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AI in shipping and logistics

The AI landscape: traditional, generative, and agentic AI

Traditional artificial intelligence (AI) refers to machine learning and statistical models that operate on structured data to automate, predict, and optimise decision-making processes. These systems are designed to identify patterns and improve outcomes in areas such as forecasting, risk management, and operational efficiency.

Generative AI (GenAI) extends these capabilities by using large language models (LLMs) and other generative architectures that are built to handle general inputs and outputs. GenAI can analyse and create content from unstructured data such as text, images, or audio, enabling more interactive and context-aware use of information. An AI agent (often used interchangeably with 'assistant') is an LLM configured to perform a specific task through prompt engineering and data access.

Agentic AI systems equip LLMs with a level of autonomy and access to a predefined toolbox, allowing models to perform complex tasks such as writing code, drafting slides, querying databases, and accessing systems.



We're embedding AI across our operations
– from predicting disruptions to reducing
emissions... We need to make AI less scary.

Charles van der Steene, President North America, Maersk

The state of AI in shipping and logistics

Global supply chains are being reshaped by persistent disruptions, geopolitical instability, labour shortages, port congestion, inflation, and climate-related events. Meanwhile, customer expectations for faster, more transparent, and sustainable deliveries continue to rise. Traditional operations, often dependent on siloed systems and manual processes, are struggling to keep up.

In this high-pressure environment, AI is emerging not just as a support function, but as a strategic lever for resilience, speed, and competitive differentiation. From predictive maintenance and intelligent routing to just-in-time arrivals and real-time cargo visibility, AI offers tangible answers to some of the sector's most urgent challenges.

Shipping may not be structurally transformed overnight, but the way it operates will. As highlighted in recent C-level conversations we have conducted at Implement Consulting Group, companies that invest in applied AI today will gain a lasting edge. Those that delay risk falling behind.

This document explores why AI is critical now and presents some of the highest impact use cases for AI across shipping and logistics.

Research indicate that shipping companies are experimenting, but broad adoption is lagging ...

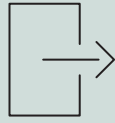
Current state of AI adoption in shipping...

AI is widely used for tasks such as route planning or invoice processing. However, there is significant potential for further adoption and exploration, particularly with emerging technologies based on generative AI.

Success stories showcase the concrete impact these tools can have on established businesses. Nevertheless, adoption is lagging.

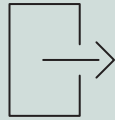
... so, what is hindering adoption?

Despite strong leadership intent and clear AI potential, adoption is often slowed by cultural and organisational barriers, not technical ones. While tech readiness is essential, the real challenge lies in shifting mindsets and managing change strategically.



Lack of strategic clarity and undefined business case

Organisations often struggle with defining objectives, prioritising impactful use cases, and allocating resources.



Resistance to change and scepticism

The shipping industry's reliance on relationships and communication leads to resistance to new technology and low digitalisation due to adoption barriers.

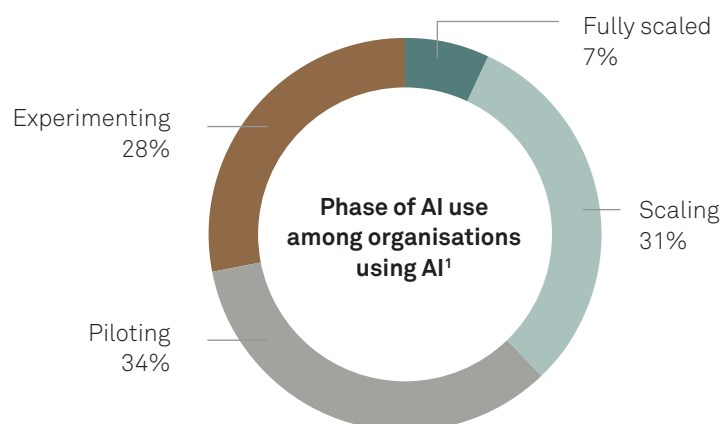
84%

of business leaders believe that AI will have a significant impact on their business¹

78%

of organisations report using AI in at least one business function¹

However, only 7% of the organisations using AI have fully scaled it, whereas the others are either piloting, scaling, or experimenting.



Sources: 1) Implement Analysis (2026), Rand (2024), Stanford HAI AI Index Report (2025), MIT CISR Enterprise AI Maturity Model (2024).

AI creates impact across the entire S&L value chain

AI is already transforming logistics operations and supply chain planning, creating competitive advantages for early adopters.

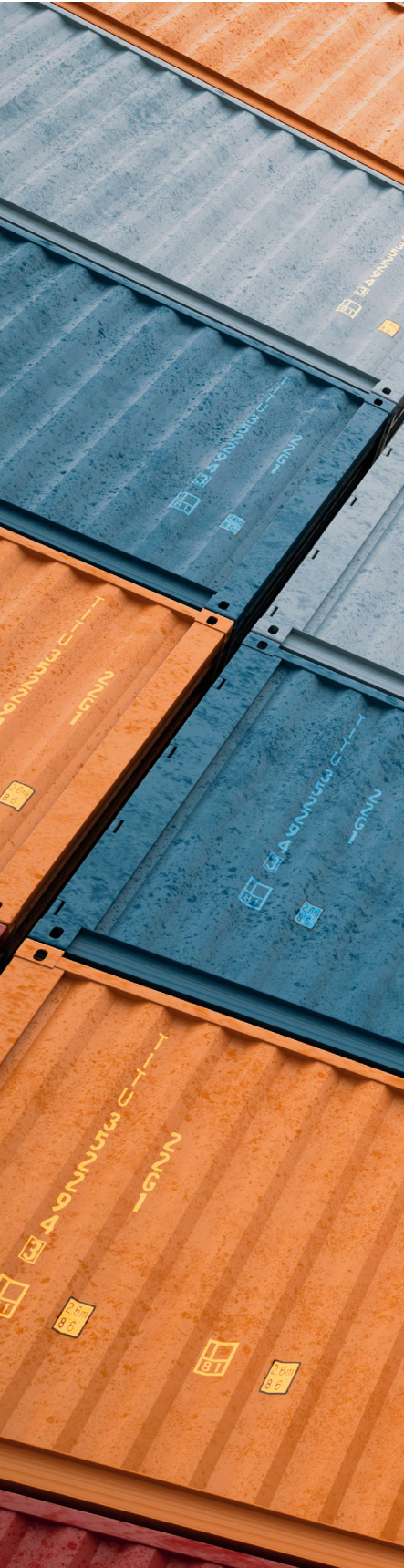
	Use case	Description	INDUSTRY ADOPTION			
			Emerging	Low	Medium	High
01. Strategy and business planning	AI-powered network optimisation	Optimises fleet capacity and multimodal coordination using real-time data on weather, traffic, and ports.	☐	☐	☒	☐
	AI-driven market and freight rate forecasting	Uses ML to forecast market freight rates and demand trends	☐	☒	☐	☐
	Scenario planning and risk simulation	AI simulations to test resilience under market, regulatory, and environmental scenarios to guide strategic positioning.	☐	☒	☐	☐
02. Commercial and business relationships	AI for customer segmentation and sales targeting	Clusters customers by shipment history, commodity, and trade lanes for targeted sales and retention strategies.	☐	☒	☐	☐
	Automated contract analysis and negotiation support	Analyse contracts for risks, compliance, and financial terms, improving negotiation efficiency.	☐	☐	☐	☒
	Lead scoring and opportunity prediction	Predicts and prioritises high-value sales opportunities using historical and market data.	☒	☐	☐	☐
03. Operations and technical management	Predictive maintenance for fleet and port equipment	Uses IoT + AI analytics to predict failures in ships, cranes, and port handling gear to prevent downtime.	☐	☐	☒	☐
	Computer vision for cargo inspection	AI image recognition detects cargo damage, verifies seals, and ensures loading compliance.	☐	☒	☐	☐
	AI voyage optimisation and fuel efficiency	Analyses vessel speed, weather, and currents to reduce fuel use and emissions while keeping schedules.	☐	☐	☒	☐
04. Post-operations	GenAI assistants for documentation and queries	Creates shipping docs, answers client queries, and supports multilingual real-time troubleshooting.	☐	☒	☐	☐
	AI-powered claims processing	Automates claims intake, document verification, and fraud detection to speed settlements.	☐	☒	☐	☐
	Automated post-operations analytics	Analyses post-voyage data to find inefficiencies, cut costs, and improve customer reporting.	☐	☒	☐	☐

Note: Based on numbers from 2026. Digitalisation maturity varies across the shipping and logistics.

Highlighted AI use cases in S&L

Several advanced AI use cases are implemented at full industrial scale and can deliver significant returns on investment from day one.

01. AI-powered network optimisation	Why:	With rising fuel costs, port congestion, and increasing customer expectations, logistics providers must plan smarter routes across air, sea, and land. Traditional planning methods struggle to adapt in real time to cargo and commodity flows, weather, traffic, or supply disruptions.
	Examples:	Global logistics firms now deploy AI to optimise routes, fleet capacity, and multimodal coordination. Real-time data (e.g., weather, traffic, port delays) is used to reroute trucks, ships, or containers dynamically, minimising idle time and maximising asset utilisation.
	Impact:	Fuel savings, reduced delivery delays, and more efficient coordination between long-haul and last-mile operations.
02. Predictive maintenance across transport and facilities	Why:	Unexpected breakdowns in trucks, ships, or material handling equipment cause ripple effects across the entire logistics network. Maintenance teams often rely on manual checks or lagging indicators.
	Examples:	Leading firms use AI-driven algorithms to detect anomalies in sensor data from ship engines, trucks, cranes, or warehouse robotics. Predictive models flag issues before failures occur, enabling proactive maintenance scheduling.
	Impact:	Minimised downtime, decreased lubrication oil usage, improved safety, and extended equipment lifespan across fleets and facilities.
03. AI-driven demand forecasting and inventory planning	Why:	From port terminals to regional warehouses, balancing supply with fluctuating demand is a persistent challenge. Poor forecasts lead to overstocking, empty shelves, or underutilised transport.
	Examples:	Logistics companies now use AI to combine historical shipping data, customer behaviour, market trends, and seasonality to forecast demand at route, product, and location levels. This guides resource allocation and staffing across the value chain.
	Impact:	Decreased labour costs, higher customer satisfaction, and higher equipment utilisation.
04. GenAI assistants for communication and operational support	Why:	Logistics involves constant coordination across ports, warehouses, customs, drivers, and clients, generating high volumes of emails, reports, and queries. Manual handling slows responsiveness and drains capacity.
	Examples:	Operators now use GenAI tools to auto-summarise shipment updates, generate customs documents, answer client queries, and translate multilingual requests. Some use GenAI copilots to assist in real-time troubleshooting and dispatch.
	Impact:	Faster internal coordination, improved customer service, and increased team productivity.



Selected AI reference cases in S&L

The two projects demonstrate how AI is being integrated into shipping and logistics operations, delivering significant results and creating substantial impact for early adopters.

Reducing fuel consumption, lowering emissions, and boosting operational efficiency through AI-powered routing for a leading shipping company

A leading global shipping company sought to leverage AI to optimise voyage routing for greater fuel efficiency, lower emissions, and enhanced safety. We supported the company in defining sustainability goals, identifying high-impact use cases, and selecting AI partners. The work included piloting optimisation tools, assessing ROI potential, and shaping an operating model and transformation roadmap to scale AI across fleet operations.

Impact

- Voyage efficiency improved by 7%
- More than 60 mUSD in annual fleet savings
- Project return on investment of 26x

Regulated enterprise

Compliance GenAI

Increasing uptime through AI-enabled maintenance and automation

A global shipping operator sought to reduce downtime and improve asset longevity by enhancing its maintenance processes. The company faced challenges with manual corrosion tracking, inefficient paint maintenance, and inconsistent reporting across its fleet. To address this, they implemented an AI-based solution that automates corrosion monitoring, estimates paint needs, and delivers intuitive dashboards for proactive decision-making.

Impact

- Cut downtime by 20% through automated maintenance planning
- Boosted efficiency by reducing manual work by 30–40%

Customer operations

Agentic AI

The first step to AI success is setting a strategic direction and defining the boundaries for exploration

01. Current business

How might we identify high-potential opportunities in the current business to fast-track efficiency and quality gains?

02. Future business

How might we rethink our business model if powered by AI, taking a zero-based approach?

03. Accelerated impact

How might we experiment with and scale AI opportunities to unlock the full potential faster than the competition?

04. Building blocks

How might we nurture, build, or access the essential capabilities and technologies required to become fit for the future?

05. Human transformation

How might we take a profoundly human-centric approach to transforming the business and crossing the emerging AI chasm?

06. Sustainable results

How might we shape our future in an ethical and responsible manner to safeguard our business and deliver sustainable results?



In our experience, you need to explore these six strategic questions to unlock the full potential of AI

Source: Implement SME

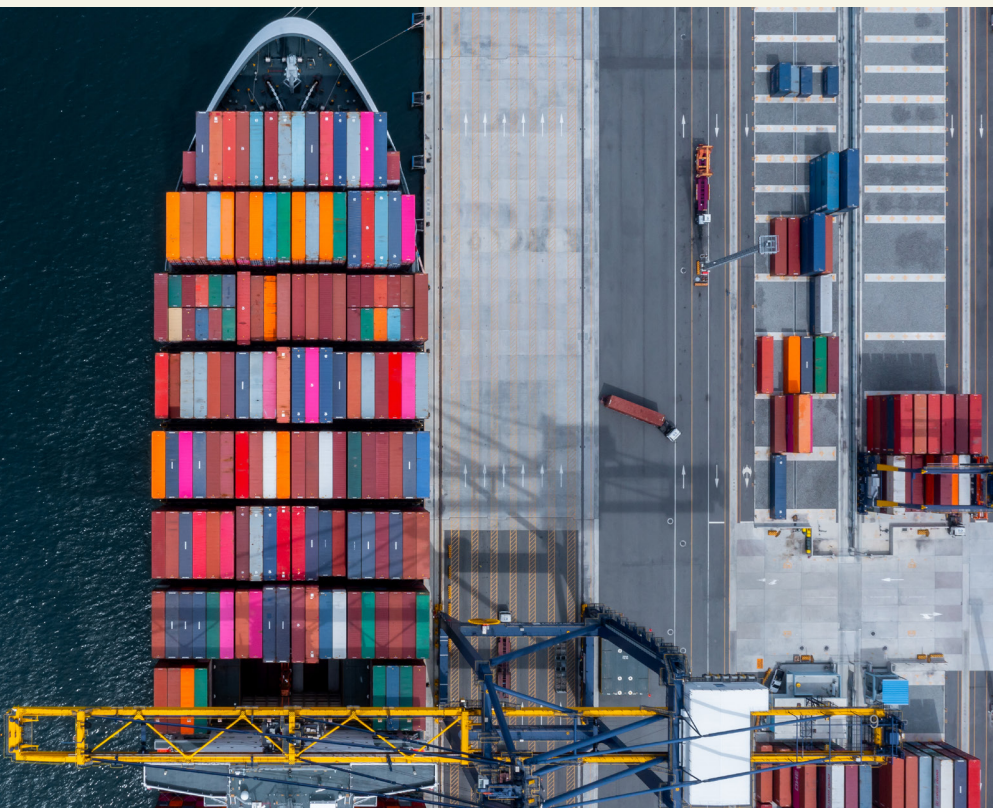
Future outlook

AI's role in shipping and logistics is growing fast. Autonomous trucks, ships, and drones are moving from pilots to full-scale deployment, and analysts expect these technologies to cut delivery costs by up to 30%. At the same time, infrastructure is getting smarter. From connected ports to AI-enabled warehouses and sensor-equipped roads, the entire value chain is becoming more responsive and adaptive.

Generative AI (GenAI) brings new opportunities. It can summarise customs documents, find insights in complex data, and power virtual assistants for tracking shipments, handling delays, or answering multilingual queries. In the back office, GenAI tools can automate reports and help with planning tasks, boosting speed and accuracy.

AI-driven digital twins are also gaining ground, offering full visibility across supply chains. These models can simulate disruptions such as congestion or delays and help managers reroute goods or adjust inventory before issues escalate. AI-based forecasting uses market trends and demand signals to optimise pricing, capacity, and delivery planning.

To keep up, shipping and logistics companies need to build strong data and AI strategies and adopt more flexible operating models. More than just tools, AI technologies should be seen as enablers of smarter networks, new business models, and faster, more data-driven decisions across the value chain.



We can support you throughout your AI journey

We believe in co-creation to deliver successful solutions, and we bring together a team of experts in machine learning, data engineering, security, and change management. We help clients with:

Our offerings:

AI strategic advisory

- AI strategy
- Identification of AI ambition
- AI roadmap development
- Organisational readiness assessment

AI operating model

- AI use case discovery and piloting
- Use case identification and prioritisation
- Feasibility assessment
- Proof-of-concept development
- Co-development of advanced pilot prototypes

AI solution delivery

- Scaling proof-of-concepts
- Deployment of ready-to-use AI solutions
- AI delivery model management
- Integration with existing systems

AI security and compliance advisory

- Risk assessment and mitigation
- Data privacy and confidentiality
- Compliance with regulations and standards
- AI architecture

AI learning journeys and adoption

- Productivity increase through AI training
- AI change management planning and execution
- Operating model changes and implementation with AI
- Organisational culture and leadership development



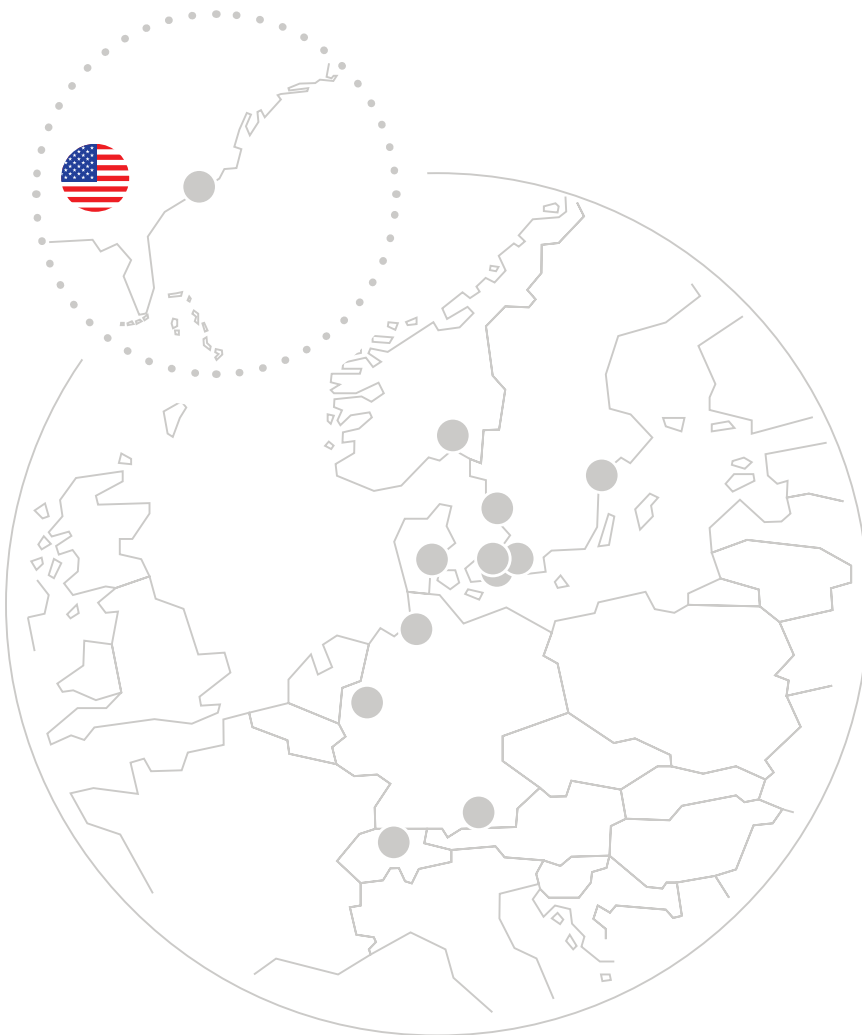
Local roots, global perspective

Founded in Denmark and built internationally, Implement combines Scandinavian roots with experience from complex transformation across Europe and the United States.

In defence and security, we help public authorities, defence organisations, and companies turn investment and ambition into capability that works in practice.

Our work spans programme leadership, organisational capability, data and technology, industrial collaboration, and implementation.

We help strengthen the links between procurement, people, industry, data, and operational use, so new capability can be brought into service, sustained, and improved over time.



- Founded in Denmark in 1996
- Partner and employee owned
- 12 offices in six countries
- Working across Europe and the United States

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