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Telecom Customer Churn Analysis:

Background:

Scenario:
You are a data analyst at Airtel, a leading telecommunications company. Recently, the company has noticed an increase in the number of customers discontinuing their services. This trend is alarming to the management as it could significantly impact the company's revenue and market share. Your task is to dive deep into the customer data to identify patterns and insights that could help understand the factors leading to customer churn. Your analysis will play a crucial role in developing strategies to improve customer retention.

Problem Statement

The primary challenge is to analyze the factors contributing to customer churn at Airtel. Understanding why customers are leaving will enable the company to implement targeted interventions to improve retention rates.

Data Dictionary

- **state**, *string*. 2-letter code of the US state of customer residence
- **account_length**, *numerical*. Number of months the customer has been with the current telco provider
- **area_code**, *string*="area_code_AAA" where AAA = 3 digit area code.
- **international_plan**, *(yes/no)*. The customer has an international plan.
- **voice_mail_plan**, *(yes/no)*. The customer has a voicemail plan.
- **number_vmail_messages**, *numerical*. Number of voice-mail messages.
- **total_day_minutes**, *numerical*. Total minutes of day calls.
- **total_day_calls**, *numerical*. Total number of day calls.
- **total_day_charge**, *numerical*. Total charge of day calls.
- **total_eve_minutes**, *numerical*. Total minutes of evening calls.
- **total_eve_calls**, *numerical*. Total number of evening calls.
- **total_eve_charge**, *numerical*. Total charge of evening calls.
- **total_night_minutes**, *numerical*. Total minutes of night calls.
- **total_night_calls**, *numerical*. Total number of night calls.
- **total_night_charge**, *numerical*. Total charge of night calls.
- **total_intl_minutes**, *numerical*. Total minutes of international calls.
- **total_intl_calls**, *numerical*. Total number of international calls.
- **total_intl_charge**, *numerical*. The total charge of international calls
- **number_customer_service_calls**, *numerical*. Number of calls to customer service
- **churn**, *(yes/no)*. Customer churn - target variable.

1. Geographic Analysis: Churn by Area Code

- **Findings**:
    - Area Code **415** exhibits the highest churn rate (**49.60%**), significantly outpacing Area Code **408 (25.55%)** and **510 (24.85%)**.
- **Insight**:
    - Regional issues such as service quality or competitive pressure may be more pronounced in Area Code 415.
- **Impact**:
    - Prioritize service quality improvements and regional marketing in Area Code 415 to address the high churn rate.

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2. Customer Service Interaction: Number of Calls

- **Findings**:
    - Churn rates increase sharply for customers making **4 or more service calls**:
        - **92 churns (44%)** for 4 calls.
        - **60% churn** for 5 calls, and **~65% for 6+ calls**.
- **Insight**:
    - Frequent service calls indicate unresolved issues, contributing to customer dissatisfaction.
- **Impact**:
    - Enhance first-call resolution rates and proactively address recurring problems to improve customer satisfaction.

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3. Customer Tenure: Account Length

- **Findings**:
    - Churn peaks among customers with account lengths between **101–120 months (125 churns)**.
    - Newer customers (1–40 months) also face significant churn, with **35 churns in total**, indicating early disengagement.
- **Insight**:
    - Both long-tenured customers and new customers have unique retention challenges.
- **Impact**:
    - Design targeted engagement strategies for new customers and re-engagement programs for long-tenured ones.

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4. International Call Charges and Plan Usage

- **Findings**:
  - ○ Customers with higher international charges (**4–6 units**) exhibit a **50% churn rate**, while low spenders (**0–2 units**) show a lower churn rate (**35%**).
  - ○ Non-subscribers of international plans churn at much higher rates (**431 churns**) compared to plan subscribers (**167 churns**).
- **Insight**:
  - ○ Cost concerns or lack of affordable plans may drive dissatisfaction among international users.
- **Impact**:
  - ○ Introduce cost-effective international plans tailored for low to moderate users.

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5. Daytime Usage Patterns (Calls and Minutes)

- **Findings**:
  - ○ Daytime calls:
    - ■ Customers making **40–50 calls** experience the highest churn (**195 churns out of 598 cases**).
    - ■ Lower call volumes (10–20 calls) have fewer churn cases (**54 churns**).
  - ○ Daytime minutes:
    - ■ Customers using **200–300 minutes/day** experience the highest churn (**160 churns**), with churn decreasing for higher ranges (e.g., only **46 churns for 300–350 minutes**).
- **Insight**:
  - ○ High daytime usage correlates with churn, likely due to cost sensitivity or service dissatisfaction.
- **Impact**:
  - ○ Offer flexible or usage-tiered daytime pricing plans to better align with customer needs.

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6. Evening Usage Patterns (Calls and Charges)

- **Findings**:
  - ○ Evening charges:
    - ■ Churn peaks in the **20–25 unit range (153 churns out of 903 cases)**.
  - ○ Evening calls:
    - ■ Customers making **125–149 calls** show significant churn (**66 churns out of 443 cases**).
- **Insight**:
  - ○ Evening heavy users may face issues with service quality or pricing.
- **Impact**:
  - ○ Provide tailored discounts or flexible plans for evening usage to improve customer satisfaction.

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7. Voicemail Plan Usage

- **Findings**:
  - Customers with voicemail plans sending **30–39 messages** show moderate churn (**32 churns out of 421 customers, 7.6%**).
- **Insight**:
  - Moderate voicemail usage correlates with less perceived value in the service.
- **Impact**:
  - Revamp voicemail offerings or bundle with additional features like text messaging to improve value perception.

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8. International Calls and Churn

- **Findings**:
  - Customers making **0–7 international calls** account for **84% of churn cases**.
  - Among international plan subscribers, churn is higher for customers making **4–7 calls (28%)**.
- **Insight**:
  - Moderate international callers are likely dissatisfied with the current offerings.
- **Impact**:
  - Optimize international plans for moderate users to balance cost and value effectively.

Overall Business Impacts

1. **Geographic Strategy**:
   - Address high churn in Area Code 415 through targeted marketing and service quality enhancements.
2. **Service Quality Improvements**:
   - Focus on resolving customer service issues efficiently to reduce churn from frequent callers.
3. **Engagement Programs**:
   - Implement robust onboarding strategies for new customers and re-engagement initiatives for long-tenured customers.
4. **Tailored Pricing Models**:
   - Introduce segmented pricing plans for heavy daytime and evening users to match their usage patterns.
5. **Product Bundling**:
   - Design affordable voicemail and international calling bundles to meet customer needs.
6. **Behavioral Insights Application**:
   - Use data-driven models to predict high-risk customers based on tenure, usage, and service interactions, enabling proactive retention efforts.

Conclusion

This comprehensive analysis highlights critical drivers of customer churn and provides actionable insights for reducing churn. By addressing these findings with targeted solutions, the telecom company can significantly improve customer retention, satisfaction, and profitability.