



BCG x TIC4.0: Grasping the Benefits of an Industry Shared Benchmark on Port Digitalization

C-Level Roundtable Discussion at TOC Europe in Rotterdam

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BCG and TIC4.0 collaboration brings together deep strategic, digital, and operational expertise



Dr. Johannes Distler
Managing Director and Partner
Boston Consulting Group

- BCG is a leading strategic consultancy in wide variety of industry and functional practices
- Deep experience in Marine Ports, working with some of the largest terminal operators, port authorities, and investors

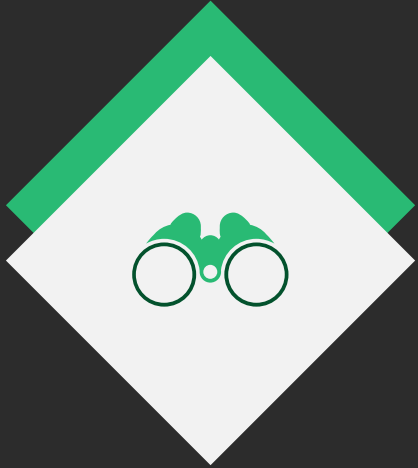


Boris Wenzel
President
TIC4.0



- TIC4.0 is the international not-for-profit association dedicated to the elaboration and promotion of digital standards for the cargo handling industry
 - TIC4.0 regroups 74 global terminal operators and suppliers of equipment, technology and solutions for the terminal industry

Key benefits of participating in the initiative



Gives visibility on your maturity level

Understand what each level of maturity means in terms of business capabilities

Benchmark your terminals against the top tier terminal groups & set clear, actionable improvement targets



Provides best practices from peers

Learn from top-performing peers & adopt proven practices to guide your digital journey



Facilitates dialogue with stakeholders

Drive aligned decision-making across the port ecosystem (authorities, clients, suppliers) by providing fact-based insights



Unlocks value quickly

Benefit from our existing benchmark database to receive insights quickly & generate immediate value

Our terminal survey framework benchmarks 5 pillars core to digital maturity



Digital Benchmarking Pillars

1



Process Automation

Waterside

Quayside

Yardside

Landside

2



Machine Automation

Waterside

Quayside

Yardside
Horizontal Transport
Container Stacking

Landside

3



Data Driven Intelligence

Long-term/Short-term resource planning

Operations/Maintenance/Commercial Execution

Pricing

Data Visualization & Forecasting

4



Stakeholder Digital Connectivity

Shipping Lines

Landside Transport

Regulatory Authorities

Other Terminals

Core pillars

5



Terminal Operating System

Berth and Vessel Planning

Operational Module

Transport Module

Yard Module

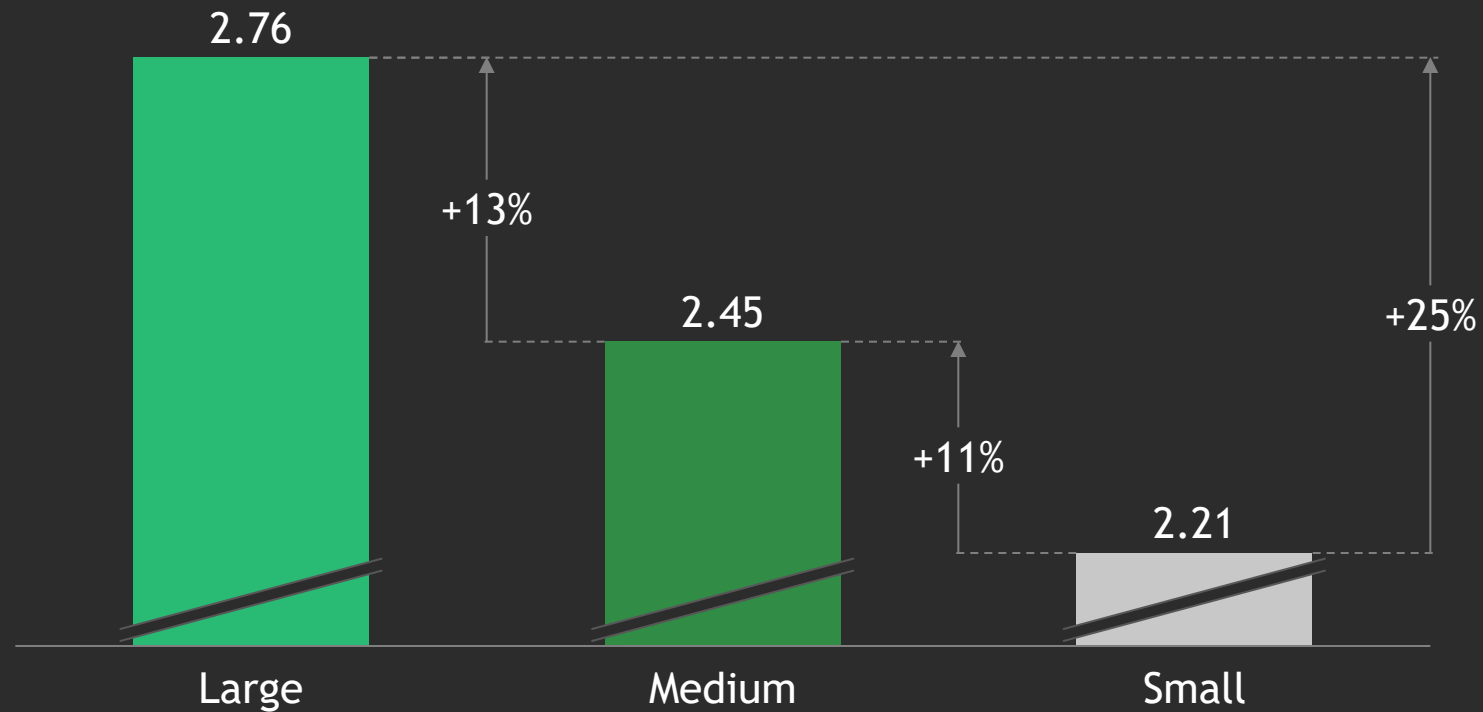
Gate Module

Rail Module

Integration Module

Enabler

Terminal size as the determining factor, as large terminals score 25% higher on average than small terminals



2.52 Avg. overall digital maturity score

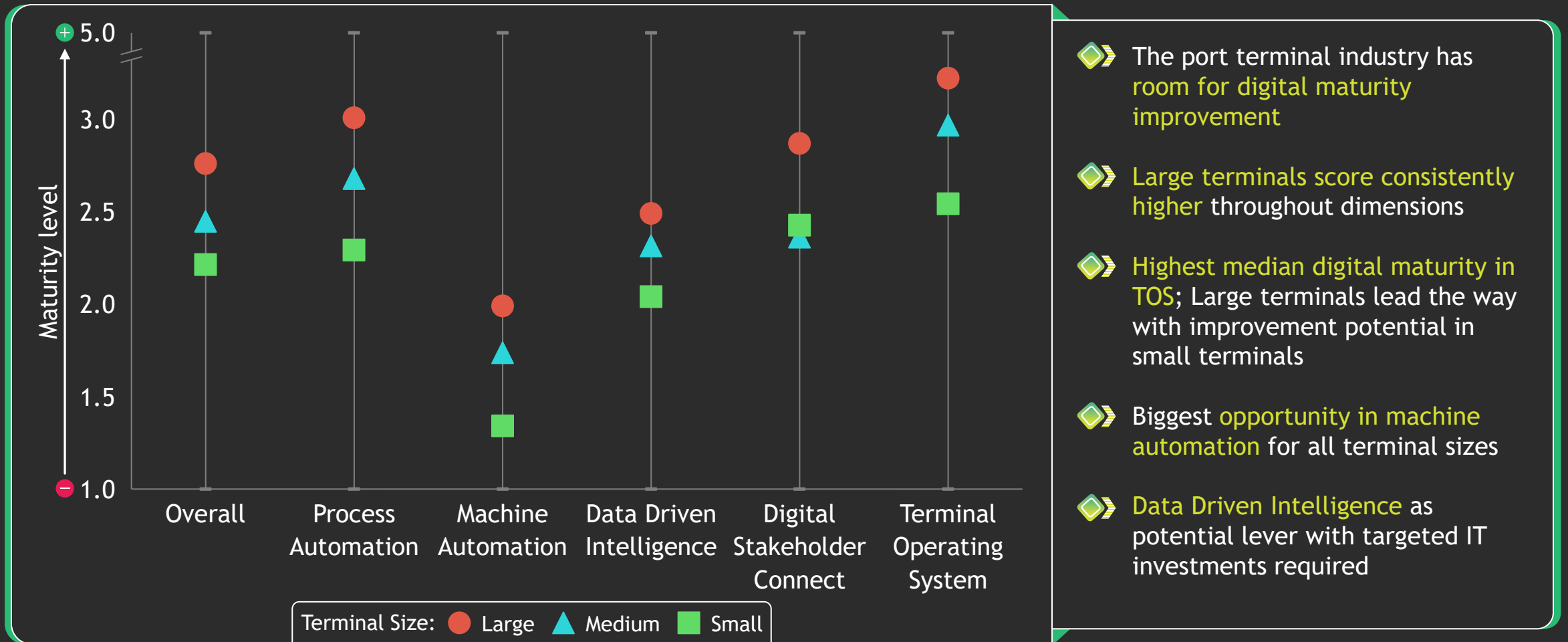


Benchmarking Sample

Terminal Size	Throughput	No. of benchmarked Terminals
Large	>1.5M TEU	12
Medium	0.5M - 1M TEU	12
Small	<0.5M TEU	8

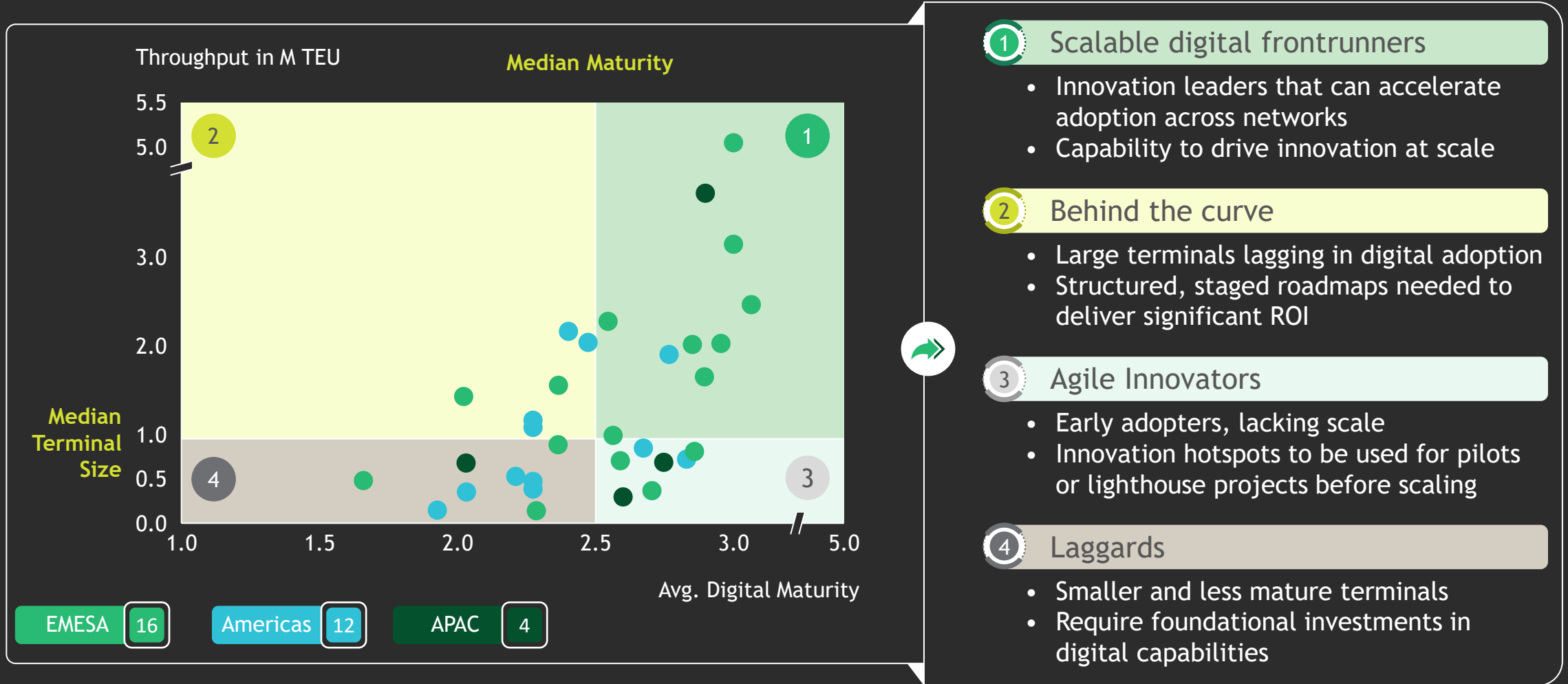
Note: Sample size of 32 terminals
 Source: BCG Digital Ports Benchmarking Survey, 2024/2025

Large terminals (>1.5M TEUs) show a **higher degree of digitalization across all pillars** with the biggest advantage in process automation and TOS




Note: Sample size of 32 terminals, Terminals categorized by throughput (Small <0.5M TEU; Medium 0.5-1M TEU; Large >1.5M TEU)
 Source: BCG Digital Ports Benchmarking Survey, 2024/2025

Large terminals have **capability to drive innovation at scale** - terminals in EMESA are leading the sample



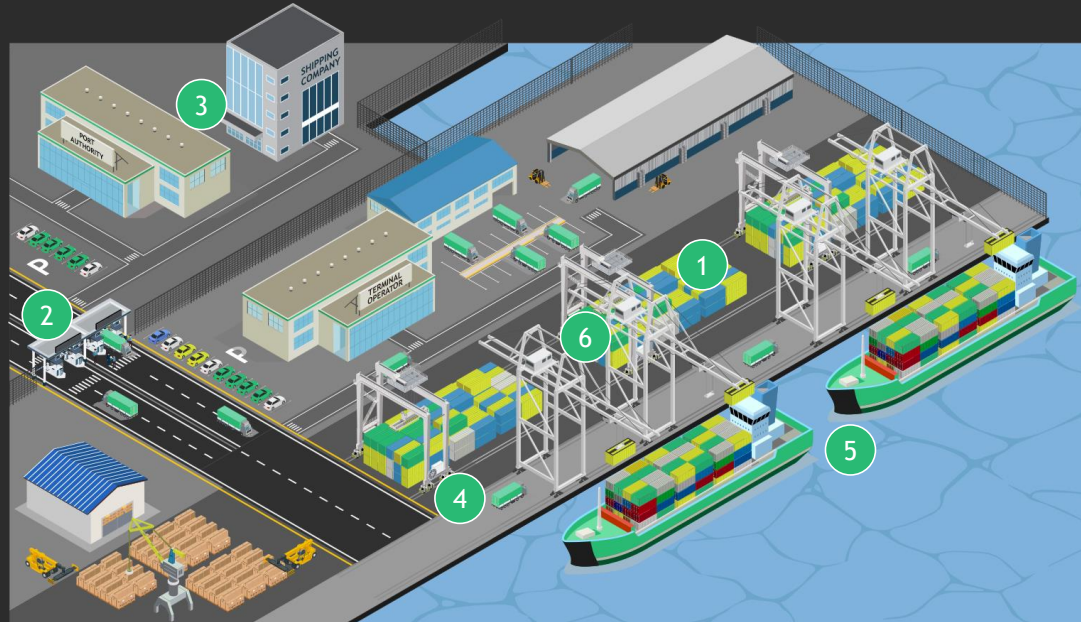
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We see 6 key priority areas with highest impact on digitalization

1 

Optimize Yard operations


Use digital tools to plan, move & stack containers more efficiently



6 

Automate key equipment

Introduce automation to critical handling equipment

2 


Streamline gate & landside flow

Streamline gate operations, truck appointments & cargo transfers

3 

Connect & integrate external ecosystem stakeholders

Exchange data in real-time with partners, customs & authorities

4 

Optimize horizontal transport

Automatically assign & route internal vehicles to move containers efficiently

5 

Optimize port call & vessel operations

Coordinate berth planning, vessel scheduling & crane operations

BCG x TIC4.0 Benchmark: Five core messages on terminal digitalization



1

Terminals face a **common set of pressures**, e.g. cost - creating shared momentum for digital transformation



2

Large terminal size and regulatory framework are enablers but not prerequisites for digitalization - even small terminals can be strong in digitalization



3

Ownership model (liner vs independent) and terminal type (transshipment vs gateway) do **not predict overall digital maturity**



4

Machine automation remains the biggest challenge and large untapped opportunity for terminals of all sizes



5

While a **structured digitalization approach is essential**, each terminal needs a **tailored roadmap given local context**

Let's open up the discussion

Defining the right level of automation in a regional context of digitalization



How to develop a successful digitalization roadmap on a terminal portfolio level



Introducing the concept of dynamic pricing to container terminal business



Impact of new alliance setup and global demand shift on data intelligence and players' connectivity



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