CONCEPT

Smart Shipping and Maritime Digitalisation: Vessel Data, AI Analytics and Digital Roadmap

23 – 27 May 2027
Riyadh - KAFD district five-star



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Introduction:

Smart shipping and maritime digitalisation promise lower voyage costs, fewer breakdowns and faster port calls, yet many shipping companies still run on manual noon reports, disconnected onboard systems and pilot projects that never scale. Sensor data sits unused, analytics vendors are chosen without a data plan and cyber exposure grows with every new connection. This Core Concept course trains managers and technical teams to connect vessels, judge data quality, apply AI analytics to voyages, machinery and hulls, digitalise port calls and documents, and control cyber risk. Participants finish with a Smart Shipping Digital Roadmap and Business Case.

Course Objectives:

- Assess a shipping company's digital maturity across vessels, shore offices, port interfaces and commercial processes
- Specify a vessel connectivity, IoT sensor and fleet data platform architecture that feeds shore-based decision making
- Evaluate data quality in manual noon reports against high-frequency sensor data and set data governance rules for a fleet
- Apply analytics and AI use cases for voyage optimisation, fuel consumption modelling, predictive maintenance and hull performance
- Plan port call data exchange, electronic trade documents and cyber risk controls for a connected fleet
- Build a phased digital roadmap and business case covering use case priorities, benefits, costs and remote operations readiness

Target Audience:

- Managers responsible for fleet operations, marine and technical departments in shipowning and ship management companies
- Managers responsible for vessel performance monitoring, fuel and machinery data analysis across a fleet
- Managers responsible for digital transformation, IT and data platforms in shipping and maritime service companies
- Managers responsible for port call planning, terminal coordination and maritime digital services
- Managers responsible for commercial operations, chartering data and trade documentation in shipping companies

Course Outline:

Day 1: Digital Transformation Drivers and Shipping Company Digital Maturity

- Smart Shipping Value Chain Map: Vessel, Shore Office, Port and Cargo Interested Parties
- Digital Transformation Drivers: Cost Pressure, Charterer Data Demands and Crew Workload
- Digital Maturity Assessment Grid for Fleet, Technical, Commercial and Port Call Processes
- Legacy Onboard Systems Inventory: Bridge, Engine Room, Cargo and Office Applications
- Digital Initiative Portfolio Review: Pilots, Scaled Tools and Stalled Projects

Day 2: Vessel Connectivity, IoT Sensors and Fleet Data Platforms

- Ship-to-Shore Connectivity Options: VSAT, Low Earth Orbit Satellite and Coastal Networks Compared
- IoT Sensor Layer: Shaft Power Meters, Flow Meters, Vibration and Temperature Sensors
- Onboard Data Logger and Edge Computing Architecture for Machinery and Navigation Signals
- Fleet Data Platform Design: Data Lake, Vessel Data Model and API Integration With Office Systems
- Noon Report Versus High-Frequency Sensor Data: Accuracy, Latency and Validation Rules

Day 3: Vessel Performance Analytics and AI Use Cases

- Vessel Performance Monitoring Dashboard: Speed, Draught, Weather and Consumption Normalisation
- Voyage and Route Optimisation Models Using Weather Forecasts and Ocean Current Data
- Machine Learning Fuel Consumption Models: Feature Selection, Training Data and Error Checks
- Predictive Maintenance for Main Engine and Auxiliaries: Condition Monitoring and Anomaly Detection
- Hull Performance Analytics: Fouling Trend Detection and Cleaning Trigger Rules

Day 4: Port Call Digitalisation, Electronic Documents, Cyber Risk and Remote Operations

- Port Call Optimisation: Estimated Time of Arrival Sharing, Berth Planning Data and Just-in-Time Arrival Messaging
- Electronic Trade Documents at Overview: Electronic Bills of Lading, Title Registries and Platform Interoperability
- IMO Guidelines on Maritime Cyber Risk Management at Overview: Functional Elements for Ship and Shore
- IT and OT Network Segregation, Remote Access Control and Vendor Connection Risks on Board
- Remote Operations and MASS Degrees of Autonomy: Shore Control Centres, Decision Support and Readiness Gaps

Day 5: Case Work: Smart Shipping Digital Roadmap and Business Case

- Case Brief: Mid-Sized Mixed Fleet Operator With Fragmented Vessel Data
- Use Case Prioritisation Matrix: Value, Data Readiness and Implementation Effort
- Business Case Model: Fuel, Maintenance and Port Time Benefits Against Connectivity and Platform Costs
- Change and Capability Plan: Crew, Superintendent and Shore Analyst Roles and Vendor Governance
- Smart Shipping Digital Roadmap and Business Case Presentation and Peer Challenge

Skills You Will Gain:

- Maritime Digital Maturity Assessment
- Fleet Data Architecture Design
- Sensor Data Validation
- Vessel Performance Analysis
- AI Use Case Scoping
- Port Call Data Coordination
- Ship Cyber Risk Assessment
- Digital Business Case Development

Why Attend This Course:

- Return with a Smart Shipping Digital Roadmap and Business Case built on a realistic fleet case and challenged by peers
- Question analytics, connectivity and platform vendors on data sources, model accuracy and integration effort before signing
- Tell apart AI use cases that save fuel, maintenance cost or port time from pilots that stay on the shelf
- Compare digital practice with owners, ship managers, port and maritime service staff from several segments and countries

Conclusion:

Smart shipping depends on connected vessels, trusted data and analytics that change voyage, maintenance and port decisions. The course moves from digital transformation drivers and maturity assessment, through connectivity, IoT sensors and fleet data platforms, to performance dashboards, route and fuel models, predictive maintenance and hull analytics, then to port call data, electronic documents, cyber risk and remote operations. The final day turns this material into a Smart Shipping Digital Roadmap and Business Case for a case shipping company.