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Transforming global logistics

Increasing efficiency and sustainability with Unified Logistics

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Ready to start the sustainable transformation of your logistics? Get in touch

Introduction

Global commerce and the supply chain: Ensuring seamless flow in increasingly uncertain times

The global economy is now more interconnected than ever, and the logistics and transportation sector acts as the central pillar to world trade. It is pivotal to facilitating the seamless flow of goods and services worldwide, making everything from next-day delivery to the distribution of humanitarian aid packages a possibility.

This means that minor disruptions can have a profound impact, influencing global trade dynamics in significant ways. Supply chain disruptions lead to shortages of key goods, price inflation, unloaded shipping containers, and negative effects on a nation's economic wellbeing. This impact is not limited to specific products, it affects the full spectrum of goods, from the expensive, such as cars, to the essential, such as food, medicine, oil and gas – all of which have a trickle-down impact on the cost of living and availability of key items or services.

Supply chain shocks account for around one-third of the strains in global production networks limiting activity and trade on an international level.

Learn more about Supply chain disruptions and the effects on the global economy from European Central Bank Bulletin >

The sector also faces other issues such as labor shortages, inadequate transport capacity to handle escalating cargo volumes, and mounting pressure to achieve carbon neutrality, which have underscored its vulnerability to systemic challenges. The onset of the COVID-19 pandemic, as well as ongoing global conflicts, has exacerbated these vulnerabilities, revealing stark regional and sectoral disparities in recovery from supply chain disruptions and logistics bottlenecks.

Amid these varied challenges, logistic companies will have to overcome them while also striving for a more sustainable supply chain and responding to increasing consumer demand. The EU has already released legislative plans to accelerate carbon neutrality by 2050, increasing the cut of 1990 carbon levels to 55% by 2035. However, even the most innovative carbon reduction efforts are now being performed while tackling the pressures to respond to the ever-growing demands of the eCommerce sector, set to hit $1.4 trillion in volume by 2025.

76% of supply chain operations say they are facing notable labor shortages in the logistics sector, while 37% claim the impact is either high or extreme.

Learn more about the Supply Chain and Logistics Workforce Challenge from Descartes document >

However, amid these challenges, the crisis has accelerated innovation. Digital technologies like AI, IoT, and blockchain have gained prominence in recent years, transforming supply chain management with 77% of digital champions having implemented solutions to gain visibility across their end-to-end supply chain. These advancements have become indispensable, driving efficiency gains, and bolstering operational robustness in the face of evolving global challenges.

Ongoing and worsening disruptions

Beyond immediate operational concerns, there looms a continual and serious threat of climate change, which can turn smooth sailing into port blockages.

The projected economic losses due to supply chain disruptions linked to extreme weather events range from $3.75 trillion to $24.7 trillion.

Learn more about Supply chain disruptions from nature article >

The impact goes beyond just the financial. As weather-related incidents disrupt transportation networks and port operations with increasing frequency, agility in operations and technological sophistication emerge as crucial pillars for navigating future uncertainties.

In this context, it's important to understand how these intersecting dynamics are shaping the future of logistics and transportation, especially in terms of enhancing resilience, leveraging digital innovations, and preparing for the evolving challenges of a continually complex marketplace.

1 Overcoming the pain points

To effectively counteract these existing challenges, the ability to react quickly, or even anticipate events before they happen is essential. Focus here should involve:

- **Optimizing logistics and freight transportation**
- **Achieving GHG emission reduction targets**
- **Mitigating labor shortages**
- **Establishing a robust logistics infrastructure**

However, despite the technology being both sophisticated and available, many logistics companies are hampered by existing disconnected systems and manual processes, all underscored by a clear lack of data. In turn, organizations have difficulty accessing key insights making decision making more challenging and less data-driven.

Freight transportation contributes approximately 8% of all global greenhouse gas emissions, when factoring in warehousing operations, the figure rises to 11%.

[Learn more about the role freight transportation plays in global economy from Climate Portal's explainer >]

Navigating uncertain waters

Technology offers a pathway to overcome these challenges. Predictive analytics and real-time tracking can help anticipate and respond to disruptions more effectively. Automated systems for sorting, loading, and unloading cargo can enhance efficiency and accuracy, while IoT sensors and GPS for real-time shipment tracking improve visibility and reduce delays. Additionally, AI can optimize routing, demand forecasting, and inventory management, even facilitating changes to operations without human interaction.

Despite these advancements, many logistics companies remain vulnerable to unforeseen challenges. Even with sophisticated predictive technologies and data analytics, natural disasters, geopolitical shifts, and other sudden disruptions can catch them unprepared. You only need to recall the Port of Baltimore crash or the recent blockage at the Panama Canal to see how the unpredictable is always imminent and human error can never truly be eliminated.

Put simply, logistical issues can affect both sides of the financial balance sheet, as well as the overall welfare of society. The implementation of real-time data integration and agile response mechanisms is crucial but remains a work in progress. Predictive models, trained on past data, often fail to account for unforeseen events and changes, particularly those driven by climate change, social shifts, or that just happen to exist outside of the predictable parameters.

A more collaborative way of working

This makes response just as important as readiness. Overcoming these challenges therefore requires collaboration beyond individual companies. There is a growing need for joint delivery and relay transportation, optimizing resources, reducing costs, and improving efficiency. This can be achieved through coordinated efforts and shared investment in infrastructure and technology where data can be easily shared and accessed. This collaborative approach, while beneficial, demands significant coordination and investment from all stakeholders involved.

The Baltimore bridge collapse caused approximately $190 million a day to be lost with Maersk's share price falling by 7% in the immediate fallout.

2 How Fujitsu supports the logistics sector

Fujitsu's expertise in supporting organizations to overcome logistics and transportation challenges is well-established. Through our Unified Logistics portfolio, we offer comprehensive solutions designed to address key pain points such as labor shortages, transport capacity issues, and environmental impact. These solutions enable logistics and transportation companies to:

- **Optimize operations**
- **Improve efficiency**
- **Contribute to a more sustainable supply chain**

We deliver cutting-edge AI and technology solutions that not only alleviate specific issues, but also unify the overall logistical supply chain. These innovations facilitate cargo operation optimization, streamline work processes, and reduce environmental impact. Our solutions include logistics data standardization, visualization, and the automation of operations, providing a holistic approach to logistics management.

With a proven track record of innovation, Fujitsu combines deep industry understanding with a robust portfolio of technology solutions. This combination ensures that logistics and transportation companies can effectively address their challenges, enhance operational efficiency, and achieve their strategic objectives.

Case study

Hamburg Port Authority (HPA)

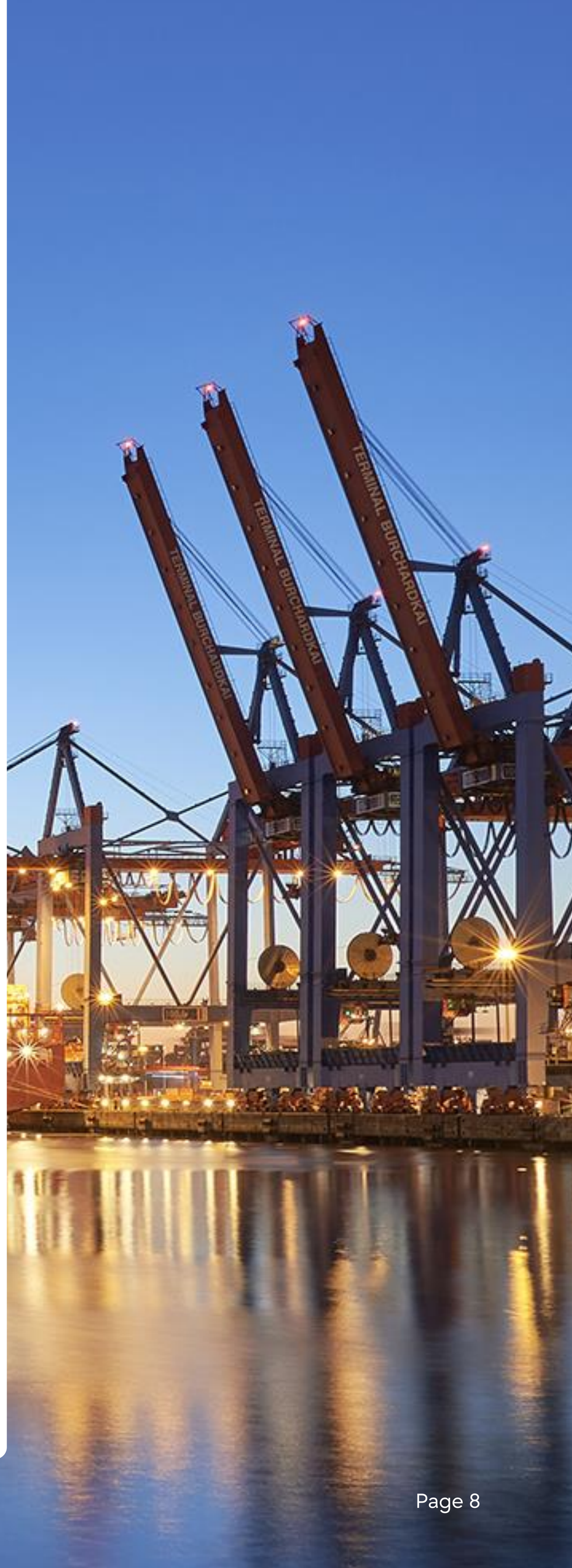
In a major step toward preventing supply chain logjams, HPA has successfully demonstrated a more sustainable approach to the transportation of goods. The solution hinges on applying Fujitsu's quantum-inspired technology to accelerate logistics flows, which reduces port traffic congestion and cuts CO_2 emissions.

Working with Fujitsu, HPA has proven the potential to reduce congestion in its harbor area. By applying Fujitsu's quantum-inspired Digital Annealer technology and services to real traffic data, they have established the possibility of optimizing traffic throughput across the harbor area, while still leveraging the existing traffic control infrastructure.

Instead of local management of individual traffic-light managed crossings, the quantum-inspired approach optimizes the entire grid. This significantly cuts dwell times for ships, trucks and cars, resulting in faster supply chain interactions.

Using the Fujitsu Digital Annealer, HPA has noted significant improvements in areas including:

- **Reduced travel time** up to **15%** for cars and trucks in the supply chain
- **Lower CO_2 emissions** from trucks and cars
- **Faster turnaround** for container ships leading to **increased flow of goods**
- **Greater capacity to handle trucks** in the confined space of HPA
- **Less traffic congestion** within the harbor area



Case study

Singapore Marine and Port Authority (MPA)

Singapore MPA is using Fujitsu Human Centric AI Zinrai to detect ship collision risks and predict areas where they are concentrated as dynamic risk hotspots. It provides information to the MPA, maritime traffic controllers in Singapore and vessels, which can then recognize the risk and strategically adjust their maneuvering to avoid it. This risk detection technology was able to quantify risk in more detail, further in advance, than human operators.

Globally, the Vessel Traffic Service (VTS) systems, which manage marine traffic, rely on anticollision warnings, using closest point of approach techniques to detect and notify ships when vessels get unusually close to one another. As vessel operations and interactions become more complex, the ability to detect and predict vessel movements in advance, especially in high density vessel traffic areas like Singapore, is key to managing and reducing collision risks.

In response, Fujitsu has built a new ship collision risk prediction technology that leverages the power of artificial intelligence (AI) to predict near misses between vessels. This technology has the potential to assist maritime traffic controllers in managing marine traffic proactively, with the aim of improving the safety of navigation.

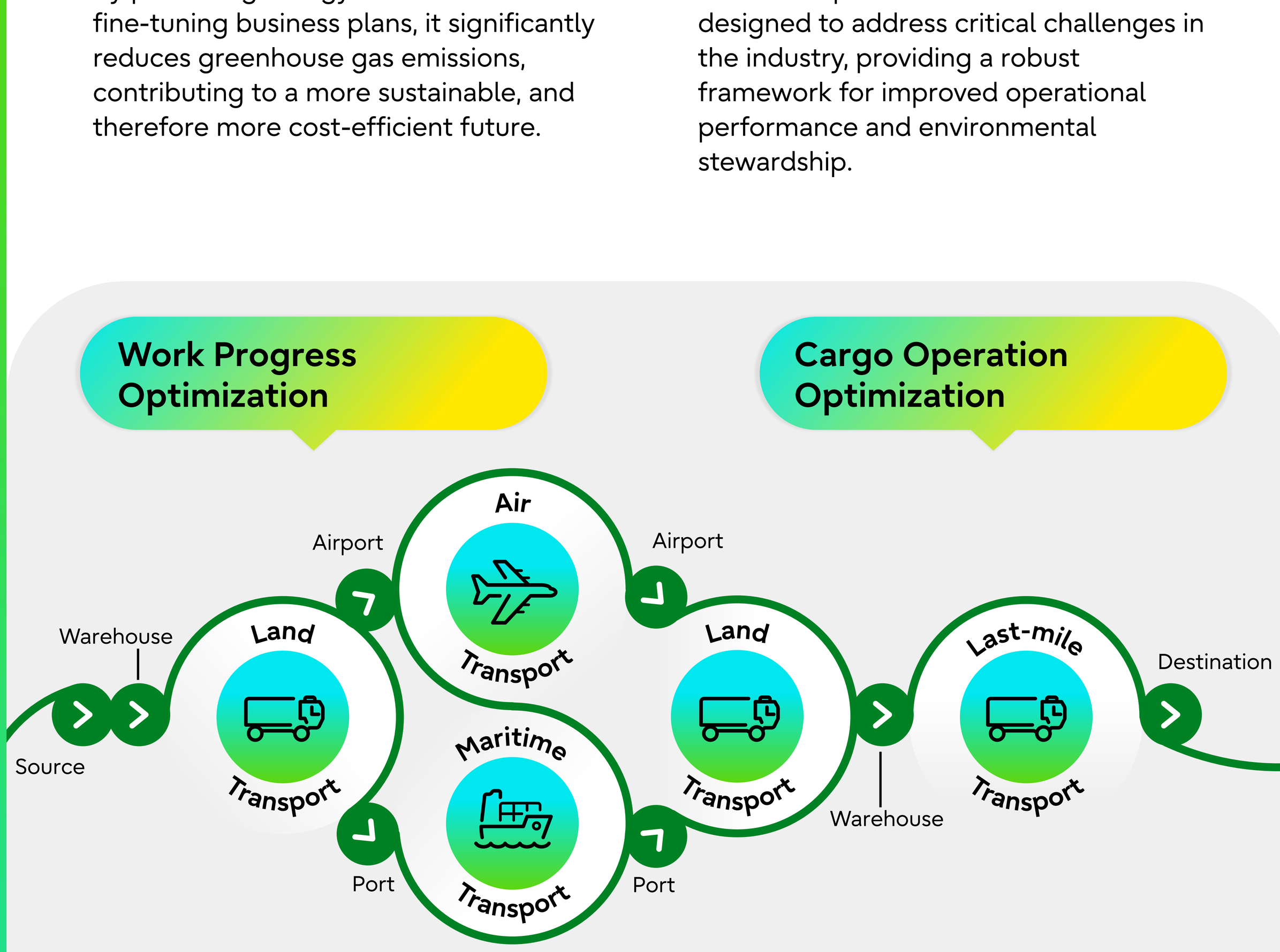
3 How Unified Logistics can optimize operations

The core ethos of Fujitsu Unified Logistics solutions is to enhance and standardize operational planning and processes, aiming for heightened efficiency and consistency across various operations. By predicting energy demand and fine-tuning business plans, it significantly reduces greenhouse gas emissions, contributing to a more sustainable, and therefore more cost-efficient future.

Additionally, we have sophisticated solutions for optimizing transportation equipment utilization by forecasting future cargo volumes, ensuring resources are used effectively and economically. These comprehensive solutions are designed to address critical challenges in the industry, providing a robust framework for improved operational performance and environmental stewardship.

Work Progress Optimization

Cargo Operation Optimization



Security & Safety Management

Logistics Orchestration

Work Process Optimization

The Unified Logistics portfolio is dedicated to optimizing and standardizing planning and processes for logistics-related operations at warehouses, ports, and airports. This includes implementing advanced Warehouse Management Systems (WMS) to enhance the management of warehouse receiving, shipping, and inventory operations.

Example in action - Streamlining port operations through traffic flow optimization to significantly reduce congestion and improve overall efficiency.

This solution contributes to a more efficient logistics industry, where standardized and automated systems create a more manageable work environment, reducing the impact of ongoing labor shortages.

Cargo Operation Optimization

Optimizing the loading of cargo is fundamental to achieving logistical efficiency. By streamlining how cargo is loaded onto trucks, airplanes, freighter, and container yards, organizations can contribute towards resolving transportation resource shortages without impacting productivity.

Example in action - Automating the intricate calculations involved in planning airfreight loading to reduce logjam potential.

Fujitsu has developed the Airfreight Load Planning Service, which enhances the quality of loading plans by leveraging quantum-inspired computing technology and AI technologies. By automating these complex operations, the service helps mitigate transportation resource shortages and reduces overall cargo handling efforts. This makes logistics operations not only more efficient and effective, but also safer.

Security and Safety Management

Fujitsu employs high-precision behavior recognition and object tracking technology to detect suspicious behaviors from camera images – without biases – facilitating early responses to potential problems.

Example in action – Automatically detecting suspicious behavior and tracking suspicious personnel entering prohibited areas in an airport.

By utilizing video behavior detection, the system automates incident detection and target tracking, effectively eliminating human error and biases.
This automation reduces the need for manual review of footage from hundreds or thousands of cameras, significantly enhancing the level of protection for both individuals and cargo. Simultaneously, this removes the more mundane elements of day-to-day jobs for an individual, allowing them to focus on higher value tasks.

Logistics Orchestration

The standardization and visualization of logistics data in warehouses, ports, and airports is critical if organizations are going to utilize their data more effectively – especially when it comes from disconnected or siloed operations.

Example in action – An individual can connect data from multiple global ports together to prevent potential ship congestion which could cause delays.

Fujitsu has developed Global Link, which standardizes data and links it across multiple logistics systems, using this data for KPI analysis and visualization to drive improvement. In the future, the use of platform services for shared delivery and the facilitation of data exchange across companies will likely necessitate standardized data formats. This makes standardization crucial for ensuring future growth and optimized logistics operations.

Linking all your logistics together

“Logistics Global Link” is a data conversion and visualization service that complies with the Logistics Information Standard Guidelines for the logistics field. By automatically converting and standardizing logistics data formats from multiple different systems, we can facilitate inter-company collaboration, contribute to solving social issues in logistics, and realize a more optimized supply chain.

A data hub function seamlessly links logistics data, enabling advanced analysis and utilization both within and between companies to consolidate and store a wide range of logistics data.

This provides a logistics KPI function that visualizes aggregated and stored logistics data numerically, constantly analyzing it for improvement and reform.

4 Supporting the planet, encouraging prosperity, improving lives

As the world becomes more technologically advanced, the solutions used in a logistics environment need to have benefits that extend beyond the immediate. Our solutions are helping supply chains continuously evolve in a fast-changing environment, ensuring they run smoothly using solutions to facilitate greater levels of adaptability.

Planet – Building a more sustainable industry

The focus on developing innovative technologies is central to supporting goals such as net-zero emissions and fostering circular economies. Our Unified Logistics solutions can contribute to these goals by minimizing the environmental impact throughout the global supply chain.

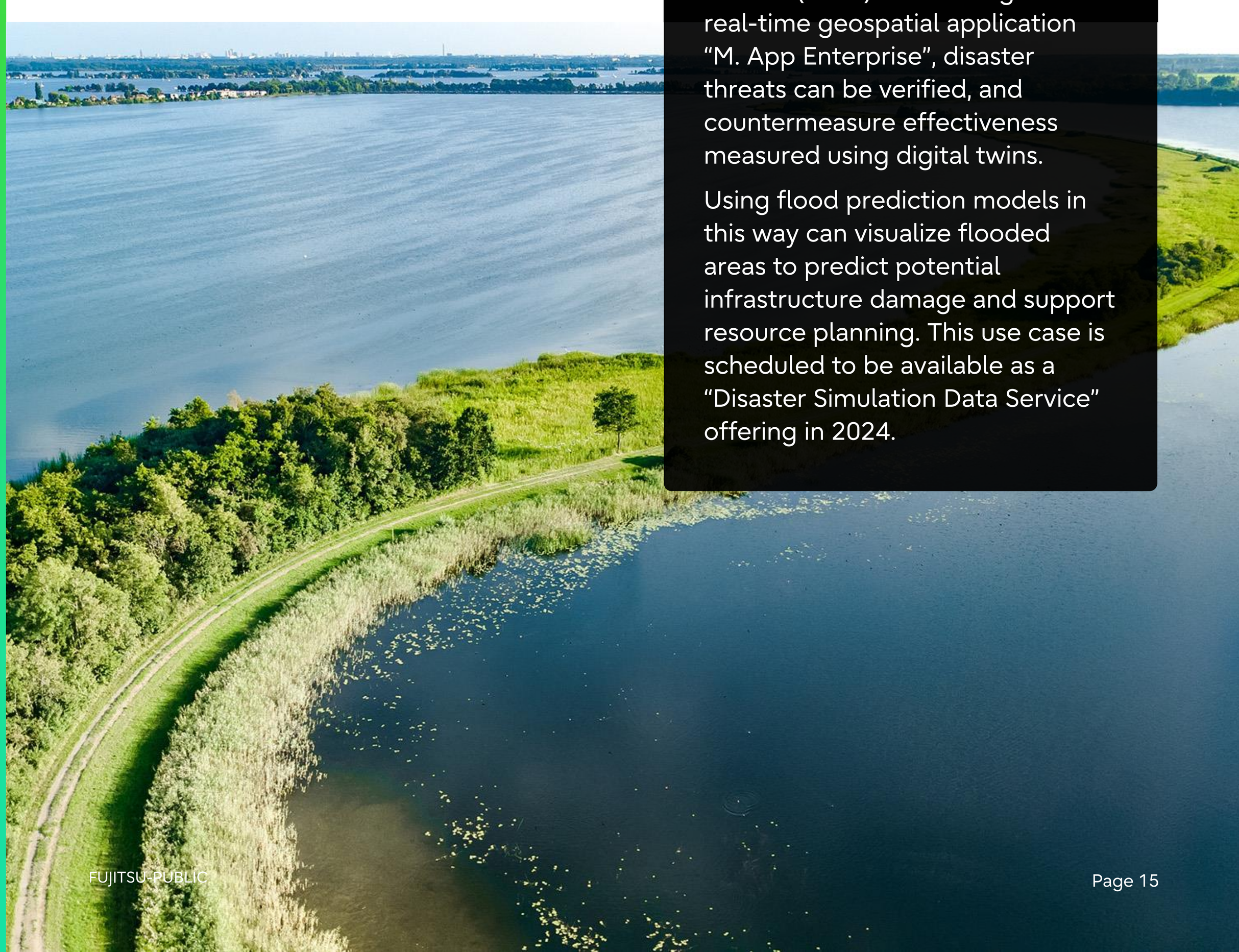
To meet global net-zero targets, transport needs to reduce emissions by around 20%, to less than 6 Gt by 2030, in anticipation of the projected growth in demand for global trade.

For example, technology can now be employed to identify and model potentially harmful natural incidents, such as floods and mudslides, to aid planning. Utilizing technology in these scenarios not only mitigates the impact of adverse weather on supply chains but also ensures that these efforts are resource-efficient without contributing additional carbon emissions.

Supporting disaster preparedness

Hexagon and Fujitsu have developed use cases that utilize digital twin technology to protect people from natural disasters. Utilizing “Fujitsu Computing as a Service (CaaS)” and Hexagon’s real-time geospatial application “M. App Enterprise”, disaster threats can be verified, and countermeasure effectiveness measured using digital twins.

Using flood prediction models in this way can visualize flooded areas to predict potential infrastructure damage and support resource planning. This use case is scheduled to be available as a “Disaster Simulation Data Service” offering in 2024.



Prosperity – Supporting a more profitable industry

Prosperity in the logistics industry can be achieved by standardizing processes to create a seamlessly operating infrastructure. By increasing the capacity to transport more cargo without incurring unnecessary costs or generating waste, organizations can enhance their profitability and effectively respond to the growing demand for cargo transport.

This is particularly crucial at a time when the labor force is declining, as it allows for enhanced efficiency and the ability to meet rising transportation needs without relying on additional human resources. Ultimately, this can make the logistics industry more profitable, especially considering the growth potential of the sector.

By 2028, the logistics industry scale is projected to exceed 14.08 trillion U.S dollars.

People – Benefitting more people on a global scale

The Fujitsu view of technology is that it should be a net-positive force that enhances well-being across society. Therefore, our Unified Logistics solutions are designed to alleviate the manual efforts that are often difficult and potentially dangerous, allowing human workers to transition to more value-added activities.

This shift not only improves job satisfaction but also makes the logistics industry more appealing to job applicants, transforming roles into career opportunities rather than repetitive tasks. A well-run logistics infrastructure benefits everyone by ensuring materials and supplies are reliably, consistently, and effectively accessible. The primary goal of developing and designing these solutions is to benefit people. In turn this can help make communities more prosperous by reducing the environmental impact, improving the overall well-being for both people and the planet.

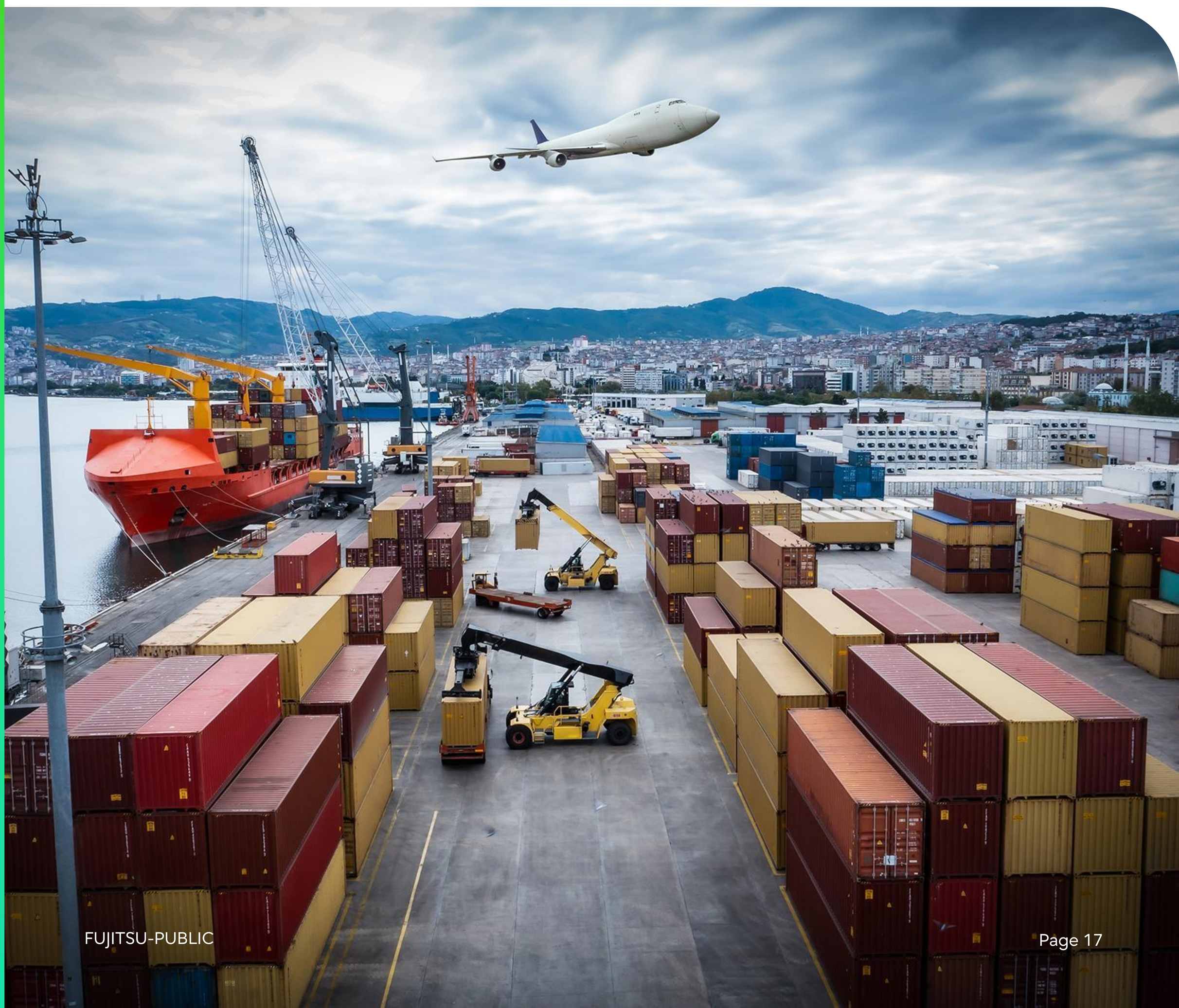
Even while facing labor shortages worldwide, the logistics sector plays a significant role in terms of job creation. In developed economies, the percentage of people employed in this sector is between 5-10% of the total workforce.

5 Streamlining the logistics sector

The integration of innovative technology in logistics brings substantial benefits to both workers and organizations. By addressing workforce shortages, these technological advancements alleviate a pressing issue in the industry, ensuring a steady and efficient labor force.

Furthermore, these technologies enable organizations to cope with rising environmental and geopolitical concerns effectively. This creates a digital and sustainable society where transport capacity is significantly enhanced for an overall net benefit.

Our focus is on merging technology with a human-centric approach, where the skills of individuals are augmented by next-generation solutions. This integration not only improves efficiency but also strengthens resilience. Embracing such advancements ensures that the logistics sector is well-prepared for the challenges of tomorrow through delivering robust, sustainable solutions for the future.



The next generation of logistics with sustainability at the center

By connecting land, sea, and air logistical data, organizations can enhance their efficiency, flexibility, and sustainability, with Fujitsu playing a key role in this transformation by standardizing logistical data and insights. Through implementing innovative technologies, we can address fundamental logistics challenges and work collaboratively to tackle emerging issues.

Our commitment to collaboration ensures the industry can navigate modern complexities with resilience, adaptability, and sustainability front of mind. Through our digital and secure Unified Logistics solutions, we can help to protect the environment, support social infrastructure, and build more resilient, safer communities.

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Ready to start the sustainable transformation of your logistics?

Contact us to discover how Fujitsu technology solutions can how our solutions can elevate your business to new heights.

Learn more about our solutions:

Unified Logistics >

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