



Beyond Automation

Connected Port Ecosystems for Performance and Sustainability

Case study: Developing a middleware solution



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Contents

- 01.** | Meet DSP
- 02.** | From Fragmented Systems to Integrated Ecosystems
- 03.** | OnGoing Project





Part 01

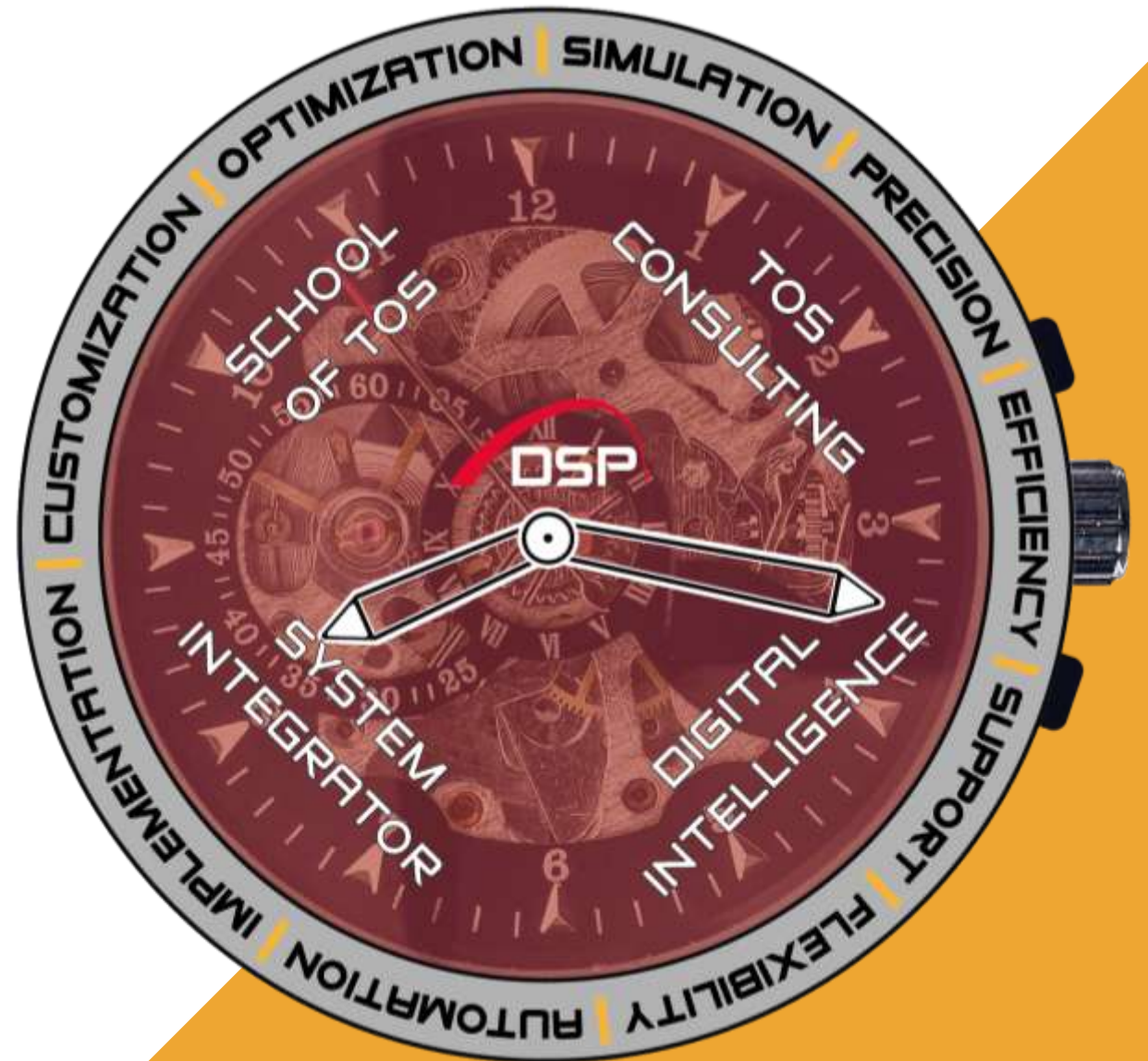
Meet DSP

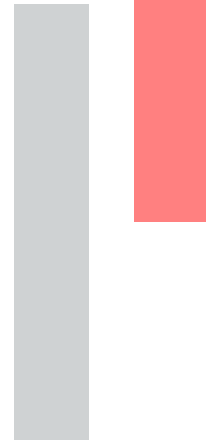
Precision & Engineering, 40 years of Swiss DNA

- 500+** Projects completed worldwide
- 55+** Industry Experts
- 24/7** Global help desk and support services
- 25+** **Navis N4 Certified** consultants
- 20+** Technology Partners



Since 2023, DSP is compliant with the ISO 27001-2013 certification to grant Information security, cybersecurity, and privacy protection to its customers





Part 02

From Fragmented Systems to Integrated Ecosystems

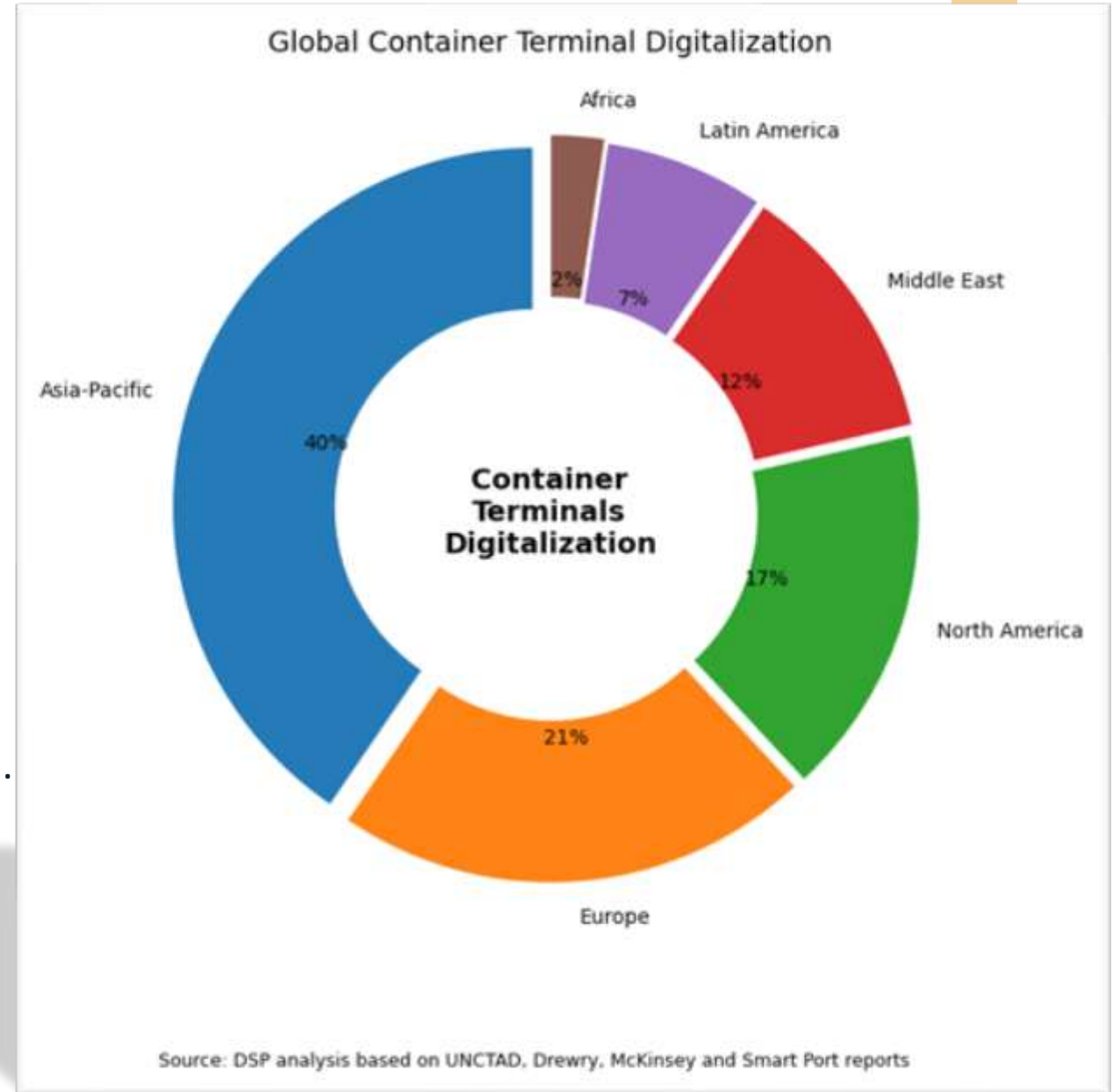
The Reality Across Global

Wide spectrum of digital maturity

- Manual workflows still present in some terminals
- Partial system integration in many sites
- Advanced automation and analytics
- Uneven infrastructure and investment capacity

Key message:

The gap is not just technology — it's integration and execution.



The Core Challenge: From System to Ecosystem

Most terminals have a TOS.
Few have a fully connected digital ecosystem.

Data exists — but is not trusted
Reporting is reactive, not predictive

Common gaps:

- TOS not fully integrated with:
 - Gate systems
 - Yard automation
 - ERP
 - Maintenance systems
 - BI platforms



Key message:

Digitalization is no longer optional — it is strategic

Benchmarking Digital Maturity

Terminals can assess themselves across:

1. Operational Systems

- TOS integration level
- Automation degree

2. Data & Analytics

- Real-time dashboards
- Predictive capabilities

3. Process Standardization

- Manual vs digital workflows

4. People & Culture

- Digital skills
- Change management readiness



Key message:

Benchmarking is not just about technology — it includes people, processes and data governance.

Building the Foundation

Key transformation pillars:

- Clean, reliable data architecture
- System integration (avoid digital silos)
- Phased investment roadmap
- Leadership alignment
- Measurable KPIs



Key message:

Transformation does not require full automation from day one — it requires a structured roadmap

The Benefits of Moving Forward



- Improved berth productivity
- Reduced turnaround time
- Better asset utilization
- Data-driven planning
- Stronger resilience to disruptions
- Lower Emission

Key message:

Digital maturity is not about technology adoption — it is about enabling smarter, faster decisions



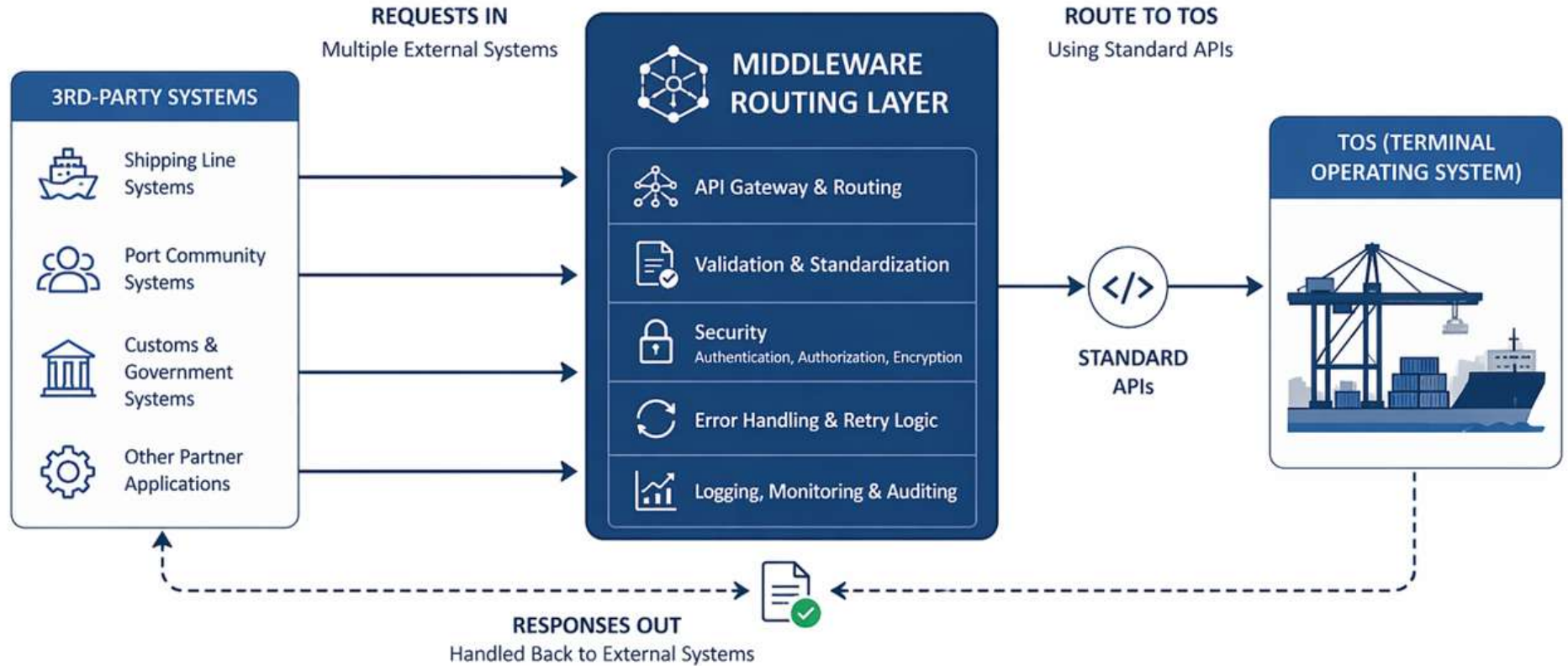
Part 03

OnGoing Project



Project Overview & Objectives

Middleware Routing Layer for Terminal Operations



BUSINESS OBJECTIVES

- Decouple external systems from direct TOS integration
- Standardize message formats and validation
- Improve scalability and maintainability
- Enable easier onboarding of future partners
- Control security and unauthorized access

KEY CAPABILITIES

- API Gateway & Routing
- Error Handling & Retry Logic
- Logging, Monitoring & Auditing
- Security (Authentication, Authorization, Encryption)

Delivery Plan (12 Sprints – 24 Weeks)

Roadmap to Production-Ready Middleware for Terminal Operations



PHASE 1 FOUNDATIONS
(Sprints 1-3)

- Requirements finalization (functional & non-functional)
- Architecture design & tech stack validation
- DevOps setup (CI/CD, environments)
- API contract definition
- Security framework definition

DELIVERABLE:
Approved architecture + development-ready platform

PHASE 2 CORE MIDDLEWARE BUILD
(Sprints 4-6)

- Core routing engine
- API connectors to TOS
- Error handling framework
- Logging & monitoring baseline

DELIVERABLE:
Functional middleware core integrated with TOS (sandbox)

PHASE 3 3RD PARTY INTEGRATIONS
(Sprints 7-9)

- Integration with 3rd Party #1
- Integration with 3rd Party #2
- Integration with 3rd Party #3
- Performance optimization

DELIVERABLE:
End-to-end flows operational for all partners

PHASE 4 GO-LIVE
(Sprints 10-12)

- Performance & load testing
- UAT & bug fixing
- Documentation (technical + operational)
- Production deployment
- Hypercare support

DELIVERABLE:
Production-ready middleware live



Expected Business Outcomes



OPERATIONAL IMPACT

- ✓ Faster onboarding of new partners
- ✓ Reduced production incidents
- ✓ Improved monitoring and traceability
- ✓ Clear accountability layer between TOS and partners



PERFORMANCE TARGETS

- 99.9% availability
- Sub-2 second response time
- Production-ready within 6 months



SUCCESS DEFINITION

- ✓ No direct partner dependency on TOS
- ✓ Fully monitored, controlled integration layer
- ✓ Smooth transition to operations



FASTER ONBOARDING

Go live new partners faster and easier



RELIABLE OPERATIONS

Fewer incidents, higher stability



VISIBILITY & CONTROL

End-to-end monitoring and traceability



CLEAR GOVERNANCE

Defined accountability between TOS and partners



Thank you

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