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

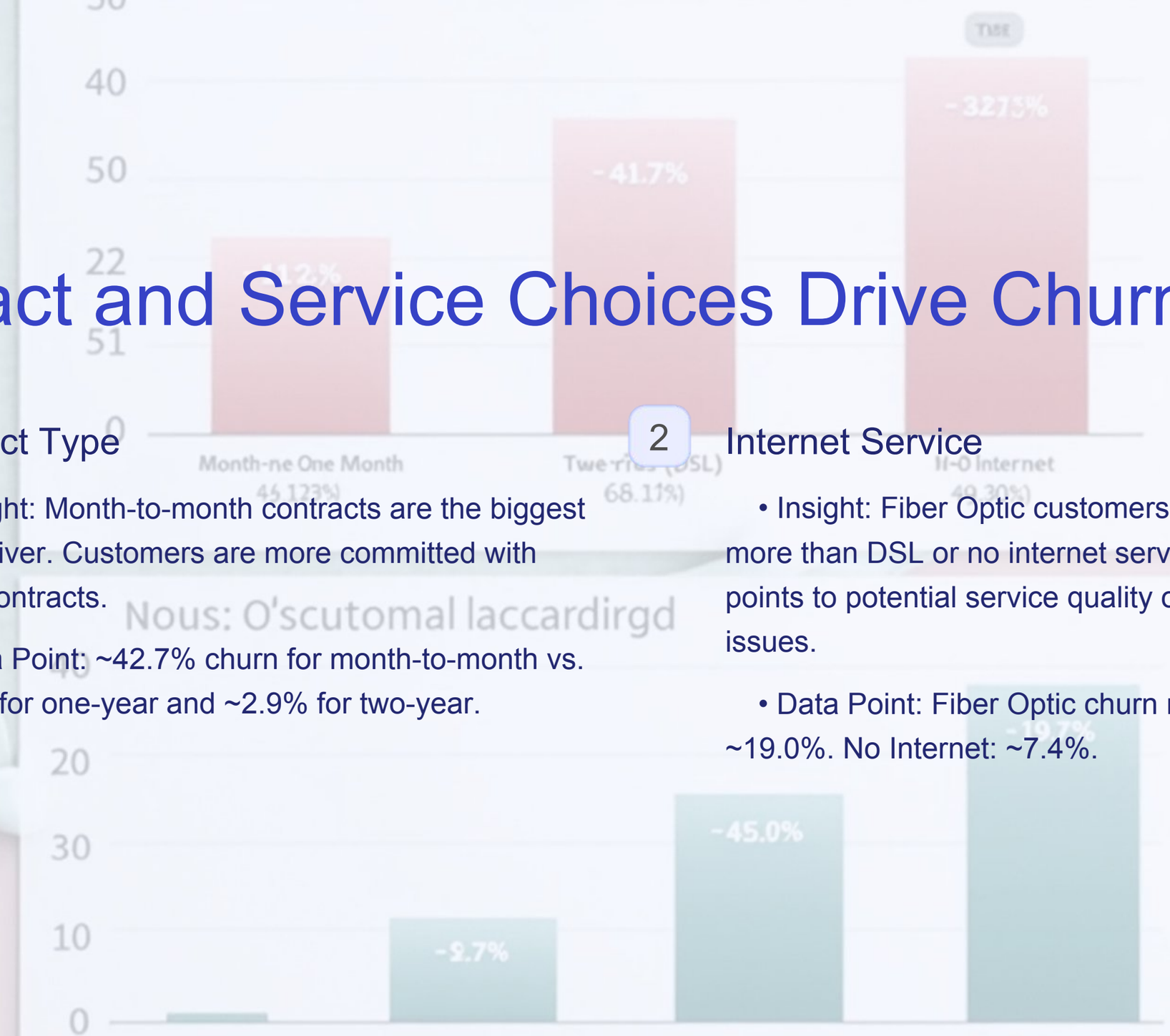
• Insight: Month-to-month contracts are the biggest churn driver. Customers are more committed with longer contracts.

• 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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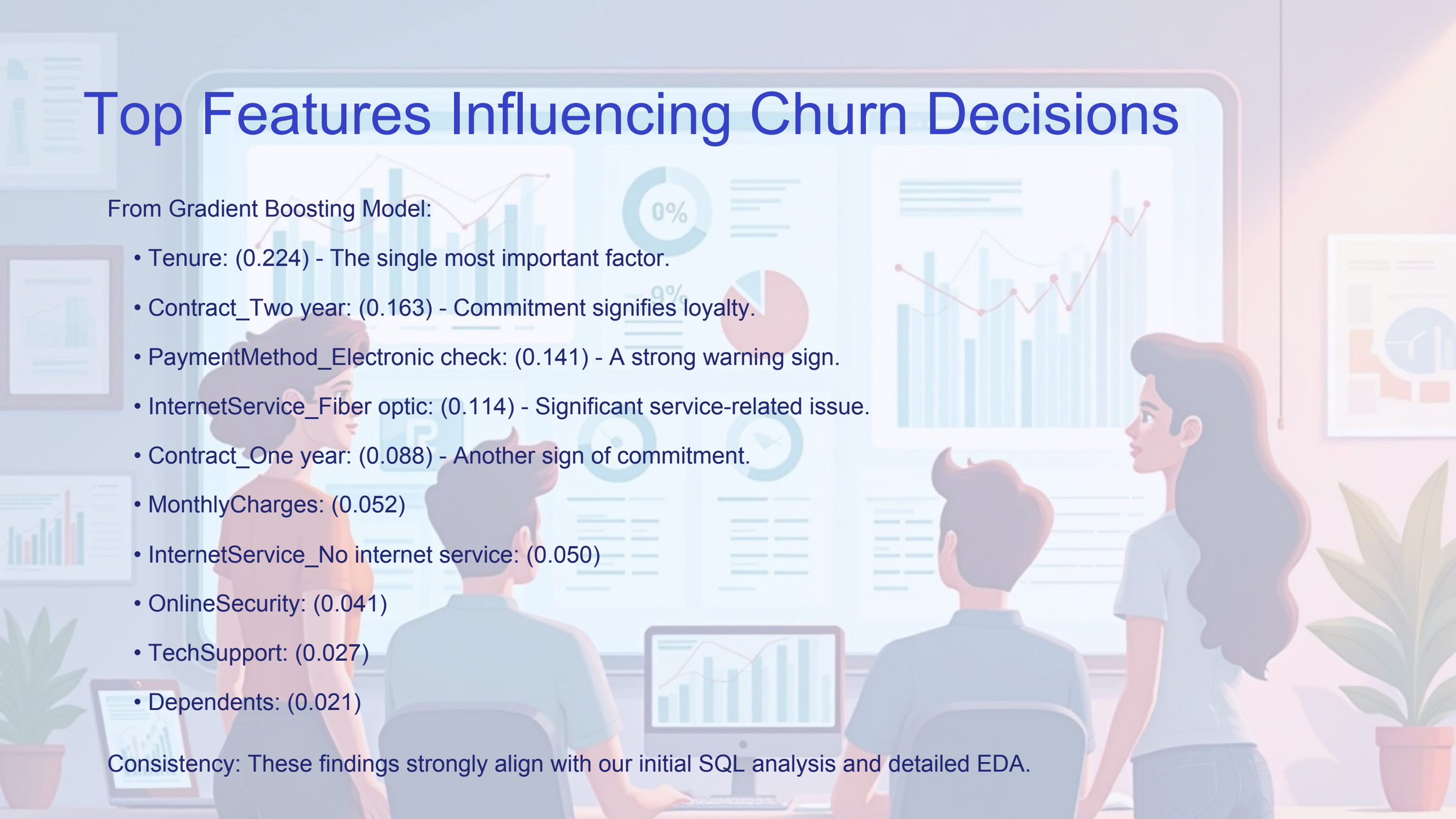
Key Predictors: What Drives Churn?

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).

Thank You