

# SEA TRANSPORT (BUNKERING) | INDUSTRY DIGITAL PLAN

A Guide for Small and Medium Enterprises (SMEs) to Assess Their Digital Readiness and Opportunities to Go Digital



Sector lead:



In Support of:



Supported by:



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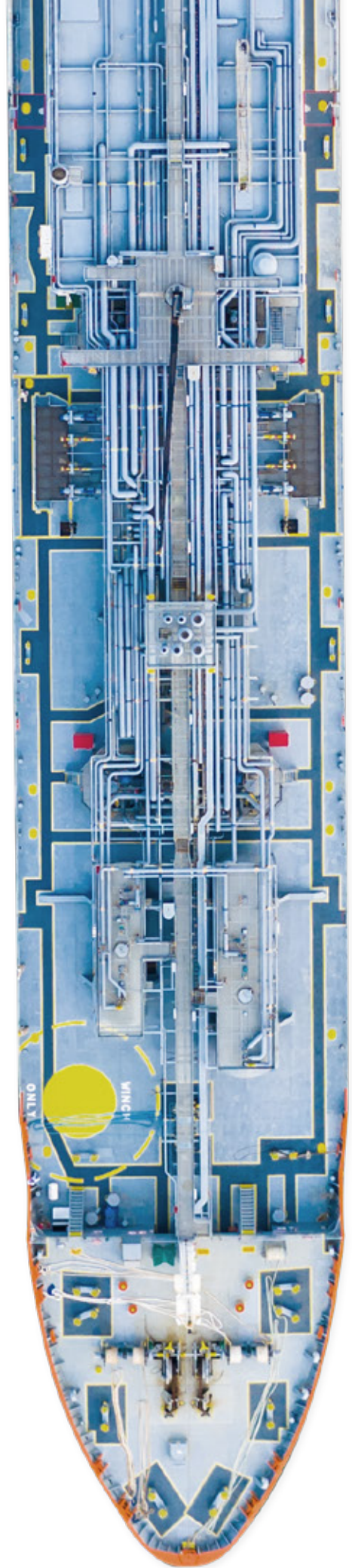
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# OUR SEA TRANSPORT INDUSTRY

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:



<sup>1</sup>GDP refers to Gross Domestic Product  
<sup>2</sup>TEUs refer to Twenty-foot Equivalent Units

Source: Maritime & Port Authority of Singapore (MPA)

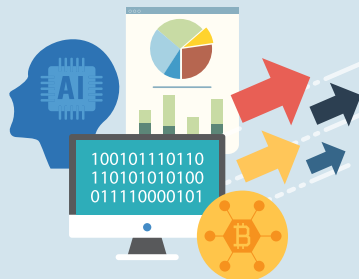
## TRENDS IMPACTING SEA TRANSPORT



### 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).

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



Click [here](#) or scan this QR code for more details on the Sea Transport ITM

## 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.



SMEs GO DIGITAL

# 3 STEPS TO GO DIGITAL



### For more information

Scan the QR code or visit  
[www.imda.gov.sg/SMEsGoDigital](http://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

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.

### 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

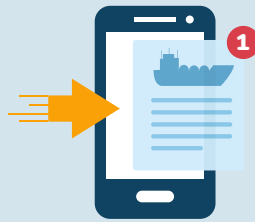
### STAGE 02

#### GROWING IN THE DIGITAL ECONOMY

Integrated Insights  
Collaborative Ecosystem



Advanced Vessel Management

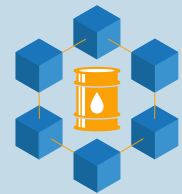


Electronic Bunker Delivery Note (e-BDN)

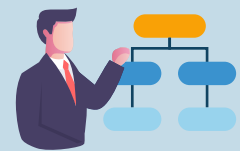
### STAGE 03

#### LEAPING AHEAD

Autonomous Operations  
Intelligent Business



Blockchain for Bunkering Transactions



Just In Time (JIT) Platform



Smart Vessels

#### BUSINESS CAPABILITIES

Accounting Management, Human Resource Management, Customer Relationship Management, Sales Management, Inventory Management, Fleet Management and Cybersecurity

Note: The roadmap will be progressively updated to reflect the advent of new digital tools and technologies for the industry.

# STAGE 01

## GETTING DIGITAL ECONOMY READY

### Streamlined Operations, Optimised Resources

Streamline and integrate your business processes to enhance productivity and efficiency



#### DIGITAL SOLUTION



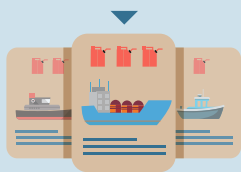
##### Bunker Barge Planning System

#### SOLUTION DESCRIPTION

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.

#### BENEFITS

- 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.

- Enable off-site monitoring on MFM and/or quality sensor data for better visibility over bunkering processes

Note: These solutions cannot be used in place of requirements to show proof of regulatory compliance.



##### 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

# STAGE 02

## GROWING IN THE DIGITAL ECONOMY

### Integrated Insights, Collaborative Ecosystem

Enable integrated insights through collaborative ecosystems to maximise business value



#### DIGITAL SOLUTION



**Advanced Vessel Management**

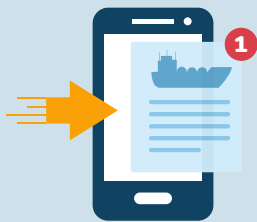
#### SOLUTION DESCRIPTION

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



**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



# STAGE 03

## LEAPING AHEAD

### Autonomous Operations, Intelligent Business

Deploy autonomous robots and advanced technologies to maximise business value and impact



#### DIGITAL SOLUTION



#### Blockchain for Bunkering Transactions

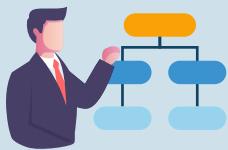
#### SOLUTION DESCRIPTION

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

Note: Solution may also include synthetic markers or Deoxyribonucleic acid (DNA) tags to track bunker fuel at every stage of its supply chain.

#### BENEFITS

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



#### Just In Time (JIT) Platform

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

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



#### Smart Vessels

Use high degree of automation and sensors on-board smart vessels.

Key features include:

- Automated mooring system
- Automated navigation system
- Integrated platform management system

- 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



	STAGE 01 GETTING DIGITAL ECONOMY READY	STAGE 02 GROWING IN THE DIGITAL ECONOMY	STAGE 03 LEAPING AHEAD
<b>“TECH BASICS” COURSES</b> Require broad-based digital literacy and awareness	Introduction to Bunkering Operations with Digital Capabilities <ul style="list-style-type: none"> <li>• Introduction to information management for Bunker Supply Chains</li> <li>• Mindset Transformation for Workplace</li> <li>• Maritime Cyber Security (Basic) Training Programme</li> <li>• Fundamental Data Analysis using Excel 2016</li> <li>• Introduction to Data Analytics and Applications</li> <li>• Robotic Automation Process</li> <li>• Appreciation of IoT and Data Management</li> <li>• WSQ Fundamentals of the Personal Data Protection Act</li> <li>• HR for Non-HR Managers</li> <li>• Relationship Marketing &amp; Digital Customer Relationship Management</li> <li>• Effective Digital Marketing and Sales</li> <li>• Stakeholder Relations</li> </ul>	Leveraging information management for Bunker Supply Chain <ul style="list-style-type: none"> <li>• Intermediate Robotic Process Automation</li> <li>• Introduction to AI and Machine Learning</li> <li>• Practitioner Certificate in Personal Data Protection (Singapore) Preparatory Course</li> <li>• Fundamentals of Drones/Unmanned Aerial Vehicle (UAV)</li> <li>• Leveraging digital technology to streamline operational effectiveness and enhance information flows</li> </ul>	Optimising information management for Bunker Supply Chain <ul style="list-style-type: none"> <li>• Robotic Process Automation Implementer</li> <li>• Introduction to Data Analytics and Applications</li> <li>• Advanced Operations of Drones/Unmanned Aerial Vehicles</li> <li>• Transforming business and processes with Blockchain</li> </ul>
<b>“TECH ADVANCED” COURSES</b> Require higher proficiency digital skills	Vendor Solution Specific Training <ul style="list-style-type: none"> <li>• Data Storytelling</li> <li>• Tableau Desktop I and Desktop II</li> <li>• DS102: Data Analytics with Python</li> <li>• Certified Deep Learning Specialist</li> </ul>	Vendor Solution Specific Training <ul style="list-style-type: none"> <li>• Certified Data Analytics (R) Specialist</li> <li>• Deep Learning and Machine Learning with TensorFlow</li> <li>• Advanced Data Analytics and Machine Learning with R</li> </ul>	Vendor Solution Specific Training <ul style="list-style-type: none"> <li>• AWS Big Data Specialist</li> <li>• Wiley Certified Data Analyst</li> </ul>

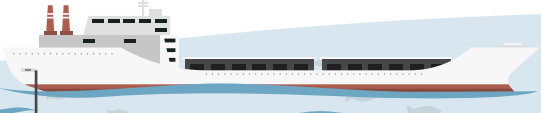


 These training programmes are aligned to Skills Framework and emerging areas under SkillsFuture Series

“Tech Basics” Course Directory: <https://www.sp.edu.sg/pace/sea-transport-industry-digital-plan>

“Tech Advanced” Course Directory: <https://www.myskillsfuture.sg/content/portal/en/training-exchange/course-landing.html>

# GET STARTED TODAY

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.



Sea Transport IDP



MPA

- 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).

## 2 | How do you get started?



SFEC



SME Centre

- 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.

## 3 | Where can you get help?



SMF

- Contact [Singapore Manufacturing Federation](#) (SMF) for digital project managers who can help you implement your digital solutions.



## ADDITIONAL INFORMATION



### 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

<https://www.mpa.gov.sg/web/portal/home/maritime-companies/research-development/industry-digital-plan>

##### 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>

### FOR INDIVIDUALS

#### CAPABILITY UPGRADING & 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](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.



[sgdigital.sg](https://sgdigital.sg)



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The content of this guide is provided for informational purposes only and is correct as of October 2020.

