

Data Analytics in Automation System

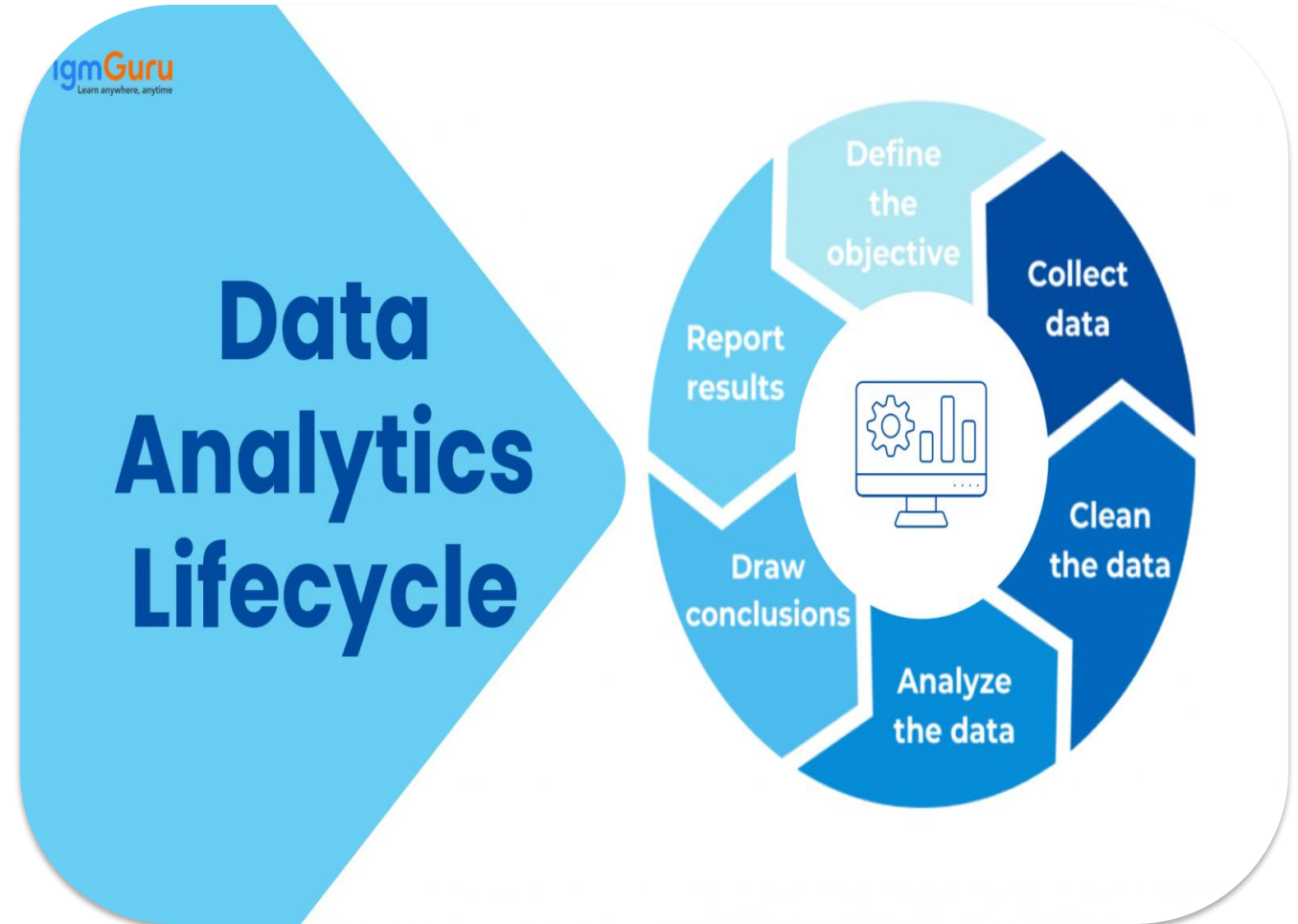
Logistics Automation

23MCT305 - Data Analytics in Automation System

What is Data Analytics?

Process of examining, cleaning, transforming, and modeling data to discover useful information, draw conclusions, and support decision-making.





- ✓ **Descriptive:** What happened?
- ✓ **Diagnostic:** Why did it happen?
- ✓ **Predictive:** What will happen?
- ✓ **Prescriptive:** What should we do?



What is Logistics Automation?

Application of automated technologies to optimize supply chain and warehouse operations.

Key Components

-  **Robotic Systems:** Automated picking and sorting
-  **Conveyor Systems:** Continuous material flow
-  **Automated Storage:** AS/RS technology
-  **IoT Sensors:** Real-time monitoring



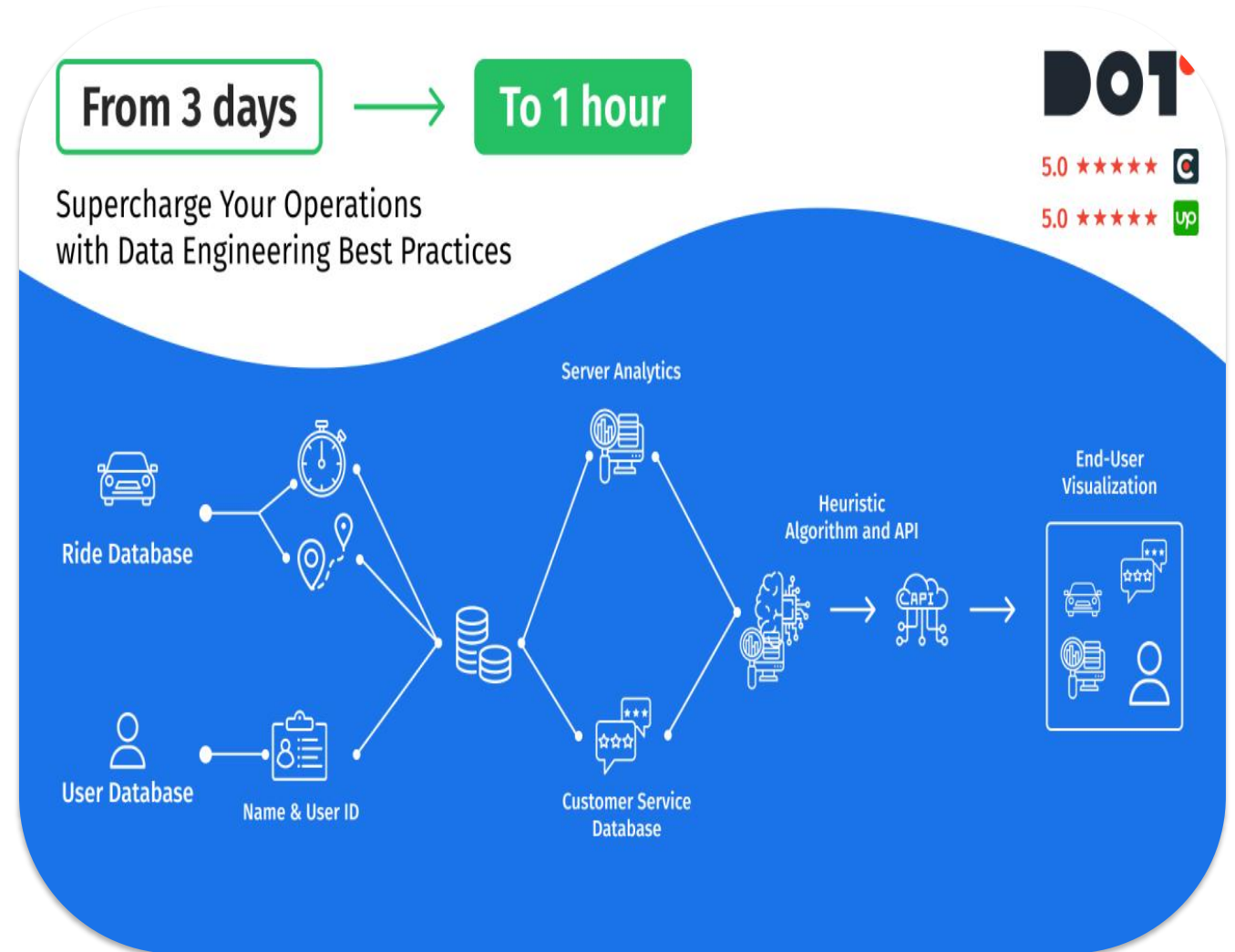
Role of Data Analytics in Logistics Automation

Data-Driven Decision Making

Transforming raw data into actionable insights for operational excellence.

Key Applications

-  **Route Optimization:** Efficient delivery planning
-  **Inventory Management:** Real-time stock control
-  **Predictive Maintenance:** Minimize downtime
-  **Demand Forecasting:** Anticipate market needs



(📶) Modern Data Collection

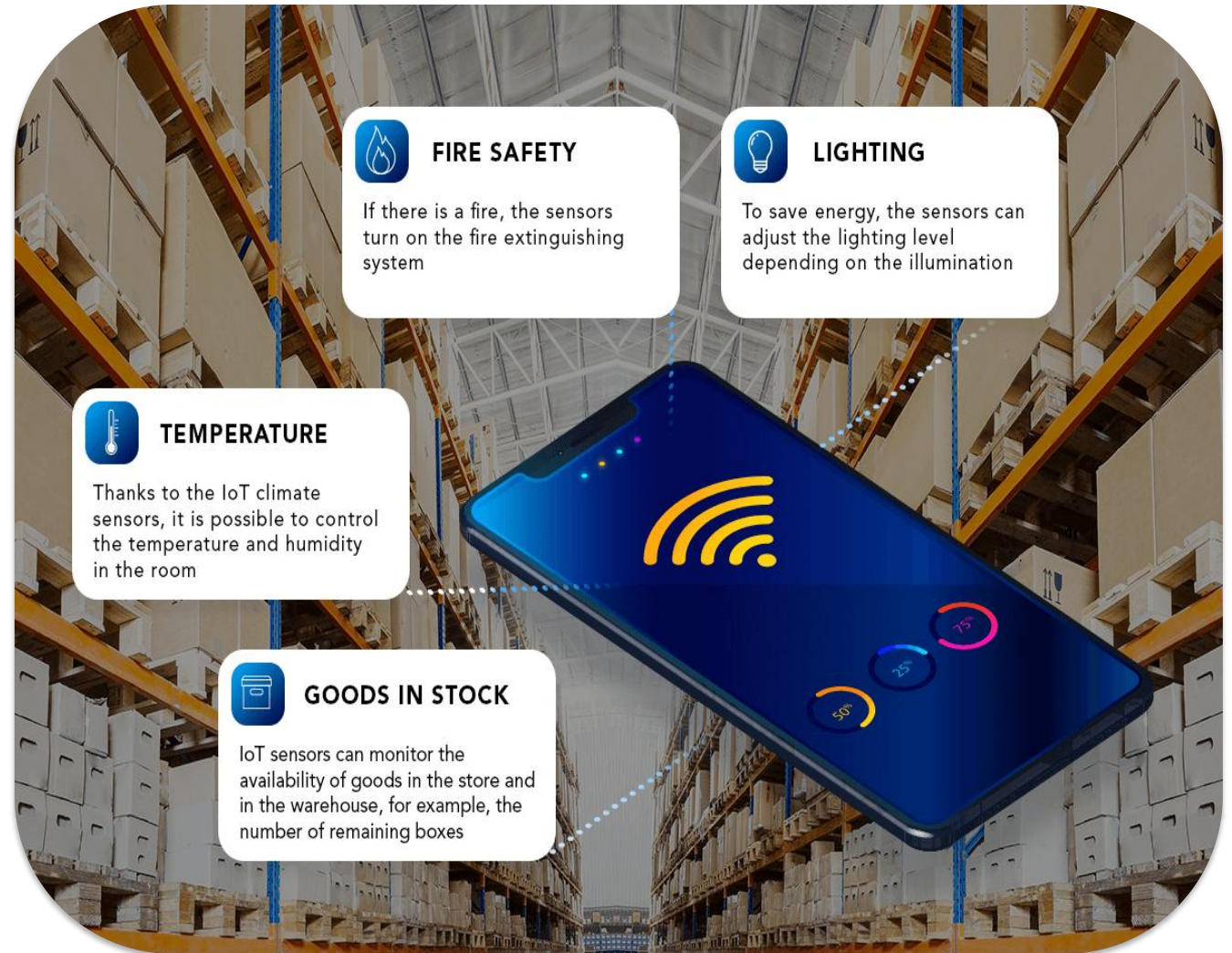
Advanced technologies for real-time, accurate, and efficient data gathering.

📶 **IoT Sensors:** Temperature, humidity, motion tracking

📶 **RFID Technology:** Wireless identification of goods


📶 **Barcode Systems:** Scanning and tracking inventory

📶 **GPS Tracking:** Real-time location monitoring





Advanced Analytics

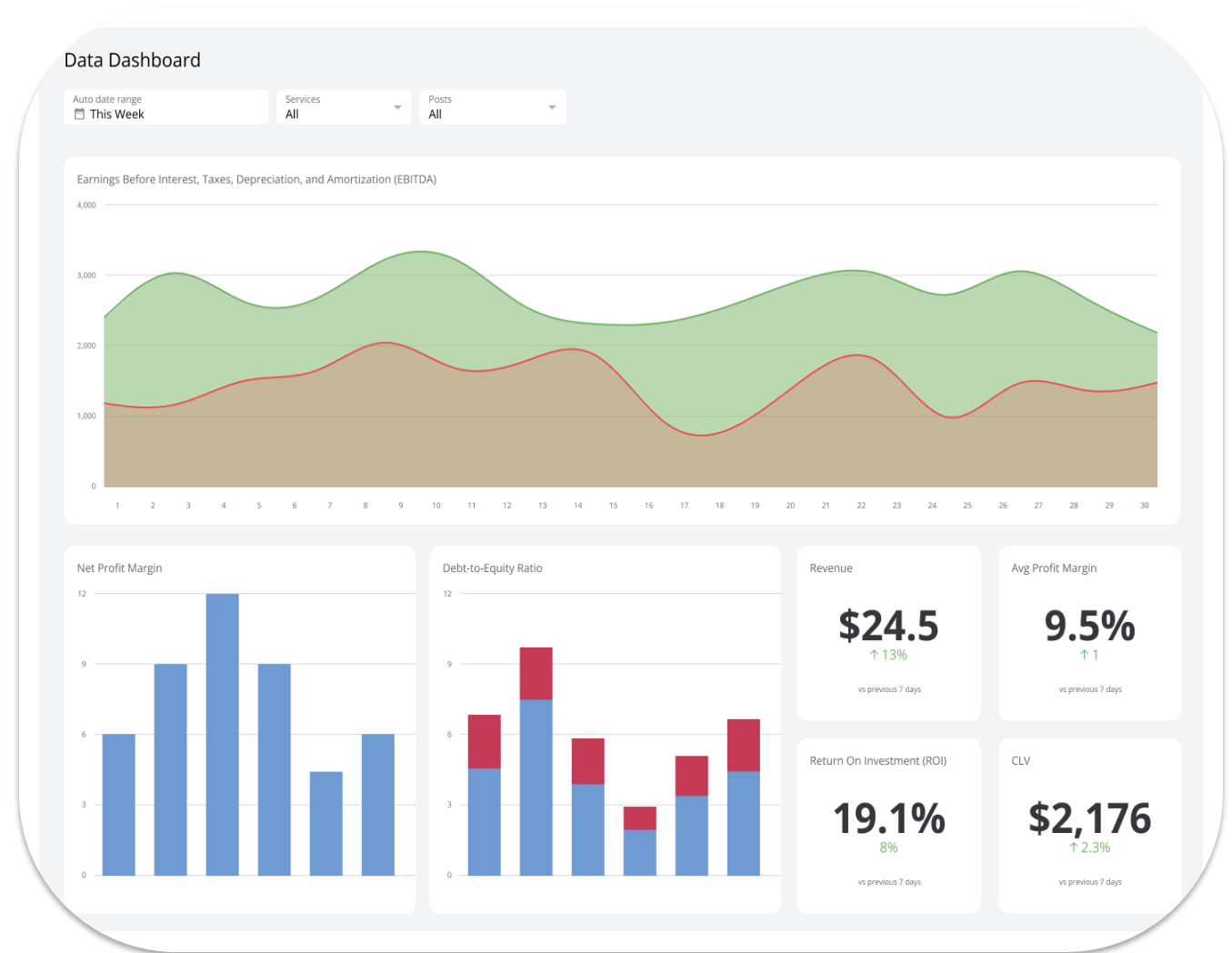
Transforming logistics data into strategic insights for competitive advantage.

 **Descriptive:** What happened? Historical analysis

 **Diagnostic:** Why did it happen? Root cause analysis

 **Predictive:** What will happen?
Forecasting models

 **Prescriptive:** What should we do?
Optimization strategies



Success Stories

Practical implementations demonstrating data analytics impact in logistics.

 **Amazon:** Robotics & AI optimization

 **DHL:** Route analytics improvement

 **FedEx:** Predictive maintenance

 **Walmart:** Demand forecasting AI



Mind Map – GenAI Generated Content

Complete Concept Overview

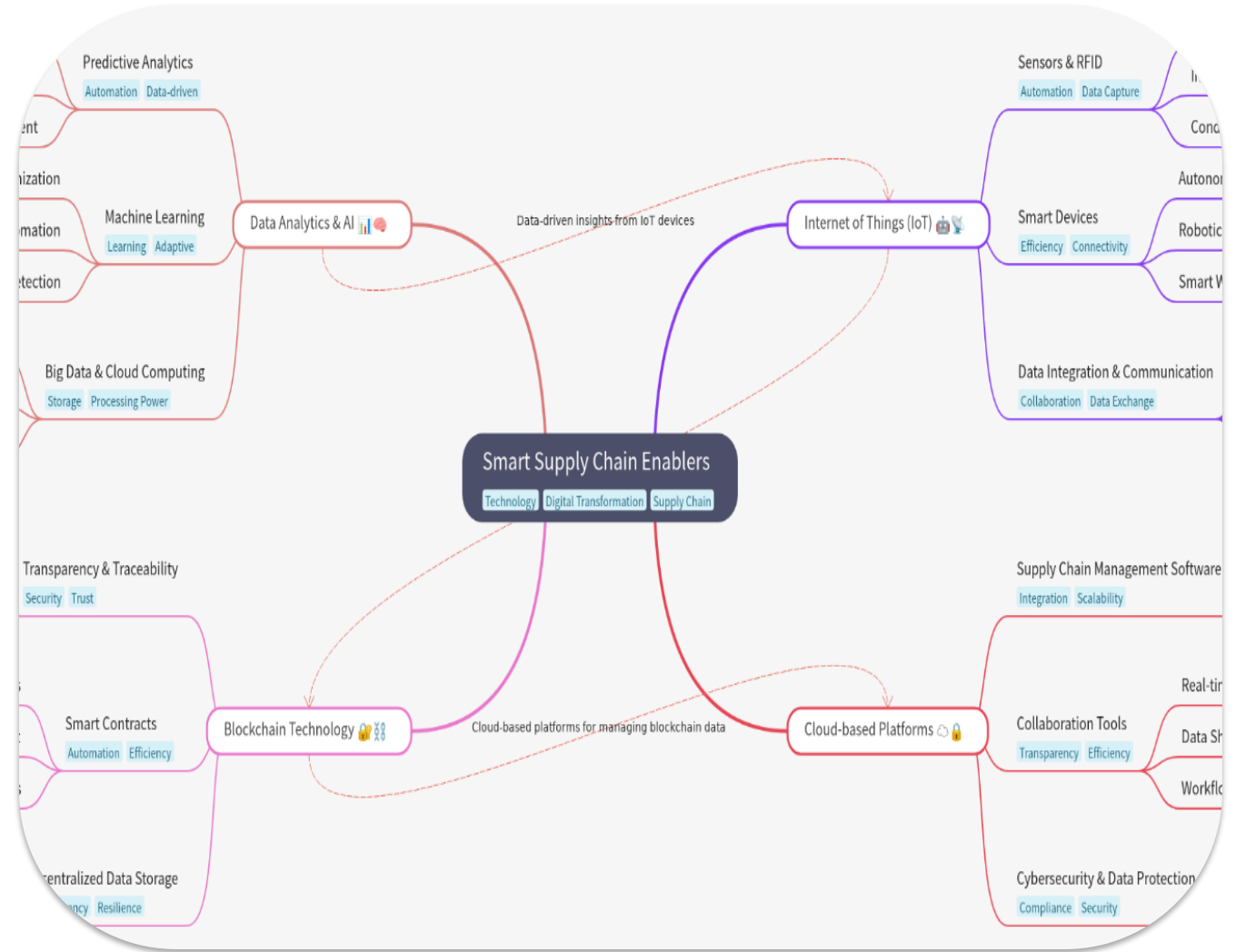
Visual representation of all interconnected components in logistics automation analytics.

Core Concepts: Data lifecycle, collection methods

Analysis Types: Predictive, descriptive, prescriptive

Automation: Robotics, IoT, AI integration

Benefits: Efficiency, accuracy, cost reduction

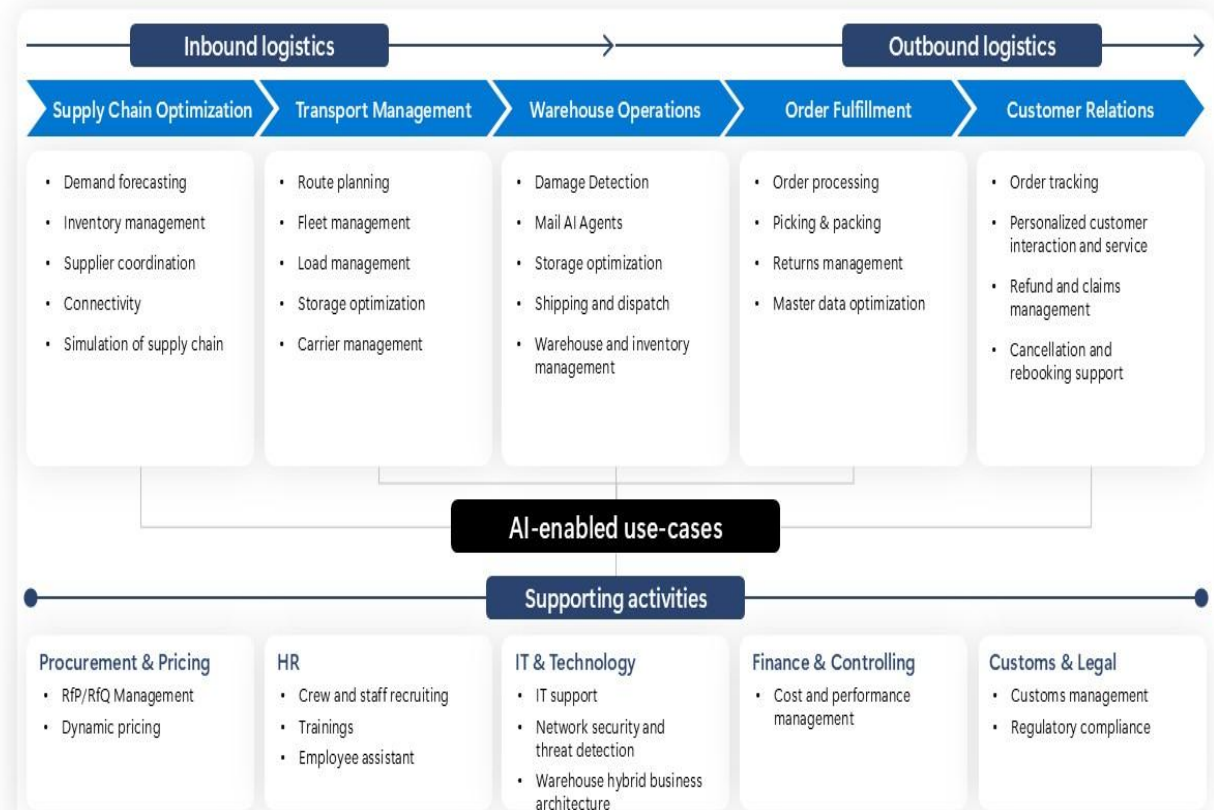


Current Challenges

Addressing obstacles in implementation and adoption of advanced analytics.

-  **Data Quality:** Inconsistent and incomplete data
-  **Privacy:** Cybersecurity and data protection
-  **Integration:** Legacy system compatibility
-  **Skills Gap:** Trained workforce shortage

Multiple AI use cases possible across the logistics value chain



✓ Key Takeaways

Essential concepts and benefits of data analytics in logistics automation.

📊 **Data-driven:** Strategic decision making

📌 **Efficiency:** Reduced operational costs

👁️ **Real-time:** Instant insights and tracking

📈 **Predictive:** Forecasting and optimization

