## **Phase 1: Data Acquisition & Understanding - Summary of Findings using SQL**

### **Conclusion of Phase 1:**

We've successfully acquired the Telco-Churn.csv dataset into MySQL and performed initial exploratory queries. We've identified several key factors strongly correlated with churn:

* **Contract Type:** Month-to-month contracts are a major churn risk.
* **Internet Service:** Fiber Optic users are highly prone to churning.
* **Demographics:** Senior Citizens churn at a significantly higher rate.
* **Overall:** The company faces a substantial churn rate of around 26.6%.

These insights are extremely valuable and will guide our deeper analysis and feature engineering in the next phase.

**Phase 1: Data Acquisition & Understanding - Summary of Findings**

This report summarizes the findings derived from the initial data acquisition and understanding phase, based on the executed queries.**1. Overall Churn Distribution (Query 3)**

* **Total Customers (implied):** 7032 customers (5163 non-churn, 1869 churn).
* **Churn Rate:**
  + **No Churn:** 5163 customers (73.42%)
  + **Churn:** 1869 customers (26.58%)
* **Insight:** Approximately **one-quarter of the customer base (26.58%) has exhibited churn behavior**. This represents a substantial proportion and validates the organization's concerns regarding customer retention. The dataset exhibits an imbalanced class distribution, with 'No' (non-churn) representing the majority class, a common characteristic in churn prediction datasets. This imbalance will necessitate careful consideration during subsequent predictive modeling efforts.

**2. Churn by Contract Type (Query 5)**

* **Month-to-month:**
  + Non-Churn: 2220
  + Churn: 1655
  + Churn Rate: 42.7%
* **One year:**
  + Non-Churn: 1306
  + Churn: 166
  + Churn Rate: 11.27%
* **Two year:**
  + Non-Churn: 1637
  + Churn: 48
  + Churn Rate: 2.85%
* **Insight:** **Month-to-month contracts demonstrate a significantly elevated churn rate (approximately 42.7%)** when compared to one-year (approximately 11.3%) and two-year (approximately 2.9%) contracts. This strongly indicates that customers on shorter-term contracts present a substantially higher risk of churn, which aligns with the intuitive understanding of lower commitment levels.

**3. Churn by Internet Service Type (Query 6)**

* **Fiber optic:**
  + Total Customers: 3096
  + Churned Customers: 1297
  + **Churn Rate: 41.89%**
* **DSL:**
  + Total Customers: 2416
  + Churned Customers: 459
  + **Churn Rate: 19.00%**
* **No Internet Service:**
  + Total Customers: 1520
  + Churned Customers: 113
  + **Churn Rate: 7.43%**
* **Insight:** **Customers utilizing Fiber Optic internet service exhibit the highest churn rate (41.89%)**, exceeding that of DSL customers by more than twofold. This observation suggests potential underlying issues with the fiber optic service, such as reliability, discrepancies between promised and actual speeds, or deficiencies in customer support pertaining to fiber optic services. Conversely, customers without internet service demonstrate the lowest churn rate, which is logical given their reduced reliance on the telecommunications provider for a critical daily service.

**4. Churn by Senior Citizen Status (Query 9)**

* **Senior Citizen (1):**
  + Total Customers: 1142
  + Churned Customers: 476
  + **Churn Rate: 41.68%**
* **Non-Senior Citizen (0):**
  + Total Customers: 5890
  + Churned Customers: 1393
  + **Churn Rate: 23.65%**
* **Insight:** **Senior citizens (41.68% churn rate) exhibit nearly double the churn rate of non-senior citizens (23.65% churn rate).** This constitutes a significant demographic finding and may indicate specific service needs or challenges experienced by senior customers.

The Telco-Churn.csv dataset has been successfully acquired into MySQL, and preliminary exploratory queries have been executed. Several key factors demonstrating a strong correlation with customer churn have been identified:

* **Contract Type:** Month-to-month contracts pose a significant churn risk.
* **Internet Service:** Users of Fiber Optic internet service are highly susceptible to churn.
* **Demographics:** Senior Citizens exhibit a statistically higher churn rate.
* **Overall:** The organization is experiencing a substantial overall churn rate of approximately 26.6%.

These insights are highly valuable and will serve as foundational guidance for the in-depth analysis and feature engineering efforts in the forthcoming phase.

**1. Synthesizing All Findings:**

We've moved from raw data to actionable insights. Here's a consolidated view:

* **Overall Churn Problem:** The company faces a substantial churn rate of **~26.6%**, with new customers being particularly vulnerable.
* **Top Churn Drivers (Risk Factors):**
  + **Short Tenure:** New customers (tenure < ~6 months) are highly likely to churn.
  + **Month-to-Month Contracts:** Customers not locked into longer contracts are at very high risk.
  + **Fiber Optic Internet Service:** Despite being a premium service, it's associated with significantly higher churn rates. This is a critical service delivery or expectation management issue.
  + **Electronic Check Payment Method:** Customers using this method show a higher propensity to churn.
  + **Senior Citizens:** A specific demographic with notably higher churn.
  + **Lack of Value-Added Services:** Customers without OnlineSecurity or TechSupport are more prone to churn.
  + **Paperless Billing:** Counter-intuitively, customers on paperless billing churn more. This might correlate with tech-savvy but less loyal segments (e.g., fiber optic users).
* **Retention Factors (Lower Risk):**
  + Longer tenure customers.
  + Customers with One-year or Two-year contracts.
  + Customers with partners and/or dependents.
  + Customers with Online Security, Online Backup, Device Protection, and Tech Support.
  + Customers with no internet service or DSL internet.
  + Customers paying by Bank Transfer, Credit Card, or Mailed Check.

### **2. Formulating Actionable Recommendations:**

Based on these insights, here are concrete, data-driven recommendations for the telecommunications company to reduce churn:

1. **Targeted Onboarding & Retention for New Customers:**
   * **Strategy:** Implement proactive outreach programs for customers in their first 3-6 months, especially those on month-to-month contracts.
   * **Action:** Offer dedicated support lines, personalized check-ins, or small loyalty incentives after 3 months to build initial satisfaction.
   * **Metric to Track:** Churn rate for customers in their first 6 months.
2. **Promote Longer-Term Contracts:**
   * **Strategy:** Incentivize customers to switch from month-to-month to one-year or two-year contracts.
   * **Action:** Offer discounts, bundled services, or special perks for signing longer contracts, particularly as their initial month-to-month period nears its end.
   * **Metric to Track:** Percentage of customers on month-to-month contracts, conversion rate to longer contracts.
3. **Address Fiber Optic Service Issues:**
   * **Strategy:** Investigate the root causes of high churn among Fiber Optic users.
   * **Action:** Conduct customer satisfaction surveys specific to fiber optic service, analyze service outages/complaints for fiber optic, and improve technical support or network reliability for this segment. Consider clearer expectation setting during sales.
   * **Metric to Track:** Churn rate of Fiber Optic customers, Fiber Optic customer satisfaction scores.
4. **Optimize Electronic Check Payment Experience:**
   * **Strategy:** Understand why electronic check users churn more. It might be related to a specific user segment or issues with the payment process itself.
   * **Action:** Explore alternative payment method promotions, offer incentives for switching to automatic bank transfer/credit card, or conduct user experience studies on the electronic check process.
   * **Metric to Track:** Churn rate by payment method, adoption rate of alternative payment methods.
5. **Tailored Support for Senior Citizens:**
   * **Strategy:** Develop specific programs or simplified communication channels for senior customers.
   * **Action:** Offer easier-to-understand billing, dedicated customer support with longer patience, or discounts on senior-friendly devices/plans.
   * **Metric to Track:** Churn rate among senior citizens, senior citizen satisfaction scores.
6. **Highlight Value-Added Services for Retention:**
   * **Strategy:** Emphasize the benefits of OnlineSecurity and TechSupport as retention tools.
   * **Action:** Promote these services (perhaps initially free for a trial period, or bundled) to new customers or at-risk segments, showcasing their ability to reduce churn.
   * **Metric to Track:** Adoption rates of security/support services, churn rate difference for users of these services.
7. **Re-evaluate Paperless Billing Strategy:**
   * **Strategy:** Investigate the higher churn among paperless billing users. It might indicate a segment that prioritizes convenience but not necessarily loyalty.
   * **Action:** Conduct user feedback on paperless billing, ensure transparency and ease of access to digital bills, and potentially pair paperless billing with loyalty programs.