who have month-to-month contracts (**23.23%**) are more likely to churn than those who have one year (**2.5%**) or two year contracts (**0.63%**). This suggests that contract duration is a strong factor for customer retention, and customers who have shorter contracts may not be committed or loyal to the service

Higher flexibility or mobility , Lower satisfaction or trust , Lower value or benefit

The graph shows that customers who pay via Credit card (automatic)(**3.19%**) have a moderate churn rate compared to other payment methods, such as Electronic check(**14.98%**), Bank transfer (automatic)(**3.85%**), and Mailed check(**4.34%**).Possible reason could be **Higher convenience or security.**



Tenure, Total Charges, and Monthly Charges: How They Affect Customer Churn



A significant number of customers are churning early in their tenure, as indicated by the peak in the blue "Churn" curve around 0-10 tenure. This suggests that the company is losing customers who are not satisfied or engaged with the service.

Customers with **lower total charges** are more likely to churn due to **lower commitment, lower switching costs, or dissatisfaction with value**. Customers with higher total charges tend to stay, having invested more, higher switching costs, or satisfaction with value received

Customers with **higher monthly charges** are more likely to churn, indicating a positive correlation. Possible reasons include **dissatisfaction with service** or **higher expectations associated with the increased cost**.

Random Forest Classifier and Logistic Regression Model to predict customer churn rate

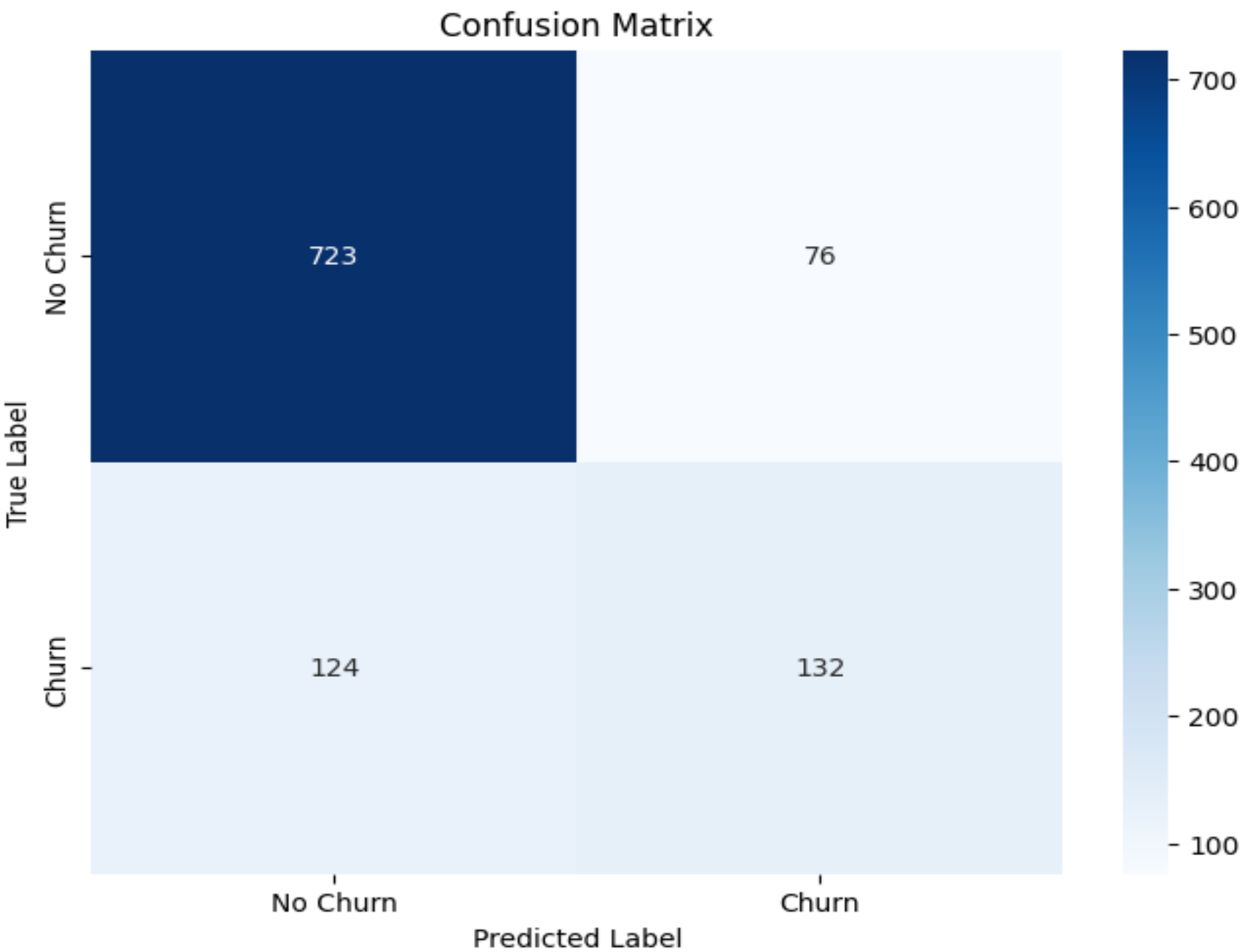
Logistic Regression

Accuracy: 81.04%					
Classification Report:					
	precision	recall	f1-score	support	
0	0.85	0.90	0.88	799	
1	0.63	0.52	0.57	256	
accuracy			0.81	1055	
macro avg	0.74	0.71	0.72	1055	
weighted avg	0.80	0.81	0.80	1055	

Random Forest Classifier

Accuracy: 78.29%					
Classification Report:					
	precision	recall	f1-score	support	
0	0.83	0.90	0.86	799	
1	0.57	0.41	0.48	256	
accuracy			0.78	1055	
macro avg	0.70	0.66	0.67	1055	
weighted avg	0.77	0.78	0.77	1055	

Logistic Regression model was used to predict Churn, the model had higher accuracy(81.04%),Recall(0.90) and f1score(0.88) compared to Random Forest Classifier



- **True Positive (TP): 723.** This means that 723 customers who did not churn were correctly identified by the model.
- **False Positive (FP): 76.** This means that 76 customers who did not churn were incorrectly identified as having churned by the model.
- **False Negative (FN): 124.** This means that 124 customers who churned were incorrectly identified as not having churned by the model.
- **True Negative (TN): 132.** This means that 132 customers who churned were correctly identified by the model.

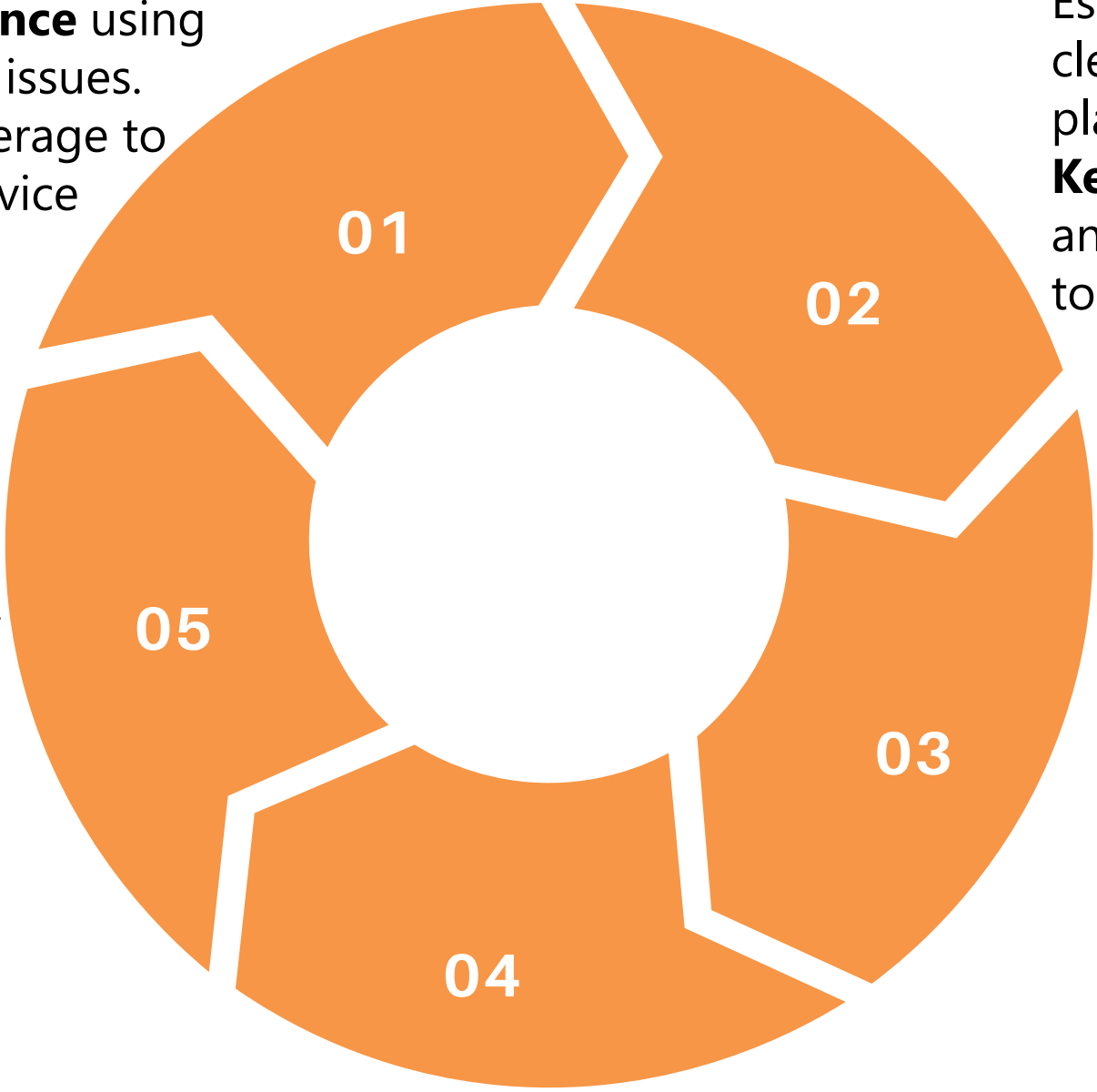
Data-Driven and Customer-Centric Strategies to Reduce Customer Churn in Zela Telecommunication

Monitor and **optimize network performance** using data analytics and AI to detect and resolve issues. **Improve capacity, speed,** and extend coverage to rural areas for reliable and high-quality service

Establish **trust** and **transparency** with customers by clear and honest communication through online platforms, newsletters, blogs, videos, or webinars. **Keep customers informed** about changes, updates, and issues affecting the service with clear and easy-to-understand terms and conditions.

Train our employees to adopt a **customer-oriented mindset**, empower them to solve customer problems, and reward them for customer retention performance. Providing customers with tailored plans, offers, and **personalized recommendations** that suit their profile and behavior

Implement a **referral program** rewarding customers for bringing in new ones. Offer discounts or incentives to referrers and benefits to the referred. Use **chatbots and self-service portals** for query automation, escalating complex cases to human agents.





Thank You
