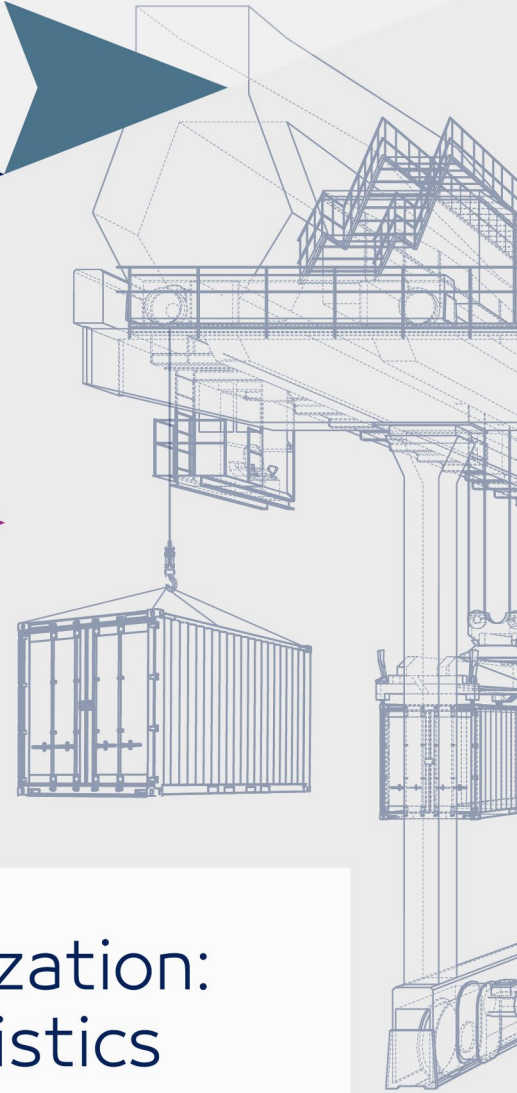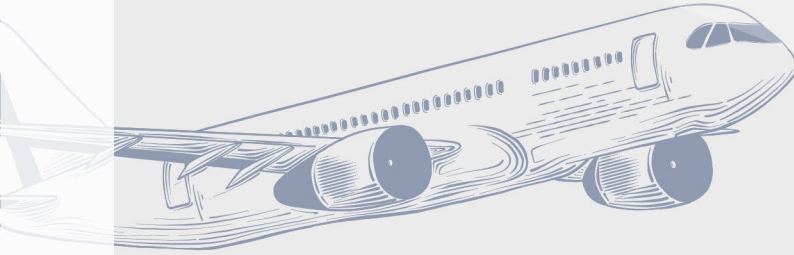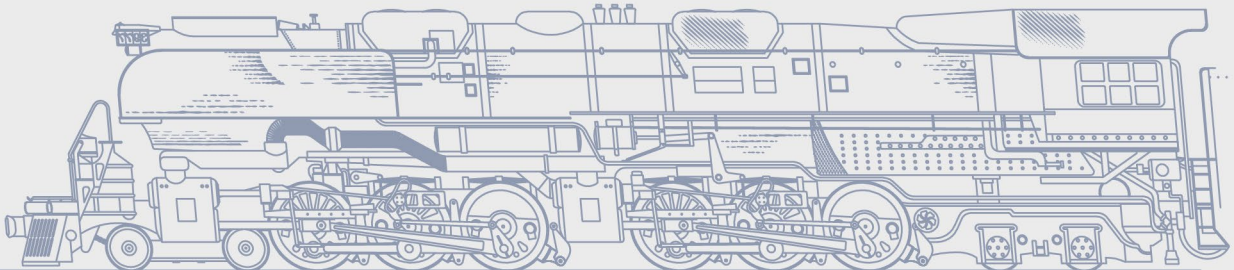ADQ FWD

القابضة فورورد

Destination Digitalization:
The Future of Logistics

PAPER

FOREWORD

Events over the past two years have exacerbated supply chain challenges and catalyzed a digital revolution that is reshaping every sector globally.

For logistics, emerging technologies, environmental regulation and sustainability, new customer expectations, and new online business models are also influencing the future trajectory.

Digital effectiveness is the way forward, with data analytics, automation, and platform solutions playing a critical role in increasing supply chain productivity, minimizing costs, and fostering greater transparency.

To fortify the supply chain, the logistics industry must embrace an innovation mindset and invest in new technologies at scale to maintain competitiveness and drive growth.

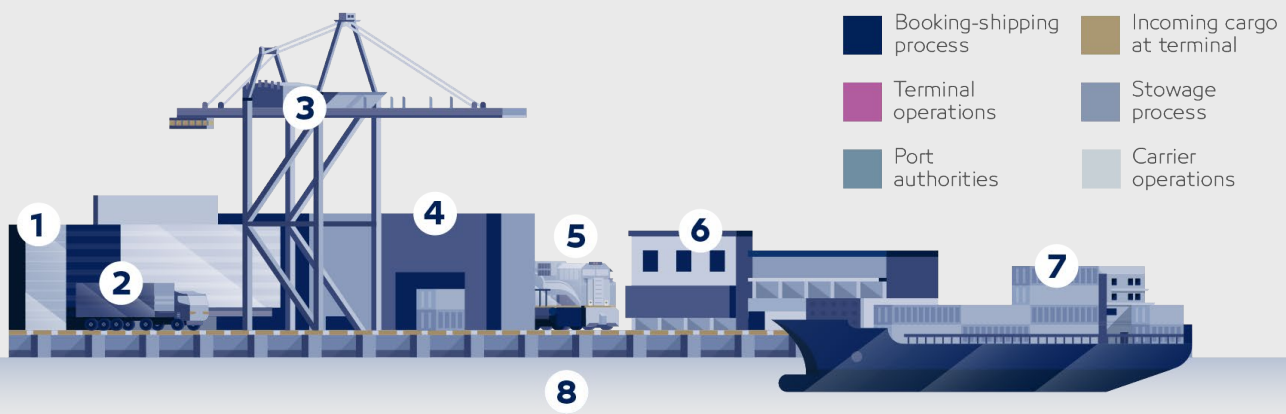Digitalization is a journey, accelerating our arrival at the future of logistics.

Our ADQ FWD paper explores opportunities for investment in digital transformation that can further strengthen the UAE's global leadership position in the logistics sector.

Jaap Kalkman
Group Chief Investment Officer, ADQ

Mobilizing container flow is imperative

Legend:
- Booking-shipping process
- Incoming cargo at terminal
- Terminal operations
- Stowage process
- Port authorities
- Carrier operations

Booking-shipping process
- (1) Container type, locations and availability not considered
- (1) Many bookings are still placed by fax or phone
- (4) Containers moving inland become misplaced

Incoming cargo at terminal
- (2) Trucks congested at terminal entrance
- (2) Boxes not always ready for truck collection
- (4) 20% of boxes booked do not show up by departure time
- (5) Rail cars sometimes not available

Stowage process
- (7) Ships not filled due to poor stow plan
- (7) ~1.2% of boxes are not where they are specified
- (8) More complex alliances increase vessel stowage complexity
- (3) ~5% of all moves are restows
- (3) Stowage plans often not optimized for availability of cranes

Terminal operations
- (8) Berths are often empty
- (3) Crane breakdowns are frequent
- (4) Information on box stowage ships received late
- (7) Gangs sometimes employed but ships arrive late
- (4) Yard gets congested waiting for feeder connections

Port authorities
- (7) Ship departures often delayed by customs or paperwork
- (8) Lack of clear visibility from port authorities of arriving vessels
- (8) Poor visibility of time of arrivals impacts scheduling of tugs and pilots

Carrier operations
- (7) Ships often steam at speed, only to wait outside for a berth
- (7) Ships burn more fuel than needed:
  - Stowage did not account for trim
  - Weather routing information not used
  - Lack of tracking actual speed and performance of vessels

Containerized logistics challenges require navigating to ensure flows are uninterrupted. But with consumer goods demand escalating, it's imperative to build resilience into the wider logistics industry.

Global overview: Building resilience into logistics is essential

Logistics platforms and capacities have been put to the test in the past couple of years. Shipping is experiencing historically high rates, container shortages, port congestion, and delays. For air cargo, widebody belly capacity is expected to increase when passenger volumes reach pre-pandemic levels.
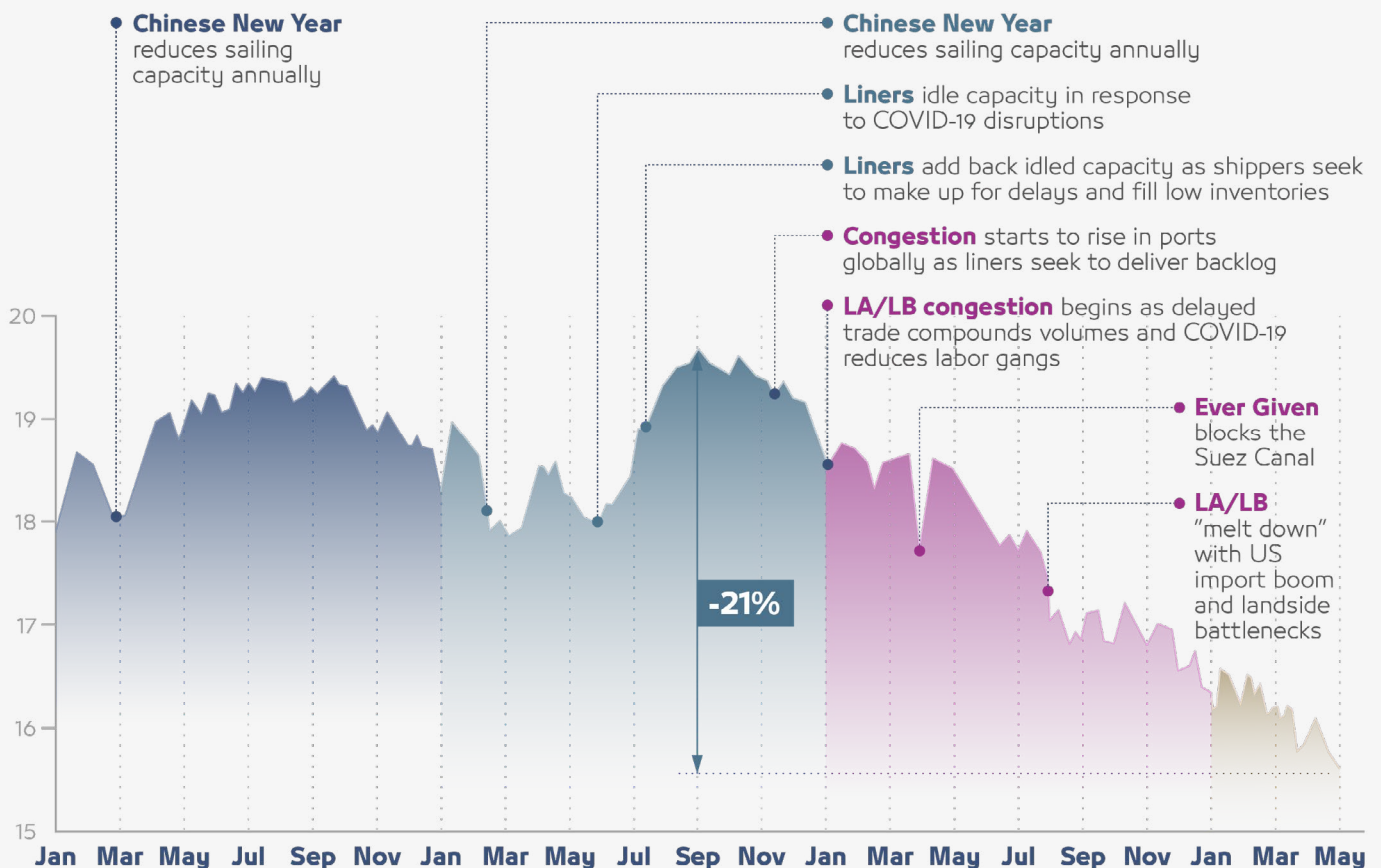
Containership sailing capacity

Port and associated supply chain congestion has caused a sharp drop in global containership capacity by **16%**.

Global containership capacity actively sailing

■ 2019 ■ 2020 ■ 2021 ■ 2022

Million TEU, ships traveling 7.5kts or more, through May 2022, 7-day moving average

- **Chinese New Year** reduces sailing capacity annually
- **Chinese New Year** reduces sailing capacity annually
- **Liners** idle capacity in response to COVID-19 disruptions
- **Liners** add back idled capacity as shippers seek to make up for delays and fill low inventories
- **Congestion** starts to rise in ports globally as liners seek to deliver backlog
- **LA/LB congestion** begins as delayed trade compounds volumes and COVID-19 reduces labor gangs
- **Ever Given** blocks the Suez Canal
- **LA/LB** "melt down" with US import boom and landside battlenecks

-21%

Since the wake of the pandemic, air cargo's performance paints a picture that illustrates the potential of advanced digital capabilities.
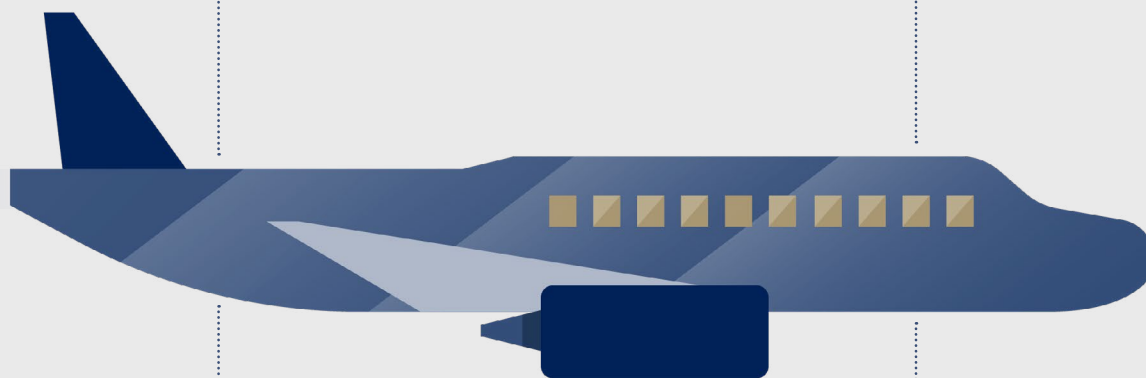
Air cargo capacity

TOTAL MARKET PERFORMANCE	July 2020 vs. July 2019	July 2021 vs. July 2019	July 2022 vs. July 2019
Available Cargo Ton Kilometers (ACTKs)	-31.2%	-10.3%	-7.8%
Cargo Tonne Kilometres (CTKs)	-13.5%	8.6%	-3.0%
Load Factor Level (CLF)	56.4% (+11.5%-pt)	54.4% (+9.5%-pt)	47.2% (+2.3%-pt)

Key considerations for air cargo

Congestion: Supply chain disruptions have created bottlenecks at key aviation hubs. Labor shortages, processing backlogs, and a shortage of airport slots in Europe for cargo aircraft have exasperated the congestion with no solution yet in sight.

Capacity: With an annual growth rate of +4% expected over the next 20 years, the industry needs to recalibrate passenger and cargo capacity ratios. Decisions need to be considered to retrofit passenger aircraft to maximize cargo capacity.

Collaboration: While most global hubs have Airport or Cargo Community Systems (CCS) to enable intelligent and secure data exchange for customs clearance and other requirements, streamlined systems are needed to enhance supply chain performance and global connectivity capabilities.
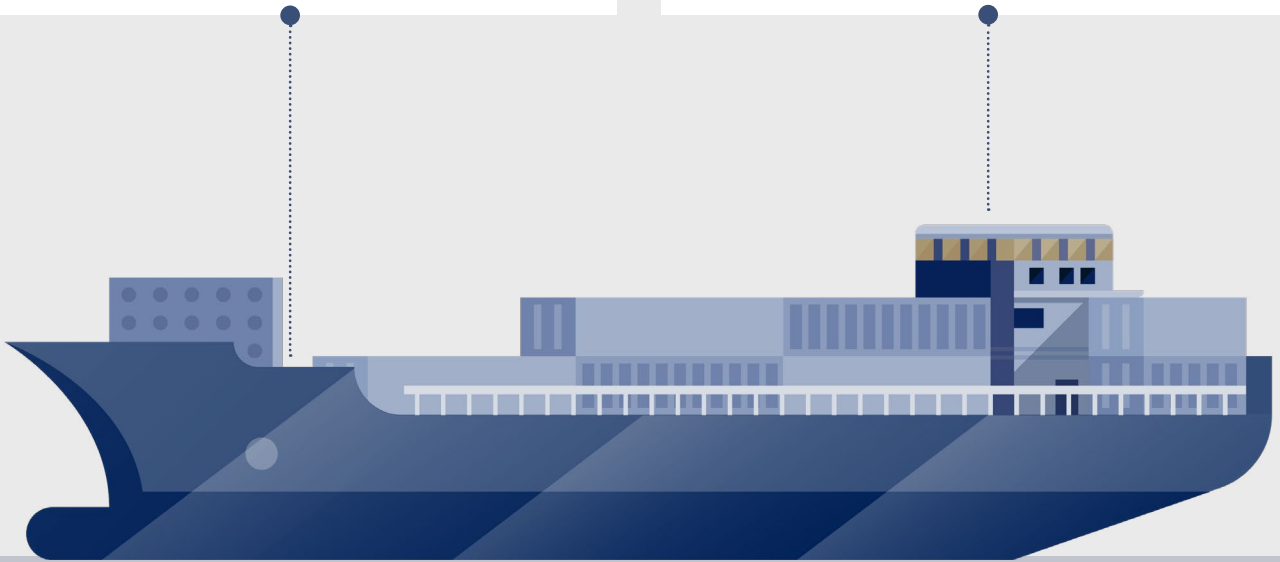
Collection: Freight bookings typically rely on person-to-person interactions and negotiations but there is significant scope to reduce friction by introducing smart digital systems that are capable of pricing freight in real-time.

Meanwhile, the shipping industry continues to navigate toward a more promising outlook of normalization. With key areas to consider, there's opportunity for ports to overcome disruption.

SECTION ONE: GLOBAL OVERVIEW | BUILDING RESILIENCE INTO LOGISTICS IS ESSENTIAL

SECTION ONE: GLOBAL OVERVIEW | BUILDING RESILIENCE INTO LOGISTICS IS ESSENTIAL

Congestion: Since the onset of the global pandemic, inland infrastructure constraints increased cargo stored at ports, resulting in plummeting cargo volumes and overwhelming port infrastructure. This is significantly affecting the speed at which containers can move through ports.

Capacity: To mitigate container flow inefficiencies, digital supply chain technologies help yield significant performance improvements. This will enable more efficient container repositioning and, by doing so, induce positive environmental impacts. Ports are well positioned to lead this initiative.

Collaboration: Many actors in the supply chain still rely on personal interactions and paper-based transactions, although several leading ports are developing smart capabilities across shipboard, ship-to-shore, and shore-to-hinterland exchanges to transition from paper-based cargo hubs to smart ports.

Collection: Multiple stakeholders with variable data, protocol, and compliance requirements, combined with different national data protection legislations, present a significant barrier to the single unified data collection and exchange system needed for data transparency and greater efficiencies.

> Sharing data between all entities is crucial to establish a fully connected ecosystem, and it also underlines the importance of integrating with regulatory authorities to ensure smooth cross-border operations.

Khalid Hasan Ali Al Marzooqi
Division Director, Development & Strategic Planning, Abu Dhabi Customs

Insight Into Port of Los Angeles

As the busiest container port in the US and among the top 20 globally, the Port of Los Angeles has over 200,000 companies that import and export goods worldwide.

The rise of e-commerce and a shift in spending from the service industry to other sectors resulted in a 14% increase in cargo volumes in 2021. This spike in demand placed greater pressure on the supply chain, vessel schedules, and affected cargo movements through the Port complex into the domestic supply chain throughout the US, causing severe bottlenecks.

Two solutions had the greatest benefit in facilitating the smooth flow of movement:

Decrease aging cargo

Identifying importers using the Port as a warehouse facility and announcing the intention to leverage penalty fees resulted in a 60% decline in aging cargo.

Decrease dwell times

Decongesting the marine terminal and port increased fluidity and almost halved the dwell time relating to container truck movement. Overall, dwell times plunged from an average of 13.5 days to two.

A model for maritime digitization in the US

In collaboration with the General Electric Transportation Company, the Port of Los Angeles launched the only port community system in the US. Its advanced award-winning platform serves to enhance the efficiency and speed of port processes and reduce paperwork in real-time.

Services and features include Electronic Data Interchange (EDI) information exchange and centralization; customs declarations including inspections; and electronic handling of all information relating to the import and export of containerized, general, roll-on/roll-off, and bulk cargo.

Visibility

Increased cargo visibility from 2 to 14 days prior to vessel arrival

Productivity

8 to 12% projected productivity increase as the solution is scaled across the Port of Los Angeles

Usability

93% of participants stated that data in the portal is easy to understand and of value

"Our port system is based on models in the Middle East, Asia, and Europe applied to an understanding of the products and volumes expected, ensuring workforce and equipment are managed efficiently while utilizing data insights effectively.

Eugene Seroka
Executive Director, Port of Los Angeles

SECTION TWO

The future of mobility and logistics in the UAE

The UAE aims to be at the forefront of the global logistics industry as a vital enabler of economic diversification. The nation's strategic location, global connectivity by air, land, or sea, modern infrastructure, and focus on innovation and technology are key drivers for the realization of its ambition to emerge as a champion for regional logistics.

Situated at the crossroads of trade routes between the east and west, the UAE provides access to over five billion people within an eight-hour flight time. Propelled by its position as a facilitator for global re-exports, the nation's regional leadership is reinforced by a mobility and logistics sector that is among the best in the world.

The UAE ranks among the world's leading countries for mobility and logistics

IMD World Competitiveness Yearbook 2020

- Quality Of Air Transportation Index – 2nd Globally

World Bank Logistics Performance Index

- Sustainable Environment & Infrastructure – 11th Globally
- Timeliness – 4th Globally
- International Shipments Index – 5th Globally
- Tracking and Tracing – 14th Globally

The Global Competitiveness Index 4.0

- Efficiency of Seaport Services – 12th Globally

Global Competitiveness Report

- Liner Shipping Connectivity Index – 13th Globally

2021 Agility Emerging Markets Logistics Index

- 1st in the Middle East
- 4th Across all 50 Emerging Markets

The Economist Intelligence Unit

- Business Environment – 1st in the Region, 19th Globally
- Infrastructure – 21st Globally

> " Global logistics providers are increasingly looking at Abu Dhabi. The sector presents a strong growth opportunity for the Emirate, which further amplifies the strength of our world-class infrastructure and global competitiveness. "
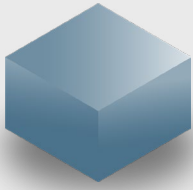
Jonpaul Simpson
Director of Logistics Development Division, Abu Dhabi Department of Economic Development (ADDED)

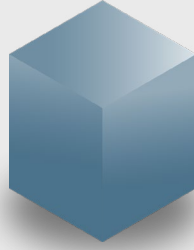# The UAE logistics market is on an upward trajectory
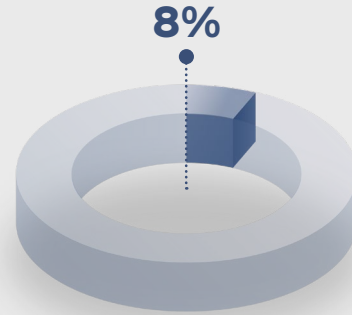
Market value

2021
Valued at
$19.65 billion

By 2026
Predicted value of
$31.41 billion, growing
at 8.41% CAGR

GDP contribution

8%

The UAE logistics sector contributes
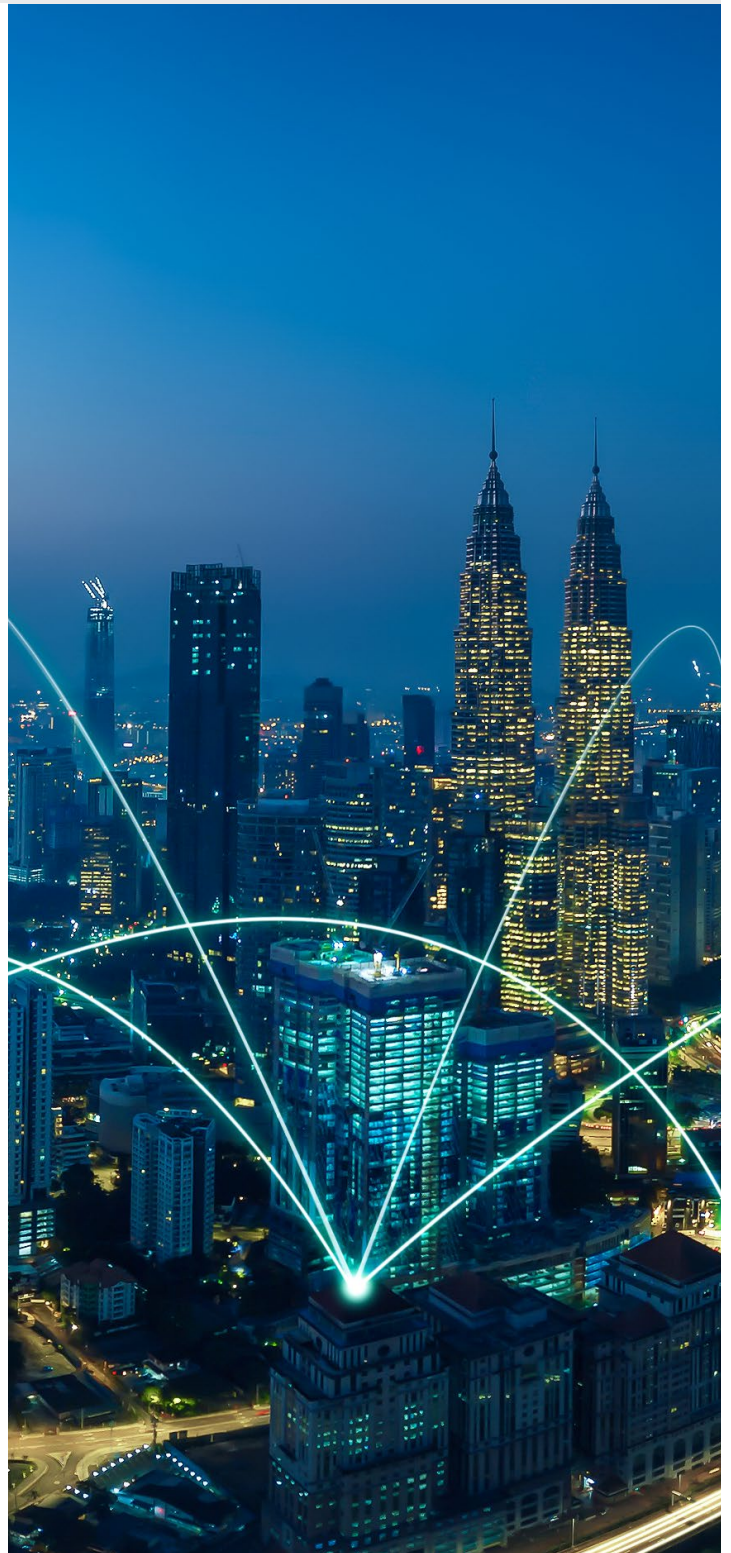**8%** to the national economy

Infrastructure investment and government measures spur revival

The UAE is set to remain in prime position as the global economy recovers through the implementation of a series of robust measures that include extensive legal reform, trade facilitation, fast customs clearance, and nationwide digital transformation initiatives.

Additionally, investment in maintaining a highly robust logistics infrastructure with substantial modernization initiatives across maritime ports and airports is helping to increase resilience.

Technology has the power to transform capabilities

Technological innovation and digital acceleration are pivotal to the UAE's development and diversification goals. Government initiatives such as introducing drones for last-mile delivery, the UAE National AI Program, and the National Innovation Strategy will contribute to the long-term evolution of the nation's logistics capabilities.

The acceleration of e-commerce is gathering pace

Restrictions on movement at the onset of the global pandemic prompted consumers to turn to digital platforms to shop, socialize, and be entertained in record numbers and accelerated speed. The UAE, a primary hub for e-commerce in the region, has witnessed record growth, which is underpinned by having one of the world's highest internet penetration rates (99%), a developed transport logistics network, advanced digital payment systems, and strong government support . advanced digital payment systems, and strong government support.

UAE: e-commerce projected to grow substantially

YEAR	2020	2021	2022	2023	2024	2025 (projected)
Year-on-year growth (value)		+$20%			+$14%	
Total sales value	$7 billion	$10 billion	$12 billion	$14 billion	$15 billion	$17 billion
CAGR growth			+16%			

Strong e-commerce activity and a significant uptick in freight and logistics business have stimulated growth across all geographies where we are active.

Johannes Distler
Chief Strategy Officer, Aramex

ADQ and the journey to a digitalized supply chain and logistics ecosystem

The integration of technology in logistics and supply chains were already priorities before the crisis, and the growing demand for faster delivery has accelerated its adoption.

ADQ's Mobility and Logistics cluster facilitates the flow of digital trade across land, air, sea, industrial and free zones, positioning the Emirate as a leading integrated hub for global trade. Key initiatives include developing an Advanced Trade & Logistics Platform (ATLP) and implementing the automation and digitization of terminal and port operations.

Reimagining the logistics landscape

The emergence of the new digital supply network relies on integration across borders, between different community systems, and across all modes of transportation.

Operating a centralized digital platform delivers a speedier, more efficient, and flexible service by giving all parties oversight on capacity, availability, location tracking, and access to delivery windows. AI-powered solutions also facilitate reliable forecasting and advanced data analysis in real-time, enabling capacity to be quickly scaled up or down in response to changing conditions.

Building interconnected networks across the port supply chain

The adoption of integrated **PCS and Port Management Systems (PMS)** are vital to facilitate a single data flow across the transport and logistics chain. Ports around the world need to move to **Maritime Single Windows (MSW)** driven by electronic data exchange to speed up and simplify the flow of information between trade and government.

Strategic partnerships and collaborations are driving digital acceleration

Collaboration is a critical enabler to futureproof the global supply chain and increase resilience across the logistics landscape.

AD Ports Group works with leading partners to improve digital capabilities and develop critical infrastructure. Recent partnerships include:

Strategic agreement inked with the Aqaba Development Corporation in Jordan, which includes an advanced digital Port Community System and the development and modernization of a multipurpose port and King Hussein International Airport

Investment agreement representing AED 570 million with France-based CMA CGM Group to develop a new terminal at Khalifa Port

Maqta Gateway is spearheading port transformation

In alignment with Abu Dhabi's mandate to implement the digital transformation of its maritime, trade, and government services, Maqta Gateway is leading the way to deliver innovative solutions designed to enable trade and transform port communities.

Maqta Gateway products include:

Licensing Management System: A powerful platform for the issue of Abu Dhabi Ports licenses and renewal with advanced tracking, administration, and payment capabilities

Vessel Management System: A centralized solution for the issue of approvals for vessels, including registration, shifting, and clearance

Verified Gross Mass: Digital single window that enables information flow between port stakeholders and customers

Maqta Payment Gateway: Advanced digital payment solution that can be integrated with ERP

Initiating Integration: Maqta Port Community System (mPCS)

Maqta PCS (mPCS) is the UAE's first Port Community System and the first solution in the Middle East to achieve PCS-to-PCS integration. The system is currently operational in five ports, 54 private jetties, and 20 shipping lines.
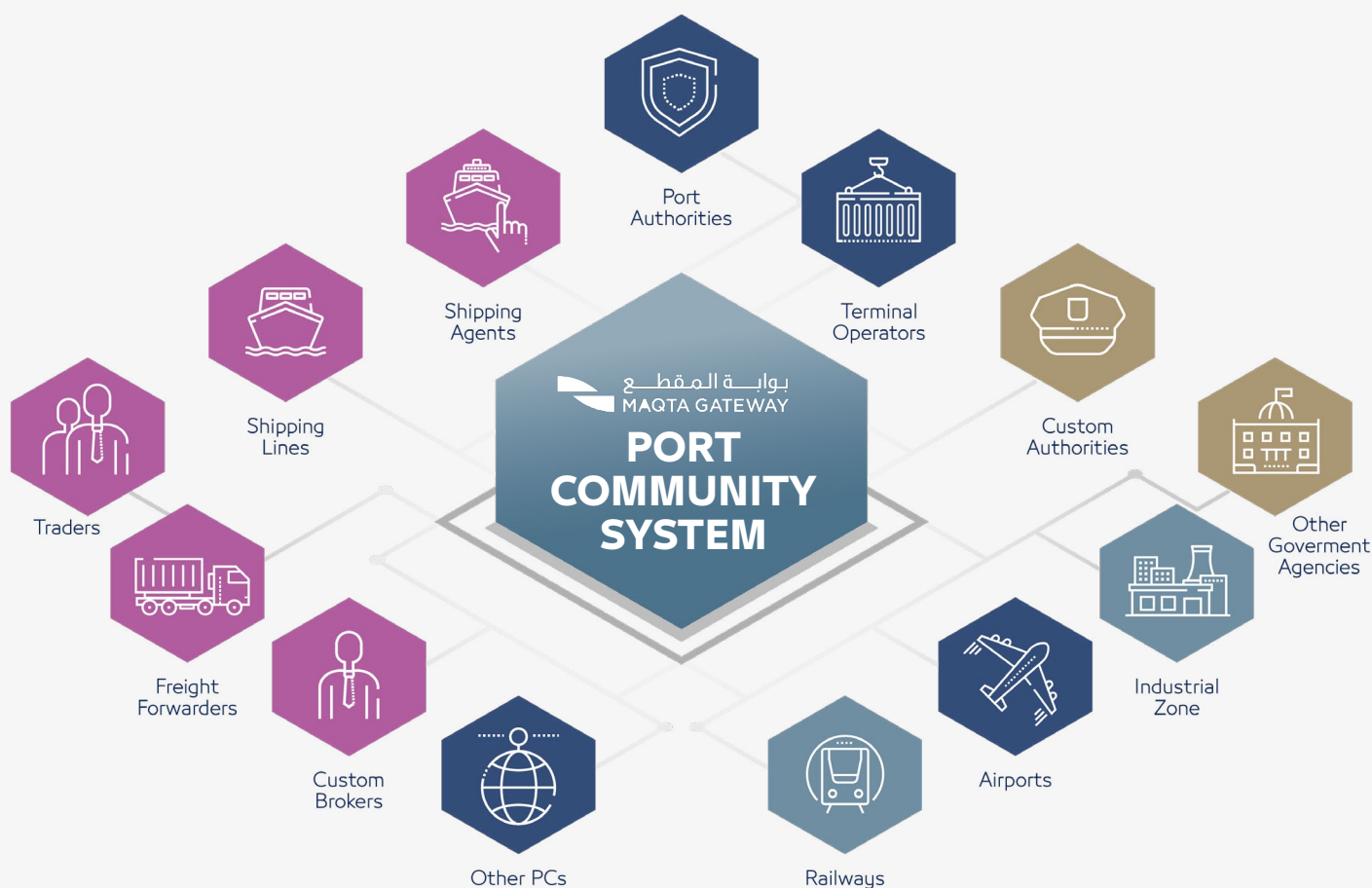
Key benefits of mPCS:

Standardizes and secures information exchange among port stakeholders, customers, and government authorities

Provides a single window to all port services with system-to-system integration

Unlocks access to information in real-time to facilitate transparency, oversight and information flows

Incorporates over 100 services catering to the needs of the entire Port community, from Seaside to Hinterland

"The opportunity lies not only in applying the most advanced tools to solve complex problems but on how we can collaborate to unlock the challenges that have arisen due to the previous lack of communication and information flow.

Dr. Noura Al Dhaheri
Chief Executive Officer, Maqta Gateway, AD Ports Group

SECTION THREE: ADQ AND THE JOURNEY TO A DIGITALIZED SUPPLY CHAIN AND LOGISTICS ECOSYSTEM

Digital levers for an evolved interconnected ports network

Breakthrough technologies will be at the heart of sustaining connected port systems that can improve operational efficiency. Through key digital levers, ports can accelerate progress in positioning for the future of logistics.

01

Connected objects powered by the Internet of Things (IoT) and Cloud technology

02

Disruptive innovation along the value chain

Ocean carriers
• Autonomous ships

Terminal operators
• 3D printing,
• Ship-to-shore cranes
• Automated guided vehicles
• Automatic stacking cranes

Origin carriers
• Autonomous trucks
  Chaotic warehouse

03

Ecosystem orchestration and real-time optimization

04

Data-as-service model that aggregates, structures, and cleans data for use by the entire Port Community

05

Big Data & Machine Learning to enable resource optimization and dynamic scheduling
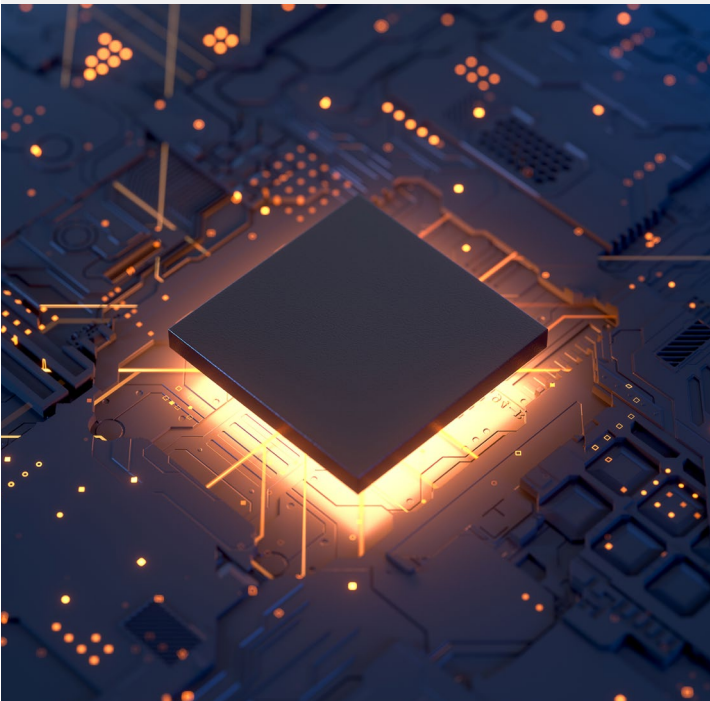
06

Cybersecurity ensures secure IT infrastructure protected by state-of-the-art cyber tools

As the logistics industry increasingly digitalizes, it will have a broad effect on the multiple modes of transport the sector relies on to keep it moving.

Prioritizing port cybersecurity

Digitization brings new risks. Between February and May 2020, cyberattacks increased by 400% in the maritime sector.

The Port of Los Angeles recently upgraded its Cyber Security Operations Centre (CSOC), employing advanced technologies with layered detection capabilities to block between 20 to 30 million unauthorized intrusion attempts every month. Going forward, the Port plans to extend the G2 CSOC to the broader port community.

Digitizing the aviation industry

ADQ is establishing a new company dedicated to aerospace and aviation services and Abu Dhabi Airports is working to deliver seamless operational efficiency through cutting-edge infrastructure as aviation recovers globally. Volumes are increasing, and cargo facilities need to keep pace. To facilitate speed, increasingly smart solutions are required.

To improve forward tracking and supply chain visibility, Airport or CCS must evolve into single interconnected systems that link every aspect of the supply chain, ensuring maximized capacity, enhancing service delivery and guarding against lost opportunities.

Requirements to facilitate an agile interconnected air cargo network

Streamlined data flow

Provides real-time visibility of air freight combined with logistics updates to maximize availability and capacity, enable agility and leverage cost savings.

Digital automation

Optimizes performance, reduces human error, and results in more efficient and faster operators.

Real-time location tracking

Enables oversight of the end-to-end shipment process on the ground and in the air to keep cargo secure and ensure on-time delivery.

Digital freight booking

Facilitates more accurate demand forecasting and dynamic pricing and improves response rates and processing times, increasing revenue opportunities.

> Airlines must strike a balance between passenger capacity and allocated capacity for cargo. There's a significant number of aircraft on the ground, so the opportunity is there to adapt passenger aircraft to carry freight.

Francois Bourienne
Chief Commercial Officer, Abu Dhabi Airports Company

SECTION FOUR

Conclusion

Adopting advanced technologies to foster the emergence of a data-driven interconnected global logistics network is critical to foster a more secure future for the entire supply chain.

Key drivers for a more resilient and agile mobility and logistics sector

Digitized customer interactions

Digitizing the customer experience improves speed and services quality, while lowering cost of sales, increasing personalization levels, and targeting customers more precisely.

Improved operational efficiencies

Advanced data analytics significantly enhance asset utilization. As automated processing tools, such as predictive maintenance, become increasingly commonplace, operational costs will decrease.

Enhanced data ecosystems

Collaboration between carriers, terminals, and customers to share data pools will unlock new value and facilitate greater operational efficiencies.

Increased door-to-door business

Extended digital channels to pre and on-carriage unlocks the potential for a higher share of door-to-door business, particularly for simple transactions.

Public-Private Partnerships

Collaboration will drive innovative, fit-for-purpose solutions deployed at scale. Partnerships between the public and private sectors will help to promote sustainable growth.

As advanced technologies modernize the logistics industry, the UAE is at the vanguard of its digital transformation.

With improved efficiency and resilience in the supply chain, tomorrow's logistics industry will protect trade flows and facilitate the rapid movement of goods both consumers and industries rely on, paving the way to destination digitalization, the future of logistics.

ADQ FWD

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Destination Digitalization:
The Future of Logistics

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