SecureSmart Logistics Workshop

Description:

This unified case study documents the complete SecureSmart Logistics Workshop as a single, integrated implementation. Rather than treating each algorithm separately, students worked as one cohort to solve ONE comprehensive supply chain challenge using all five algorithms sequentially.
The Company Challenge:
TechGear Manufacturing operates across 8 countries with 12 suppliers, 3 production plants, and 5 distribution centers. They face:
• Supplier reliability issues (30% on-time failures)
• Route inefficiency (25% excess travel distance)
• Unbalanced workload (some zones 3x busier than others)
• Manual decision-making (no systematic rules)
• No real-time performance monitoring
• Annual losses: $5–8M from inefficiencies

Objectives:

Design a complete, integrated AI supply chain system for TechGear that:

1. Systematically ranks suppliers by risk (Algorithm 1: Weighted Scoring)
2. Optimizes delivery routes efficiently (Algorithm 2: Nearest-Neighbor)
3. Distributes work fairly across zones (Algorithm 3: K-Means)
4. Assigns tasks based on rules & constraints (Algorithm 4: Decision Trees)
5. Detects & alerts on performance deviations (Algorithm 5: Anomaly Detection)

Deliverable:
Complete optimization system with implementation roadmap, datasets, dashboards, and recommendation report for TechGear executives.

Workshop Agenda:

Day 1 – Foundation and Network Architecture

- Supply Chain Fundamentals:
  How supply chains work, KPIs, real-time data importance
- AI Risk Analysis and Optimization:
  How algorithms solve supply chain problems
- Cybersecurity Foundations:
  RBAC, data encryption, threat modeling, compliance
- Network Architecture Design

1. Created detailed network map
2. Identified supplier locations and performance data
3. Mapped delivery routes
4. Documented security requirements
5. Created performance baseline metric

Day 2 – Algorithm Implementation

- Weighted scoring algorithm
- Risk scoring implementation
    - Create supplier database
    - Build excel scoring formula
    - Sort suppliers into tiers
    - Analyze risk distribution
    - Recommend procurement strategy
- Routing, clustering and task assignment
- Integrated routing system

Day 3 – Algorithm 5 + System Integration and Presentation

- Performance dashboard
    - KPI tracking
    - Real-time monitoring
    - Dashboard design
- Security and Access control
    - Biometric authentication
    - RBAC
    - Data protection
- Anomaly detection algorithm
- Complete system integration
    - Build complete TechGear optimization system
- Team presentation and evaluation
    - Complete system overview
    - Algorithm implementation result
    - Financial impact summary
    - Implementation roadmap
    - Q&A with TechGear executives