**Data Science Use Case Document Template**

**1. Problem Statement**

**Description:**  
Telecom companies need to strategically expand their networks to meet growing demand, especially in underserved or high-growth areas. Traditional methods rely on static data and lack predictive capabilities, resulting in inefficient resource allocation. An AI-driven predictive network expansion solution can identify optimal locations and prioritize investments based on data-driven insights.

**2. Target Variable / Number of Clusters**

**Definition:**  
The target outcomes include predictions of high-demand areas, infrastructure requirements, and potential customer acquisition rates. Clustering can group regions based on population density, current connectivity, and growth potential.

**3. Input Variables / Parameters**

**Key Influencers:**

* Population density and growth trends
* Current network coverage and performance metrics
* Customer usage patterns and demand forecasts
* Competitor network coverage
* Economic and regional development data
* Regulatory constraints and opportunities

**4. Sector**

**Telecom**

**5. Approach / Technology Used**

**Technology Stack:**

* **Machine Learning Models:** To predict demand growth and identify high-priority areas.
* **Geospatial Analytics:** For mapping potential expansion zones.
* **Optimization Algorithms:** To allocate resources efficiently.
* **Data Integration Platforms:** For combining diverse datasets, including customer, network, and external data.
* **Visualization Tools:** For presenting actionable insights to stakeholders.

**6. Benefits**

* Efficient use of resources by targeting high-demand areas.
* Faster network expansion with data-backed decisions.
* Increased customer satisfaction through improved connectivity.
* Competitive advantage by staying ahead in underserved markets.
* Reduced costs associated with trial-and-error expansion approaches.

**7. Expected Outcome**

* **Optimized Deployment:** Targeted investments in areas with high ROI potential.
* **Improved Connectivity:** Better service availability for underserved regions.
* **Cost Savings:** Reduced inefficiencies in resource allocation.
* **Market Growth:** Higher customer acquisition in newly expanded areas.

**8. Challenges / Risks**

* Data accuracy and availability for reliable predictions.
* Regulatory and environmental constraints affecting deployment.
* High initial costs for AI tools and data integration.
* Potential resistance from stakeholders to adopt new methodologies.