



Customer Churn Analysis & Retention Strategy: Driving Customer Loyalty in Telecommunications

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Executive Summary

Proactive Churn Management: Identifying and Retaining At-Risk Customers

Key Problem: Our telecom company faces a significant customer churn rate of ~26.6%, impacting revenue and growth.

Key Findings (Top Drivers):

- Contract Type: Month-to-month contracts are a major churn risk (42.7% churn).
- Internet Service: Fiber Optic users churn significantly more (41.9% churn).
- Payment Method: Electronic check users have higher churn rates.
- Tenure: Newer customers (short tenure) are highly vulnerable.
- Demographics: Senior citizens show higher churn.

Our Solution: A predictive model (Gradient Boosting) identifies churners with 74.6% Recall and 0.836 ROC AUC, enabling targeted interventions.

Main Recommendation: Implement a multi-faceted retention strategy focusing on contract promotion, fiber service

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Understanding Customer Churn: Why it Matters

The Cost of Losing Customers

What is Churn? When customers discontinue their service.

Why is it Critical?

- Revenue Loss: Direct impact on recurring revenue.
- Acquisition Cost: Acquiring new customers is 5-25x more expensive than retaining existing ones.
- Brand Reputation: High churn can damage brand image.
- Growth Inhibition: Limits market share expansion.

Current State: 26.6% of our customer base is churning.





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Our Data & Approach

Data-Driven Analysis: From Raw Data to Actionable Insights

Data Source

IBM Telco Customer Churn Dataset .

Dataset Size

7,043 customer records, 20 features.

Key Tools Used

- SQL (MySQL): Data extraction, initial profiling, identifying early trends.
- Python (Pandas, NumPy, Scikit-learn, Matplotlib, Seaborn, Imbalanced-learn): Comprehensive data cleaning, exploratory data analysis (EDA), predictive modeling, model evaluation.
- Google Colab: Cloud-based environment for efficient analysis.

Methodology

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Key Insights: Who is Churning? (EDA - Numerical)

Uncovering Patterns in Customer Behavior



Tenure

- Insight: New customers (short tenure) are highly susceptible to churn. Loyalty significantly increases with tenure.

- Data Point: Tenure and Churn have a strong negative correlation (-0.35).



Monthly Charges

- Insight: While weakly correlated, customers with higher monthly charges show a slight increase in churn propensity.

- Data Point: Weak positive correlation with Churn (0.19).



Total Charges

- Insight: Aligns with tenure – customers who have accumulated more total charges are less likely to churn.

- Data Point: Weak negative correlation with Churn (-0.20).

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*Key Insights: Contract & Service Impact (EDA -
Categorical)*

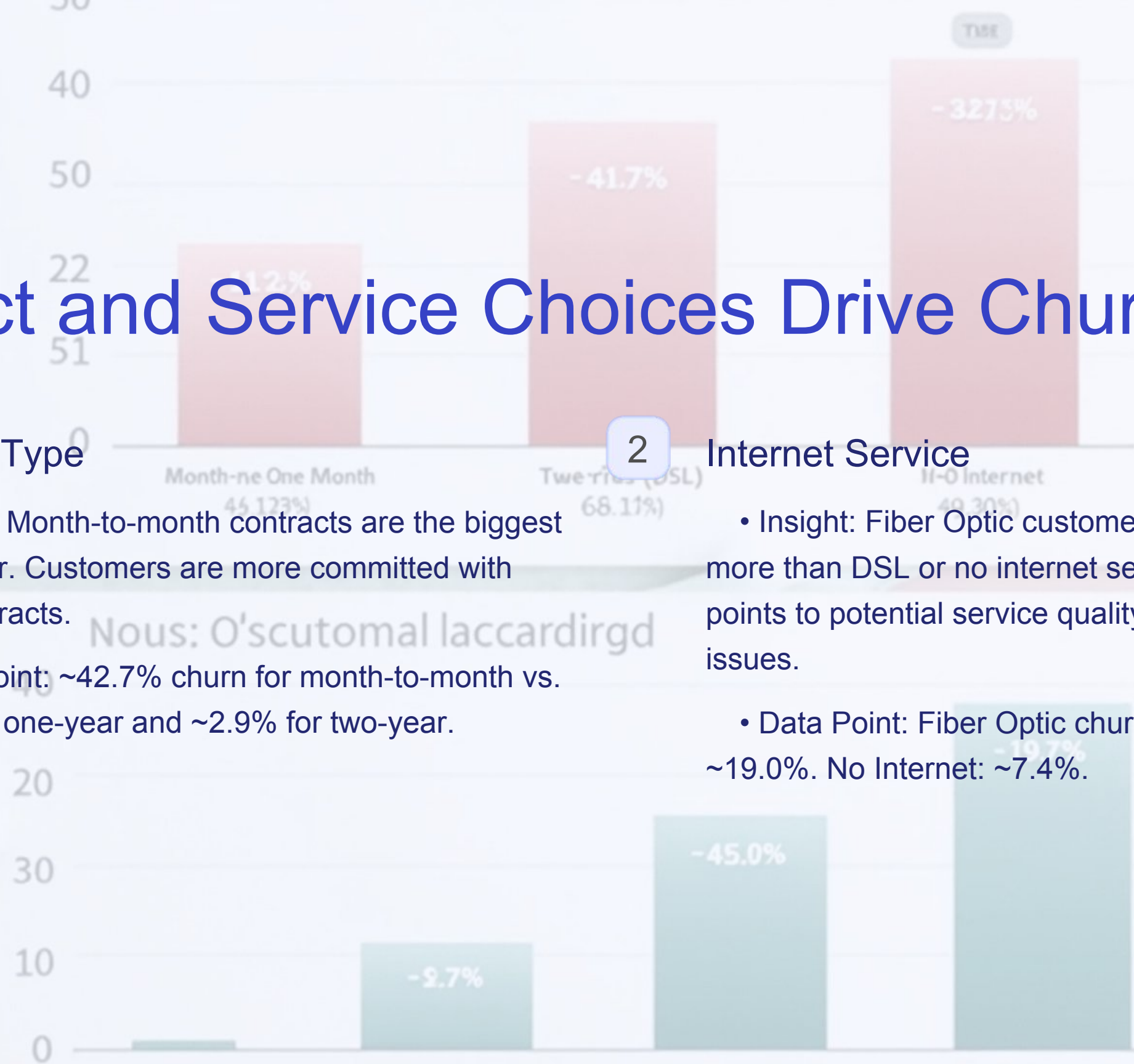
Contract and Service Choices Drive Churn

1 Contract Type

- Insight: Month-to-month contracts are the biggest churn driver. Customers are more committed with longer contracts.
- Data Point: ~42.7% churn for month-to-month vs. ~11.3% for one-year and ~2.9% for two-year.

2 Internet Service

- Insight: Fiber Optic customers churn significantly more than DSL or no internet service users. This points to potential service quality or expectation issues.
- Data Point: Fiber Optic churn rate: ~41.9%. DSL: ~19.0%. No Internet: ~7.4%.



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*Key Insights: Payment & Demographic Factors
(EDA - Categorical)*

Unpacking Other Influential Churn Drivers



Payment Method

- Insight: Electronic check users have a notably higher churn rate.

- Data Point: [Insert exact churn rates for each payment method from your analysis report, highlighting electronic check].



Senior Citizen

- Insight: Senior citizens churn at a significantly higher rate than non-senior citizens.

- Data Point: Senior Citizen churn rate: ~41.7% vs. Non-Senior: ~23.7%.



Add-on Services

- Insight: Customers with Online Security and Tech Support are less likely to churn, indicating their value as retention tools.



Other Factors

- Paperless Billing: Counter-intuitively, higher churn.

- Partner/Dependents: Lower churn (increased stability).

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Predicting Churn: Our Model

Proactive Identification of At-Risk Customers

Why a Model? To move from understanding who churned to predicting who will churn, enabling proactive intervention.

Approach:

- Data Preparation: Handled missing values, encoded categorical features, scaled numerical features.
- Addressing Imbalance: Used SMOTE to balance the training data (essential as only ~26% churn).
- Algorithms Evaluated: Logistic Regression, Decision Tree, Random Forest, Gradient Boosting.
- Best Model Chosen: Gradient Boosting Classifier
 - Reason: Excellent balance of Recall (catching actual churners) and overall discriminative power.

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Model Performance & Effectiveness

How Well Can We Predict Churn?

Key Performance Metrics (Gradient Boosting):

- Accuracy: 75.09% (overall correct predictions)
- Precision (of Churners): 52.15% (52.15% of predicted churners are truly churners)
- Recall (of Churners): 74.60% (We correctly identify ~75% of actual churners!)
- F1-Score (of Churners): 61.39% (balance of precision & recall)
- ROC AUC: 0.8360 (Strong ability to distinguish churners from non-churners)

Confusion Matrix:

- Insert your Confusion Matrix here, clearly labeled:
- `[[779 (True Negatives) 256 (False Positives)] [95 (False Negatives) 279 (True Positives)]]`

Interpretation: We successfully identified 279 true churners, while only missing 95 (False Negatives). This allows targeted action.

Metric	Value
--------	-------



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Key Predictors: What Drives Churn?

Top Features Influencing Churn Decisions

From Gradient Boosting Model:

- Tenure: (0.224) - The single most important factor.
- Contract_Two year: (0.163) - Commitment signifies loyalty.
- PaymentMethod_Electronic check: (0.141) - A strong warning sign.
- InternetService_Fiber optic: (0.114) - Significant service-related issue.
- Contract_One year: (0.088) - Another sign of commitment.
- MonthlyCharges: (0.052)
- InternetService_No internet service: (0.050)
- OnlineSecurity: (0.041)
- TechSupport: (0.027)
- Dependents: (0.021)

Consistency: These findings strongly align with our initial SQL analysis and detailed EDA.

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Strategic Recommendations: Driving Retention

Actionable Strategies to Reduce Churn and Boost Loyalty



Proactive Early Engagement for New Customers:

- Why: Short tenure is the highest risk.
- How: Personalized onboarding, dedicated welcome support, small loyalty incentives (e.g., free premium channel for 1st 3 months) for customers in their first 6 months, especially month-to-month.
- Target: New customers, month-to-month contracts.



Incentivize Longer-Term Contracts:

- Why: Longer contracts significantly reduce churn.
- How: Offer competitive discounts, bonus services, or waived fees for switching from month-to-month to 1-year or 2-year contracts. Focus on customers approaching their first few months.
- Target: Month-to-month customers.

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Strategic Recommendations (Continued)

Further Actionable Strategies

1

Address Fiber Optic Service Satisfaction:

- Why: Highest churn rate among all internet services.
- How: Conduct targeted customer satisfaction surveys, deep-dive into service complaints/outages for fiber optic, enhance technical support for fiber users, and ensure realistic expectations are set during sales.
- Target: Fiber Optic customers.

2

Optimize Electronic Check Payment Experience:

- Why: High churn rate associated with this payment method.
- How: Investigate friction points in the electronic check process, promote secure and automated payment alternatives (bank transfer, credit card) with incentives.
- Target: Electronic check users.



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Strategic Recommendations (Continued)

Final Actionable Strategies



Tailored Support for Senior Citizens:

- Why: Senior citizens show significantly higher churn.
- How: Develop simpler communication, dedicated and patient customer support lines, or senior-specific plans/discounts.
- Target: Senior Citizen customers.



Emphasize Value-Added Services:

- Why: Services like Online Security and Tech Support are strong retention factors.
- How: Proactively market and offer trials of these services to new customers and at-risk segments to demonstrate their value.
- Target: All customer segments, especially at-risk.

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Conclusion & Next Steps

Driving Future Customer Loyalty

1 Key Takeaways

- Churn is a significant business challenge, but it's predictable.
- Our analysis identifies clear, actionable drivers.
- A predictive model allows for proactive, targeted retention efforts.

2 Proposed Next Steps

- Pilot Programs: Implement and A/B test the proposed retention strategies on specific customer segments.
- Monitor & Iterate: Continuously track churn rates and the effectiveness of retention campaigns.
- Model Maintenance: Regularly re-evaluate and retrain the churn prediction model with new data.
- Further Analysis: Deep dive into specific pain points identified (e.g., fiber optic issues).

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Thank You & Q&A

Thank You



Content: Questions?



Your Contact Information: [Your Email/LinkedIn]



Thank You