📋 Business Requirements Document

DataCo Supply Chain Analysis Project - Practical Implementation

Dataset Overview

Based on the research, you're working with:

- 180,000+ order records from 2015-2018
- 50+ features covering customer orders, products, shipping, delivery, and financials
- 30,000+ unique customers and 10,000+ products
- Key data includes: Order ID, customer details, product categories, shipping modes, delivery status, costs, and late delivery risk indicators

Revised Business Goals (Achievable with Your Toolset)

Primary Goals - 8 Week Timeline

1. **Delivery Performance Analysis**: Create actionable insights to improve the current 41% on-time delivery rate toward industry benchmark of 95%
2. **Cost Optimization**: Identify 10-15% cost reduction opportunities through data-driven shipping and operational analysis
3. **Customer Segmentation**: Develop practical customer segments for retention strategies
4. **Interactive Dashboards**: Build executive and operational dashboards for ongoing monitoring

Practical Requirements by Tool Assignment

SQL Server & Database Management (Saleem Khaled)

Must-Have Requirements:

- Design normalized database schema for the 180K+ records
- Create data quality checks for key fields (order dates, shipping costs, delivery status)
- Build standardized views for analysis (monthly summaries, customer profiles, product performance)
- Document data lineage and create backup procedures

Deliverables:

- SQL database with optimized indexes
- Data quality validation scripts
- Standard query library for common analyses

Excel Data Analysis & Financial Modeling (Mohamed Mostafa)

Must-Have Requirements:

- Cost-benefit analysis templates for shipping mode optimization
- Financial impact calculators for delivery improvement initiatives
- ROI models for recommended changes

- Monthly/quarterly financial summaries with variance analysis

Should-Have Requirements:

- Scenario planning tools for different cost reduction strategies
- Budget forecasting based on historical trends

Deliverables:

- Dynamic Excel models with sensitivity analysis
- Financial summary templates
- What-if scenario tools

Python Analytics & Modeling (Abdelrahman Mohamed)

Must-Have Requirements:

- Develop late delivery risk prediction model using existing late_delivery_risk indicators
- Create customer segmentation using RFM analysis (Recency, Frequency, Monetary)
- Build time series analysis for demand patterns and seasonality
- Generate automated insights reports

Should-Have Requirements:

- Simple demand forecasting for next 30-60 days
- Shipping cost optimization analysis by carrier/mode

Deliverables:

- Jupyter notebooks with documented analysis
- Python scripts for automated reporting
- Predictive models with performance metrics

Tableau Visualization (Mohamed Sameer)

Must-Have Requirements:

- Executive dashboard: KPIs, trends, geographic performance
- Operational dashboard: Order tracking, delivery performance, bottleneck identification
- Financial dashboard: Cost analysis, profit margins by segment
- Interactive maps for regional performance analysis

Should-Have Requirements:

- Drill-down capabilities by product category, customer segment, time period
- Parameter controls for scenario analysis

Deliverables:

- 3-4 interactive Tableau workbooks
- Published dashboards with refresh schedules
- User guides for stakeholders

Simplified Success Metrics

Quantitative KPIs:

- **Delivery Performance**: On-time delivery rate by region/product (target: identify improvement opportunities)
- **Financial**: Average cost per order, shipping cost as % of sales, profit margin trends
- **Customer**: Customer retention indicators, high-value customer identification
- **Operational**: Average lead time, order processing efficiency

Project Success Metrics:

- All dashboards functional and accessible
- Predictive models achieve >70% accuracy
- Cost optimization recommendations with quantified impact
- Stakeholder approval of final presentation

Focused Analysis Areas

Week 1-2: Data Foundation

- Database setup and data quality assessment
- Initial exploratory analysis across all tools
- Standardize metrics definitions

Week 3-4: Core Analysis

- Delivery performance deep-dive by geography, product, shipping mode
- Customer segmentation and behavior analysis
- Cost structure analysis and optimization opportunities

Week 5-6: Predictive Insights

- Late delivery risk modeling
- Demand pattern analysis
- Financial impact quantification

Week 7-8: Integration & Reporting

- Dashboard finalization and testing
- Integrated reporting across all tools
- Presentation preparation and documentation

Realistic Constraints & Risk Mitigation

Scope Limitations:

- Focus on historical analysis (2015-2018 data)
- No real-time integration requirements
- Limited to existing dataset features
- No external data sources

Risk Management:

- **Data Quality Issues**: Implement validation checks early
- **Tool Integration**: Use common export formats (CSV, Excel) for data sharing
- **Timeline Pressure**: Prioritize Must-Have over Should-Have requirements
- **Skill Gaps**: Pair team members for knowledge sharing

Practical Deliverables Integration

Integrated Outputs:

1. **Executive Summary Report** (PowerPoint): Key findings, recommendations, ROI analysis
2. **Operational Handbook** (PDF): Process improvements, KPI definitions, monitoring procedures
3. **Technical Documentation**: Database schema, model documentation, dashboard user guides
4. **Financial Models**: Excel-based tools for ongoing cost optimization
5. **Dashboard Suite**: Tableau workbooks for different user types

Collaboration Framework:

- Weekly sync meetings for progress alignment
- Shared data dictionary and naming conventions
- Common GitHub repository for version control
- Cross-validation of findings across tools