SEA TRANSPORT (BUNKERING) INDUSTRY DIGITAL PLAN

A Guide for Small and Medium Enterprises (SMEs) to Assess Their Digital Readiness and Opportunities to Go Digital
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07 ADDITIONAL INFORMATION
The Sea Transport industry, which comprises the port, port services, shipping and maritime services sub-sectors, is a key pillar of the Singapore Maritime Cluster, which:

- Employed about 170,000 workers
- Contributed about 7% of Singapore’s GDP
- Contributed about 37.2 million TEUs in container volume in 2019

1GDP refers to Gross Domestic Product
2TEUs refer to Twenty-foot Equivalent Units

Source: Maritime & Port Authority of Singapore (MPA)
The Sea Transport Industry Transformation Map (ITM) was launched in January 2018. Developed by the Maritime and Port Authority of Singapore (MPA) in partnership with the industry, unions and other government agencies, the Sea Transport ITM builds on MPA’s strategic long-term plans to develop Singapore’s next-generation port and strengthen our International Maritime Centre (IMC).

Specific initiatives have been laid out under the Sea Transport ITM to catalyse innovation, drive productivity improvements and enhance the skills of the maritime workforce.

Source: Sea Transport Industry Transformation Map

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**TRENDS IMPACTING SEA TRANSPORT**

**Intensifying competition from key ports and maritime centres**

More intense competition from regional ports that are expanding (eg. Klang, Tanjung Priok) and aspiring maritime centres (eg. Dubai, Shanghai) drive the need for our sea transport sub-sectors to improve their operational efficiency.

Source: Maritime & Port Authority of Singapore (MPA)

**Accelerating pace of technological advancements**

The acceleration of technology advancements, e.g. data analytics, Internet-of-Things, artificial intelligence, blockchain, smart sensors, and robotic process automation, brings opportunities for greater productivity.

**Shrinking local workforce, rising costs and more educated workforce with higher aspirations**

Tighter labour market, rising manpower costs and higher aspirations of a more educated workforce increase the need for well-trained workers, who can leverage technologies to optimise resources, streamline and simplify business processes.

INDUSTRY TRANSFORMATION MAP (ITM)

The Sea Transport Industry Transformation Map (ITM) was launched in January 2018. Developed by the Maritime and Port Authority of Singapore (MPA) in partnership with the industry, unions and other government agencies, the Sea Transport ITM builds on MPA’s strategic long-term plans to develop Singapore’s next-generation port and strengthen our International Maritime Centre (IMC).

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Source: Sea Transport Industry Transformation Map
SMEs GO DIGITAL

Aligned to the ITM, the Industry Digital Plan (IDP) is part of the SMEs Go Digital programme that helps make going digital simple for SMEs.

3 STEPS TO GO DIGITAL

1. Is your business digital-ready?
   Find out using the Industry Digital Plan (IDP) for your sector.

2. How do you get started?
   Take up pre-approved solutions with grant support.

3. Where can you get help?
   Contact your nearest SME Centre for support.

For more information
Scan the QR code or visit www.imda.gov.sg/SMEsGoDigital

Support available
- Pre-Approved Solutions
- Start Digital Pack
- Grow Digital
- Consultancy Services (SME Digital Tech Hub)
- Government Grants (e.g. Productivity Solutions Grant (PSG); SkillsFuture Enterprise Credit (SFEC))
- Digital Resilience Bonus
- Digital Project Management Services

SMEs Go Digital comprises the following:

Industry Digital Plan (IDP)
Guide on digital solutions and training required for each stage of your business growth.

Start Digital Pack
Foundational digital solutions for new SMEs, to help you get a head start in going digital.

Grow Digital
Business-to-Business (B2B) and Business-to-Consumer (B2C) e-commerce platforms you can leverage to go global.

Consultancy Services (SME Digital Tech Hub)
Expert advice you can tap on, to transform your business using digital technologies.

Pre-Approved Solutions
Proven SME-friendly digital solutions pre-approved by IMDA to meet your business needs. Government grants, e.g. Productivity Solutions Grant (PSG), are available for the adoption of these solutions.

Digital Resilience Bonus
Bonus for uplifting your digital capabilities to emerge stronger after the circuit breaker period, starting with the Food Services and Retail sectors.

Digital Project Management Services
Project managers with expertise to support you in implementing the digital solutions.
DIGITAL ROADMAP FOR BUNKERING

This Digital Roadmap serves as a guide for your business as you embark on your digital journey.

STAGE 01
GETTING DIGITAL ECONOMY READY
Streamlined Operations
Optimised Resources

Bunker Barge Planning System
Bunker Fuel Data Profiling
Bunker Sales Management
Video Surveillance and Monitoring System

STAGE 02
GROWING IN THE DIGITAL ECONOMY
Integrated Insights
Collaborative Ecosystem

Advanced Vessel Management
Electronic Bunker Delivery Note (e-BDN)

STAGE 03
LEAPING AHEAD
Autonomous Operations
Intelligent Business

Blockchain for Bunkering Transactions
Just In Time (JIT) Platform
Smart Vessels

BUSINESS CAPABILITIES

Note: The roadmap will be progressively updated to reflect the advent of new digital tools and technologies for the industry.
GETTING DIGITAL ECONOMY READY
Streamlined Operations, Optimised Resources
Streamline and integrate your business processes to enhance productivity and efficiency

DIGITAL SOLUTION | SOLUTION DESCRIPTION | BENEFITS
--- | --- | ---
Bunker Barge Planning System | Auto-schedule bunker barges (according to vessels’ estimated time of arrival (ETA) and fuel type), track bunker barges and customers’ vessels, and a dashboard to analyse barges performance. | • Schedule bunker barges dynamically according to vessels’ ETA instead of manually through spreadsheets • Enable the ease of tracking of bunker barges’ positions and monitoring their performance

Bunker Fuel Data Profiling | Automate data from Mass Flow Meter (MFM) for further analysis, such as to plot charts and flag out anomalies. Note: These solutions cannot be used in place of requirements to show proof of regulatory compliance. | • Enable off-site monitoring on MFM and/or quality sensor data for better visibility over bunkering processes

Bunker Sales Management | Automate request for quotation, manage order and purchase, nomination details and schedules (i.e. vessel name, quantity, fuel type, bunker time and location, etc.), and a dashboard to analyse profit margin. | • Improve the management of sales and purchase processes • Provide insights on customers’ details, credit worthiness and buying history • Enable the ease of generating performance reports • Reduce costly omission and data entry error

Video Surveillance and Monitoring System | Manage external/internal surveillance of vessels to monitor the safety of crews and pump operations, using tamper-proof camera with night vision capability. Key features include real-time off-site and/or on-demand monitoring. | • Improve access to real-time monitoring • Minimise disputes in the event of incident and insurance claims • Reduce pilferage of cargo/fuel
GROWING IN THE DIGITAL ECONOMY
Integrated Insights, Collaborative Ecosystem
Enable integrated insights through collaborative ecosystems to maximise business value

DIGITAL SOLUTION

**Advanced Vessel Management**

- Facilitate vessel management through advanced features including:
  - Monitoring of fuel consumption, speed, travel distance, engine performance, engine vibration, sound, temperature, etc.
  - Maintenance of records.

**Electronic Bunker Delivery Note (e-BDN)**

- Digitalise bunker delivery note, with data fields auto-populated from the MFM, endorsed with secure electronic signatures and forwarded to relevant parties.
  - Increase the productivity of stakeholders involved in the supply chain and minimise the possibility of data entry error
  - Provide instantaneous transfer of bunkering data to both buyers and sellers

SOLUTION DESCRIPTION

**Facilitate vessel management through advanced features including:**

- Monitoring of fuel consumption, speed, travel distance, engine performance, engine vibration, sound, temperature, etc.
- Maintenance of records.

BENEFITS

- Optimise vessel performance and maintenance to reduce operating cost
LEAPING AHEAD
Autonomous Operations, Intelligent Business
Deploy autonomous robots and advanced technologies to maximise business value and impact

DIGITAL SOLUTION
Blockchain for Bunkering Transactions
Enable end-to-end bunker transactions for tracing bunker quality and quantity.
Note: Solution may also include synthetic markers or Deoxyribonucleric acid (DNA) tags to track bunker fuel at every stage of its supply chain.

SOLUTION DESCRIPTION

Enable end-to-end bunker transactions for tracing bunker quality and quantity.

BENEFITS
• Provide an accurate means for tracing bunker quality and quantity
• Enable the detection of fuel-related anomalies and malpractices

DIGITAL SOLUTION
Just In Time (JIT) Platform
Facilitate real-time information sharing within the port community for better coordination of port activities.

SOLUTION DESCRIPTION

Facilitate real-time information sharing within the port community for better coordination of port activities.

BENEFITS
• Optimise port resources and operational efficiency
• Minimise unnecessary emission and fuel wastage
• Improve schedule reliability and supply chain visibility

DIGITAL SOLUTION
Smart Vessels
Use high degree of automation and sensors on-board smart vessels.

SOLUTION DESCRIPTION

Use high degree of automation and sensors on-board smart vessels.
Key features include:
• Automated mooring system
• Automated navigation system
• Integrated platform management system

BENEFITS
• Improve safety and reduce the number of incidents
• Increase productivity with the reassignment of crew to perform higher value-added tasks
DIGITAL SKILLS NEEDED

Bunkering job roles will evolve to meet the changing needs of customers and support the growth of companies. Upskilling of workers helps companies to harness the potential of digital technologies, and remain competitive and relevant.

ALL USERS
Require broad-based digital literacy and awareness

ADVANCED USERS
Require higher proficiency digital skills

“TECH BASICS” SKILLS

- Broad-based innovation mindset and digital literacy/awareness
  - SkillsFuture Singapore (SSG) funded broad-based courses e.g. Skills Future for Digital Workplace

“TECH ADVANCED” SKILLS

- Higher proficiency level digital skills
  - Training mapped to the Skills Framework for Sea Transport and Information and Communication Technology (ICT)

Examples of job roles
- Bunker Trader
- Bunker Surveyor
- Bunker Operations Manager
## DIGITAL SKILLS NEEDED
### DIGITAL ROADMAP ON TRAINING

### “TECH BASICS” COURSES
Require broad-based digital literacy and awareness

<table>
<thead>
<tr>
<th>Introduction to Bunkering Operations with Digital Capabilities</th>
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<tbody>
<tr>
<td>• Introduction to information management for Bunker Supply Chains</td>
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<tr>
<td>• Mindset Transformation for Workplace</td>
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<td>• Maritime Cyber Security (Basic) Training Programme</td>
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<td>• Fundamental Data Analysis using Excel 2016</td>
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<td>• Introduction to Data Analytics and Applications</td>
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<td>• Robotic Automation Process</td>
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<td>• Appreciation of IoT and Data Management</td>
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<td>• WSQ Fundamentals of the Personal Data Protection Act</td>
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<td>• HR for Non-HR Managers</td>
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<td>• Relationship Marketing &amp; Digital Customer Relationship Management</td>
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<tr>
<td>• Effective Digital Marketing and Sales</td>
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<td>• Stakeholder Relations</td>
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### “TECH ADVANCED” COURSES
Require higher proficiency digital skills

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<tr>
<th>Vendor Solution Specific Training</th>
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<tbody>
<tr>
<td>• Data Storytelling</td>
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<td>• Tableau Desktop I and Desktop II</td>
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<tr>
<td>• DS102: Data Analytics with Python</td>
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<tr>
<td>• Certified Deep Learning Specialist</td>
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<th>Vendor Solution Specific Training</th>
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<tbody>
<tr>
<td>• Certified Data Analytics (R) Specialist</td>
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<tr>
<td>• Deep Learning and Machine Learning with TensorFlow</td>
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<tr>
<td>• Advanced Data Analytics and Machine Learning with R</td>
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<th>Vendor Solution Specific Training</th>
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<tbody>
<tr>
<td>• AWS Big Data Specialist</td>
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<tr>
<td>• Wiley Certified Data Analyst</td>
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### “TECH BASICS” Course Directory: https://www.sp.edu.sg/pace/sea-transport-industry-digital-plan


These training programmes are aligned to Skills Framework and emerging areas under SkillsFuture Series

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**STAGE 01**
**GETTING DIGITAL ECONOMY READY**

**STAGE 02**
**GROWING IN THE DIGITAL ECONOMY**

**STAGE 03**
**LEAPING AHEAD**
You will be supported at every stage of your digital journey, through three simple steps:

1. **Is your business digital-ready?**
   - Find out if you are digital-ready by using the IDP resources [here](#) or scan the QR code.

2. **How do you get started?**
   - Visit the [MPA](#) website to contact solution providers to procure and implement digital solutions. If funding support is required, apply for Sea Transport IDP Grant.
   - You can also apply for training subsidies under the [SkillsFuture Enterprise Credit](#) (SFEC).

3. **Where can you get help?**
   - Make an e-appointment with a Business Advisor at your nearest [SME Centre](#) for digital advice, or be referred to the Principal Consultants at the SME Digital Tech Hub for more advanced digital needs.
   - Contact [Singapore Manufacturing Federation](#) (SMF) for digital project managers who can help you implement your digital solutions.
**FOR SME**

**DIGITAL SOLUTIONS**

SMEs Go Digital
https://www.imda.gov.sg/SMEsGoDigital

GoBusiness Gov Assist
https://govassist.gobusiness.gov.sg/productivity-solutions-grant

MPA Website

Be Safe Online
https://www.csa.gov.sg/gosafeonline/resources/be-safe-online-handbook

**BUSINESS ADVISORY & DIGITAL CONSULTANCY**

SME Centres managed by Trade Associations
- SME Centre@ASME
- SME Centre@SCCCI
- SME Centre@SICCI
- SME Centre@SMCCI
- SME Centre@SMF

https://www.enterprisesg.gov.sg/smecentre
Enterprise Infoline: +65 6898 1800

SME Digital Tech Hub
http://www.digitaltechhub.sg

**DIGITAL PROJECT MANAGEMENT SERVICES**

Singapore Manufacturing Federation
http://www.smfederation.org.sg/capability-capacity-development/project-management-services

**FOR ICM VENDORS**

SMEs Go Digital
https://www.imda.gov.sg/SMEsGoDigital

Vendor Self-Assessment Checklist
https://www.imda.gov.sg/icmvendors

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**FOR INDIVIDUALS**

**CAPABILITY UPGRADE & CAREER FACILITATION**

Institute of Higher Learning
https://www.sp.edu.sg/pace/sea-transport-industry-digital-plan

Course Directory
http://www.skillsfuture.sg/credit

Fundamentals for Future Economy
http://www.skillsfuture.sg/digitalworkplace

Skills Framework
http://www.skillsfuture.sg/skills-framework

Sea Transport Skills Framework
https://www.skillsfuture.sg/skills-framework/sea-transport

TechSkills Accelerator (TeSA)
https://www.go.gov.sg/TeSA

WSG’s Careers Connect
http://www.wsg.gov.sg/career-services.html

WSG PCP
http://www.wsg.gov.sg/WST_PCP

WSG’s MyCareersFuture
https://www.mycareersfuture.sg

e2i Centres
http://e2i.com.sg/app

Maritime Singapore Connect
https://www.maritimesgconnect.com

MPA pre-approved courses
https://www.mpa.gov.sg/web/portal/home/maritime-companies/setting-up-in-singapore/developing-manpower/training-maritime-singapore

MPA Academy
https://www.mpa.gov.sg/web/portal/home/mpa-academy

This Industry Digital Plan is part of the SMEs Go Digital Programme
For programme information and feedback:
https://www.imda.gov.sg/SMEsGoDigital
#SGDIGITAL

Singapore Digital (SG:D) is a nation-wide movement to unify Singapore's digitalisation efforts. Whether it is help for different industries to start their digitalisation journeys, or creating new ecosystems, opportunities and capabilities for the future, SG:D is set to take us ahead as a leading digital global node. The :D smiley face icon in the logo signifies the optimism of Singaporeans advancing together with digital innovation. As we progress into the digital economy, it is all about the people - the heart of all we do.

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youtube.com/IMDAsg
youtube.com/c/MPASingaporeOfficial
linkedin.com/company/IMDAsg
linkedin.com/company/maritime-and-port-authority-of-singapore
instagram.com/IMDAsg
instagram.com/Maritime_sg