# Predictive Churn Analysis for Tower Tenants (MNOs)

Case Study 1

# Problem

Telecom infrastructure companies like IHS, Helios, or American Tower lease space on towers to mobile network operators (MNOs) such as MTN, Airtel, Vodacom, and Orange. This tower colocation model is the backbone of Africa's mobile connectivity.

- MNOs sign long-term contracts (often 5–10 years).
  - But sometimes, they reduce or cancel leases if:
  - They merge with another operator.
  - They shut down unprofitable regions.
  - They build their own towers.
  - Market competition or financial stress hits them.

When churn happens, the tower company loses steady recurring revenue and faces under-utilized infrastructure.

- Predicting tenant churn is currently manual and reactive. MNO churn means:
  - Loss of millions of dollars in revenue.
  - Idle tower capacity.
  - Weakening of client relationships.

Without predictive analytics, companies can't plan retention strategies in advance.

# Solution

Build a churn prediction model to assess which MNO tenants are at risk of leaving.

- Input factors:
  a. Lease duration and renewal patterns.
  b. Payment history and delays.
  c. Usage patterns (active vs inactive towers).
  d. Competitor presence in the same region.
  e. Market conditions (regulation, mergers, financial performance of MNO).
- Output: Churn probability score for each tenant.
- Enable proactive retention:
  a. Discounts for long-term renewals.
  b. Bundled services (e.g., fiber + power backup).
  c. Regional incentives to retain tenants.

## Data & Dataset Plan

- **Public Datasets (Adaptable):**
  - Kaggle: Telco Customer Churn Dataset.
  - IBM Telco Churn Dataset.
- **Simulated Lease Data (Tower Context):**
  - Tenant ID, Tower ID, Lease Duration, Payment History, Usage Volume, Region, Competitor Presence, Renewal Status.
  - Target: Churn (Yes/No).

## Proposed Models

- **Baseline:** Logistic Regression (interpretable churn predictor).
- **Advanced:** Random Forest, XGBoost, LightGBM (high accuracy churn classifiers).
- **Explainability:** SHAP values to show why a tenant is at risk.

## Example Scenario

- Tenant: Airtel in Zambia.
- Features: Lease near expiry, payment delays in last 3 months, declining usage in rural towers.
- Prediction: 78% probability of churn.
- Action: Offer renewal discount + shared fiber connectivity package.
- Result: Airtel continues lease, preventing revenue loss.

## Business Impact

- **Revenue Protection:** Reduce tenant churn by 10–15%.
- **Better Resource Planning:** Anticipate under-utilized towers and repurpose capacity.
- **Stronger Client Relationships:** Proactive support → trust with MNOs.
- **Competitive Advantage:** Tower company becomes a strategic partner, not just a landlord.

## Conclusion

Predictive churn analysis helps telecom tower companies protect recurring revenue by identifying at-risk MNO tenants in advance. With proactive strategies, they can **retain key clients, reduce revenue leakage, and strengthen their market leadership** in Africa's telecom infrastructure sector.