



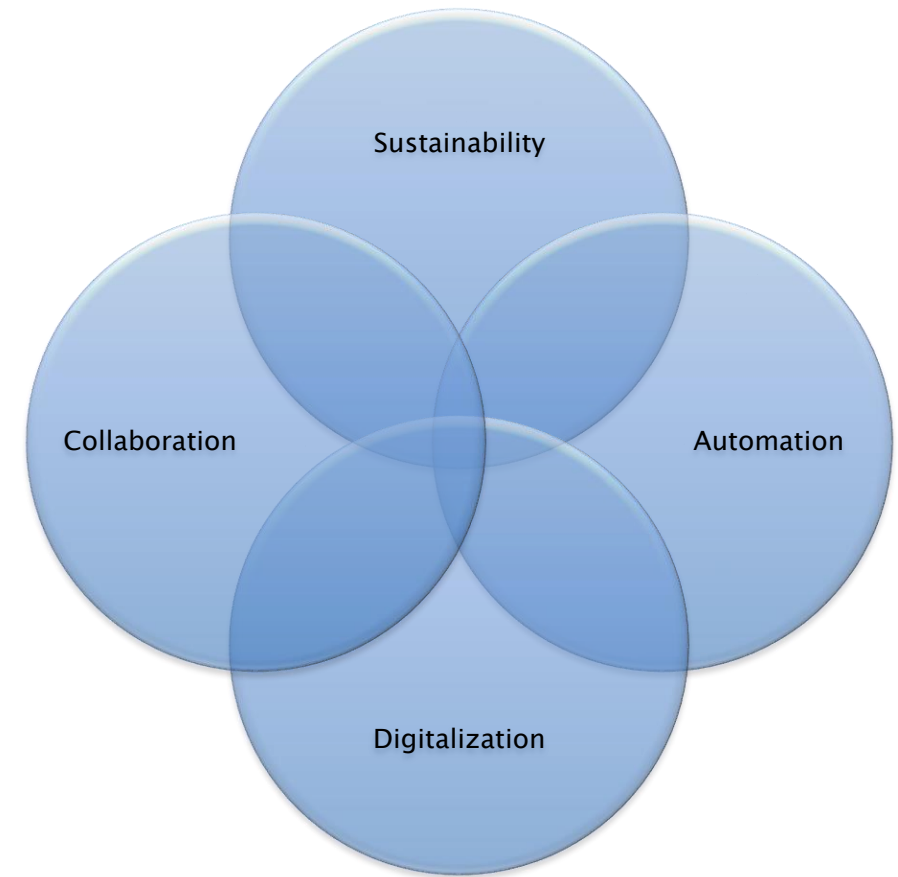
Navigating the Future: Leveraging Technology to Enhance American Ports

May 24, 2023



Leveraging Technology to Enhance American Ports

1. Sustainability
2. Digitalization
3. Automation
4. Collaboration



Introductions

> Todd Neely, MPE

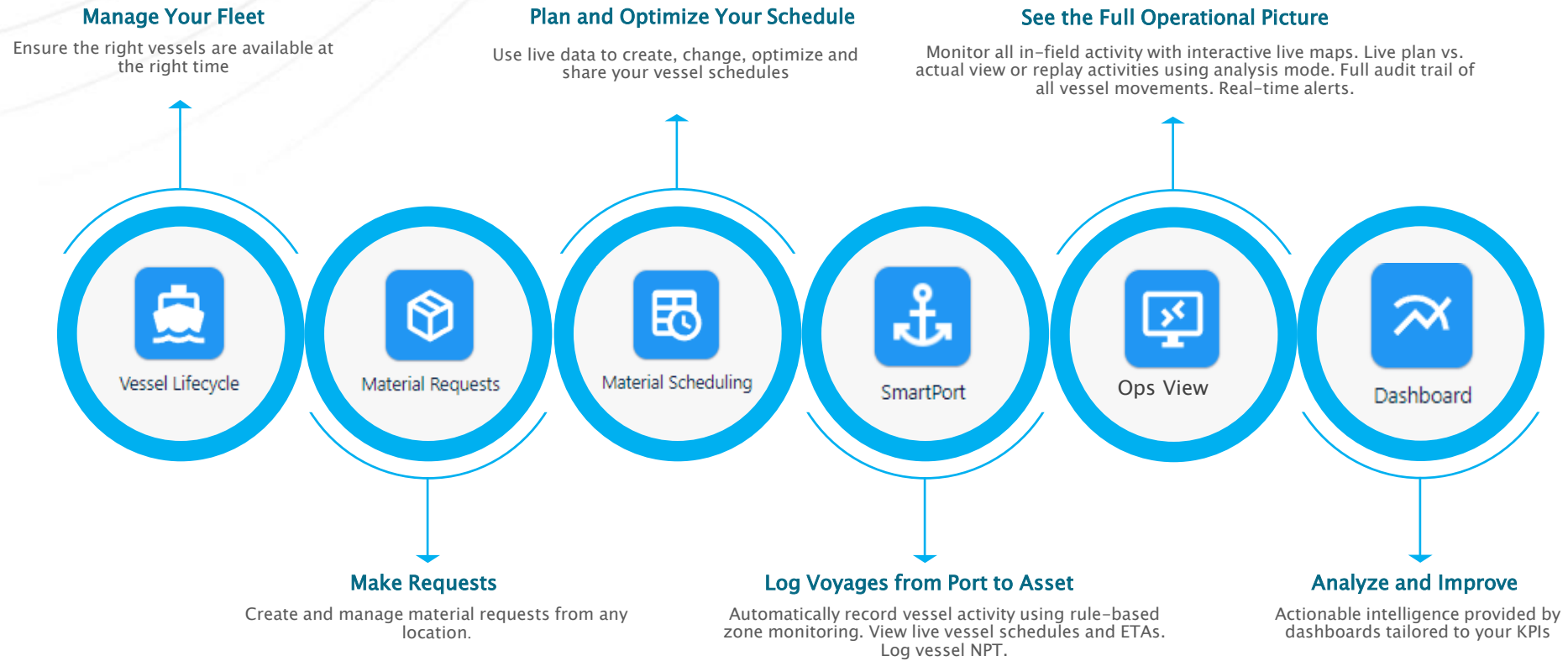
- Sercel – Software & Services
- Director of Business Development, Americas

> Sercel

- Global leader in the design and manufacturing of innovative equipment for managing natural resources, earth & ocean monitoring, infrastructure monitoring, defense, marine logistics and ports.
- For over 40 years, we have provided intergraded hardware and software solutions to clients worldwide.

Marlin

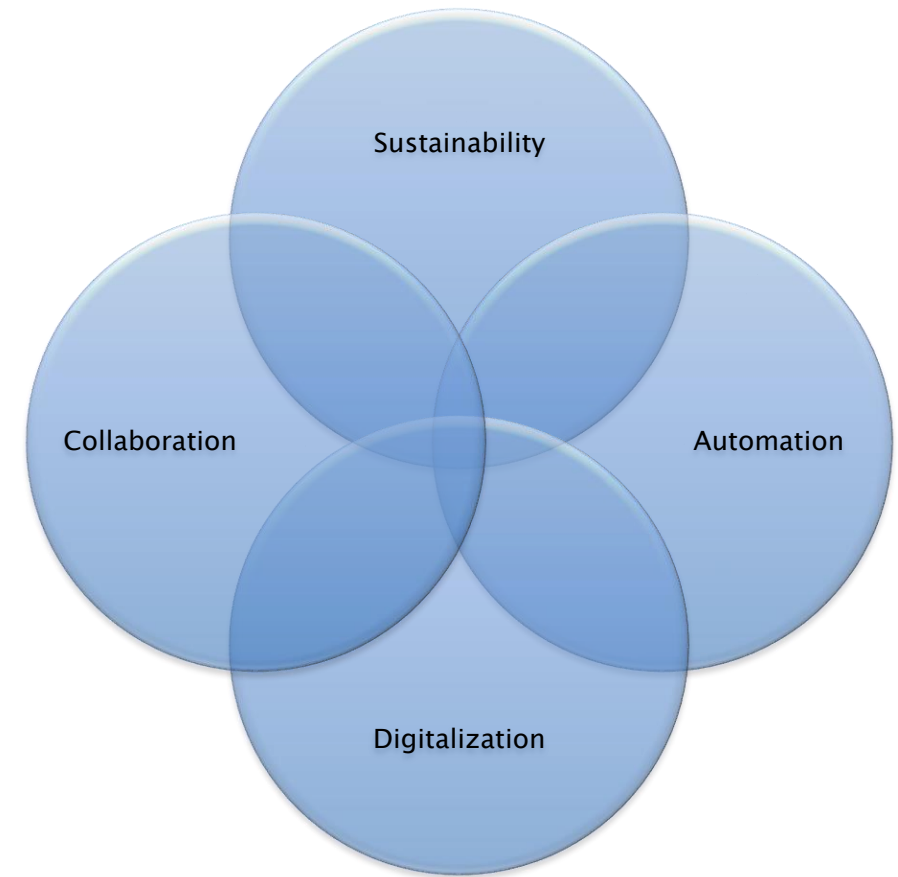
> Marlin Application Suite



Leveraging Technology to Enhance American Ports

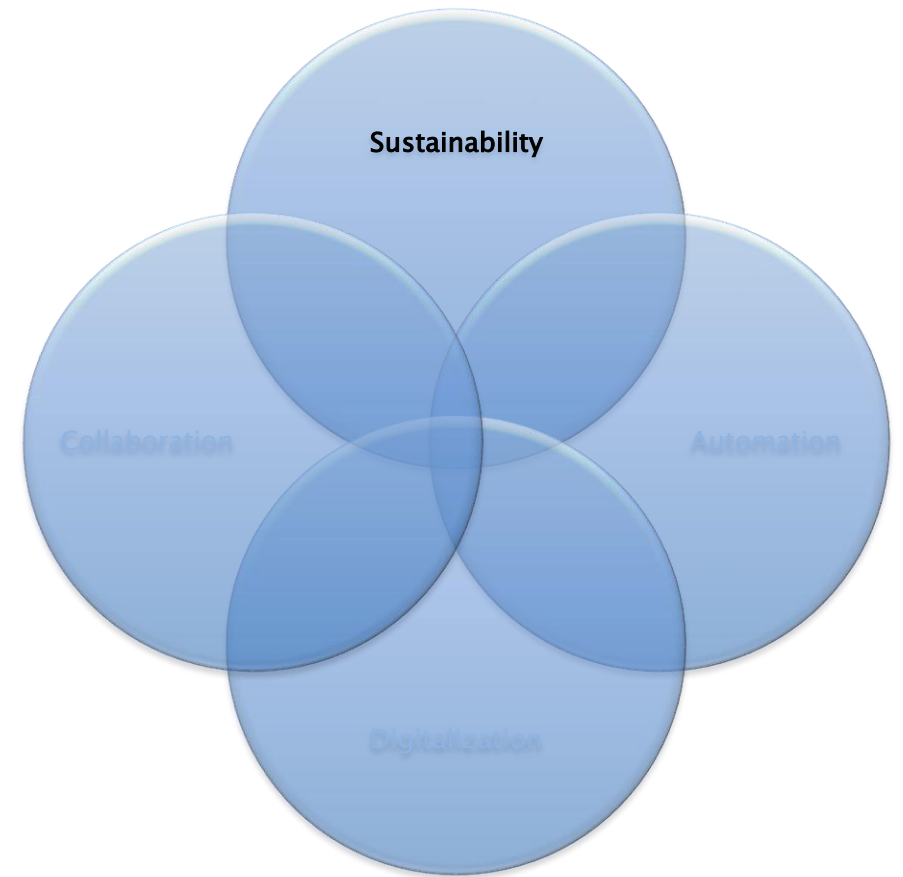
Leveraging Technology to Enhance American Ports

1. Sustainability
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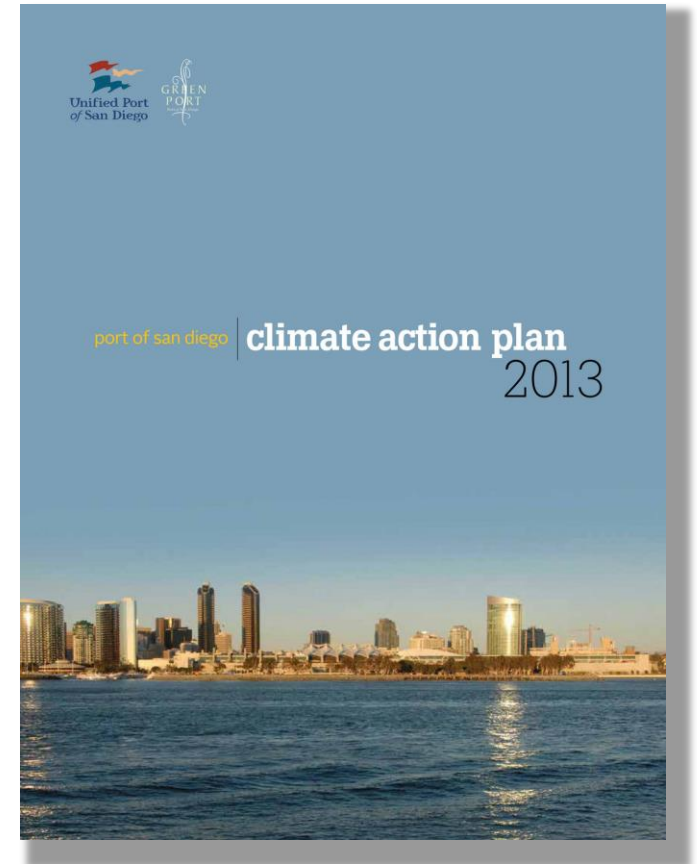
Sustainability

- › Ports are increasingly embracing sustainable business practices to reduce their environmental impact and improve their operational efficiency.
- › You can't improve what you can't measure. Establishing a baseline impact is key to making improvements.
- › Technology provides the means to measure and monitor the impact of implementing sustainable practices.



Sustainability

- › What's happening in the industry?
- › Port of San Diego – Climate Action Plan
 - Adopted in 2013
 - Goals for decreasing Green House Gases (GHG) by 10% by 2020 and ultimately by 80% by 2050
 - One of the key Guiding Principles of this plan was to “Focus on data-driven results...”



Sustainability

- › Technology's role?
- › Measure and monitor GHG emissions
 - Direct measurements/instrumentation
 - Remote sensing
 - Energy consumption analysis
- › Environmentally friendly alternatives
 - Equipment electrification
 - Shore power/cold-ironing



Satellite mapping & monitoring GHG emissions



Shore power at the Port of Seattle

Sustainability

› Optimizing Vessel Operations

- Digital tools and technologies, like a PMIS, and VTS systems can help manage ship traffic
- Reduce vessel congestion
- Improve scheduling of arrivals and departures
- Reducing idling, wait times and fuel consumption

› Ability to examine the entire supply chain

- This involves engaging – collaboration
 - Shippers/Shipping Agencies/Steamship Lines
 - Logistics Providers
 - Truckers/Rail Roads
 - Beneficial Cargo Owners (BCOs)

Sustainability

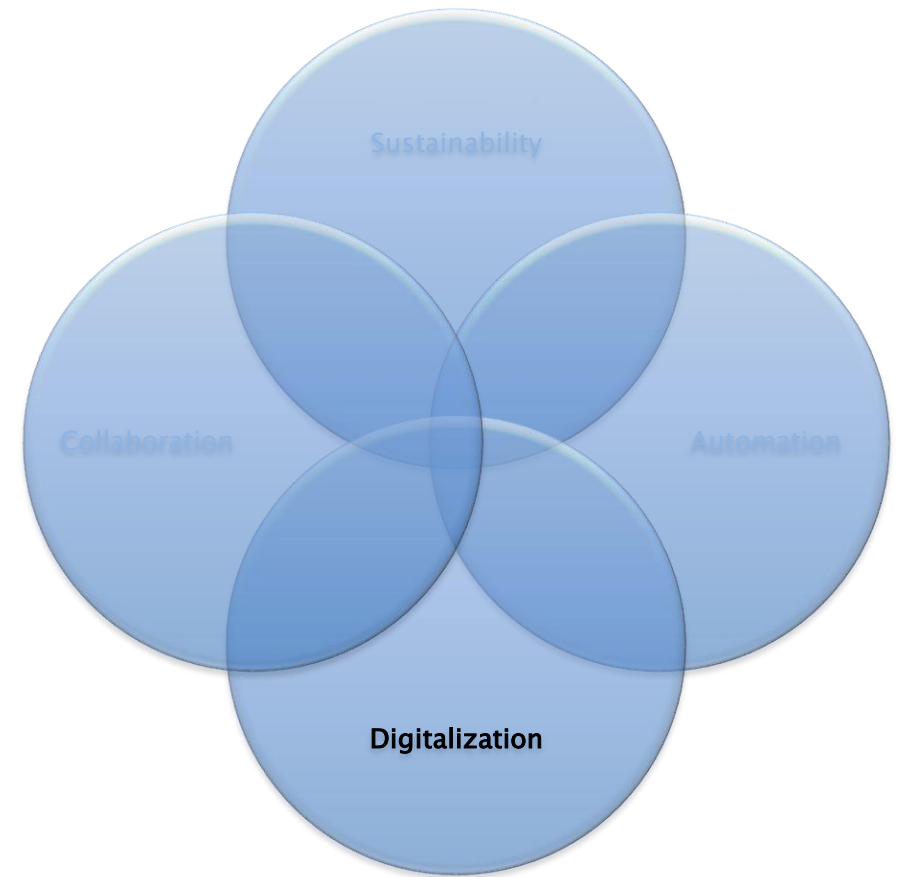
> Technologies are helping ports:

- Measure, monitor, and reduce GHG emissions
- Optimize vessel operations
- Drive sustainable performance across the entire supply chain



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2. **Digitalization**
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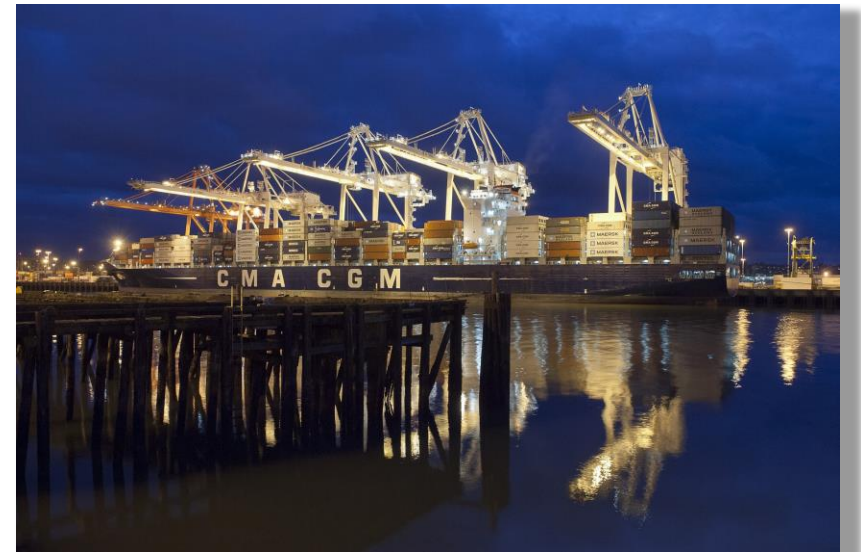
Digitalization

> Technology vs. Digital Technology

- Technology is the application of scientific knowledge, tools, and techniques for practical purposes.
- Digital Technology specifically refers to technology that uses digital or electronic signals and data.
 - Computers, software, and digital devices
 - Process, transmit, store, and manipulate data in digital form



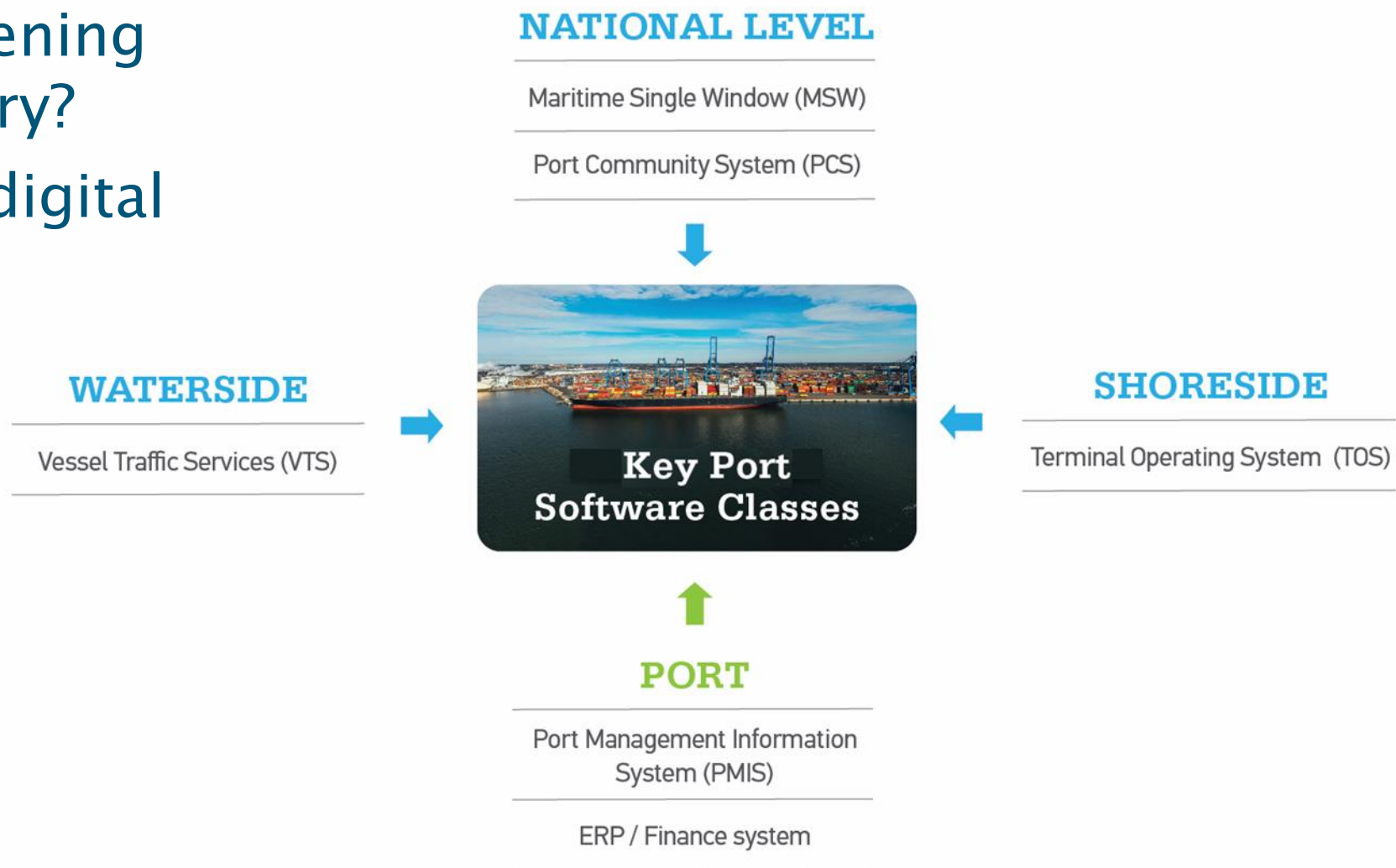
Gloucester, MA circa 1890



San Pedro Bay, circa 2020

Digitalization

- › What's happening in the industry?
- › A myriad of digital systems



Digitalization

› What is a Smart Port?

- A Smart Port is a port that uses automation and innovative technologies including Artificial Intelligence (AI), Big Data, Internet of Things (IoT) and Blockchain to improve its performance.

Port Technology, April 14, 2021

› A Smart Port can be any port along the journey of digitalization

- Digitalization is a process
- Your organization's agility will determine your pace of adoption
- Spreadsheets and whiteboards are not digital solutions



Digitalization

> Leaders in Port Digitalization

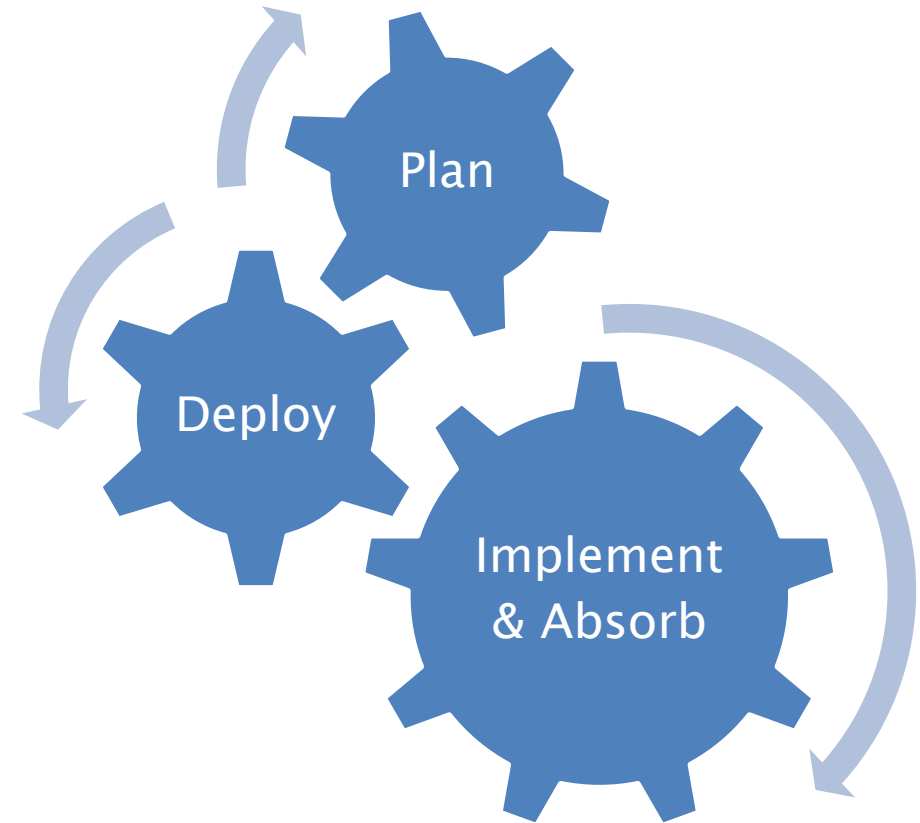
- Port of Los Angeles
- Port of Long Beach
- Port of New York & New Jersey
- Port of Metro Vancouver, BC
- Port of Montreal



Digitalization

> The Challenges

- What worked for one port may not be a template for other ports.
- Resistance to change and siloed functions are key challenges to digitalization of the maritime industry.
- Digitalization requires strong leadership and a strong change management strategy.



Digitalization

> Mandates and aspirations

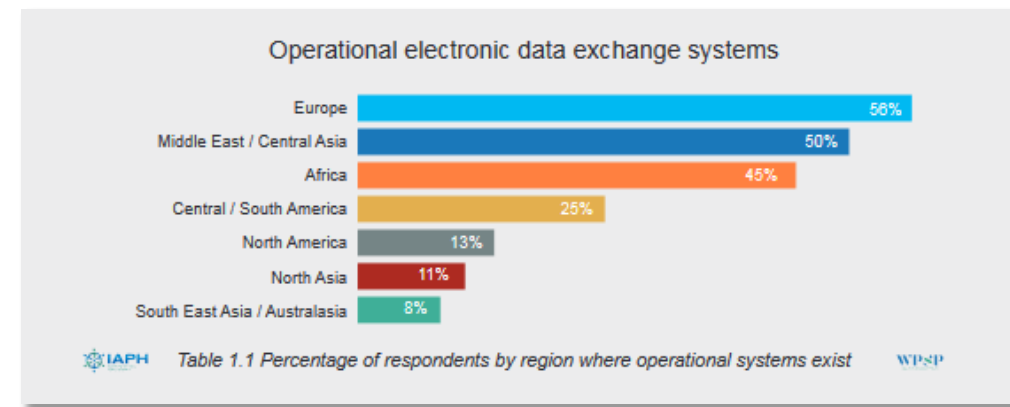
- Push the industry forward

> Progress is slow, but steady

- But it is progress, nonetheless

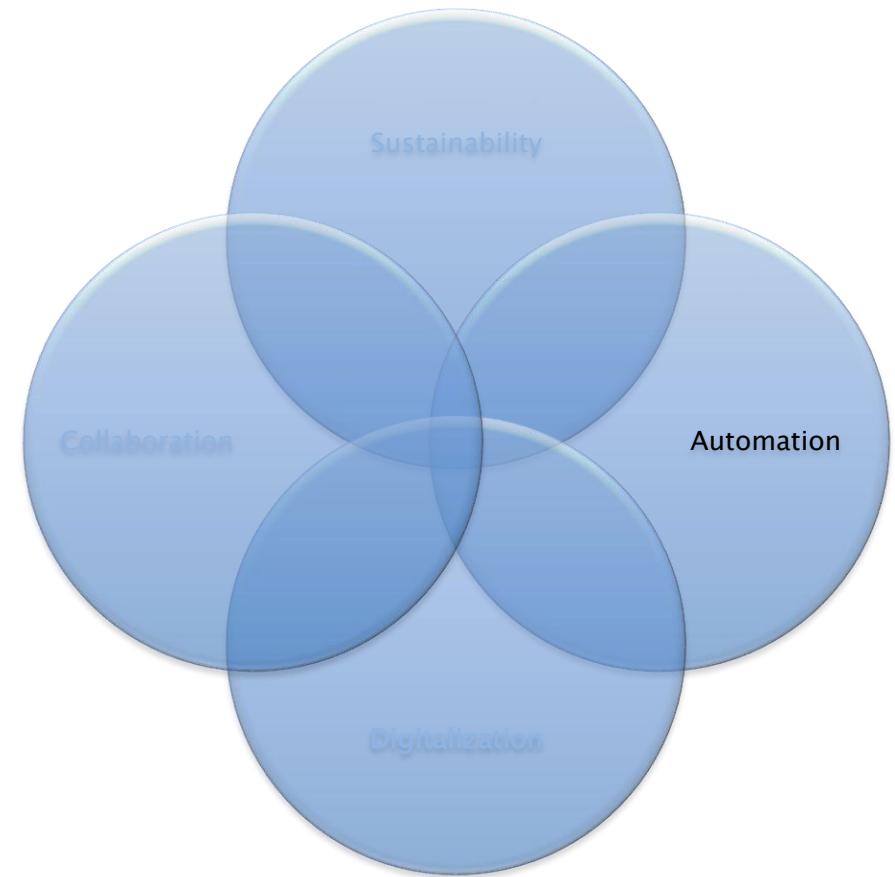
Global Smart Port Market in 2021 = USD \$1.7 Billion
Global Smart Port Market in 2026 = USD \$5.1 Billion

Markets and Markets, Top Market Reports 2021



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Automation

- › Automated Ship-to-Shore Cranes
- › Rubber Tire Gantries (RTGs)
- › Automated Guided Vehicles (AGVs)
- › Rail Mounted Gantries (RMGs)
- › Terminal Operating Systems (TOS)
- › Gate Operations Systems (GOS)
- › Automated Mooring Systems

**NOT
TODAY'S
TOPIC**

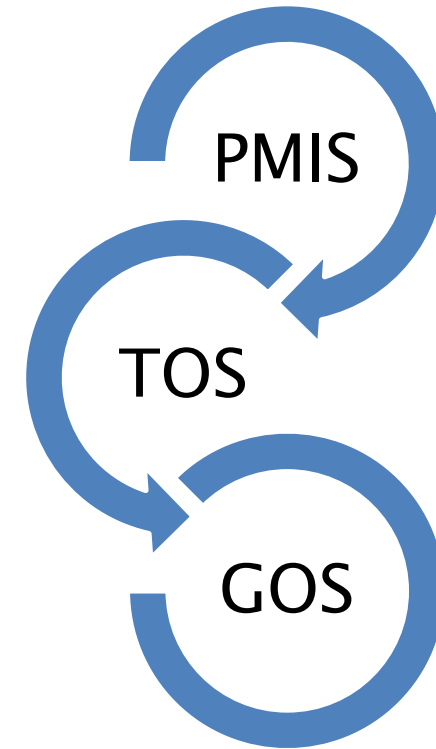


Virginia
International
Gateway

Long Beach
Container
Terminal

Automation

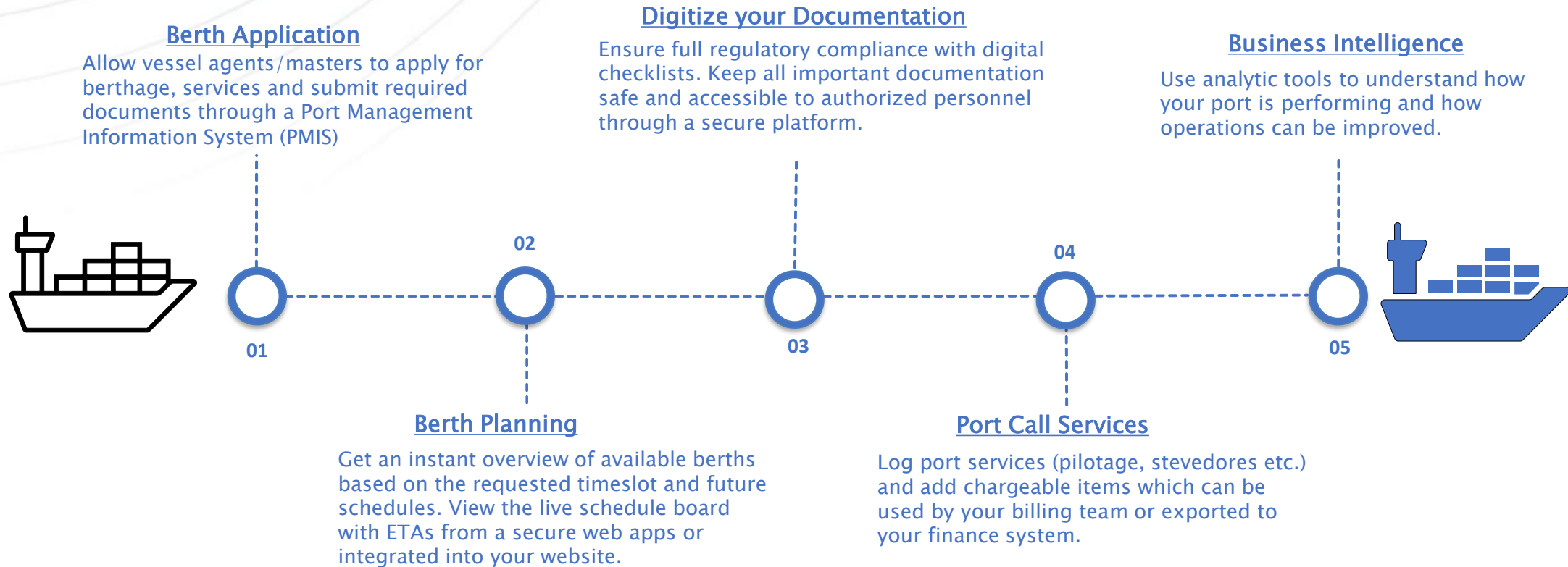
- › What are the operational tools at ports which feature systems automation?
 - Port Management Information Systems (PMIS)
 - Digitally manage vessels and berths
 - Terminal Operating Systems (TOS)
 - Digitally manage cargo arrival/departure
 - Gate Operating Systems (GOS)
 - Digitally manage cargo moving inbound and outbound through the gates
- › These systems can communicate with one another and with other legacy systems to create even greater efficiencies.



Automation

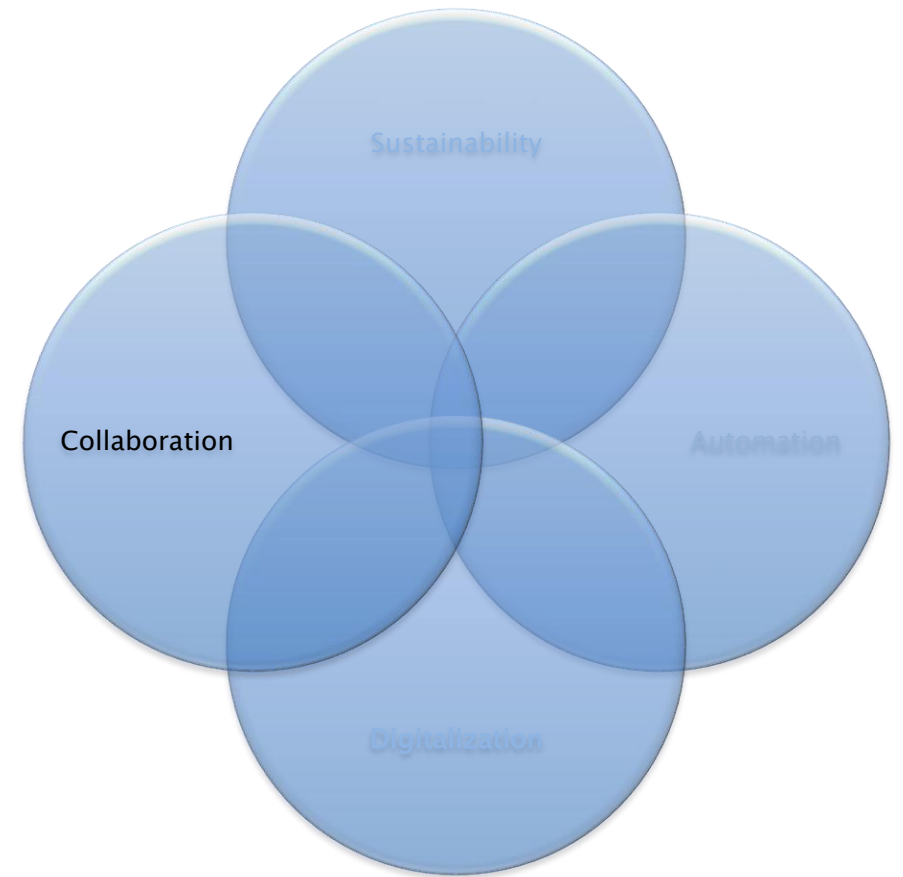
- › What's happening in the industry?
- › Ports are deploying systems to automate routine task and communications
 - Common Digital Platform for all port call information
 - Increased Transparency through interactive live maps and reporting
 - Emissions reduction through operations optimization
 - Regulatory compliance through digital forms and checklists
 - Optimized workflows allow operators to do their job efficiently

Automation



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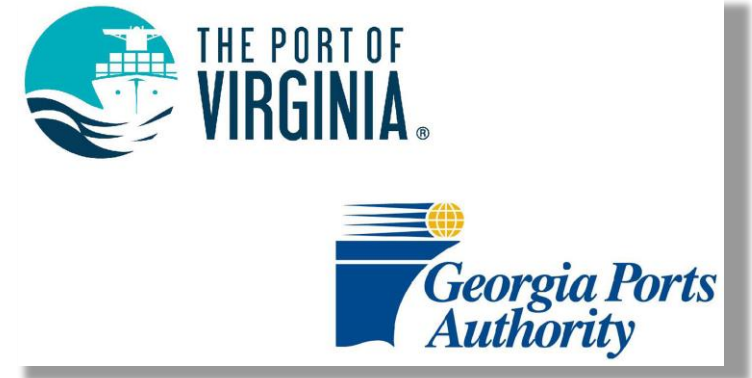
Collaboration

- › What is the industry doing?
- › Operational Transparency
 - Information Sharing
 - Ports are beginning to share information on vessel schedules, container movements, and other data to improve supply chain visibility and optimize operations.
 - Partnerships, both Public–Public and Public–Private
 - Ports are collaborating with private companies and government agencies to implement sustainability initiatives and improve efficiency. These partnerships can help to mobilize resources and expertise and drive innovation.

Collaboration

> Collaborative Port Agreements

- Northwest Seaport Alliance
 - Approved Summer of 2015
 - Combined cargo operations of the Port of Seattle and the Port of Tacoma
- East Coast Gateway Terminal Agreement
 - Approved Spring 2017
 - Allowed VPA and GPA to share operational information

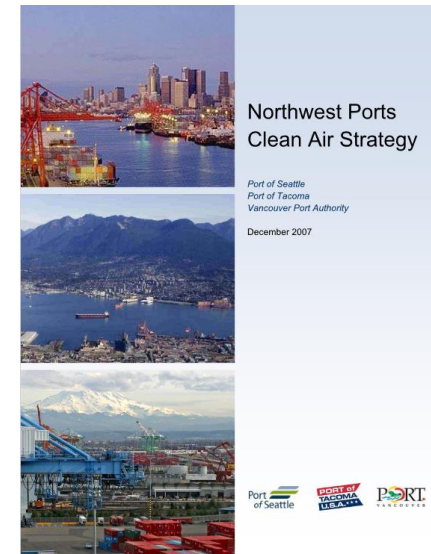


“Our industry is changing rapidly and as a result increased collaboration between ports is necessary to provide the service excellence our customers expect and deserve.”

Griff Lynch, Executive Director, Georgia Ports Authority

Collaboration

- › Northwest Ports Clean Air Strategy
 - Originally launched in 2008
 - Updated in 2013
 - Most recently reaffirmed in 2020 with the vision of eliminating GHG emissions from seaport related activities by 2050.



Conclusions

- › Driven by advances in technologies
 - Advances in sustainable vehicle technologies and higher emissions standards
 - Advances in digital systems to optimize port operations
 - Advances in systems and equipment automation to improve port throughput and efficiencies
 - Broader acceptance of collaboration in the highly competitive North American Port market



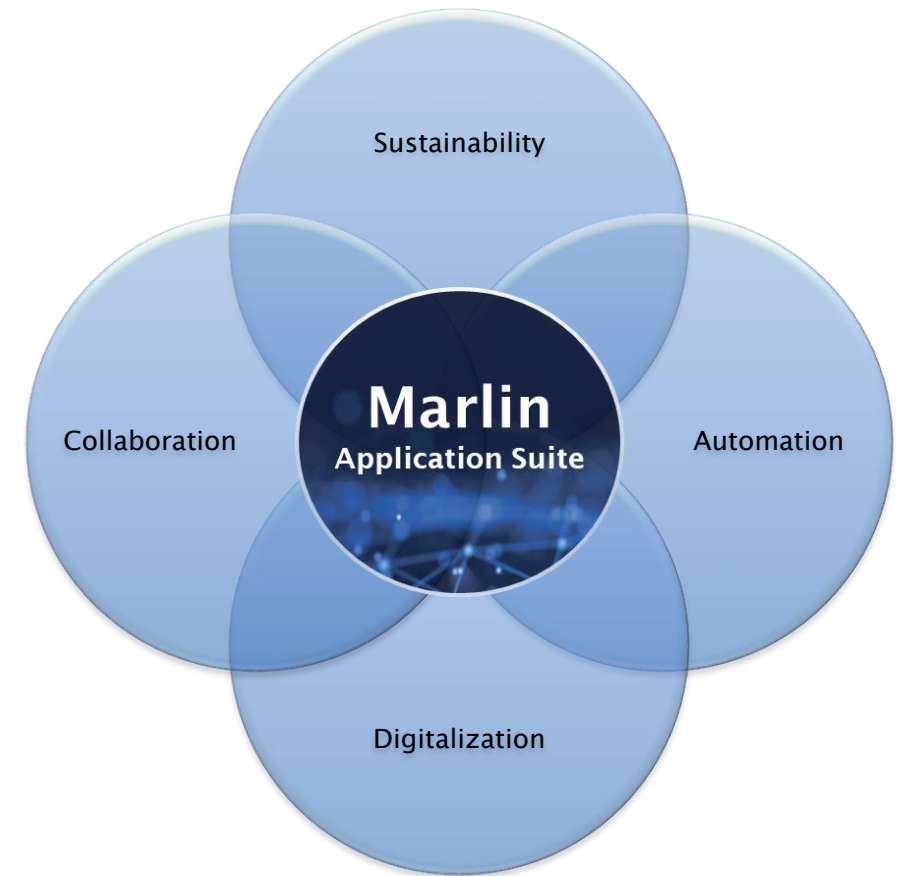
1st Generation iPhone, 2008

iPhone 14 and 14+, 2023



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Questions & Discussion

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Thank You for Your Time

