Arab Academy
for Science , Technology and Maritime Transport

13
Marl**o**g
2024

The International Maritime Transport
and Logistics Conference

"MARLOG 13"

Towards
Smart Green Blue
Infrastructure

3-5 March 2024 - Alexandria, Egypt

Nistor Andrei, PhD student
Professor Cezar Scarlat, PhD

INTEGRATING ARTIFICIAL INTELLIGENCE AND GEOSPATIAL TECHNOLOGIES FOR SUPPLY CHAIN OPTIMISATION

INTEGRATING ARTIFICIAL INTELLIGENCE AND GEOSPATIAL TECHNOLOGIES FOR SUPPLY CHAIN OPTIMISATION

- **Addresing the supply chain complexities**

- **AI and geotechnologies in supply chain operations**

- **Applications in supply chain optimisation**

- **Case study on the Port of Constanța**

- **Challenges and considerations**

Overview of Supply Chain Challenges and the Need for AI and Geospatial Technologies

- Supply chains face complexities like limited visibility, demand unpredictability, and inefficient routes, causing delays and increased costs.

- AI enables real-time data analysis, forecasting, and decision-making, while geospatial techchnologies enhances route planning, tracking shipments, and optimizing logistics.

- Integration of AI and geospatial technologies in supply chains enhances agility, reduces risks, and promotes sustainability by minimizing wastage and carbon footprint.

The role of AI and Geospatial Technologies

Harnessing the Power of Technology for Supply Chain Management

Artificial Intelligence

- Predictive analytics
- Machine learning
- Smart decision-making

Geospatial Technologies

- Spatial data analysis
- Route optimization
- Logistics planning

Predictive demand analysis with AI

• Predictive analytics utilizes historical data to forecast future demand;

• By leveraging advanced algorithms and machine learning models, organizations can anticipate fluctuations in demand, streamline production, and enhance customer satisfaction;

• Implementing predictive demand analysis minimizes stockouts, reduces inventory holding costs, and improves overall operational efficiency within the supply chain;

Data collection → AI analysis → Demand Forecast → Strategic adjustment → Supply chain optimization

Eficiency through Geospatial Routing
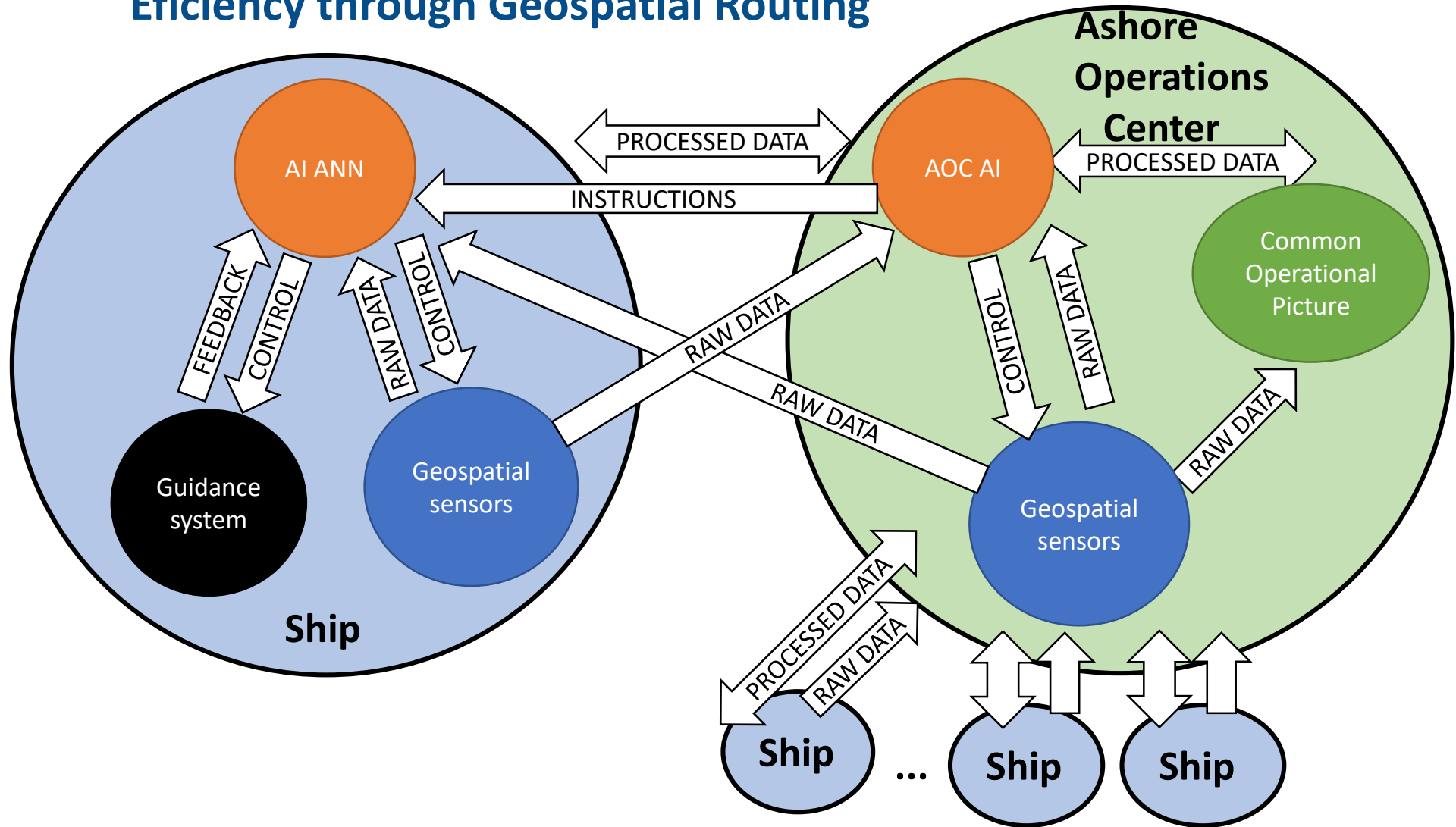
AI and Geospatial Technologies in Warehouse Management

How can AI and geospatial technologies transform warehouse operations?

Before integration	**After integration**
• Suboptimal space use	• Optimized storage
• Manual energy control	• Automated energy control
• Manual tracking	• Automated real-time tracking

Case Study: the Port of Constanța

The Potential Technological Transformation of the Port of Constanța

Today

- AIS;
- Marine Radars;
- Electro-Optical Sensors.

Future

- Artificial Intelligence AOC;
- LiDAR and SAR Sensors;
- Automated Guided Vehicles.

Challenges and Considerations in Technological Integration

Future Implications and Research Directions

- Future implications include enhanced supply chain visibility, predictive analytics for demand forecasting, and optimized route planning for efficient logistics.

- Research directions may focus on AI-driven risk management in supply chains, geospatial data integration for real-time monitoring, and sustainability practices implementation.

- The integration of AI and geospatial tech can pave the way for autonomous supply chain systems, drone delivery, and circular economy models in logistics.