Key Drivers

- Industrial Internet of Things
- CPS Integration
- Edge Computing
- Mass "Servitization"
- Intelligent Automation

Key Roles

Wireless Connection
- Real-time monitoring
- Port-wide data collection
- Speedy and more accurate communication

Man-Machine Interface
- M2M connectivity
- Port-wide terminal planning
- Information sharing throughout the maritime logistics chain
- Networked port operations
- Cluster collaboration

Local Data Storage and Computation
- Remote control, repair, and maintenance
- Big data analytics and update

Mass Customization
- Data-driven demand projection
- Self-equipment maintenance and repair scheduling
- Faster response time
- Value-added service

Real-time Execution
- Robotic process automation
- Human error reduction
- Inefficiency or Error detection
- Asset utilization

Ultimate Goals

- Convergence of Virtual and Physical Worlds
- Maximum Port Operating Efficiency
- Built-In Service Management

Smart Port Goals

Economic Development
Energy-awareness
Efficient Logistics
Operations

Smart Port Services

Port Monitoring
Infrastructure Management
Real-time Navigation
Energy Management
Data Analysis & Predictions
Emergency, Rescue &
Security operations

Enabling Technologies

Sensors
RFID
IoT
Fog Computing
Cloud Computing
Big Data Technologies

**Port Infrastructures &
Stakeholders**

Road
Rail
Bridge
Terminal
Parking
Container
Warehouse
Port Authorities
Shipping Companies