

INNOVATION EXCELLENCE AWARD

APPLICATION REPORT 2019



MPA
SINGAPORE

MPA AWARDS MILESTONES

1996

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award



1997

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

1998

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

1999

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Culture of Excellence

- Singapore Quality Class (SQC)

Choice Employer

- SAF Award for Employers

2000

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award
- Best Bunkering Policy Award

Choice Employer

- SAF Award for Employers
- Singapore Health Award (Silver)

2001

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award
- Bunkering in Asia Awards

Culture of Excellence

- Singapore Quality Class (SQC)

Choice Employer

- SAF Award for Employers
- Singapore Health Award (Silver)

2002

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award
- Bunkering in Asia Award

Maritime Knowledge & Innovation Hub

- Intelligent20 Award
- MOT Minister's Innovation

Award Choice Employer

- People Developer

2003

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Maritime Knowledge & Innovation Hub

- Intelligent20 Award
- Enterprising Agency Award
- CIO 100 Honourees 2003
- MOT Minister's Innovation Award

Culture of Excellence

- Singapore Quality Class (SQC)
- Public Service Milestone Award

2004

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award
- Seatrade Award for Safety at Sea

Maritime Knowledge & Innovation Hub

- Enterprising Agency Award
- MOT Minister's Innovation Award

Culture of Excellence

- Community Chest Award (Silver)

Choice Employer

- SAF Award for Employers
- MHA Award for NSmen's Employers
- Singapore Health Award (Silver)

2012

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award
- Best Green Service Provider - Seaport

Maritime Knowledge & Innovation Hub

- MOT Minister's Innovation Award

Quality Maritime Workforce

- The International Committee on Seafarers' Welfare (ICSW) Award - Drop-in Centre of the Year

Culture of Excellence

- Public Service Milestone Award (Silver)
- Community Chest Award

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (1st)

Choice Employer

- MHA Award for NSmen's Employers
- Singapore Health Award (Gold)

2011

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Safeguard Strategic Maritime Interests & An Influential Voice

- Norwegian Business Association (Singapore) Award

Maritime Knowledge & Innovation Hub

- MOT Minister's Innovation Award

Culture of Excellence

- Eco-Office Certification

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (1st)

Choice Employer

- People Developer
- MHA Award for NSmen's Employers

2010

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award
- Port Authority Award (Seatrade Asia Award)
- Port of the Year Award

Maritime Knowledge & Innovation Hub

- MOT Minister's Innovation Award

Culture of Excellence

- Community Chest Award (Bronze)

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (3rd)

Choice Employer

- Honorary Member of the Minister for Defence Awards (MIDAs) League
- Singapore Health Award (Gold)

2009

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Maritime Knowledge & Innovation Hub

- MOT Minister's Innovation Award

Strong Maritime Singapore Identity

- Trade Conference of the Year Award

Culture of Excellence

- Singapore Quality Class (SQC)

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (1st)

Choice Employer

- May Day Model Partnership Award

2008

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award
- Port Authority Award (Seatrade Asia Award)
- Best Seaport (ASEAN)
- Environment Protection Award (Joint award with NewEarth Pte Ltd)

Maritime Knowledge & Innovation Hub

- MOT Minister's Innovation Award

Strong Maritime Singapore Identity

- Convention of the Year Award

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (1st)

Choice Employer

- May Day Model Partnership Award
- Singapore Health Award (Silver)

2007

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Maritime Knowledge & Innovation Hub

- MOT Minister's Innovation Award

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (1st)

Choice Employer

- Home Team NS Awards for Employers (Special Award)

2006

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Maritime Knowledge & Innovation Hub

- The Enterprise Challenge (TEC) Public Service Innovation Award (Silver)
- MOT Minister's Innovation Award

Culture of Excellence

- Singapore Quality Class (SQC)

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (2nd)

2005

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Maritime Knowledge & Innovation Hub

- Enterprising Agency Award
- MOT Minister's Innovation Award

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (2nd)



2013

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award
- Port of the Year Award
- Environmental Campaign of the Year Award

Maritime Knowledge & Innovation Hub

- MOT Minister's Innovation Award
- MOT VFM Achievement Award

Culture of Excellence

- Singapore Quality Class (SQC) Star

2014

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Maritime Knowledge & Innovation Hub

- MOT Minister's Innovation Award
- MOT VFM Achievement Award

Quality Maritime Workforce

- MPA Academy achieved accredited VTS training centre status by IALA
- International Seafarers' Welfare Awards 2014 (One of 5 finalist)

Culture of Excellence

- Corporate ISO 9000 Certification
- International Best Practice Competition 2014 (Runner-up)
- Restroom Association of Singapore 4-star Happy Toilet Certification
- Team Symposium 2014 (2 Silver and 1 Bronze Awards)

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (1st)

Choice Employer

- May Day Model Partnership Award

2015

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Maritime Knowledge & Innovation Hub

- MTI Innovative Award (Silver)
- MOT Minister's Innovation Award
- MOT VFM Achievement Award

Strong Maritime Singapore Identity

- 29th International ARC Awards - Bronze
- Gold Tabble Award

Culture of Excellence

- Singapore Innovation Class
- Singapore Service Class
- Eco-Office Re-certification
- Happy Toilet Re-certification
- PEP-SBF Pro-Enterprise Award (1st)
- Special Events Platinum Award
- Singapore Sustainability Awards 2015 (Large Enterprise)
- Singapore Environmental Achievement Awards (SEAA) 2015
- Singapore Apex CSR Awards (Small and Medium Organisations Category)
- PS21 ExCEL Awards - Most Innovative Project/Policy (Bronze)

- PS21 Star Service Team Award
- International Convention on Quality Control Circle (ICQCC) 2015 (Bronze Award)
- Team Excellence Symposium 2015 (2 Gold & 4 Silver Awards)

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (1st)

Choice Employer

- People Developer
- May Day Model Partnership Award
- NS Advocate Award

2016

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport In Asia Award
- Green Ports Award System (GPAS)
- Top 50 Engineering Feats @ IES-SG50 Award

Maritime Knowledge & Innovation Hub

- CAPAM International Innovations Awards (IIA)
- MOT Minister's Innovation Award
- MOT VFM Achievement Award

Strong Maritime Identity

- 2016 ARC Awards

Culture of Excellence

- 6th Asia Best CSR Practices Awards 2016
- ASEAN Corporate Sustainability Summit and Awards (ACSSA) 2016
- Asia Responsible Entrepreneurship Award
- ComChest Special Events Gold Award
- Eco-Office Re-certification
- International Sea Keepers Society Asia Achievement Award
- PS21 ExCEL Award: Most Innovative Project/Policy
- PS21 Star Service Team Award
- Singapore Quality Award

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (1st)

2017

Safe, Efficient & Sustainable Global Hub Port

- Best Seaport in Asia Award

Maritime Knowledge & Innovation Hub

- MOT Minister's Innovation Award
- MOT VFM Achievement Award

Strong Maritime Identity

- 2017 Galaxy Awards
- 23rd Annual Communicator Awards

Culture of Excellence

- ComChest Corporate Gold Award
- Eco-Office Re-certification
- European Society for Quality Research (ESQR) Quality Achievements Awards 2017
- Golden Peacock Global Award for Sustainability
- International Best Practice Award Competition (IBPC) Organisation-Wide Innovation Award
- Corporate ISO 9000 Re-certification
- PS21 Star Service Team Award
- Public Service Premier Award

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (2nd)
- Public Sector Pro-Enterprise Initiative Award

2018

Safe, Efficient & Sustainable Global Hub Port

- Maritime 2020 & LNG Asia Summits - Most Extraordinary Contribution to HSSE Award
- Green Ports Award System (GPAS)
- Asian Freight and Supply Chain Awards
- Caterpillar and INFORMS Analytics Society Innovative Applications in Analytics Award (IAAA)

Maritime Knowledge & Innovation Hub

- CAPAM International Innovations Awards (IIA)
- MOT VFM Award
- MOT Minister's Innovation Award

Strong Maritime Singapore Identity

- Honorary Fellowship by the Institute of Chartered Shipbrokers
- New Silk Road CEO of the Year Awards 2018
- International Seafarers' Welfare (ICSW) Awards - The Port of the Year
- GREEN4SEA Awards

Culture of Excellence

- Public Sector Transformation Awards
- 6th International Best Practice Competition - Top 10 Best Practices for the project on Accelerating Innovation in the Maritime Industry through the MPA Living Lab
- Charity Bronze Award
- ISO 9000 Transition Audit
- Public Sector Transformation Awards
- NTUC May Day Awards 2018
- Champions of Good 2018
- Sustainable Business Awards Singapore 2018

Strong Partnerships

- PEP-SBF Pro-Enterprise Award (1st)

Choice Employer

- National Day Awards 2018
- 15th Annual HRM Awards 2018



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“
SINGAPORE’S RAISON
D’ÊTRE WAS ITS PORT.
SINGAPORE MUST
STRIVE TO REMAIN
A MAJOR HUB PORT.
”

MR LEE KUAN YEW,
MINISTER MENTOR

MPA Senior Management

01 April 2019



Ms Quah Ley Hoon
Chief Executive



Mr Goh Chung Hun
Director (Shipping)
Director (Marine)



**Captain Daknashamoorthy
s/o Ganasen**
Director
(Operations & Marine Services)



Captain M Segar
Assistant Chief Executive
(Operations)



Ms Tan Beng Tee
Assistant Chief Executive
(Development)



Ms Bernice Yeoh
Director
(Strategy & Policy)



Ms Tan Woei Tyng
Deputy Director
(International Maritime Centre)



Mr Thai Low Ying-Huang
Chief Hydrographer
(Hydrographic)



Mr David Foo
Director
(Operations Technology)



Mr Tham Wai Wah
Director
(Engineering & Project Management)
Chief Engineer



Mr Kenneth Lim
Director (Innovation, Technology
& Talent Development)
Chief Technology Officer



Ms Angela Png
Director
(International)



Ms Caroline Goh
Deputy Director
(Business Capability Development)



Mr Tan Suan Jow
Dean
(MPA Academy)



Ms Caitlin Fua
Director
(Communications & Community)



Ms Ong Seok Bin
Director
(Human Resource)



Ms Yvonne Chan
Director
(Finance, Procurement & Admin)
(till 28 April)



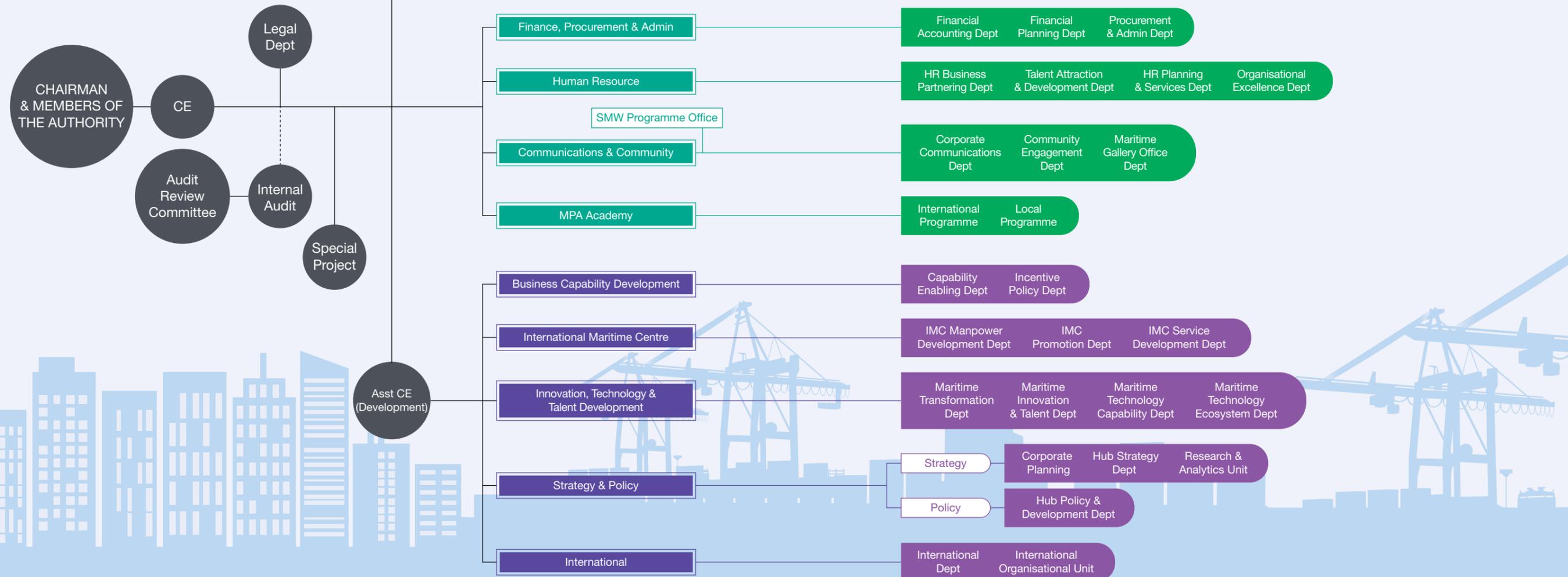
Ms Cindy Sim
Director
(Finance, Procurement & Admin)
(from 29 Apr)



Mr Tan Cheng Peng
Director
(Special Project)

MPA Organisation Structure

(01 April 2019)



OUR MISSION

To develop and promote Singapore as a premier global hub port and an international maritime centre, and to advance and safeguard Singapore's strategic maritime interests

OUR VISION

A leading maritime agency driving Singapore's global maritime aspirations

OUR VALUES

Forward Thinking, Integrity, Respect, Service Excellence, Teamwork

OUR FUTURE READY FRAMEWORK

To build a Future Ready Maritime Singapore, embodied in the six key thrusts below, MPA must reposition itself to be:

Relevant

Well-equipped to fulfil our roles as Port Authority, Port Regulator, Port Planner, IMC Champion and National Maritime Representative

Responsive

Receptive to feedback, with prompt and consistent service delivery to stakeholders, and a high level of operational readiness

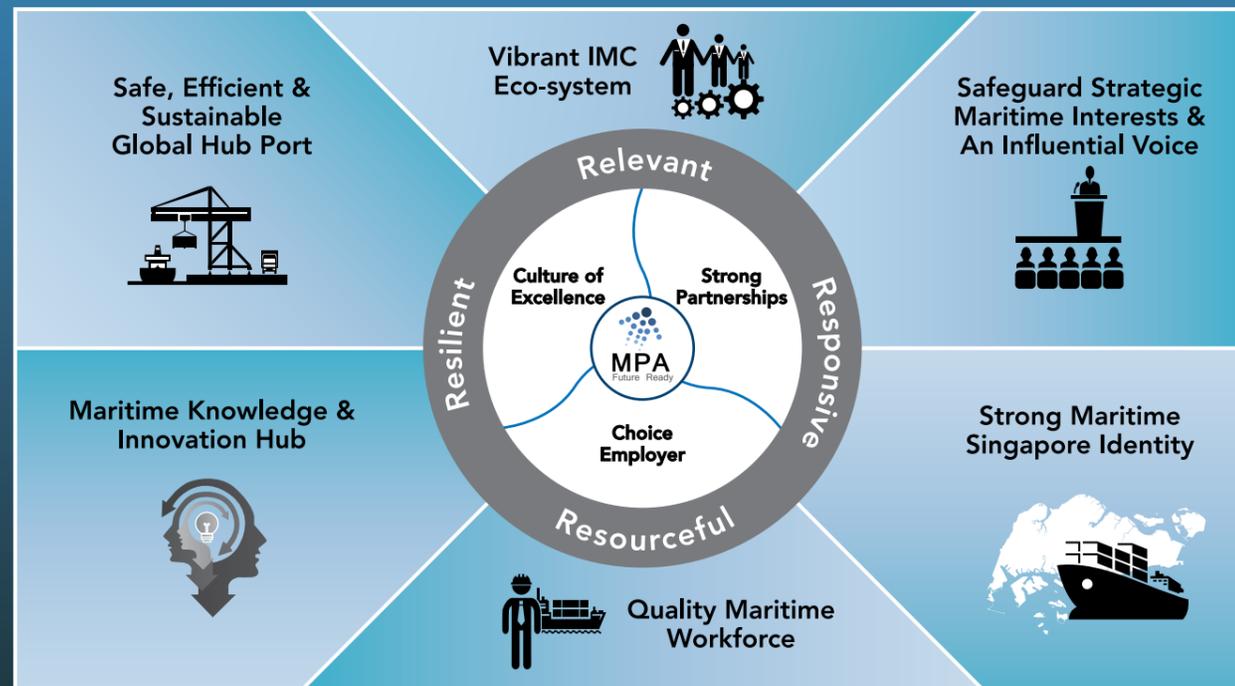
Resourceful

Innovative and efficient to carry out the functions of the organisation sustainably

Resilient

Adaptable to challenges and able to recover quickly from potential setbacks

Organisationally, MPA must forge Strong Partnerships with our stakeholders, ensure we remain a Choice Employer, and embody a Culture of Excellence in all we do.



1. Organisational Description

2. Organisational Challenges

Vision

Mission

ORGANISATIONAL PROFILE

Values



Organisational Structure

INTRODUCING MARITIME SINGAPORE



ORGANISATIONAL PROFILE

Organisational Description

Mission, Vision and Values (MVV)

Maritime and Port Authority of Singapore (MPA) was established in 1996 as a statutory board under the Ministry of Transport (MOT) to take up roles that were previously performed by the National Maritime Board, Marine Department and regulatory departments of the former Port of Singapore Authority. In 2004, MPA also took on the promotion of commercial shipping, which had previously been handled by IE Singapore.

Our Mission

To develop and promote Singapore as a premier global hub port and an International Maritime Centre (IMC), and

to advance and safeguard Singapore's strategic maritime interests.

Our Vision

A leading maritime agency driving Singapore's global maritime aspirations.

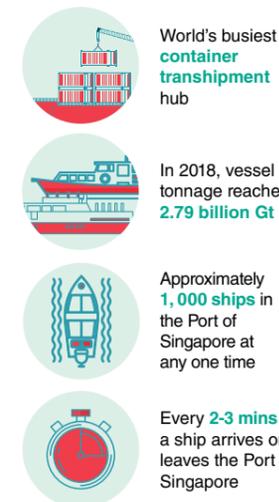
Our Values

FIRST: Forward Thinking, Integrity, Respect, Service Excellence, Teamwork

Business Model

Future Ready Framework (see page VI)

Premier Global Hub Port



Main Products and Services



International Maritime Centre



Key Roles and Competencies

Port Authority

MPA conducts maintenance dredging of fairways, provides and maintains lighthouses and aids to navigation, and works with enforcement agencies to improve maritime safety and security measures. Additionally, MPA performs Port State Control (PSC) and flag state inspection to ensure that visiting foreign ships are in compliance with international regulations, and that Singapore-registered ships are well-maintained. MPA has also built 2 Port Operations Control Centres (POCCs) at PSA Vista and Changi respectively.

Port Regulator

MPA regulates and licenses port and marine services and facilities, such as container terminals, ferry and cruise terminals, pilotage, towage and bunkering.

Port Planner

MPA strives to optimise the use of sea space and waterfront facilities to provide capacity for growth. MPA also ensures that port infrastructure and facilities are able to meet increasing demand.

IMC Champion

MPA strives to make Singapore home to the world's highest concentration of international shipping groups and global maritime service providers. This is done through active promotion, compelling incentives, a pro-business environment and a vibrant maritime ecosystem. To be future-ready, MPA also spearheads manpower and knowledge development to help Singapore remain a competitive port and vibrant IMC.

National Sea Transport Representative

MPA advises the Government and represents Singapore on sea transport, marine and port matters. It also safeguards and advances Singapore's maritime interests on global platforms.

MPA ensures that sea lines of communication or shipping routes between ports are open, safe and secure, especially in the Straits of Malacca and Singapore (SOMS). In particular, MPA cooperates closely with Singapore's littoral neighbours (Indonesia and Malaysia) in the SOMS. The organisation also actively fosters regional efforts to combat piracy and sea robbery through the Regional Cooperation

Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP).

In its role as National Sea Transport Representative, MPA also actively champions green efforts nationally and internationally.



Organisational Challenges

1 Competitive Environment

- Describe the competitive position (e.g. relative size and growth) in the industries or markets served
- Outline the key success factors (e.g. productivity growth and innovation)
- Describe the key changes in the competitive environment and growth opportunities

Overview of Key Maritime Cluster

Maritime Singapore is an important economic pillar anchored to Singapore's global hub port and vibrant IMC. Singapore is a leading global hub port and has been regarded as one of the most complete IMCs. These qualities set Singapore apart from other maritime centres.

Based on the latest international benchmarking studies, Singapore has remained in the top 2 for the last 5 years in the Menon Report for Leading Maritime Capitals of the World, as well as the Xinhua-Baltic Exchange

International Shipping Centre Development Index.

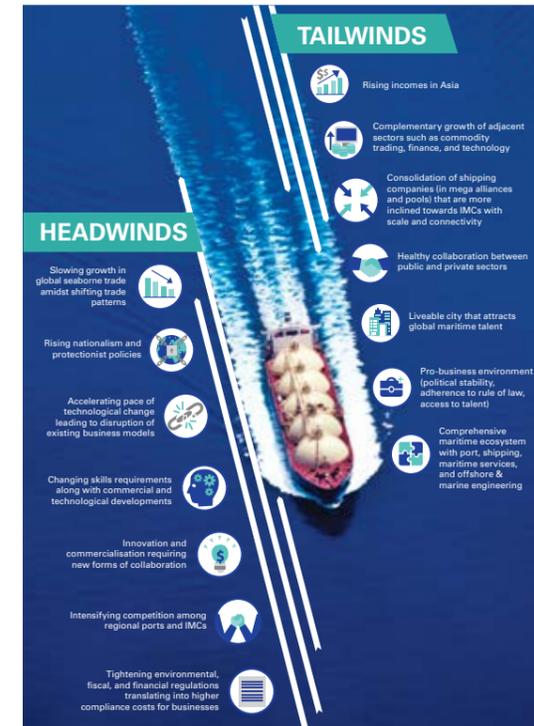
Due to its significant economic contributions, Maritime Singapore was one of the industries identified for Singapore's wider economic restructuring, which was driven by the Committee on the Future Economy led by Minister Heng Swee Keat. The Sea Transport Industry Transformation Map (ITM) was developed in consultation with industry leaders from diverse fields to ensure that the industry continues to generate significant economic activities and provide good jobs for Singaporeans.

2 Strategic Challenges

- Describe the key business, operational and human resource strategic challenges

Maritime Singapore faces strong headwinds and tailwinds as illustrated below in Figure 1:

// Fig 1: Driving Forces – Headwinds and Tailwinds //

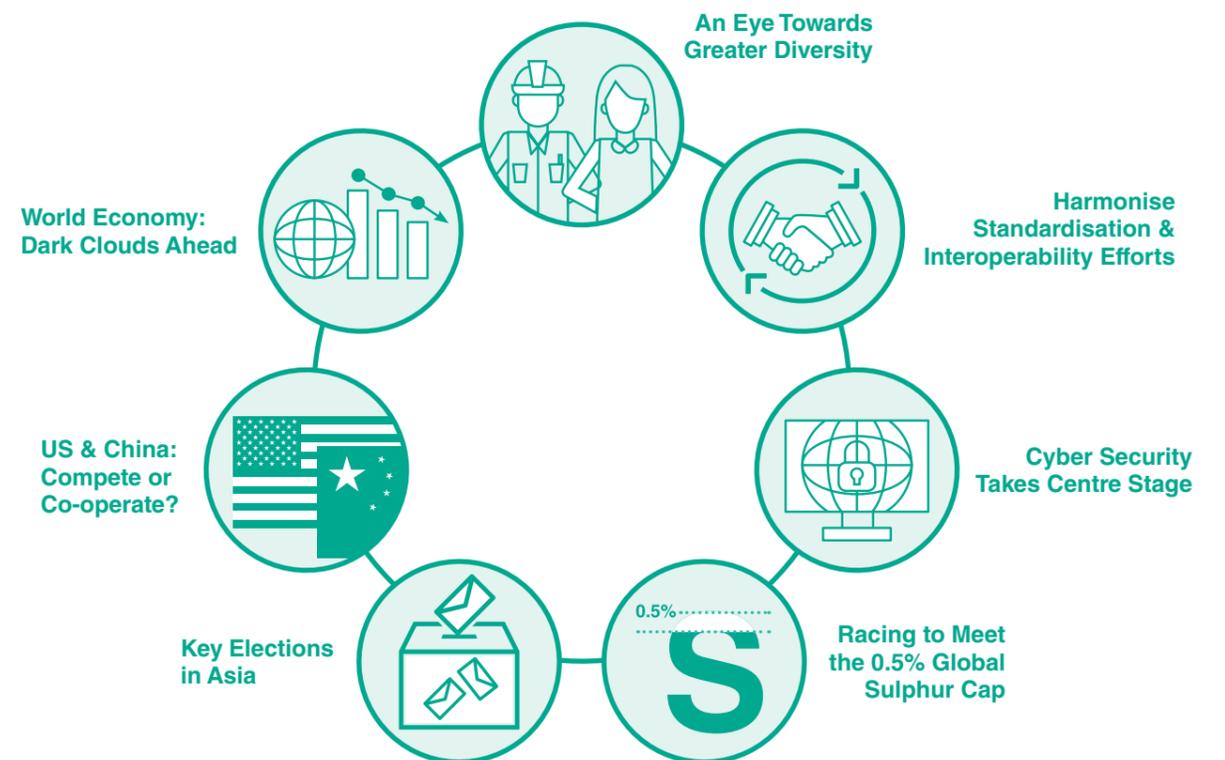


2018 was a year of uncertainty. Global trade tensions intensified, and there was little sign that the China-US trade war would abate. Global trade volume suffered, with growth below the World Trade Organisation's earlier projection of 4.4%. The Port of Singapore maintained a stable performance in 2018, with container throughput growing by 8.7% to 36.6 million twenty foot equivalent units (TEUs) and total cargo throughput remaining stable at 630 million tonnes. Singapore retained its position as the world's leading bunkering port. It also remains home to a diverse range of maritime businesses, generating good jobs and contributing some 7% to Singapore's GDP.

These developments did not happen by chance and should not be taken for granted. For Maritime Singapore to continue growing, it would need to continue to stay competitive and embrace the technology disruption. With Next Generation Port (NGP) 2030, IMC 2030 and the Sea Transport ITM, MPA has to transform organisationally as well, and is cognisant that in the change management journey, the storm comes before the dawn. With the war for talent, engaging MPA's staff and aligning them to the longer term direction becomes increasingly critical.

In 2019, 7 key areas stand out in particular, as illustrated in Figure 2:

// Fig 2: 7 Key Areas Identified //



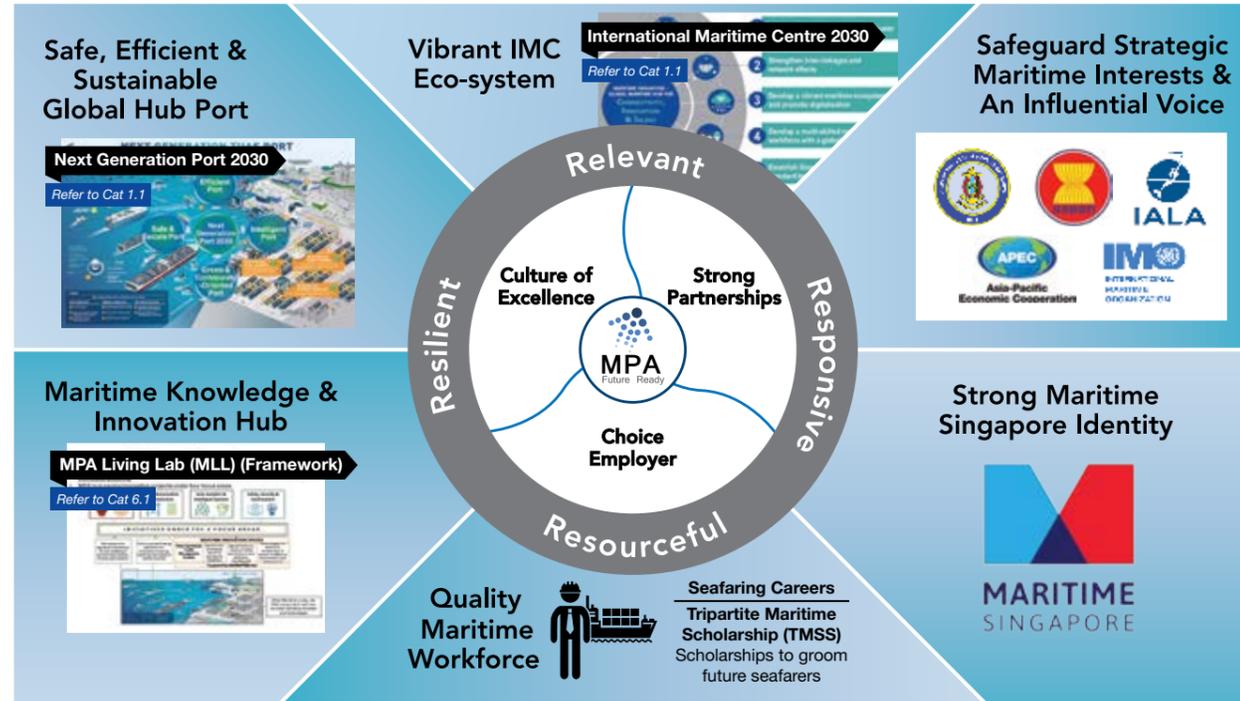
3 Organisational Directions

- Outline new thrusts (e.g. entry into new markets, formation of new alliances, introduction of new technologies, services or products and changes in strategy)

As the operating environment and challenges which MPA faces in this volatile era become more complex, MPA needs to remain focused on its core mission, achieve synergy across teams (both internal and external), drive succession planning and enhance development exposure for its staff. These organisational priorities are summarised as the 3As:

- **Align:** To align MPA and its partners to the core mission of keeping Singapore waters safe
- **Ambition:** To entrench MPA's status as a Global Maritime Hub
- **Action:** To sharpen MPA's competitive edge in the long run

The strategic thrusts in the MPA Future Ready Framework support all of MPA's missions:



Conclusion

The Maritime Singapore Future Ready 2030 initiative seeks to build upon the fundamentals of Singapore's maritime cluster, while identifying new areas of strategic opportunity. As Singapore progresses, MPA

will collaborate with the industry to develop and review initiatives to ensure it is aligned to its long-term vision and strategies, and stays ahead of competition so as to contribute to Singapore's GDP and create good jobs for Singaporeans.

01

LEADERSHIP



Grooming Future Leaders



Innovative Thinking



- 1.1 Senior Leadership
- 1.2 Organisational Culture
- 1.3 Corporate Governance and Social Responsibility

Sustainable Performance

Shipping will play an even bigger role in the economic well-being of countries as trade expands. We have an increasing stake in ensuring shipping remains the most secure, efficient and environmentally friendly mode of transport. The world's maritime nations will need centres in Asia known for integrity, quality and neutrality to enable them to plug into Asia's growth. Singapore hopes to be one such centre.

Mr Lee Kuan Yew
Minister Mentor

Singapore's re-election to the IMO Council is certainly an affirmation from our many friends here at IMO. The re-election also acknowledges the hard work that the MPA team has put in to grow our maritime industry and to prepare it for the future. We will continue to work closely with IMO to future-proof itself as it pursues its vision of a secure, efficient and sustainable shipping.

Mr Khaw Boon Wan
Minister for Transport
Coordinating Minister for Infrastructure

One of the unique things about Singapore is the close working relationship between industry and government. In Singapore, you can actually make a difference, you can make things happen if you are prepared to make the effort. I have sat on various committees in other countries and often, there is just talk and no results - which is a waste of time. On a national scale, there is this kind of engrained mentality that we always need to improve. No one sits down and says "Oh well, here we are." They keep getting better because they are always looking for the next improvement.

Mr Esben Poulsen
Chairman, International Chamber of Shipping
President, Singapore Shipping Association
Chairman, Eneset Pte Ltd

Singapore has many favourable attributes. It must play to its fantastic infrastructure. It remains well placed as a maritime centre.

Mr Kristian Siem
Founder & Chairman, Siem Industries

At the core of MPA's initiatives lies holistic innovation. MPA is committed in its efforts to source, design and engage safe and reliable systems that support the demands of the continually evolving global shipping industry. MPA constantly strives to seek ways to improve its suite of services and evolve for the future.

Mrs Gina Lee-Wan
Chairman,
Legal & Insurance Committee,
Singapore Shipping Association

01 LEADERSHIP

1.1 Senior Leadership

1.1a Develops the organisation's mission, vision and values, and communicates them to key stakeholders

MPA's Senior Management (SM) Team

MPA's SM team is led by the organisation's Chief Executive (CE), and comprises 2 Assistant Chief Executives (ACEs) and 15 Heads of Division. The SM is accountable to the Chairman of the MPA Board and the Permanent Secretary of MOT. Together, they work closely to lead MPA while being guided by MPA's MVV.

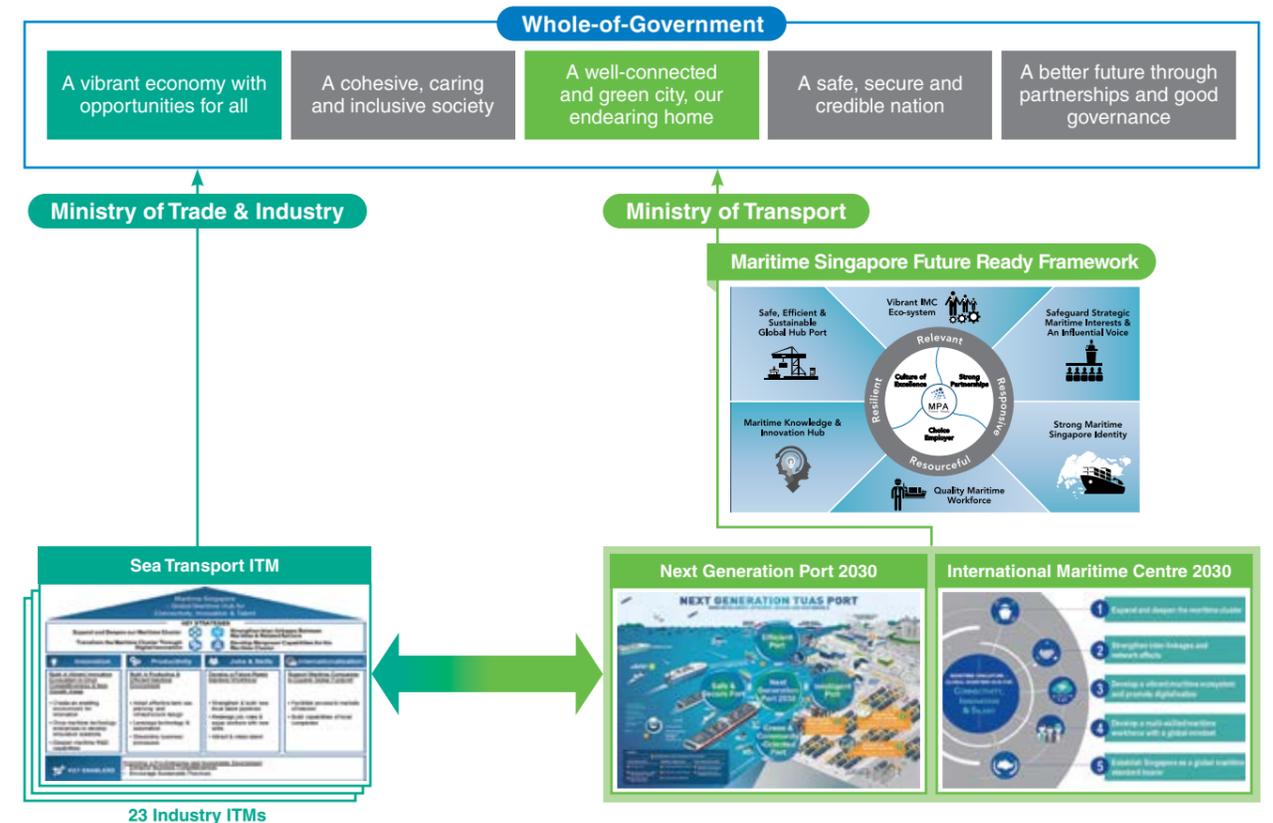
MPA is the world's first maritime authority to provide oversight for both the port and maritime industry. Recognising innovation's critical role in maintaining and

enhancing Maritime Singapore's competitiveness and world-class results, SM has provided strategic direction and leveraged on staff, partners and technology to steer MPA and Maritime Singapore towards greater heights. MPA has achieved many innovative firsts in port operations and cemented Maritime Singapore's status as a one-stop destination and global hub for port and marine activities.

Mission, Vision and Values (MVV)

SM, together with the Board and MOT, collaborates actively to deploy and review MPA's MVV. Clear alignment to Whole-of-Government (WOG) Strategic Outcomes (see Figure 1.1.1) is maintained to clarify how the organisation collaborates with other public service agencies to improve stakeholder experience.

// Fig 1.1.1: MPA's Mission is aligned to Whole-of Government Strategic Outcome //



This strategic clarity in MPA's MVV has continued to improve since its formation (see Figure 1.1.2).

// Fig 1.1.2: Evolution of MVV //

	Positioning (1996-2003)	Leading (2004-2005)	Advancing (2006-2013)	Future Ready (2014 onwards)
Mission	Established upon MPA's formation in 1996	Validated and found to be relevant	Included "Advance" in mission statement Established 5P strategy Established corporate Balanced Score Card (BSC)	Validated for relevance Supported by the Future Ready Framework for strategic clarity
Vision	Developed via focus group discussions in 1997		Recrafted via SM and focus group discussions	Complemented with NGP 2030, IMC 2030 and Sea Transport ITM for more clarity
Values	Developed via focus group discussions in 1997. Established via behaviour norms and team-building	Revisited FIRST and changed "Responsibility" to "Respect" via management retreat and focus groups	Validated and found to be relevant	Validated and found to be relevant

The Future Ready Framework: Helping Maritime Singapore Navigate the Future

MPA's latest top-level review took place in 2014, with the then-CE leading over 350 staff to identify a new way forward for Maritime Singapore amidst an increasingly

challenging environment. This review resulted in the development of the Future Ready Framework (see page VI), while NGP 2030, IMC 2030 and the Sea Transport ITM were all developed to add specificities into roadmaps and facilitate execution.

Charting New Directions for the Next Generation Port – NGP 2030

As preparation for the new port at Tuas, MPA launched the NGP 2030 initiative as a WOG effort to drive the overall master planning and development of Singapore's port. This initiative reaffirms MPA's commitment as a leading maritime agency to driving Singapore's global maritime aspirations.

Through a port systems roadmap, MPA has initiated the development of several new systems. These include the Just-In-Time (JIT) Planning and Coordination and the MSW system, which will allow for seamless arrivals and departures from Singapore's port, as well as potential manpower, time and cost savings for port users.



Global Maritime Hub for Connectivity, Innovation & Talent – IMC 2030

In 2017, an IMC 2030 Advisory Committee led by the Chairman of BW Group, Mr. Andreas Sohmen-Pao, submitted the IMC 2030 Strategic Review report to the Singapore Government, with a vision for Maritime Singapore to become the Global Maritime Hub for connectivity, innovation and talent.

PROPOSED STRATEGIES



Spearheading Transformation for Maritime Singapore – Sea Transport ITM

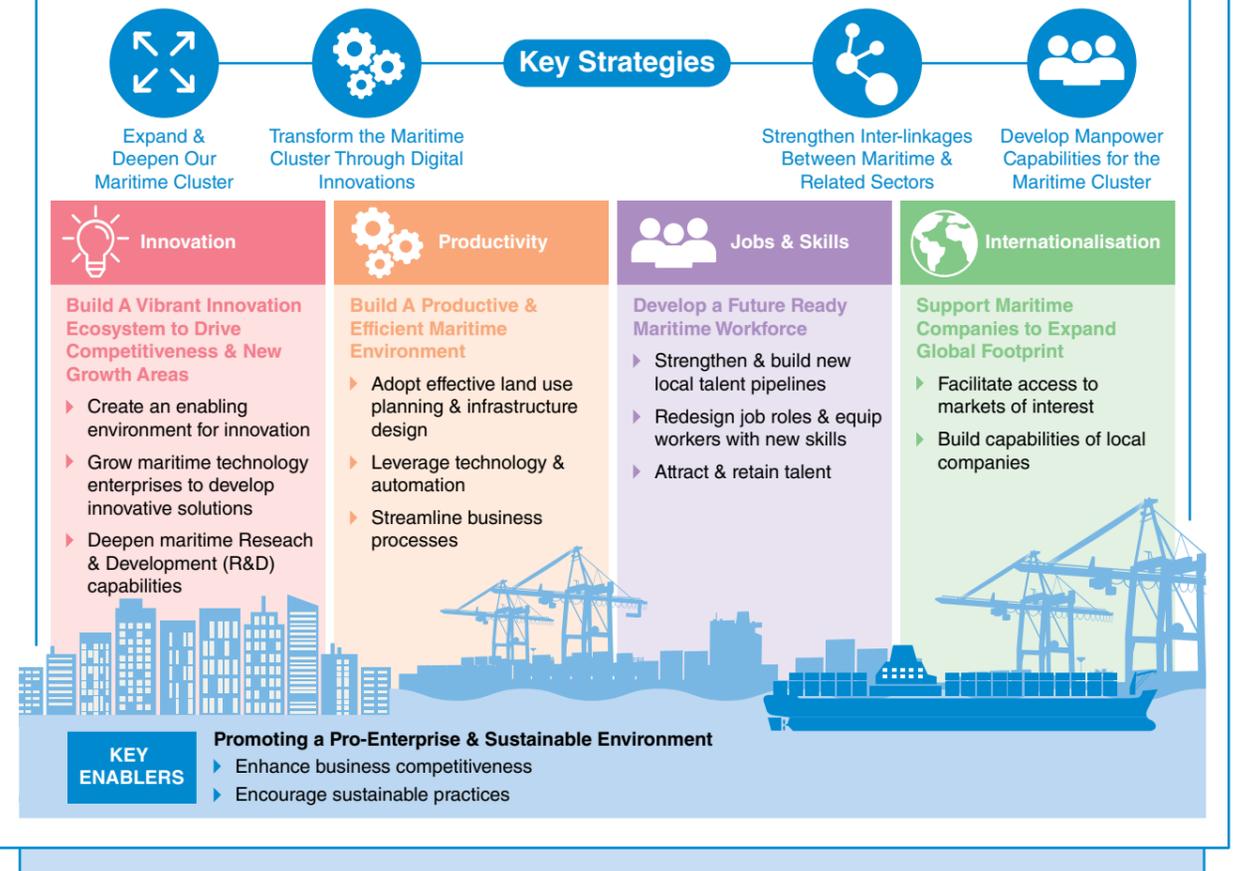
In 2018, MPA launched the Sea Transport ITM. Developed by MPA in partnership with the industry, trade associations and chambers, unions, Institutes of Higher Learning (IHLs) and other government agencies, the Sea Transport ITM serves as a blueprint for sectorial transformation over the next few years.

The Sea Transport ITM outlines strategies to embrace technology, enhance productivity and equip the maritime workforce with the necessary skills to support the growth of a more connected and innovative maritime ecosystem.

It also incorporates recommendations from the NGP 2030 Steering Committee and IMC 2030 Advisory Committee.

Successfully transforming the Sea Transport industry requires strong partnerships with key stakeholders in the ecosystem. To achieve this, MPA leverages on a tripartite partnership consisting of industry stakeholders, unions and government agencies to increase awareness, drive implementation and monitor the progress of key ITM initiatives.

GLOBAL MARITIME HUB FOR CONNECTIVITY, INNOVATION AND TALENT



1.1b Engages key stakeholders to drive the organisation's performance

// Fig 1.1.3: MPA Engages Stakeholders on 3 Levels to Realise Its Mission //

	Organisational Leadership	Industry Leadership	International Leadership
Level	Internal	National	Global
Stakeholders	MPA staff	Other government agencies, local Research Institutes (RIs), players in the Maritime Singapore ecosystem, IHLs and Amalgamated Union of Statutory Board Employees (AUSBE)	International maritime bodies, players in the international maritime scene, foreign RIs and other port authorities
Goal	To create a committed and innovative internal team that is sharply focused on ensuring that Maritime Singapore stays ahead of the game	To dynamically engage Singapore's maritime industry players, in order to drive the industry towards future-readiness	To systematically engage the international maritime community, in order to influence the development of global shipping to Singapore's benefit

MPA's SM provides 3 forms of leaderships – Organisational Leadership, Industry Leadership and International Leadership (see Figure 1.1.3).

Organisational Leadership
SM deploys a wide range of communication platforms to lead the organisation (see Table 1.1.1).

// Table 1.1.1: Communication Platforms for Organisational Leadership //

Mode	Platform	Objectives	Frequency
Electronic & Print	e-Connect Portal	Communicate MVV	Ongoing
	Line from CE	Allow CE to communicate messages related to MVV to staff	Ongoing
Face-to-Face	Employee Engagement Survey (EES) & Pulse Survey	Capture current staff engagement level and provide opportunities to improve work environment	Annual
	Workplan seminar & Management Advance	Communicate MVV, communicate and develop corporate workplans and discuss key projects	Annual
	Townhall sessions	Showcase staff initiatives & provide opportunities for open dialogue	Annual
	Values Week	Communicate & role model FIRST values	Annual
	Staff events	Provide opportunities for staff bonding	Annual
	CE's tea/lunch sessions with staff & foundation programme for new staff	Communicate & solicit feedback on MVV & strategic focus areas, & welcome new staff	Quarterly
	Conversation with CE (new)	Communicate hot topics & solicit feedback from staff	Quarterly
	Divisional activity days & divisional dialogue sessions	Communicate & solicit feedback on MVV & strategic focus areas	Quarterly
	CE's field trips	Communicate strategic focus areas & understand field operations	Ongoing
	Appreciation Hour	Recognise staff who have shown service excellence & excellence in other projects	Quarterly
	Festive celebrations	Communicate MVV & provide opportunities for staff bonding	4 times a year to coincide with key festivals
Future Ready brainstorming sessions	Solicit ideas regarding strategic focus areas from staff	Ad-hoc	

// Table 1.1.2: Communication Platforms for Industry Leadership //

Mode	Platform	Objectives	Frequency
Electronic & Print	Corporate website, SRS microsite & e-Bulletin, presentations, videos & social media	Communicate MPA's MVV & major initiatives to the public & shipping community, & facilitate platforms for electronic transactions	Ongoing
	Corporate brochures, Singapore Nautilus (quarterly magazine) & annual report/integrated report	Communicate MPA's MVV & major initiatives to the public, & report organisational performance	Ongoing
Face-to-Face	MOT Ministerial Staff Meetings (MSMs) & Maritime Policy Forum (MPF)	Obtain buy-in of MPA's MVV & corporate workplans, & provide updates on the progress of key initiatives to the Minister of Transport & MOT Headquarters	Monthly
	Board Meetings	Obtain buy-in of MPA's MVV & corporate workplans, & provide updates on the progress of key initiatives to Board Members	Bimonthly
	Singapore Maritime Week (SMW)	A week of flagship conferences, dialogues, exhibitions & social events in celebration of maritime-related matters	Annual
	MaritimeONE	Communicate MPA's MVV & gain an understanding of the industry's manpower needs	Annual
	Industry engagements (e.g. Singapore International Bunkering Conference (SIBCON), Safety@Sea Week), dialogue sessions & consultations with the maritime community	Share MPA's MVV & solicit feedback on strategic focus areas	Ongoing
	Safety briefings	Communicate MPA's MVV & impart safety messages	Ad-hoc
	Networking events such as lunch meetings & tea sessions	Share MPA's MVV & solicit feedback	Quarterly
	Singapore Maritime Gallery (SMG) & documentary shows (e.g. National Geographic) inside Maritime Singapore	Cascade MPA's MVV & profile Singapore's maritime industry	Ad-hoc

Intimate Engagement through Conversation with CE

Conversation with CE is a new initiative implemented in 2019 to deepen 2-way engagement between CE and staff on the ground. CE is provided with another platform to feel the pulse on the ground, allowing her to address areas of concern directly and immediately.



Industry Leadership

MPA's SM employs innovative communication methods and a proactive media strategy (see Table 1.1.2) to engage with stakeholders (see Category 5.3) and customers (see Category 2) in order to create an awareness about the industry and promote Maritime Singapore.

To promote Maritime Singapore, MPA also engages stakeholders through the following channels:

- Funding and development schemes through the Maritime Cluster Fund (MCF) and the Maritime Innovation and Technology (MINT) Fund
- Industry initiatives such as the Maritime Innovation Lab, Smart Port Challenge (SPC) and Port Innovation Ecosystem Reimagined @Block 71 (PIER71) for technology start-ups
- Joint R&D partnerships with IHLs and Centres of Excellence (CoEs)
- Community engagement events such as the annual Amazing Maritime Race
- Forums and conferences such as the SMW and the Safety@Sea Week.

MPA-organised Forums and Conferences: Reaching Out to Multiple Stakeholders

SMW is an annual event that reaches out to a broad spectrum of stakeholders. Since its inauguration in 2006, SMW has grown significantly and now attracts over 40,000 local and international participants per year. It supports Maritime Singapore's vision to be a Global Maritime Hub for driving connectivity, innovation and talents through people, ideas and opportunities. It brings together regional and industry leaders, subject area experts, and other representatives from the maritime industry for a week of conferences, dialogues, exhibitions, learning journeys and social events.



International Leadership

Singapore is a small country highly dependent on international seaborne trade. The safety, security, sustainability and efficiency of international shipping is thus important to the nation. Furthermore, shipping is global in nature: Singapore thus needs to play its part and contribute to international and regional efforts to promote safe, secure, sustainable and efficient shipping.

With strong presence and an influential voice in international maritime affairs, Singapore is better positioned to safeguard its maritime interests. MPA spearheads Singapore's efforts to advance and safeguard these interests through engagement channels such as:

- Inking bilateral agreements with RIs and port authorities for collaborative efforts
- Organising events that bring the international maritime community together, including forums, seminars, conferences and dialogues

- Presenting papers at and participating in international maritime meetings and working groups in order to learn from and share Singapore's position on maritime issues with others
- Serving as council members of international maritime organisations

MPA actively participates and holds leadership positions in key international bodies such as the International Maritime Organisation (IMO), the International Hydrographic Organisation (IHO), the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), and the Port Authorities Roundtable (PAR), among others.

Regionally, MPA also plays a leading role in key forums such as the Co-operative Mechanism on Safety of Navigation and Environment Protection in the SOMS, the ReCAAP, the ASEAN Maritime Transport Working Group (MTWG) and the APEC Port Services Network (APSN).

Maintaining an Influential Voice through IMO Council Membership

Since becoming an IMO Council Member in 1993, Singapore has chaired the IMO Council, the then Sub-Committee on Bulk Liquids and Gases and the then Sub-Committee on Flag State Implementation. Singapore has assumed the position of Vice-Chair of the Marine Environment Protection Committee, the Maritime Safety Committee and the Sub-Committee on Human Element, Training and Watchkeeping. To date, Singapore has ratified and implemented every major IMO convention in force relating to ship safety and the prevention of pollution from ships.

Singapore was re-elected to the IMO Council for a 13th consecutive term for 2018-2019, once again securing the highest number of votes in Category

C. As a Council member, Singapore will continue to work with the IMO and its member states to advance the international maritime community's efforts in navigational safety, promote efficient and sustainable shipping, and protect the marine environment.



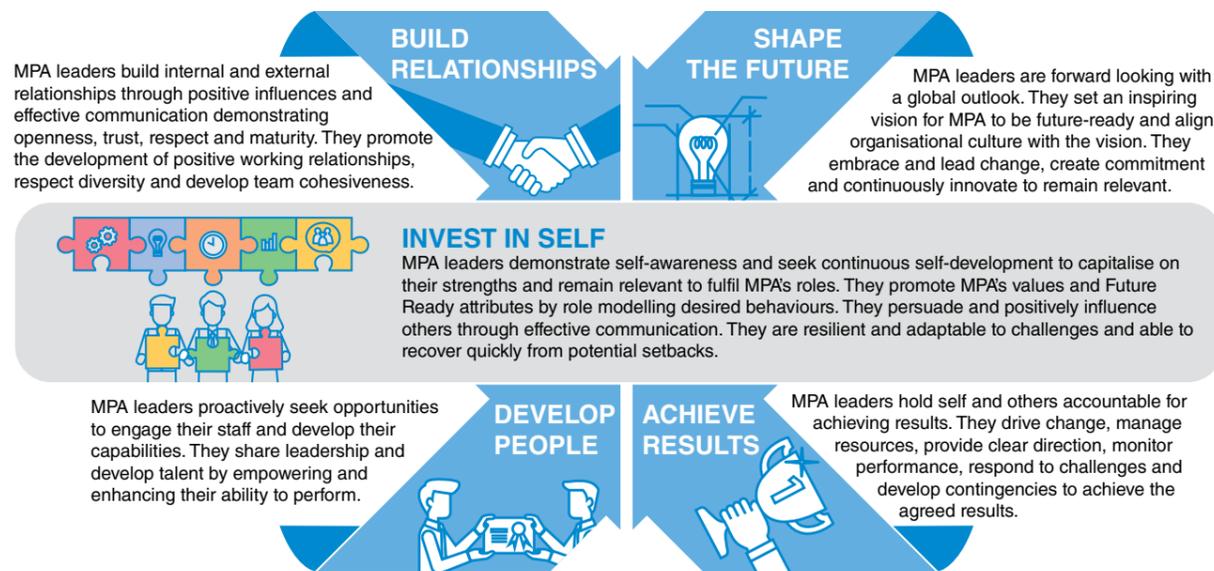
1.1c Acts as role models and grooms future leaders

Leadership Competency Model

The leadership competency model guides MPA to develop leaders who are forward-looking, have a global outlook and are able to develop staff while delivering results. MPA leaders must demonstrate 5 leadership capabilities: Invest in Self, Shape the Future, Achieve Results, Develop People and Build Relationships. These interdependent competencies reinforce each other, helping MPA leaders

to excel in their roles and enhancing individual and organisational performance.

It is imperative for MPA's SM to be good role models who not only pay attention to individual achievements, but also encourage teamwork and co-operation, support others' growth and development, and recognise the positive behaviours and attitudes they display (see Figure 1.1.5). Leaders are encouraged to nurture a learning culture with psychological safety, where staff are not afraid to speak up and change is embraced and highly encouraged.



// Fig 1.1.5: Role Modelling by Walking the Talk //

SM leads the way on a day-to-day basis by committing to excellence, serving as role models to younger leaders through:



To groom its future leaders, MPA has implemented a comprehensive programme in line with the entire Public Service Talent Management Framework. Senior leaders play their part by having conversations with these future leaders, exposing them to different scopes of work and opportunities, and engaging them with projects that deepen their understanding of MPA's work.

Senior Leaders Walking in MPA Ground Officers' Shoes



Service Day was introduced in 2017 for SM to better understand the work of ground officers. This enhances their effectiveness in engaging the ground as they role model the right behaviours and support ground officers physically, mentally and emotionally.

An organisational restructuring exercise was carried out in 2019 to enhance focus on MPA's core mission, achieve synergy across teams, drive succession planning and enhance development exposure for staff. Many young leaders took on Head of Division roles, and will continue to receive mentorship from senior leaders to become more effective for the future.

1.1d Demonstrates and reinforces their commitment to innovation excellence

Innovation Excellence is 1 of the 3 key pillars underpinning MPA's Culture of Excellence, as reflected in MPA's Future Ready Framework, the other 2 being Service Excellence and Enterprise Risk Management (ERM).

To ensure that SM remains attentive to innovation matters, a Chief Innovation Officer has been appointed to drive innovation activities within MPA. The Chief Innovation Officer is also the Director of the Innovation, Technology and Talent Development Division (ITTD), which is responsible for developing Singapore as the Global Maritime Hub for innovation and talent. This ensures that MPA is internally aligned with external innovation efforts, with the support of a network of Innovation Champions, secretariats and taskforces.

SM clearly articulates MPA's commitment to Innovation Excellence, and celebrates the organisation's achievements in these areas at various platforms like

the InnovFest, Workplan seminar and Townhall. This is necessary for innovation to take root in MPA's culture.

SM regularly welcomes ideas from all sources, offering their support to ideas and projects surfaced via the iSuggest and Work Improvement Teams (WITs) platforms. Ideas that require additional funding for Proofs of Concept (POCs) can also tap on the internal MPA Innovation Fund. To ensure that innovation excellence is systemic and that a good part of their efforts focuses on innovations within their work areas, divisions within MPA explicitly state and explain their top 10 workplan items during the workplan cycle.



1.2 Organisational Culture

1.2a Develops a culture that supports the organisation's mission, vision and values to drive growth

1.2b Translates values into desired employee behaviours to enable innovation, learning and achieve the organisation's goals

MPA's MVV are aligned such that the Mission helps to achieve the Vision, and the Values articulate the behaviours expected of MPA staff in the pursuit of MPA's Vision. MPA's FIRST Values are translated into guiding policies, behaviours and practices that foster the desired culture, which enables innovation, learning and the achievement of MPA's goals (see Table 1.2.1).

// Table 1.2.1 – Fostering a Robust Organisational Culture in MPA //

Policies/Behaviours	Programmes/Practices
<p>FIRST Value: Forward Thinking We aim to be proactive & innovative. We will harness the best technologies & practices so as to stay relevant, efficient & competitive.</p> <ul style="list-style-type: none"> Set long-term goals Think out of the box Embrace change & innovation Anticipate problems & explore possible solutions Transform current way of doing things Adopt a risk-taking mindset 	<p>MVV, Future Ready Framework, NGP 2030, IMC 2030, Sea Transport ITM</p> <p>Global perspective in environment & industry sensing</p> <p>Division workplans, Workplan seminar & Corporate Key Performance Indicators (KPIs)</p> <p>Individual training roadmap including innovation training</p> <p>iSuggest, WITs, Learning Journeys & Ideathons</p> <p>Performance conversations & feedback</p> <p>Innovation STEER process & MPA Innovation Fund</p> <p>Ops-Tech & digitalisation plans</p> <p>PIER71 & SPC, MINT Fund & MCF</p> <p>Joint R&D partnerships with IHLs & industry</p>
<p>FIRST Value: Integrity We shall act responsibly, & be honest & morally courageous in carrying out our duties. We will be fair & above board in all our business dealings & relationships.</p> <ul style="list-style-type: none"> Carry out duties in an ethical & professional manner Be fair & above board in dealings with customers & suppliers Do not accept bribes or favours from anyone Take responsibility for actions Have courage to make difficult decisions 	<p>Corporate governance & sustainability reporting</p> <p>Code of ethics and whistle-blowing policy</p> <p>Public Service IMs & MPA Circulars</p> <p>ERM</p> <p>MPA conduct & discipline</p> <p>ISO 9001:2015 Quality Management System</p> <p>Supplier management</p>
<p>FIRST Value: Respect We shall respect the feelings of the individual, his/her dignity & self-worth, his/her time & effort, & his/her need to balance work & family life.</p> <ul style="list-style-type: none"> Listen to colleagues' views & ideas with an open mind Be flexible & understand the work-life harmony needs of staff Create a sense of camaraderie at the workplace Encourage colleagues & recognise their efforts by praising them or giving them a "pat on the back" 	<p>Conversation with CE and Townhall, other engagement events</p> <p>Volunteerism & Care Team</p> <p>HR Planning to be a Choice Employer</p> <p>People developer & talent management</p> <p>Work-life & staff welfare/well-being policies & initiatives</p> <p>MPA Care crisis response team</p> <p>Workplace safety & health</p> <p>Appreciation Day</p> <p>Rewards & recognition</p>
<p>FIRST Value: Service Excellence We shall strive to serve our customers competently, courteously & efficiently. We shall persevere so as to excel in all areas of our work through continual learning & a positive work attitude.</p> <ul style="list-style-type: none"> Show empathy to both internal & external customers Be patient when servicing customers' requests Listen attentively to understand customer concerns Value customer feedback & constantly look for ways to improve service Greet everyone with a smile Project a professional image in dealings with customers 	<p>Strategic service intent</p> <p>Service journey mapping</p> <p>Service competency & MPA archetype training</p> <p>Industry engagement forums</p> <p>Design thinking & co-creation with customers</p> <p>Pro-Enterprise initiatives & ranking survey</p> <p>Customer feedback channels</p> <p>Feedback & complaint management process</p> <p>Minimum service standards audit</p>
<p>FIRST Value: Teamwork We value teamwork, harmony & unity in our working relationships. We shall do our work with steadfastness & consideration for our colleagues & customers.</p> <ul style="list-style-type: none"> Participate in group activities Share information with colleagues Be willing to help others with their work Put the interests of the organisation before self Work cohesively as a team, putting aside personal differences Motivate team members to work towards a common goal 	<p>One MPA, One Partnership, One Maritime Singapore</p> <p>First responder & no-wrong-door policy</p> <p>COMPASS & outsourced service centre</p> <p>e-Platforms like MSW & SG-MDH</p> <p>MPA Workplan seminar</p> <p>Divisional & departmental activity days</p> <p>Union, industry & WOG partnerships</p> <p>KM Framework</p>

1.2c Embraces organisational change for sustainability

Since 2014, the Future Ready Framework co-created with staff has given the organisation clarity on the direction towards which MPA and Maritime Singapore are moving. NGP 2030, IMC 2030 and the Sea Transport ITM add further granularity to this direction. They have also been consistently used to provide staff with direction and insights on the future industry and operating environments. Governance platforms and the necessary resources are also in place to enable agile response to changes in the operating environment. This helps MPA and its staff to stay ahead of change.

MPA's innovation process 'STEER' (see Figure 5.1.1) is also applied to the change management process to ensure that organisational change is embraced for sustainability. The process involves:

- Scanning the environment for opportunities and ideas
- Translating ideas into plans
- Evaluating and selecting the best plan to address the gaps
- Executing the action plan
- Reviewing and monitoring implementation for effectiveness and continuous improvement

1.2d Nurtures a culture that enables innovation

MPA Innovation Framework

MPA's FIRST Values, especially "Forward Thinking," drive MPA's innovation culture. Both top-down and ground-up innovation matter for MPA. The Innovation Framework has been developed to articulate MPA's approach to nurture a pro-innovation culture (see Figure 1.2.1). The framework comprises 3 key thrusts: Align, Ambition and Actions, which work in concert to innovate and create value for both internal and external stakeholders.

Align: MPA drives innovation amongst its staff by providing big picture goals through master plans and key strategies. These visions and strategies are formulated and realised by dedicated committees.

Ambition: MPA enables innovation by providing staff with the tools and resources to nurture innovative ideas. These tools and resources include funding, innovation workshops, sharing of innovation stories and a structured process to review and implement ideas.

Actions: MPA strives to create an environment where creativity and innovation can flourish by engaging its staff in the innovation journey. It does this through recognition/reward schemes and innovation events, as well as by continually celebrating innovation, reinforcing its messages and communicating its Vision.

Dividing Deeper into Innovation Culture – The BMW Spirit
In response to feedback provided during 2018's EES, the BMW (Breakthroughs, Meaningful Impact and Willpower) Spirit was defined to reinforce management support for MPA's innovation efforts, and cascade expectations on its innovation culture.

The BMW Spirit (see box story on Communication to Facilitate the Embracing of Organisational Changes) was developed to remind staff of the right spirit with which to drive innovation. It was first articulated during InnovFest 2019.

Values Week 2019 – Forward Thinking Day

As part of MPA Values Week 2019, Forward Thinking Day kicked off the rest of the week's festivities and celebrated the value of Forward Thinking. It sought to reinforce MPA's efforts to drive a culture that supports innovation, provide a platform to promote the use of innovative solutions, and enable participants to experience, learn, understand and apply innovation.



Communication to Facilitate the Embracing of Organisational Changes

WHY?

"IF WE DO NOT **DISRUPT**, WE WILL BE **DISRUPTED**."



CE's Speech at InnovFest 2019

Clarity of direction and communication is critical to help the organisation embrace change. Through InnovFest 2019, Conversation with CE and Workplan seminar 2019, CE rearticulated the Mission, key directions and ambitions of MPA. She explained the impetus for the upcoming changes and how they would be carried out. She shared that SM would be cascading the key points to the ground, and opened her doors to feedback and suggestions. As a follow up to concerns raised at the Conversation with CE, 4 work streams led by 6 Heads of Department (HODs) and sponsored by 6 different Division heads were commissioned to develop recommendations to facilitate organisational change.

WHAT?

DISRUPT BUT...



AS WE **A**LIGN to our core mission. Entrench our **A**MBITION for Singapore to be a Global Maritime Hub. Put into **A**CTIONS our plan to remain competitive in the long run.

HOW?

WORKFORCE TRANSFORMATION



TEAMWORK

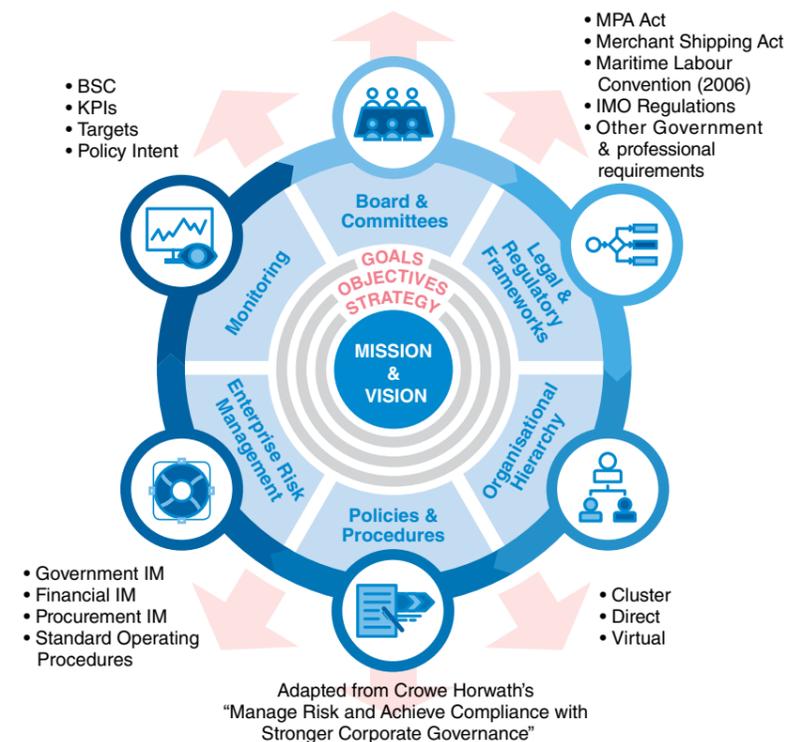


1.3 Corporate Governance and Social Responsibility



1.3a Establishes a governance system to ensure accountability and transparency

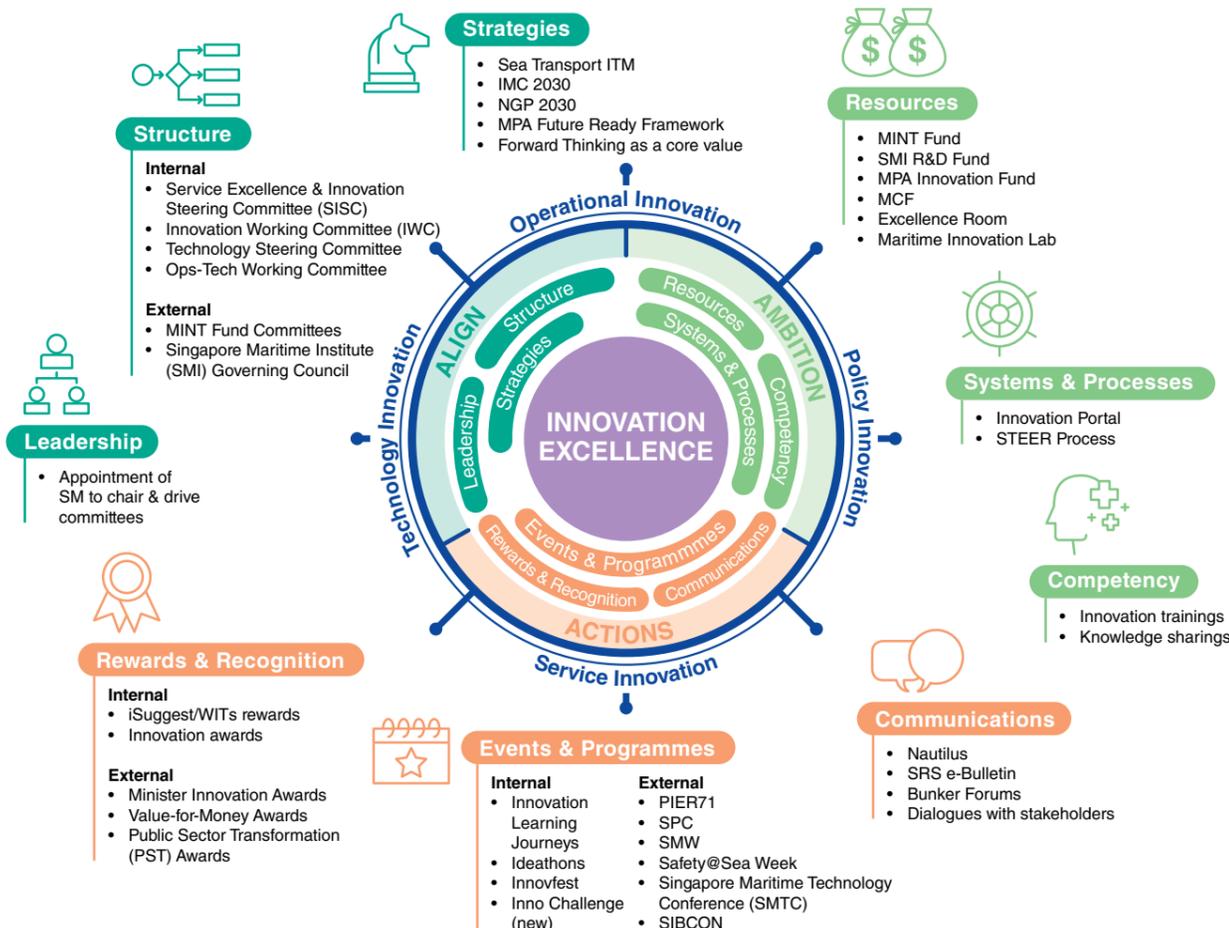
MPA has a comprehensive Corporate Governance Framework to ensure good governance throughout MPA.



1.3b Implements policies and involves stakeholders to contribute to the community and the environment

Formed in 2014, the MPA Sustainability Office reports directly and accounts to the Board at regular intervals on the progress of initiatives and KPIs. Its key objectives are to foster a culture of good governance, prudent resource management and conscientious environmental and social practices, both within MPA and industry-wide. Sustainability is a community effort and MPA actively involves stakeholders to implement its policies (see Table 1.3.1).

// Fig 1.2.1: MPA Innovation Framework //



MPA as a Champion of Good

MPA was recognised as a Champion of Good by the National Volunteer & Philanthropy Centre in 2018. As the leading driver of Singapore's global maritime aspirations, MPA believes that this influence can be leveraged to encourage its staff and stakeholders (such as WOG partners, unions and maritime partners) to give back to society. In particular, MPA hopes to benefit its adopted charities Kids In Play (KIP) Programme and REACH Community Services Society.

The MPA Charity Flea Market held in 2019 saw the Care Team marshalling the whole organisation to sell food and second-hand products to staff and partners (e.g. MOT) within the PSA Building (PSAB). There was also an e-bidding charity sale at the charity flea market. These efforts raised \$7,266.20, which was wholly donated to beneficiaries. The process also brought together staff from different parts of MPA in a collective charitable endeavour.



// Table 1.3.1: Examples of MPA's Sustainability Efforts //



To lead in promoting sustainability practices in Environment, Economic, Social & Financial spheres, ensuring that the Maritime Industry is future-ready.

Thrust	Environment Air Water Waste	Economic IMC SMI Global Port	Social People Charity	Financial Governance Resource Management
Examples of Initiatives	<ul style="list-style-type: none"> Water efficiency programme MPA recycling efforts Maritime Singapore Green Initiatives (MSGI) Energy consumption Solar panel installation Green mark 	<ul style="list-style-type: none"> International efforts for promoting secure, sustainable & efficient shipping e.g. Singapore-IMO Third Country Training Programme (since 1998) 	<ul style="list-style-type: none"> Fund raising events e.g. MPA Charity Golf, Charity Flea Market & e-Bidding, Say It with Flowers 	<ul style="list-style-type: none"> Driving industry sustainability reporting
Examples of Partners	Nature Society (Singapore), Singapore Environment Council, Singapore Reef & Marine Conservation Committee	IMO, countries covered under geographical scope of MOU with IMO	Singapore Maritime Community, The Salvation Army Prison Support Services Kids In Play, REACH Family Service Centre, Community Chest	Singapore Exchange (SGX), Big 4 Accounting Firms

Emphasising Environmental Sustainability

Maritime Singapore Green Initiative (MSGI)

Green Ship Programme (GSP)	Green Port Programme (GPP)	Green Technology Programme (GTP)	Green Energy Programme (GEP) (Introduced in 2016)	Green Awareness Programme (GAP) (Introduced in 2016)
Singapore-registered ships	Ocean-going ships calling at port	Local maritime companies	Industry at large	Industry at large
Encourage reduction of CO ₂ , SO _x , and NO _x	Encourage reduction of SO _x and NO _x	Encourage adoption of green technologies	Promote adoption of alternate/green marine fuels	Promote awareness of green shipping

In 2011, MPA pledged to invest up to S\$100 million over a 5-year period to support 5 different programmes within the MSGI. Maritime companies were also

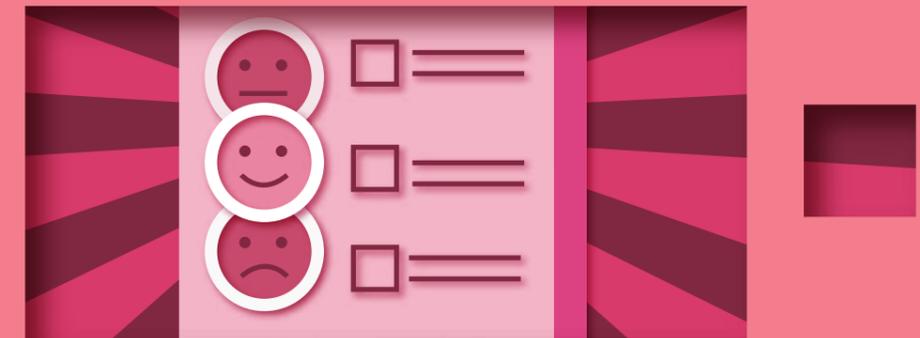
invited to take the Maritime Singapore Green Pledge to demonstrate their commitment to promoting clean and sustainable shipping in Singapore.

Advancing Leadership in Sustainability Reporting

Pioneering sustainability reporting in the maritime and Singapore public sectors, MPA innovatively combines 3 frameworks to conduct best-in-class reporting. MPA's reports are aligned to the widely-adopted Global Reporting Initiative (GRI) Sustainability Reporting Standards, the principle-based International Integrated Reporting Council's Integrated Reporting Standards and the United Nations Sustainable Development Goals.

MPA also launched its Sustainability Reporting Co-Funding Scheme to encourage SGX-listed maritime companies to embrace SGX's sustainability reporting requirement. In 2019, MPA and its industry and sustainability partners developed the Maritime Sustainability Reporting Guide, the first sectoral-driven sustainability reporting guide developed in Singapore, and amongst the first few guides in the world to be aligned to GRI Standards' Sector Disclosure initiative.

02



Customer Feedback

CUSTOMERS



Customer Experience



Customer Satisfaction



Customer Service

2.1 Customer Requirements

2.2 Customer Experience

2.3 Customer Satisfaction

Lloyd's is very grateful for the support from MPA and the Monetary Authority of Singapore (MAS), and we will continue to work closely with both organisations to further develop our base here as the regional hub for the Asia-Pacific.

Mr Kent Chaplin
CEO,
Lloyd's Asia Pacific

MPA is and continues to be a good listener and partner to the maritime finance industry - from attracting ship owners to Singapore to making the Singapore flag/registry ships even more attractive to supporting various shipping seminars and programmes.

Mr Lee Keng Mun
Head of Shipping Asia,
HSH Nordbank AG, Singapore Branch

MPA went beyond its role to acquire knowledge of the full commercial linkages and used it to expand our coverage of the maritime cluster. By doing so, MPA was able to ensure that we ring-fenced the incentives support while still complying with international tax procedures. This success was evident in Singapore being rated the Top Maritime City of the World for 8 continuous years, as shown in the Menon report.

Mr David Chin
ex-Director General of Trade, Ministry of Trade and Industry
ex-Deputy CEO, Trade Development Board

Start-ups bring grit, agility and potentially disruptive innovation into an industry that is steeped in tradition and inefficiencies. The collaborative efforts amongst MPA and their industry partners in turn offer deep domain expertise and are great opportunities for start-ups to penetrate a relatively untapped and under-served market, which is a win-win scenario.

Mr Kelvin Ong
Partner, TNB Ventures

It is heartening that in the evolving maritime landscape, the Singapore government is galvanising the industry to embrace emerging technologies and relook their systems and processes to achieve greater efficiencies and optimisation. The development of the Sea Transport Industry Transformation Map is another testimony of the strong alignment between the government and industry in Singapore that has been and will continue to be the key to the success of Maritime Singapore.

Mr Esben Poulsson
Chairman, International Chamber of Shipping
President, Singapore Shipping Association
Chairman, Enesel Pte Ltd

02 CUSTOMERS

MPA Service Excellence Framework

With its belief in Service Excellence, commitment to being pro-enterprise, and support for innovation, entrepreneurship, new business models and technological advancements, MPA has developed a Service Excellence Framework (see Figure 2.1.1) to anchor service delivery. This framework revolves around 3 customer management tenets:

- Stay close to customers' needs
- Go the extra mile
- No challenge too difficult; no task too small

// Fig 2.1.1: MPA Service Excellence Framework //



2.1 Customer Requirements

2.1a Segments markets and customers and understands their current and future requirements

MPA puts customers at the core of service delivery and constantly seeks feedback to better understand their concerns and needs. These feedback are received through platforms such as:

- Market surveys and studies: Pro-Enterprise Ranking (PER) Survey, Annual Marine Services Survey (AMSS) and other comparative reports on the maritime industry
- Direct engagements with customers at industry forums, conferences, events, dialogue sessions and company visits: SMW, SIBCON and Safety@Sea Week
- Feedback and complaints from the organisational website, e-service channels, one-to-one interactions and appeals

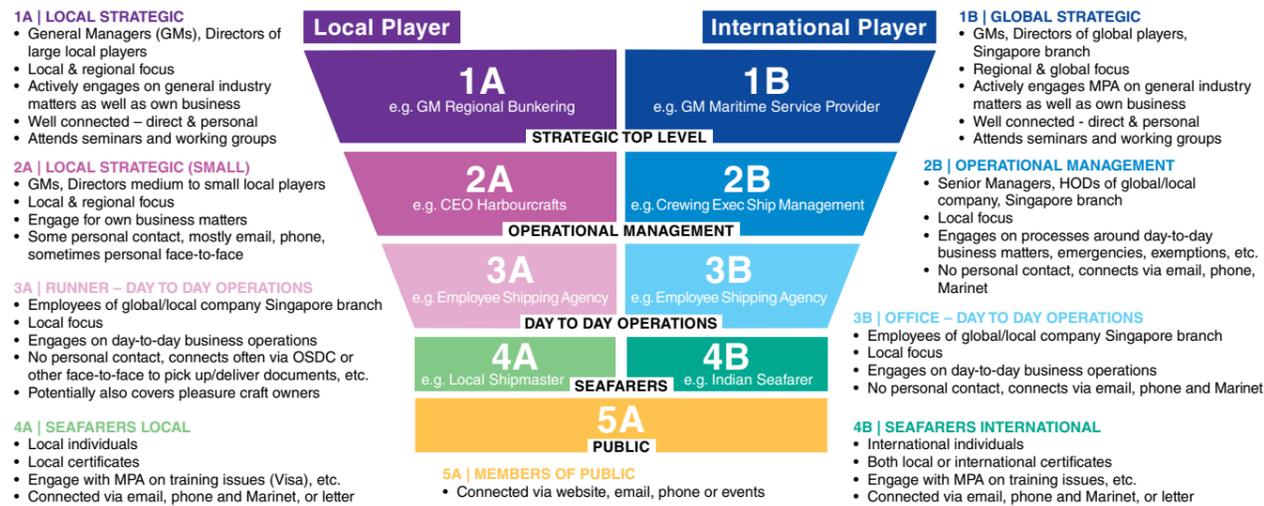
MPA's customers are segmented according to the key services it provides.

Understanding customer needs and emotions are crucial to create a positive customer experience. MPA is working on developing a more detailed service journey map to deepen its understanding of the end-to-end journey for its customers. This will provide additional data-points to identify and prioritise policies and services for review and redesign.

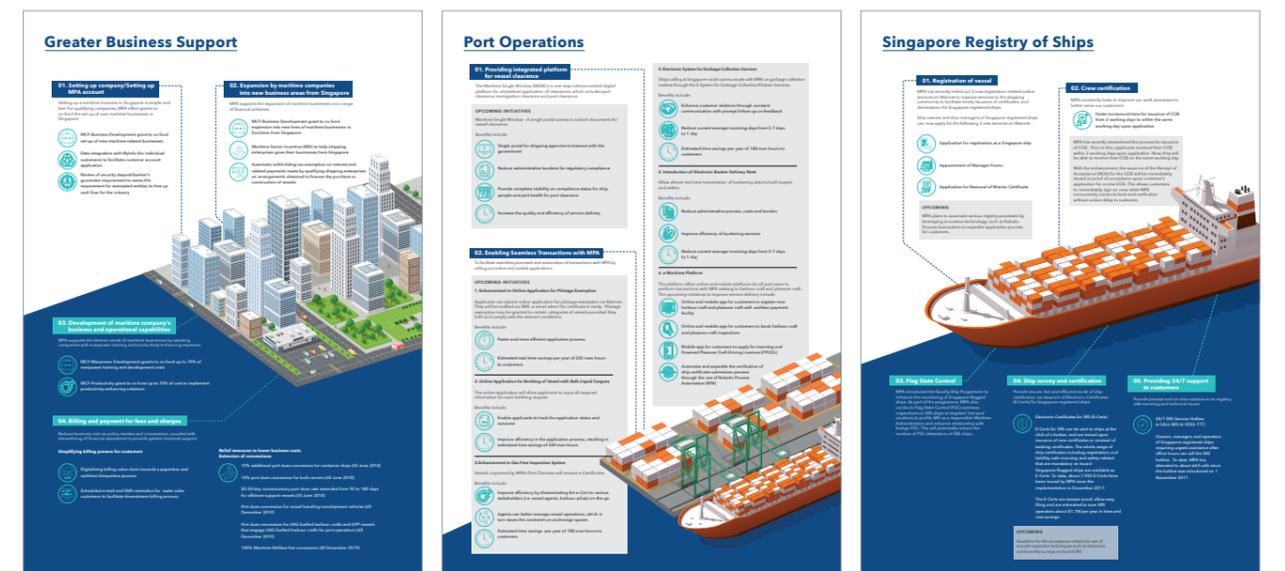
To deepen MPA's understanding of its customers' voice, the organisation embarked on a collaborative project with the Civil Service College (CSC) to develop 9 customer archetypes (see Figure 2.1.2). This crystallised the different archetypes' needs, challenges and expectations of good service. This provides MPA with a better position from which to develop its service strategies to enhance customer service. To empower staff's empathy with customers' perspectives and enhance their ability to care for, listen to and understand customers' needs and challenges, MPA also translated these 9 customer archetypes into a training programme.

With listening posts and processes in place, MPA will continue to validate its understanding of its customer segments and the operating environment, and use different methodologies to deliver better value and experiences to its customers.

// Fig 2.1.2: MPA Customer Archetypes with an Example of the Voice of an Archetype //



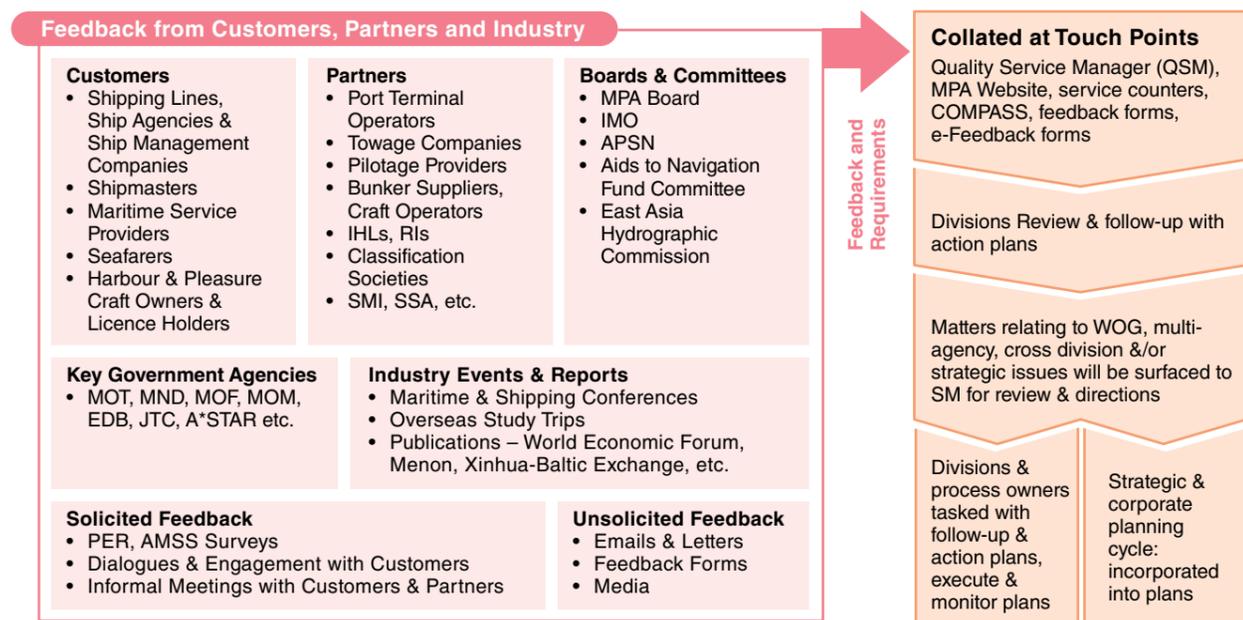
// Fig 2.1.4: Examples of Strategic Plans Developed from Market and Customer Requirements //



2.1b Incorporates market and customer requirements into strategic plans

MPA's process for incorporating customer requirements into strategic improvement plans is outlined in Figure 2.1.3. Figure 2.1.4 illustrates how MPA has incorporated the requirements into its strategic plans.

// Fig 2.1.3: Incorporation of Customer Requirements into Strategic Improvement Plans //



2.2 Customer Experience

2.2a Incorporates customer expectations in designing touch points, products, processes and services

Apart from actively incorporating customer insights and expectations into the design of its touch points, products, processes and services, MPA also co-creates them with different customer segments and partners (see Table 2.2.1).

// Table 2.2.1: Examples of Co-creation with Customers //

Co-creation Method	Examples
Formation of steering committees and working groups featuring industry players	Formation of the IMC 2030 Advisory Committee chaired by Mr. Andreas Sohmen-Pao, Chairman of BW Group, to develop the IMC 2030 Strategic Review Report
Active engagement to solicit feedback	Active soliciting of industry feedback for Sea Transport ITM and the Maritime Industry Transformation Series
Soft launches, pilots and prototypes to get feedback	Pilot of blockchain-based maritime trade platform TradeTrust, which will initially focus on blockchain-powered electronic bills of lading (see box story on Blockchain in Category 5.1)
Co-funding and joint implementation of projects	Supporting start-ups from the SPC to work with maritime companies for prototype development

Building up a 360° View of the Customer through COMPASS

To enhance efficiency and effectiveness in handling customer information, which currently resides with various touch points, COMPASS was launched as a customer-relationship management (CRM) system. As a centralised information bank on customer interactions, it provides MPA with a 360° view of customers. This allows MPA to review and streamline its current processes and enable MPA staff to provide a more holistic customer experience while presenting a 'One MPA' image. Furthermore, COMPASS ensures that customer information is retained when there are staff movements.



2.2b Ensures customer feedback is addressed and analysed

All feedback and complaints go through a standard Feedback Management Process and Complaint

Management Process to ensure professional resolution and drive improvements.

Feedback and complaints received, as well as compliance with the service-level agreement set, are analysed and reported at the SISC Meeting for SM's discussion (See Fig 2.2.1).

Fig 2.2.1 Feedback from Customers, Industry and Partners

Feedback from Customer Surveys, PER, Events, etc.

Touch Points: Staff, OSDC, Website, e-Services, etc.

- Captured by departments & Organisational Excellence Department (OED) (aggregate & analyse); forwarded to Divisions for review
- Collation & deliberation of feedback through the 3 tracks (Business Cost, Compliance & Port Efficiency)
- Divisions will plan, prepare & propose action plan (resources & deployment) to address issues
- For strategic issues: Divisions will present action plan to SISC &/or Senior Management Meeting (SMM) for evaluation
- Divisions or identified process owners will execute & implement action plan (involving Staff, Partners and Customers). Monitoring & reporting of progress across timeline to Division Heads, SISC &/or SMM

Incorporated in Future Plans

- Post-implementation review

2.2c Provides ease of access for customers to seek assistance and information to enhance the customer experience

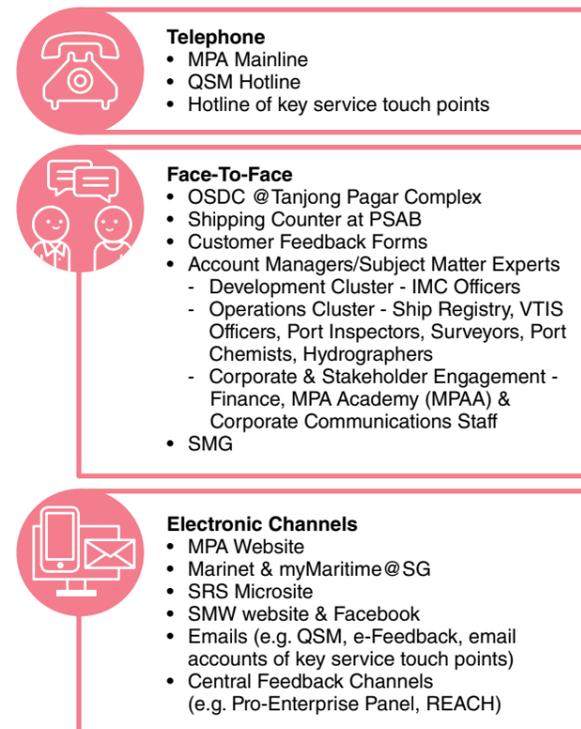
As part of the overall customer experience, MPA seeks to provide better accessibility for customers to seek assistance and information. Multiple touch points are made available, as shown in Figure 2.2.2.

A deep-dive study of MPA customers' experiences revealed the following:

- Many queries managed by MPA's contact centre were actually straightforward and easily resolved online.
- Customers acknowledge that digitalising processes have helped enhance their efficiency.
- They are open to digital options to carry out their transactions, but prefer dealing with MPA staff directly for exceptional cases.

As MPA continues its push towards digitalisation and improving customer experience, a 2025 goal of enabling customer self-help as the first option was set. To achieve this, MPA will continue to create intuitive and customer-centric digital options for customers, educate and nudge customers towards the digital options, and drive process improvements to simplify customer processes.

Fig 2.2.2: Customer Feedback Channels

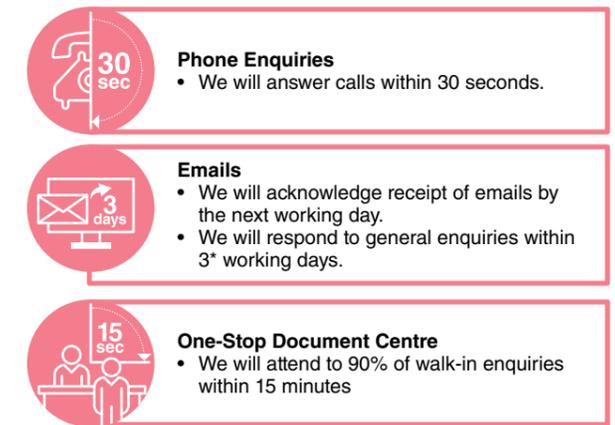


2.2d Sets performance standards at customer touch points to ensure consistent service delivery

MPA sets performance standards at its touch points to ensure consistency in service delivery. Corporate service standards (see Figure 2.2.3) ensure that MPA's staff respond to customer enquiries speedily and efficiently.

Specific customer service standards are also set for each customer segment. These are regularly reviewed to ensure they meet the evolving needs and expectations of customer segments.

Fig 2.2.3: Corporate Service Standards



*For complex enquiries which require a longer response time, we will give an interim reply within 3 working days and a full reply within 14 working days.

2.3 Customer Satisfaction

2.3a Determines and improves customer satisfaction for various customer segments

To ensure consistent and positive experiences at its touch points across various customer segments, MPA puts in place mechanisms to measure customer satisfaction and surface opportunities for improvement (see Table 2.3.1).

Table 2.3.1: Key Mechanisms Determining Customer Satisfaction

Customer Segment	Mechanism
Ship owners/operators, ship agents & ship management companies	<ul style="list-style-type: none"> • PER Survey • Annual Marinet Survey • AMSS
Maritime service providers	<ul style="list-style-type: none"> • Focus Group Discussions • PER Survey
Shipmasters	<ul style="list-style-type: none"> • AMSS
Seafarers (locally registered seamen eligible for welfare schemes administered by MPA)	<ul style="list-style-type: none"> • Course Evaluations
Harbour craft & pleasure craft owners & licence holders	<ul style="list-style-type: none"> • PER Survey • Feedback Forms • Annual Marinet Survey

MPA Continues to Receive Top Honours in PEP-SBF PER Survey

MPA uses the PER Survey to monitor how pro-business it has been in delivering its regulatory and promotional functions. Drawing upon insights from the 2017 survey, MPA enhanced communications



with its customer groups to ensure that they understand how MPA was closing the loop to their feedback to address areas of concerns. For its efforts, it regained its top ranking in 2018.



2.3b Determines current and future drivers of customer satisfaction

MPA takes reference from components of the PER survey to determine current drivers of customer satisfaction. They are as follows:

- 
Customer Responsiveness
 MPA's awareness of customers' issues and responsiveness in addressing these issues
- 
Transparency
 How clearly MPA communicates its regulations and decisions
- 
Review of Rules and Regulations
 How often MPA reviews its regulations and whether it consults the public in these reviews
- 
Pro-Enterprise Orientation
 How business-friendly MPA's policies are
- 
Compliance Cost
 How costly it is to comply with MPA's regulations

To forecast the future requirements and expectations of its customers, MPA relies on:

- 
 Intelligence shared by industry partners, MOT and other government agencies
- 
 Papers presented at maritime conferences and industry events
- 
 Collaborations with IHLs, RIs and the industry
- 
 Benchmarking studies and learning journeys
- 
 Surveys about customers' future expectations

The key indicators of customer satisfaction and feedback are reviewed and evaluated for service improvement opportunities. Improvement plans are subsequently drawn up, endorsed by SM and incorporated into strategic plans.

2.3c Incorporates customer insights and feedback into the strategic improvement plans

The key indicators of customer satisfaction and feedback from customers are actively analysed to develop insights which will feed into MPA's strategic improvement plans (see Section 2.1b).

Enabling Maritime Singapore's Digitalisation Efforts

MPA, in partnership with the Infocomm Media Development Authority, Enterprise Singapore (ESG) and SkillsFuture Singapore (SSG), rolled out the Sea Transport Industry Digital Plan (IDP) for the ship agency and harbour craft sub-sectors.

Aligned to the Sea Transport ITM, the Sea Transport IDP provides Small and Medium Enterprises (SMEs) in the Sea Transport industry with an easy-to-use, step-by-step guide on the digital solutions to adopt at each stage of their growth.

03

Strategy Development



Risk Management

STRATEGY



Strategy Implementation



3.1 Strategy Development

3.2 Strategy Implementation

Future-Ready

3.1 Strategy Development

3.1a Determines organisational challenges and anticipates external changes and risks

MPA relies on environment scans, sense-making and analytics and ERM to determine organisational challenges and anticipate external changes and risks.

Environment Scans

MPA conducts regular environment scans based on a set of driving forces and the Future Ready strategic thrusts. The key challenges identified through such scans are then closely monitored and regularly reviewed by SM and relevant officers. A comprehensive environment scan is conducted annually, and the results are presented at the Management Advance for consideration when mapping out the upcoming year's workplans.

Sense-making and Analytics

To better enhance its understanding of the environment, MPA has made a conscious effort to improve its interpretation of gathered data through:

- Deep-dive studies and analyses conducted internally or by research partners
- Comparative and benchmarking studies
- Learning journeys, industry engagements and round table discussions
- Data analytics and dashboarding

MPA signed a MOU with IBM to acquire data analytics skills in aspects such as safety, security and port operations (see Category 6 Box Story on SAFER). Additionally, MPA works closely with other national security agencies, such as RSN and PCG, to use analytics to predict hostile threats. To deepen MPA's sense-making and data analytics capabilities, the Data Science and Artificial Intelligence Department was set up to drive focus and change in this area.

Enterprise Risk Management (ERM)

To ensure that MPA is focused on its Mission and remains on course to fulfil its Vision, the organisation developed the ERM Framework (see Figure 3.1.1).

The framework articulates a structured process to identify, assess and treat risks. This process is coordinated with MPA's annual workplan. Insights gathered from environment scanning and sensing initiatives are used to identify potential risks that could derail the organisation from its mandate. Risk mitigating measures are then developed and committed as work initiatives by SM, as part of the annual workplan cycle.

// Fig 3.1.1: Enterprise Risk Management Framework //



Port Authorities Roundtable (PAR)

The PAR, initiated and inaugurated by MPA in 2015, facilitates the exchange of ideas and the learning of best practices. It is a key platform for leaders of port authorities to share and discuss issues of common interest openly, and seek mutually beneficial collaboration opportunities in today's evolving maritime landscape. In 2018, the PAR was hosted by the Port of Long Beach, and was themed "The Port of the Future." It was attended by 14 port authorities. Topics discussed at PAR included safety, security, sustainability, innovation and productivity and preparing the workforce of the future.



Global developments in sea transport can be seen through the growth and transformation of Singapore as a maritime centre. The development of Maritime Singapore is about participating in the future, adapting to change, creating and seizing opportunities, and the pursuit of excellence.

Mr Lee Kuan Yew
Minister Mentor

The maritime industry continues to create good jobs and employs 170,000 people while contributing 7% to Singapore's GDP. Singaporeans know that the port is important to us but I suspect many of us don't realise how critical it is.

Mr Lee Hsien Loong
Prime Minister

As we grow and move towards innovation, we want to put the industry in a digitalisation and technology adoption phase. Unlike the aviation industry, ships are not manufactured by multiple companies. They are manufactured by multiple companies with multiple suppliers. From a ship management perspective, managing spare parts is a nightmare. Using technology, supplies can be printed on demand.

Mr Michael Phoon
Executive Director,
Singapore Shipping Association

The successful growth of Singapore's maritime sector over the past decade has been founded on a clear strategy, effective implementation and strong alignment between the government and the maritime community. These factors are even more relevant at a time where the outlook is less certain and where the emphasis is shifting from physical to virtual flows. Connectivity, innovation and talent are seen as the best ways to remain responsive to changing conditions.

Mr Andreas Soehmen-Pao
Chairman, BW Group
Chairman, Singapore Maritime Foundation

Finance plays a critical role in the capital-intensive maritime industry. While the sector is presently facing headwinds, our listed maritime and offshore services companies raised nearly US\$4 billion from 2013 to 2015 through IPOs, secondary fundraising and bond listing on SGX.

Mr Loh Boon Chye
CEO, SGX

3.1b Develops long- and short-term strategies to address organisational goals

NGP 2030, IMC 2030 and Sea Transport ITM

The NGP 2030 master plan maps out MPA's developmental strategy towards Maritime Singapore's vision to be a Safe, Efficient and Sustainable Global Hub Port, while the IMC 2030 vision is for Singapore to be the Maritime Hub for Connectivity, Innovation and Talent. The Sea Transport ITM builds on these strategic long-term plans with specific initiatives to catalyse innovation, drive productivity improvements and enhance the skills of the maritime workforce (see Figure 1.1.1). MPA's mandate is to ensure Maritime Singapore stays ahead of future competition, continues to remain a key pillar of Singapore's economy and generates good jobs for Singaporeans.

Workplan Cycle

While MPA's Future Ready Framework and long-term master plans guide its strategic direction, these must be translated into mid- and short-term milestone targets. MPA continuously reviews and updates its strategic priorities. The process is supported by the annual workplan exercise, where the organisation charts its workplans for the next 1 to 5 years against evolving developments. The workplan

cycle begins with the Management Advance, where the participants collectively brainstorm how to refine MPA's focus areas. This is followed by the workplan exercise where all divisions in MPA develop and seek SM's endorsement of their plans for the upcoming years. The plans are consolidated into an organisational corporate workplan which is then endorsed/approved by MOT and the Board. This governance process ensures that MPA remains aligned to its strategic direction and the WOG, moving together as "One MPA, One Partnership, One Maritime Singapore" to achieve its goals for 2030 and beyond.

3.1c Engages key stakeholders in the strategy development process

MPA engages key stakeholders through numerous platforms to keep abreast of sentiments and developments in the global maritime industry, and to solicit valuable feedback taken into consideration during strategy development. Platforms include SRS Forum, Steering Committee meetings for NGP 2030, PIER71 and MINT Fund, and also quarterly meetings with PSA Corporation (PSAC), Jurong Port Pte Ltd (JPPL) and Singapore Cruise Centre Pte Ltd.

Singapore International Bunkering Conference and Exhibition (SIBCON) 2018

SIBCON has been recognised as a leading and key forum for the marine fuels industry, where bunkering and shipping professionals connect with top industry leaders. SIBCON 2018 achieved a record of over 2,000 participants from more than 50 countries, including C-suite industry stakeholders.

With IMO's 2020 sulphur cap looming, SIBCON 2018 presented itself as a significant platform to discuss how the bunker industry could comply with the requirements. MPA used the platform to initiate the co-creation of a 2030 roadmap for the Singapore bunker industry with its industry partners.



3.1d Develops innovation strategies with clear goals and articulation of their intent and value to the organisation

The Sea Transport ITM provides the vision and strategies for transforming Singapore's maritime industry. Innovation is a key pillar which aims to sharpen industry competitiveness, catalyse new growth areas, enhance productivity, create future jobs and skills,

and encourage local companies to internationalise. It remains critical as Singapore strives to develop new industry capabilities and solutions that leverage on cutting-edge technologies such as AI, autonomous systems and robotics, big data analytics, cloud and mobile computing, and modelling & simulation.

MPA has consulted the industry, trade associations, unions and relevant agencies to craft the innovation strategies (see Table 3.1.1).

// Table 3.1.1: MPA Innovation Strategies with Clear Intent and Value to MPA and Maritime Singapore //

Innovation Strategies	Description
Build a vibrant maritime innovation ecosystem	<p>To promote industry digitalisation, MPA recently set up the Chief Digital Officer (CDO) Network, with the aim of creating innovation champions in maritime companies to help drive transformation through the adoption of technology and innovation. The first cohort of digital officers was formed by 23 maritime companies, and has since been expanded to 46 members. Going forward, MPA will set up a Chief of HR Officers Network, to work together with the CDO Network on the transformation of skillsets to support digitalisation of the sector.</p> <p>MPA has also launched the Sea Transport IDP initiative with IMDA, ESG and SSG, as part of the SME Go Digital Programme that makes going digital simple for SMEs. The Sea Transport IDP for the harbour craft and ship agency sectors was developed to guide SMEs on their digital transformation efforts, and will be extended to other sub-sectors over time.</p> <p>In addition, MPA takes an active and targeted approach to strengthening local and international collaboration to further maritime industry innovation and capability development. This includes specific areas of innovation such as port technologies to improve terminal productivity and efficiency (through MOUs with PSAC and JPPL), digitalisation of trade and maritime documentation (through MOUs with SSA, Singapore Customs and IMDA), and promoting additive manufacturing (AM) for maritime processes (with PSA, SSA, NAMIC and 3DMetalforge). Through collaborations with technology providers (e.g. ST Electronics, M1 and Wartsila), classification societies and RIs, knowledge spill-overs, linkages and other collaborations in R&D can take place. For example, RICs (e.g. Lloyds Register's Global Technology Centre and ClassNK's Global Research and Innovation Centre) have been set up in Singapore to facilitate industry innovation and industry-academia collaboration. These efforts support the deepening of maritime R&D capabilities and value creation and capture for Singapore.</p> <p>Within MPA, a robust process for developing innovation strategies and approaches also exists. Led by a Chief Innovation Officer who is also the director-in-charge of industry innovation, the IWC develops strategies to drive a culture of innovation within MPA. These strategies are discussed in detail at SMMS, SISC meetings, IWC meetings and project meetings. Through this process, the MPA Innovation Process, Innovation Culture, MPA Innovation Fund, Ops-Tech Roadmap, Digitalisation Plan and PST Strategy have been developed to guide MPA's innovation efforts.</p>
Create an enabling environment for innovation	<p>Port of Singapore as a Living Lab – The MLL serves as a technology collaboration platform where innovative projects such as next generation vessel traffic management concepts, remote pilotage, Maritime Autonomous Surface Ships (MASS), JIT port operations and other new innovative solutions are piloted. To encourage companies to embark on rapid innovation and experimentation, MPA put in place an enabling environment, infrastructure, data and smart regulations for innovation. Singapore has one of the world's busiest hub ports and waterways, which presents the most demanding environment for spurring innovative ideas and solutions. The MLL, together with PSA Living Lab and Jurong Port Living Lab, aims to bring together process owners, technology providers and researchers to co-innovate, test-bed new systems in an actual operating environment, and bring these solutions closer to market.</p> <p>Some of these key innovation enablers are:</p> <ul style="list-style-type: none"> • Government co-funding through the MINT Fund • Provision of test-bedding areas in port waters, regulatory sandbox, wireless ship-to-shore communication infrastructure, and Maritime Innovation Lab co-working spaces • Provision of data through SG-MDH

Engaging Stakeholders on Sea Transport Industry Transformation

The Sea Transport ITM has been co-created in partnership with industry unions and government agencies to catalyse innovation, drive productivity improvements and enhance the skills of the maritime industry workforce. The aim is to grow the sector's value-add by \$4.5 billion and create 5,000 good jobs by 2025.

The 5 MOUs signed between MPA and tripartite partners at the Sea Transport ITM launch underscore the collective commitment of all stakeholders to drive innovation, productivity and human capital development to transform Maritime Singapore.



Since then, the Maritime Industry Transformation Series has been launched through 6 thematic sessions, engaging about 650 participants in the process. Within the government, MPA has also continued collaborating with other government agencies like SSG, Workforce Singapore, ESG and GovTech, industry associations such as Singapore Maritime Foundation (SMF) and Singapore Shipping Association (SSA), as well as its unions on initiatives that harness growth for the sector.

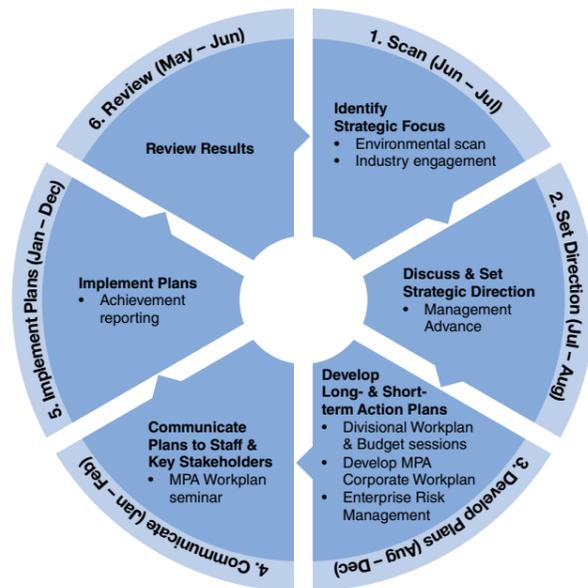


Innovation Strategies	Description
Deepen maritime R&D capabilities	<p>As reflected in the recently launched Maritime R&D Roadmap 2030, MPA and SMI promote R&D and innovation to deliver impact to the maritime industry in these 5 strategic areas:</p> <ul style="list-style-type: none"> • Efficient & intelligent world-class next generation port • Strategic sea space & maritime traffic management • Smart fleet operations & autonomous vessels • Effective maritime safety & security • Sustainable maritime environment & energy <p>In order to become a global maritime knowledge hub and develop a long-term quality pool of maritime researchers and specialised R&D capabilities, MPA and SMI have jointly established 3 maritime CoEs to deepen R&D capabilities in strategic areas. The 3 areas are: (a) Next Generation Ports; (b) Maritime Energy and Sustainable Development; and (c) Maritime Safety. The CoEs seek to strengthen the collaboration between industry and the research community, develop innovative solutions for the port and maritime sector and accelerate technology transfer to the industry.</p> <p>In addition, MPA and SMI launched the Maritime Transformation Programme (MTP), a key vehicle to implement the innovation initiatives under the Sea Transport ITM. The MTP will leverage the National Research Foundation's (NRF's) Research, Innovation and Enterprise Funds (RIE Funds) to grow maritime R&D capabilities and transform the sector. The focus areas for the MTP are aligned with the 5 strategic areas of the Maritime R&D Roadmap as mentioned above.</p>
Grow maritime technology enterprises to develop innovative solutions	<p>MPA also works with the industry and overseas partners in the start-up ecosystem to grow tech start-ups for the maritime sector in Singapore. The PIER71 and SPC programmes aim to attract innovative start-ups from Singapore and overseas. These initiatives help develop solutions to industry issues and anchor the development of next generation maritime technology to deliver economic value for Singapore. Through attracting, connecting with and grooming global tech start-ups, entrepreneurs and private capital, MPA accelerates innovation and forays into adjacent/new growth areas, builds capabilities and solutions for Singapore's maritime industry and strengthens Singapore's status as a Global Maritime Hub for innovation and talent.</p>

3.2 Strategy Implementation

3.2a Develops and implements long- and short-term action plans

// Fig 3.2.1: Corporate and Strategic Planning Cycle //



Development and Implementation of Workplans

MPA adopts a corporate and strategic planning cycle (see Figure 3.2.1) to achieve its organisational goals, which describes the development and implementation of action plans by all Divisions. These action plans are anchored by MPA's future-ready goals and strategic focus, which are in turn constantly reinforced/re-aligned as MPA's environment evolves.

Anchored by this strategic focus from the Management Advance, each Division develops their workplans and budgets for the following year.

Projects that involve the efforts of different Divisions, agencies or industry partners are supported and guided by special committees, e.g. SISC, ERM Steering Committee and NGP 2030 Steering Committee.

Workplan implementation progress is tracked via regular progress reports and KPIs. See Table 3.2.1 below for the list of institutionalised reporting on progress updates.

// Table 3.2.1: Monitoring Workplan Implementation //

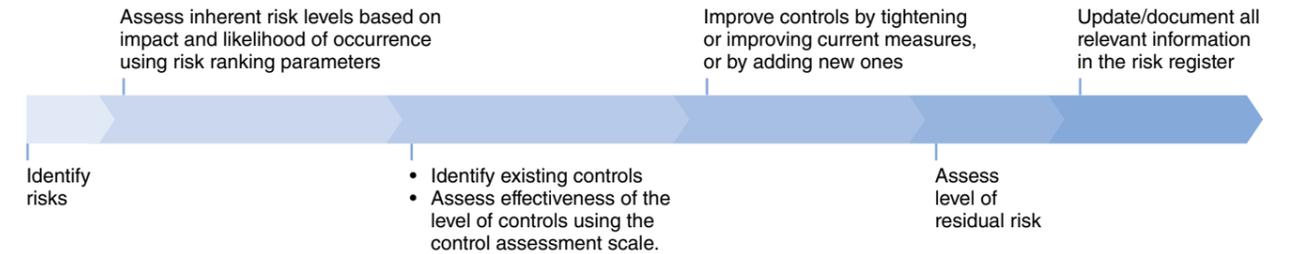
Performance Reporting	Platform	Frequency
WOG Alignment		
KPIs & strategic initiatives under MOT sea theme	MPF	Annually
KPIs supporting WOG outcomes, especially 'Develop Singapore as an International Maritime Hub'	Budget Book - MOT/MOF	Annually
Internal Reporting (MPA, MPA Board, MOT)		
Corporate performance reporting	SMM, MSM & Board	Biannually: mid-year & year-end
Management indicators	SMM, MSM & Board	Monthly
Staff progress & performance review	Staff performance appraisals	Biannually: mid-year & year-end

3.2b Manages organisational risk associated with plans

MPA employs the ERM Framework to develop a risk management process for the whole organisation (see

Figure 3.2.2). In 2017, MPA embarked on a strategic review of its ERM framework and processes to ensure that it remains on track to achieve its mission objectives. Following the review, MPA enhanced its risk management process, and re-assessed strategic risks which have evolved amidst a dynamic operating and strategic environment.

// Fig 3.2.2: Risk Management Process //



To ensure that the risk management process is effective and remains aligned to the ERM Framework, MPA has created an ERM governance and reporting structure, which is guided by the ERM Steering Committee and MPA Board.

The ERM Steering Committee and Working Committee will meet at least once a year, and the meetings are aligned to the workplan cycle. To reinforce a culture of risk management, MPA continues to build its staff's risk knowledge and competencies through training, communicating key risk issues as well as sharing lessons learnt through the Risk Digest, a regular newsletter published by MPA's Internal Audit Department.

MPA's ERM also interfaces with its Internal Audit, which factors the effects of relevant strategic, operational and corporate governance risks from the corporate risk matrix into its auditable processes. This process aids in prioritising the areas to be audited.

- Maintaining active business partnerships with divisions to enhance operational efficiency vis-à-vis financial prudence

MPA is thus able to maximise the outputs derived from financial inputs allocated at the right time and achieve its strategic goals with greater efficiency.

Human Resources (HR)

To ensure there is sufficient manpower to implement workplans, HR planning at MPA is integrated into the annual corporate planning cycle. During the annual workplan cycle, HR works closely with each Division to support the execution of their workplans (see Figure 4.1.1 and 4.1.2).

To ensure MPA understands and optimises manpower distribution, HR plans and current situations are constantly communicated to all departments and leaders (see Table 4.1.1).

3.2c Allocates resources in a timely manner to achieve strategic goals

Financial Resources

During the annual workplan process, each division is required to state their budget requirements in their workplan submissions. The Finance team will then weigh the various budget submissions against the organisation's strategic priorities and present them to SM for discussion and endorsement.

Other than planning for the annual distribution of financial resources, MPA ensures that it constantly reviews and optimises its financial resources through discussions and reporting.

Additionally, the Finance department ensures that the allocation of financial resources is optimised by:

- Actively managing reserves for higher returns
- Conducting regular fees and charges reviews to optimise cost recovery
- Regularly reporting budget utilisation to inculcate better spending discipline amongst Divisions and ensure projects and costs are properly prioritised
- Analysing grant distribution to ensure policy alignment in grant allocation

3.2d Engages key stakeholders in the strategy implementation process

MPA adopts a "One MPA, One Partnership, One Maritime Singapore" approach to promote Singapore as a global hub port and IMC. MPA has been actively engaging its key stakeholders, including maritime enterprises, port service providers, IHLs, suppliers and employees to expand its reach within Maritime Singapore, enhancing the effectiveness of its strategy implementation.

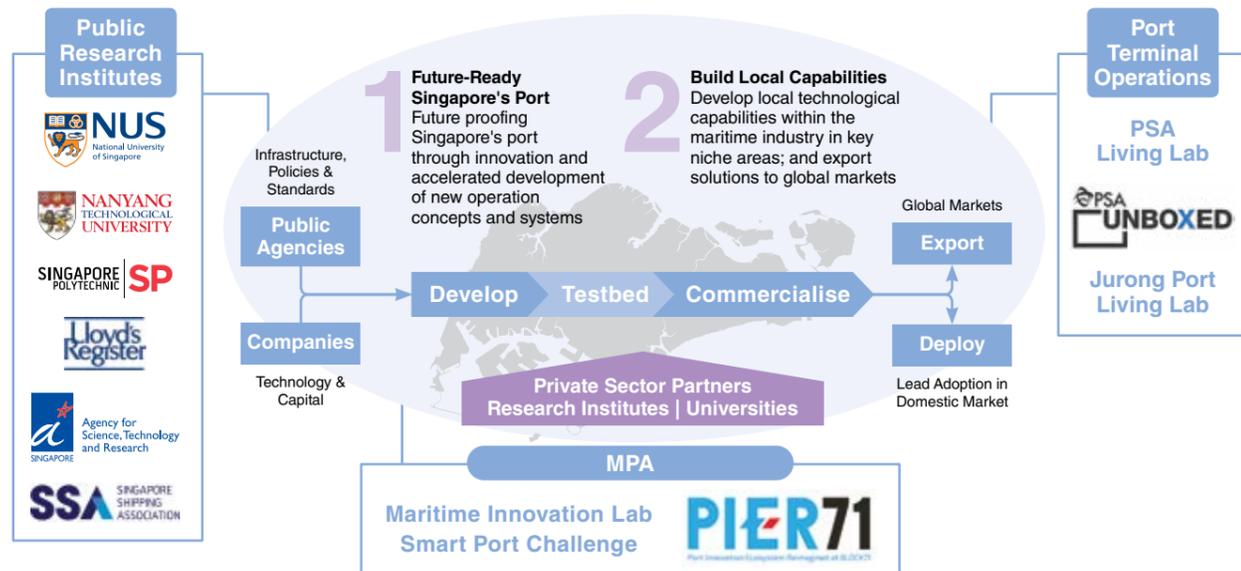
3.2e Measures performance against plans and targets

Review

Alignment to Long-term Plans

MPA measures performance against plans and targets by aligning it with the organisation's long-term plans. This constantly reminds MPA about its progress towards the targets it has set, keeping the entire organisation united and on course.

// Fig 3.2.3: Innovation Ecosystem //



To ensure that MPA stays on track, divisions are required during the annual workplan exercise to review and set targets for their KPIs for the next 5 years.

Alignment to Future-Ready Goals

Against evolving developments in the maritime landscape and the launch of its long-term plans (NGP 2030, IMC 2030 and Sea Transport ITM), MPA undertook an organisation-wide review of its Corporate KPIs in 2018 to update and align its efforts.

The review was guided by MPA's Future Ready Framework and engaged the whole organisation to identify and re-align their performance metrics against a renewed strategic focus. New KPIs were also identified to track the build-up of new strategic thrusts such as Maritime Knowledge and Innovation Hub and Strong Maritime Singapore Identity. The KPI review helped tighten the linkage between performance outcomes to strategies and accelerate transformation of the organisation towards its long-term goals.

3.2f Cascades its innovation strategies

As MPA aspires to drive the development of Maritime Singapore as a knowledge and innovation hub, it is necessary for the organisation to effectively cascade its innovation strategies to employees and stakeholders.

External

To facilitate the communication of its innovation strategies, MPA has built a close-knit innovation ecosystem (see Figure 3.2.3) with partners, IHLs and RIs. This is done through dialogues and presentations, as well as joint R&D programmes.

Dialogues and Presentations

MPA cascades innovation strategies through dialogues and presentations with external parties such as the SMTC. Held in conjunction with SMW, the conference is a platform for MPA to profile and showcase prominent maritime and port industry trends and technological developments, with a focus on innovation projects that take into account recent trends like digitalisation and environmental care.

Joint R&D Programmes

To enhance the cascading of innovation strategies for the improvement of Singapore's maritime landscape, MPA has been actively engaging its partners in R&D. For example, MPA signed an MOU with PSA up till 2020. Known as the MPA-PSA Technology R&D Programme, this programme enhances collaborations in the research and testing of new technologies for the future Tuas Terminal. Another example is the MPA-Jurong Port Green Port and Productivity Solutions Programme, which supports the co-development of new technologies to enhance the productivity of multi-purpose terminals. An added incentive for such joint R&D programmes is the exchange of innovation strategies and cultures.

Internal

MPA communicates its innovation strategies to staff by promoting an innovative culture through events and workshops like the InnovFest and Ideathon. Conducted during the FIRST Values Week, the InnovFest promotes innovation within MPA through showcasing innovation projects. The Ideathon is a platform for staff to build innovative ideas using the STEER Innovation Process (see Figure 5.1.1). It also allows MPA staff to better understand the organisation's innovation strategies and how to apply them to their daily work, enhancing the effectiveness of cascading such strategies to the whole of MPA.

3.2g Allocates resources to achieve innovation strategies

MPA ensures adequate resources are allocated to achieve its innovation strategies. This ensures that an enabling environment for innovation is created, and that both external and internal stakeholders are able to develop and pursue innovative solutions.

04



Recognition and Awards



Learning and Development



Performance Management



PEOPLE



Engagement and Well-Being



Human Resource Planning

- 4.1 Human Resource Planning
- 4.2 Employee Learning and Development
- 4.3 Employee Engagement and Well-Being
- 4.4 Employee Performance and Recognition

04 PEOPLE

4.1 Human Resource Planning



4.1a Anticipates HR needs and develops HR plans and policies which are aligned to strategic goals and organisational values

One of the key thrusts in MPA's Future Ready Framework is for the organisation to be a Choice Employer. To achieve this goal, MPA's HR team has put in place 3 key strategies to ensure that it can meet the manpower challenges and operational demands of MPA (see Figure 4.1.1).

// Fig 4.1.1: HR Strategies //



The HR planning process (see Figure 4.1.2) is aligned with the annual corporate planning cycle to ensure workplans are holistically implemented. HR supports divisional workplans by:

- Creating the right structure for divisions to best perform their roles. This includes redesigning organisational structure and job scopes where appropriate;
- Attracting, developing and retaining the right people to carry out workplans; and
- Ensuring that all staff are engaged and work with a shared sense of purpose.

// Fig 4.1.2: HR Planning Process //



MPA embarked on a strategic organisational review in 2018 to prepare for transformations in the industry and operating environment. This review encompassed structure, operating models and people strategies as part of MPA's Strategic Workforce Plan, and ensures that MPA operates with the Right Organisation, Right People and Engaged People.

The HR team works closely with SM, unions and staff to develop and implement strategic HR plans and policies that can adapt to changes in the external environment and anticipate future workforce needs. Table 4.1.1 summarises the different platforms that HR leverages to develop HR plans and policies.

// Table 4.1.1: Platforms to Develop HR Plans and Policies //

Level	Platform	Purpose
Senior Management	SMM	• Review corporate HR performance
	HR Board Meetings	• Review HR strategies, policies & plans • Review compensation & benefits • Discuss & support succession planning
	MOT	• Review development of staff in professional tracks (Vessel Traffic Management (VTM) & Mariners) • MPA talent development & management • MPA succession planning
Supervisors	Staff Meetings	• Identify areas for improvement in HR matters & developmental programmes within departments – staff engagement, core competencies, performance management etc.
	Staff Appraisals	• Establish areas of development & develop learning roadmaps for subordinates
Staff	EES	• Solicit feedback from staff
	Staff Welfare & Work Life Sub-Committees	• Identify areas of improvement for staff engagement
Union	Union Meetings	• Collaborate to engage & develop staff as One MPA

The excellent labour management relations we enjoy today are a result of continuous commitment by MPA's Management and AUSBE-MPA Branch's Union Leaders, with the purpose of advancing the interests of MPA staff and union members. MPA also regularly engages unions across the maritime industry, from the ports to the seafaring sector. The policies rolled out for workers in the industry have always been done in tripartite collaboration, resulting in the inception of the Tripartite Maritime Manpower Taskforce for Seafaring and Shore-based sectors, formulating the Sea Transport Industry Transformation Map. Such good relations must not be taken for granted and we must continuously work on them. On behalf of the Labour Movement, we are deeply appreciative of MPA's contributions towards our workers. With the strong foundation built by former Chief Executive Andrew Tan, we look forward to forging even stronger relations with current Chief Executive Quah Ley Hoon to advance tripartism and positively impact the lives of our workers in Singapore.

Ms Mary Liew
President, NTUC
General Secretary, SMOU

As we prepare our workforce for the rapidly changing employment landscape, the Labour Movement recognises the importance of equipping our working people with the necessary and most updated skills and knowledge. SkillsFuture should play a key role in ensuring that our existing workforce, new entrants to the workforce, as well as those who have yet to join the workforce, all have equal opportunities at getting access to the necessary skills and knowledge. We are heartened to have the maritime sector as an early adopter of the initiatives. On our part, we will be working closely with our unions and the relevant partners to allow more workers to benefit from these initiatives.

Ms Jessie Yeo
NTUC Transport & Logistics Lead,
Singapore Port Workers Union

AUSBE and MPA enjoy all-weather Labour Management Relations. This state of relations is not achieved overnight as it requires concerted and reciprocal effort to be invested by CE, Senior Management and AUSBE-MPA Branch's Union Leaders. I am heartened to share that our bilateral ties are on an upward trend. Last year, our former CE Mr Andrew Tan was conferred the "Medal of Commendation (Gold)" award during NTUC's May Day Award 2018. This year, we are proud to share that MPA has been conferred the "Plaque of Commendation (Gold)" Award during NTUC's May Day Award 2019. This is a testament to our achievements and "silent work behind the scenes" to make MPA a better organisation for our employees, an agency that listens to our stakeholders and a national standard bearer representing all maritime agencies in Singapore.

Mr Mohamad Arif Abdullah
Senior Vessel Traffic Officer,
MPA Union

Ms G Deepa
Manager,
Strategy & Policy Division,
MPA

Mr Calvin Lee
Senior Marine
Surveyor,
Shipping Division,
MPA

Together as one MPA family, we can advance Singapore's strategic maritime interests, riding on our innovative ideas to achieve our aspirations.

I look forward to MPA being a leader in the areas of digitalisation and innovation, and I hope that it will continue to be an influential voice on international platforms such as the Port Authorities Roundtable.

Singapore will be the place to be for maritime businesses to access both regional and global opportunities.

We want to grow a vibrant maritime innovation ecosystem for Singapore to strengthen our port competitiveness for future generations.

Ms Catherine Lai
Manager,
International Maritime
Centre Division,
MPA

My aspiration for MPA is for every staff to understand each and everyone's role and responsibility, in order for them to appreciate and recognise each others' efforts.

Mr Qamaruzzaman Zainudin
Senior Executive,
Finance, Procurement & Admin Division,
MPA

Mr Desmond Tay
Assistant Director,
Innovation, Technology &
Talent Development Division,
MPA

4.1b Establishes a recruitment and selection process to meet organisational needs

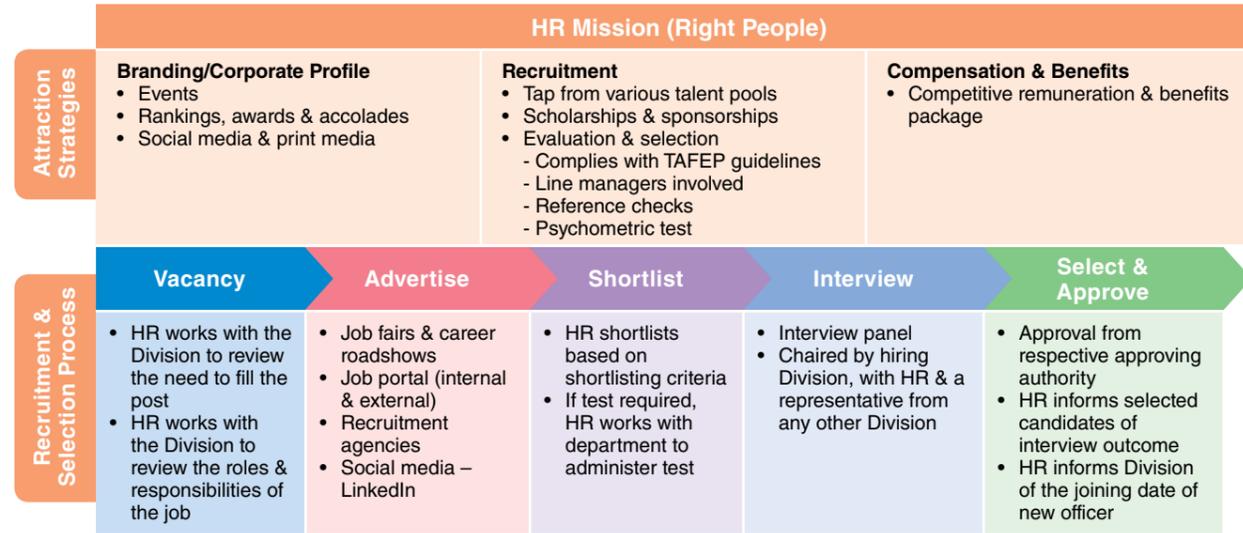
Before recruitment commences, HR evaluates the need for a vacancy to be filled and whether the job role remains relevant. At the interview, the panel focuses on the experience and competencies of the candidates in order to determine if they have the right skillsets and experience to perform well. Shortlisted candidates will be required to complete a psychometric test which provides insights in the following areas:



The psychometric test helps HR to assess an individual's FIRST competencies objectively.

Details of the HR recruitment and selection process are illustrated in Figure 4.1.3.

// Fig 4.1.3: HR Recruitment and Selection Process //



4.1c Identifies and grooms employees for high performance

Talent Identification and Development

HR ensures that a leadership and talent pipeline exists to provide a steady supply of leaders to support MPA's Mission and Vision. It does so by creating a system to rigorously identify and groom talent.

Each year, MPA's talents are identified by the annual ranking board based on performance and potential. To be identified as talents, staff have to meet strict qualifying criteria (e.g. show good performance and potential over a period of time). The list of talents is collated and reviewed by the ranking board annually.

High potential staff are placed on the LEAD programme to help widen their exposure and build their leadership skills.

Succession Planning

MPA charts its succession planning using succession plans with 3 different time horizons: immediate (within the next year), medium (within the next 2 to 4 years), and long term. These succession plans are discussed with ACEs and approved by the CE. For key management positions, succession plans are discussed with Senior Personnel Board and Permanent Secretary of MOT on an annual basis. HR consults the Directors to identify possible rotations and milestone developmental plans for nurturing potential successors along a structured development path.

4.2 Employee Learning and Development

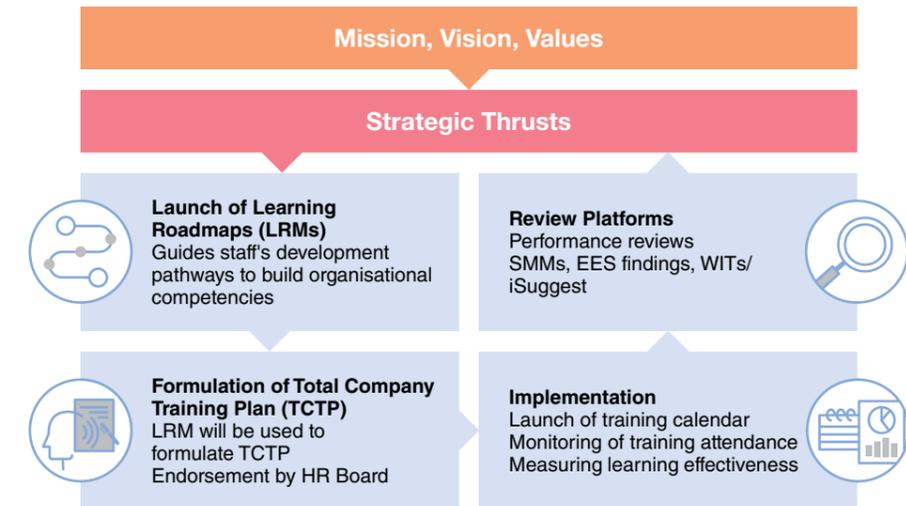
4.2a Engages employees to identify current and new competencies required to achieve organisational goals

Learning Needs Analysis

MPA adopts both a top-down and bottom-up approach to identify staff learning needs (see Figure 4.2.1). Both approaches take into account MPA's Future Ready Framework, strategic thrusts and organisational and departmental workplans.

The top-down approach addresses organisational needs such as the push for digital skills. These needs are identified as emerging competencies that the organisation will require in order to achieve its objectives moving forward. Learning Roadmaps (LRMs) are then developed to guide staff in acquiring these competencies.

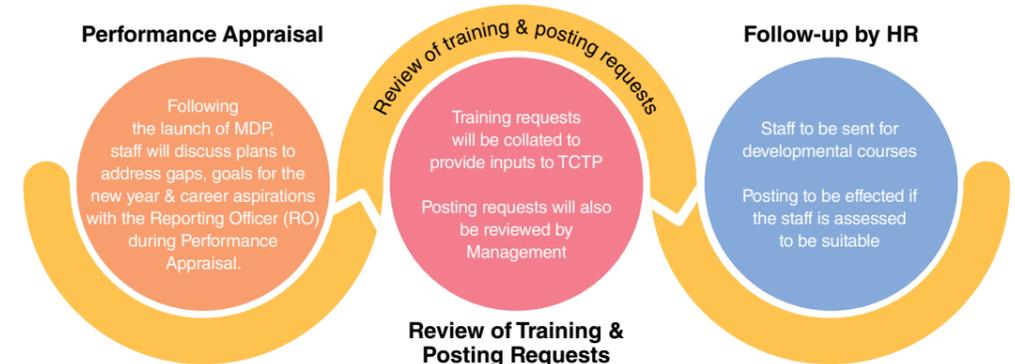
// Fig 4.2.1: Learning Needs Analysis – Top-down Approach //



In the bottom-up approach, supervisors discuss learning needs with staff during ongoing developmental and appraisal conversations (see Figure 4.2.2). Feedback and inputs from staff are actively solicited through the MPA My Development Plan (MDP).

MPA reviews the competencies and LRMs on an annual basis, taking into consideration performance gaps, new work challenges and the coming year's workplan. This results in an annual learning plan that caters to the needs of all staff and the organisation.

// Fig 4.2.2: Learning Needs Analysis – Bottom-up Approach //



4.2b Provides learning and development opportunities to staff to achieve organisational and personal growth

MPA believes strongly in nurturing its human capital through employee learning and development. It therefore places a strong emphasis on both the professional development and personal growth of its staff.

MPA adopts a competency-driven approach to build a forward-thinking and skilled workforce and develop the capabilities of its staff. The MPA Learning Framework defines the functional, leadership and core competencies required for all MPA staff, and helps them build cross-cutting competencies and expertise to meet current and future MPA needs.

Leadership development plays a crucial role in nurturing a new generation of leaders to drive MPA forward. MPA has customised programmes to cater to different levels of leaders based on its leadership competencies, including supervisors, managers and directors. The programmes aim to equip MPA's future leaders with competencies and skills that will empower them to motivate and guide their teams to handle the demands of the future.

To recognise and support the development of MPA's specialised personnel, Specialist Tracks were launched in July 2018. These cater for specialised roles such as Marine Surveyors, Hydrographers, Port Chemists and Engineers. The tracks focus on building deep expertise in domain-specific skillsets, and allow for an alternative career pathway to a management track.

MPA also aims to prepare itself for its future mode of operations. To achieve this, it has launched the first phase of a review of the core capabilities of staff working on core operations work. These include VTS Operators, Port Inspectors and Support Officers. MPA has developed training plans to build these future core competencies, for which staff will be continued to be trained in 2019.

MPA provides staff with numerous learning and development opportunities to build their competencies and capabilities. These include workshops and conferences to enable staff to keep abreast of the latest industry developments. Other developmental opportunities include overseas study trips, job rotation, stints on cross-functional project teams and secondments to other government agencies.

MPA Scholarships

As part of efforts to continuously develop talent for the maritime industry, the MPA scholarship is offered to outstanding individuals to pursue their undergraduate studies in prestigious universities both locally and overseas. The scholarship programme offers exciting opportunities – including exchange programmes and internships – for undergraduates to gain valuable exposure to the thriving and diverse maritime industry.

MPA also offers its existing staff opportunities to undertake fully sponsored post-graduate studies. This aims to add diversity and depth to their professional training and prepare them for leadership roles in MPA.

Continuing Education

MPA supports continuing and lifelong learning by providing its staff with opportunities for personal and professional development beyond their vocational needs. For example, the MPA In-Service Sponsorship Scheme for Part-Time Studies helps staff to achieve higher professional qualifications.

Personal Development & Growth

As part of MPA's efforts to support staff in realising their fullest potential, the UPGRADE Account was introduced to support lifelong learning and self-development. This supplementary learning opportunity goes beyond training of direct relevance to their job scopes, and empowers staff to take greater charge of their self-development.

Another initiative that encourages ownership of self-development is the MPA MDP. It was introduced as a first step for staff to plan their development journey by drawing up and structuring personal learning plans to meet their learning needs.

To supplement staff training beyond the classroom, MPA provides e-learning resources such as LinkedIn Learning, an on-demand library of instructional videos on the latest business, technology and creative skills. MPA has also launched LEARN.gov.sg in partnership with CSC to provide staff with access to bite-sized training materials across a range of topics, from digital awareness to effective communication. This allows staff to acquire new knowledge and skills on-the-go, and inculcates a digital learning mindset within MPA. In addition, these online platforms make learning more diverse and accessible for shift workers.

4.2c Determines employee learning and development needs to contribute to the innovation goals

Innovation is a key focus of Maritime Singapore to enable the development of future capabilities and solutions such as data analytics, robotics and AI. In view of rapid technological advancements in the maritime industry, MPA implemented the Data Analytics and Technology Roadmap to build and upskill the digital competencies of all staff. Courses to drive technology awareness and utilisation of data analytics were introduced to ensure that MPA and its staff have the knowledge and skills to leverage on upcoming technologies, and innovate to remain competitive and future-ready.

Ms Cheryl Wee: Passion for Learning

At MPA, there are ample opportunities for staff to pursue further education and take charge of their professional development. One such example is Ms Cheryl Wee, an Accounts Receivable Executive in the General Accounting Department. Cheryl constantly pushes herself to excel in her work. She has been recognised by her superiors for how she constantly initiates improvements to work processes and enhances work productivity.



Cheryl is very passionate about data analytics. As she matured in her understanding of the linkages between MPA's finance and front-end operations, she was able to initiate and participate in many analytical projects. With a strong knowledge of Microsoft Excel and PowerPoint, she has used her creativity to translate huge amounts of data into informative and easy-to-digest presentations delivered on multiple occasions, including to SM and outside of MPA.

Because of her passion, good work ethic and demonstration of MPA's FIRST Values, MPA awarded Cheryl a full sponsorship for the Bachelor of Science in Business Analytics at the Singapore University of Social Sciences in January 2018.

4.3 Employee Engagement and Well-Being

4.3a Supports individual and team participation to achieve organisational goals

The MPA Employee Engagement and Well-being Framework is key to ensuring that staff remain

engaged and motivated. The framework drives MPA's engagement efforts, which are aligned with the organisation's strategic goals and centred around 4 key engagement levers: WeShare, WeChat, WeCelebrate and WeAppreciate. Figure 4.3.1 provides examples of key engagement platforms that MPA leverages to reach out to staff.

// Fig 4.3.1: MPA Employee Engagement Framework //



Framework to Support Staff Engagement
Learning & Development, Work-life Harmony, Workplace Safety & Health (WSH), Service Excellence & Innovation & Performance Management

Key Measures
EES (Biennial) & HR Pulse Survey (Biennial)

Review Platforms
Staff Engagement Committee, WSH Committee, HR Department Meetings & Workplans, SISC & SMMs

4.3b Develops a work environment that enhances employee health and well-being

A conducive and supportive work environment plays a key role in driving innovation. Engaged staff will expend their creative energies in ways that contribute to the organisation. Harmonious working relationships also facilitate collaboration on innovative solutions.

MPA adopts a structured and comprehensive approach in looking after the physical, emotional and social well-being of staff and their families, steered by the Work-Life Harmony Framework (see Figure 4.3.2).

—// Fig 4.3.2: Work-Life Harmony Framework //—



4.3c Measures employee satisfaction, engagement and well-being

In 2018, MPA participated in the WOG EES with questions that were designed differently from before. The intention was to allow all government agencies to participate in the EES within a common timeframe, allowing for more accurate comparison of data and trends across the entire Public Service.

Leadership
SM will engage as people developers to motivate, inspire and bring out the best in staff. As MPA's CE is newly appointed, the organisation is also taking the opportunity to organise a leadership retreat to build common understanding, facilitate communications and set direction.

Work Process
SM encourages staff to do more with less without affecting performance, by having all departments review 1 process each to achieve meaningful breakthroughs.

Career Development and Rotation
SM encourages greater exposure for staff and helps them understand what other divisions are doing by offering them more structured rotation and attachments. To increase the transparency of available jobs within MPA, job postings will also be listed on MPA's e-Connect. More importantly, selected jobs in MPA will be redesigned to factor in mean technological advancement and staff's desires to progress based on their competencies. The specialist track has been developed for specialists like Port Engineers, Marine Surveyors and Hydrographers, and will be rolled out to the Marine Engineers and Port Surveyors as a start.

4.3d Develops a work environment that encourages innovation

MPA believes that everyone can contribute to its innovation journey. There are various platforms available to encourage bottom-up innovation. For example, Ideathon sessions provide staff with the opportunity to network and brainstorm ideas on a thematic basis. Staff are also encouraged to learn from the best practices of other organisations through innovation learning journeys. Viable ideas from Ideathon and learning journeys are then refined and piped into Division workplans to be implemented as innovative projects.

The SISC was set up to drive innovation and service excellence initiatives within MPA in a coordinated and collaborative manner. The Innovation Working Committee (IWC) drives innovation in MPA and puts in place various initiatives under the MPA Innovation Framework (see Figure 1.2.1) to achieve MPA's Vision, facilitate MPA's transformation into a cutting-edge organisation and drive a culture of excellence. IWC is supported by a taskforce which ropes in staff from various departments to provide creative inputs for the organisation on various innovation initiatives.

To encourage collaborations between divisions/departments and foster a culture of innovation, MPA is also designing and creating a new open concept office space. The open concept design will promote more communal spaces and encourage staff interaction and ideation across all Divisions.

These measures should move MPA's innovation culture in the right direction. Apart from the EES which measures MPA's innovation climate, output indicators such as participation in innovation initiatives and the receipt of national/international awards and recognition, prove that MPA is on the right track.

—// Table 4.3.1: Environment, Initiatives and Structure for Innovation //—

Environment & Initiatives
<ul style="list-style-type: none"> InnovFest Inno Challenge Ideathons MPA Innovation Fund Innovation Learning Journeys MPA Excellence Room MPA Innovation Lab Open Concept Office Space (new) Participation in WITs and iSuggest Sharing of best practices on innovation to other agencies PST Awards
Structure
<ul style="list-style-type: none"> MPA Innovation Framework – STEER SISC IWC & IWC Taskforce

WeAppreciate: Appreciation Day

MPA recognises and appreciates its staff's efforts and contributions through informal events such as Appreciation Day and Appreciation Hour. MPA's SM recognises and shows appreciation for the dedication and contributions of staff at the half-yearly Staff Appreciation Day. On this day, the SM team walks the ground and visits workstations personally to present individual tokens of appreciation to staff.

During the quarterly Appreciation Hour, staff are recognised – both individually and in groups – for exemplifying the MPA FIRST Values and their team contributions on various projects. MPA's CE presents the awards personally to recognise staff for jobs well done.



Inno Challenge

To promote and nurture an innovation culture, MPA is constantly looking for new platforms for staff to generate new ideas and innovations. One such platform was the MPA Inno Challenge 2019. During the half-day workshop, participants from various Divisions brainstormed challenge statements related to 'Workplace 2030' and developed solutions to address their statements.

Workgroups are formed to address specific challenge statements pertaining to 'Workplace 2030', marrying the voices of intent, customer, system and expertise through design thinking and lean methodologies. The prototypes will be presented to MPA staff at Townhall 2019 for their feedback. Thereafter, the prototypes will be refined and channelled into individual divisions' workplans for implementation.



4.4 Employee Performance and Recognition

4.4a Supports high performance, productive and innovative behaviours to achieve organisational goals

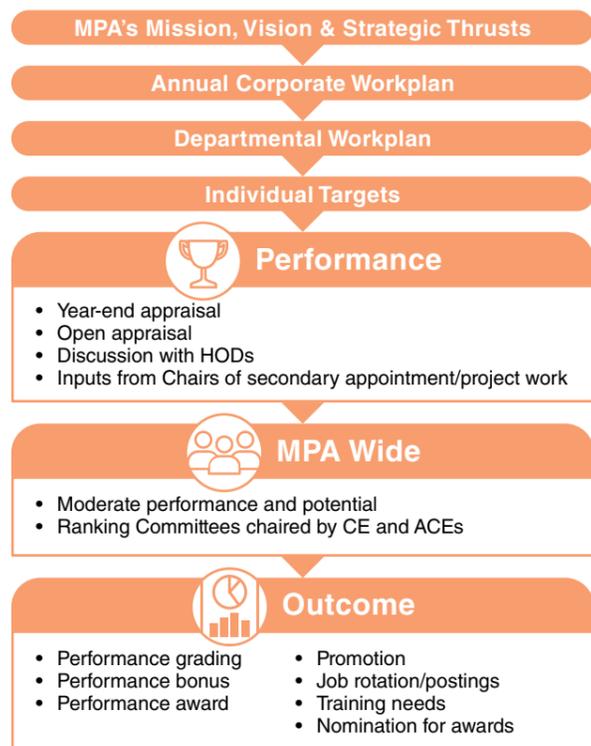
in 2018 to allow for greater alignment of the individual officer's KPIs with those at the department, Division and corporate levels, so that all efforts are aligned to help MPA achieve its Mission and Vision.

The enhanced Performance Appraisal Form allows for a more comprehensive performance assessment that takes into account MPA's Core Values (FIRST) and the leadership competencies key to MPA's success.

Figure 4.4.1 illustrates how MPA manages staff performance to achieve strategic goals.

The Performance Management Process was sharpened

// Fig 4.4.1: Performance Management //



4.4b Reinforces desired behaviours and organisational values

MPA's FIRST Values are the main motivations behind its drive for productivity, innovation and service excellence. The FIRST Values are reinforced through the Core Competencies, which are based on MPA's core values, including innovation and service.

The annual MPA Values Week is another platform to celebrate and reinforce the FIRST Values amongst all staff. The MPA FIRST Award is given out during the week to staff who exemplify the organisational values. These award winners (also known as FIRST Champions) become ambassadors of the FIRST Values and serve as role models for other staff.

MPA also recognises staff who provide excellent service to external customers through the Service Star Awards.

Both the FIRST Champion and Service Star Award winners are featured during MPA Values Week and in internal publicity materials. Sharing these achievements serves to inspire staff to strive for excellence in their work.

4.4c Rewards and recognises employees to achieve organisational goals

MPA has put in place a myriad of monetary and non-monetary rewards to encourage staff to strive for continual improvement, not just in their work performance but also in demonstrating organisational values. Figure 4.4.2 summarises the various staff performance and recognition mechanisms used by MPA.

4.4d Recognises and rewards individuals and teams for contributing to the innovation goals

At MPA, there are various awards and incentives to recognise and reward individuals and teams for their innovation achievements (see Table 4.4.1).

// Table 4.4.1: Rewards & Recognition //

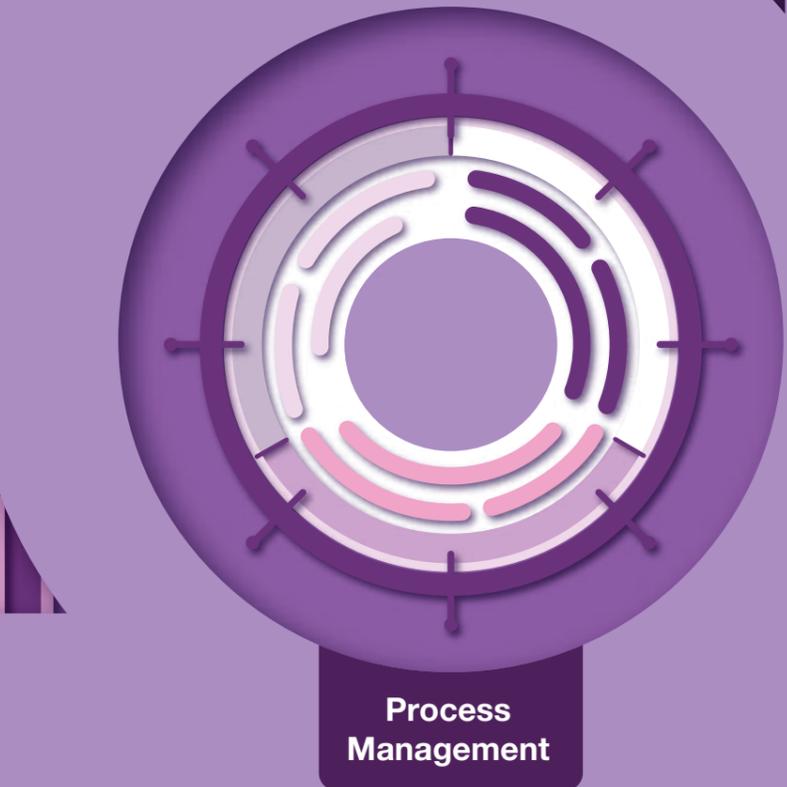
Individual	Team
<ul style="list-style-type: none"> ExCEL Innovation Champion iSuggest 	<p>International Level</p> <ul style="list-style-type: none"> Commonwealth Association of Public Administration and Management (CAPAM) International Innovation Award International Best Practice Award International Convention on Quality Control Circle (ICQCC) <p>National Level</p> <ul style="list-style-type: none"> Top 50 Engineering Feats @ IES-SG50 Award Minister's Innovation Award Value-for-Money (VFM) Award PST Award <p>Agency Level</p> <ul style="list-style-type: none"> WITs Award

// Fig 4.4.2: Employee Performance & Recognition Mechanisms //



05

One MPA, One Partnership, One Maritime Singapore



PROCESSES



5.1 Innovation Capabilities



5.1a Develops and implements innovative ideas to create value

With Maritime Revolution 4.0, digitalisation and automation have become game changers for an industry facing technological disruptions. Innovation is core to maintaining Singapore's status as a leading hub port. With competing maritime hubs around the world elevating their operations with new infrastructure and technologies to meet customers' growing expectations in efficiency and safety, Maritime Singapore must blaze new technological trails to stay ahead of the pack and remain attractive to its customers.

MPA Innovation Framework

The Innovation Framework (see Figure 1.2.1) guides the organisation towards building innovation capabilities that create value for both internal and external stakeholders.

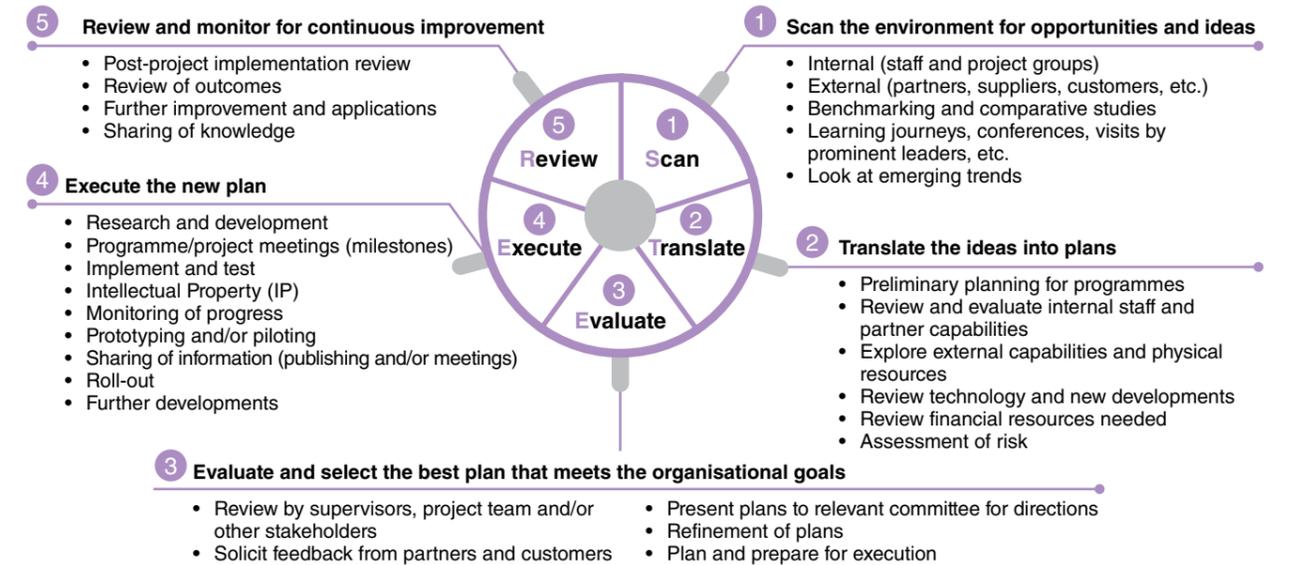
MPA Innovation Fund

MPA has set aside \$100,000 per year to encourage its staff to test-bed innovative ideas/projects through POCs or prototyping. One recent project that was granted funding was the "Detection of Dark Smoke Emissions from Vessels in Port of Singapore".

Innovation Process – STEER

MPA adopts a structured 5-step process called STEER (see Figure 5.1.1) to evaluate and implement feasible ideas. This structured process fosters innovation throughout MPA, allowing for efficient and effective development of new ideas. STEER actively engages stakeholders such as staff, customers, suppliers and partners in the innovation process, and is guided by the BMW spirit of innovating to make a meaningful impact.

// Fig 5.1.1 Innovation Process – STEER //



Ideation to Reality – The Next Generation Patrol Craft



Built to meet the increased operational demands of NGP 2030, the Next Generation Patrol Craft will increase the efficiency and effectiveness of conducting patrols. It will leverage on the future Intelligent Port Marine System – which is integrated with a wide range of sensors and systems – to provide situational awareness, data-driven targeted enforcement and incident management capabilities. To develop the Next Generation Patrol Craft, MPA will disburse an estimated \$79.6 million of funds over a period of 10 years. At the initial ideation stage, an innovation learning journey to the Singapore Civil Defence Force (SCDF) was conducted to inspire new ideas. This was followed by an Ideathon to realise some of the ideas developed.

In close collaboration with EDB, we have learned that the era of Additive Manufacturing is demonstrating pervasive importance for industry transformation. Within the maritime sector, we foresee widespread adoption on the immediate horizon. I am heartened that PSA, alongside MPA, NAMIC and 3D MetalForge, can be a pioneer in developing this technology for use in the industry. Co-creating new innovations, including digitising inventories, will create opportunities to raise maritime productivity to the next level.

Mr Ong Kim Pong
Regional CEO Southeast Asia,
PSA International

MPA continues to rank high within the maritime industry because it consistently exhibits innovation in its service as an authority and agency. For example, its strategic decision to set aside funds to promote IT and technological solutions in hackathons and PIER71 has led to many outlets for tech start-ups to generate solutions for the shipping community. The online booking of passenger launches is a good example, whereas the initiative to implement Mass Flow Meters for bunkering is a major milestone to uphold bunkering standards.

Mr Patrick Poon
Honorary Secretary and Chairman,
Singapore Shipping Association

Jurong Port is honoured to be one of MPA's partners for the Smart Port Challenge 2017. The involvement of start-ups in the new format introduced this year will potentially allow participants to go further beyond ideation and towards a more sustained and successful post-event implementation.

Mr Ooi Boon Hoe
CEO, Jurong Port

All these initiatives to encourage digitalisation gears the industry up to look at technology. It makes us realise that actually, with support from MPA, this might not be so difficult. After all it is not easy to say 'no' to digitalisation because it is coming right at our faces.

Mr Matthias Cher
Chairman, Eastport Maritime

I was pleasantly surprised at the good/strong calibre of start-ups at the Smart Port Challenge, including the large amount of hard work that had gone into it prior. A great indicator was that in subsequent conversations with venture capitalists, there was interest in the start-ups themselves. The journey towards getting corporates engaged is a long and hard one, but you are, as I see it, making great headway.

Mr Michael Pomerleau
Partner and Co-founder,
Rainmaking Innovation

We have been fostering strategic partnerships to help bridge and provide platforms for start-ups to engage with the flagship industries. The maritime sector plays a crucial role in Singapore's economy, but is known for being somewhat resistant to innovation and digitalisation. As such, it is heartening to see tech-savvy start-ups work with larger, well-established maritime corporates to catalyse the digital transformation of the industry and create new opportunities for innovation-driven growth.

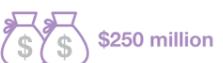
Dr Lily Chan
CEO, NUS Enterprise

5.1b Involves key stakeholders in generating and implementing innovative ideas and solutions

As a sectorial lead for the port and maritime industry, one of MPA's roles is to position Singapore as a vibrant and innovative maritime hub. To do so, MPA adopts an ecosystem approach to innovation (see Figure 5.1.2), seeking to build

a vibrant innovation ecosystem to drive competitiveness and new growth areas. In consultation with the industry and relevant agencies, 3 strategies were developed to achieve this under the Sea Transport ITM – create an enabling environment for innovation, grow maritime technology enterprises to develop innovative solutions, and deepen maritime R&D capabilities. Key stakeholders are engaged at every point of the way to enable the generation and implementation of ideas and solutions within the ecosystem.

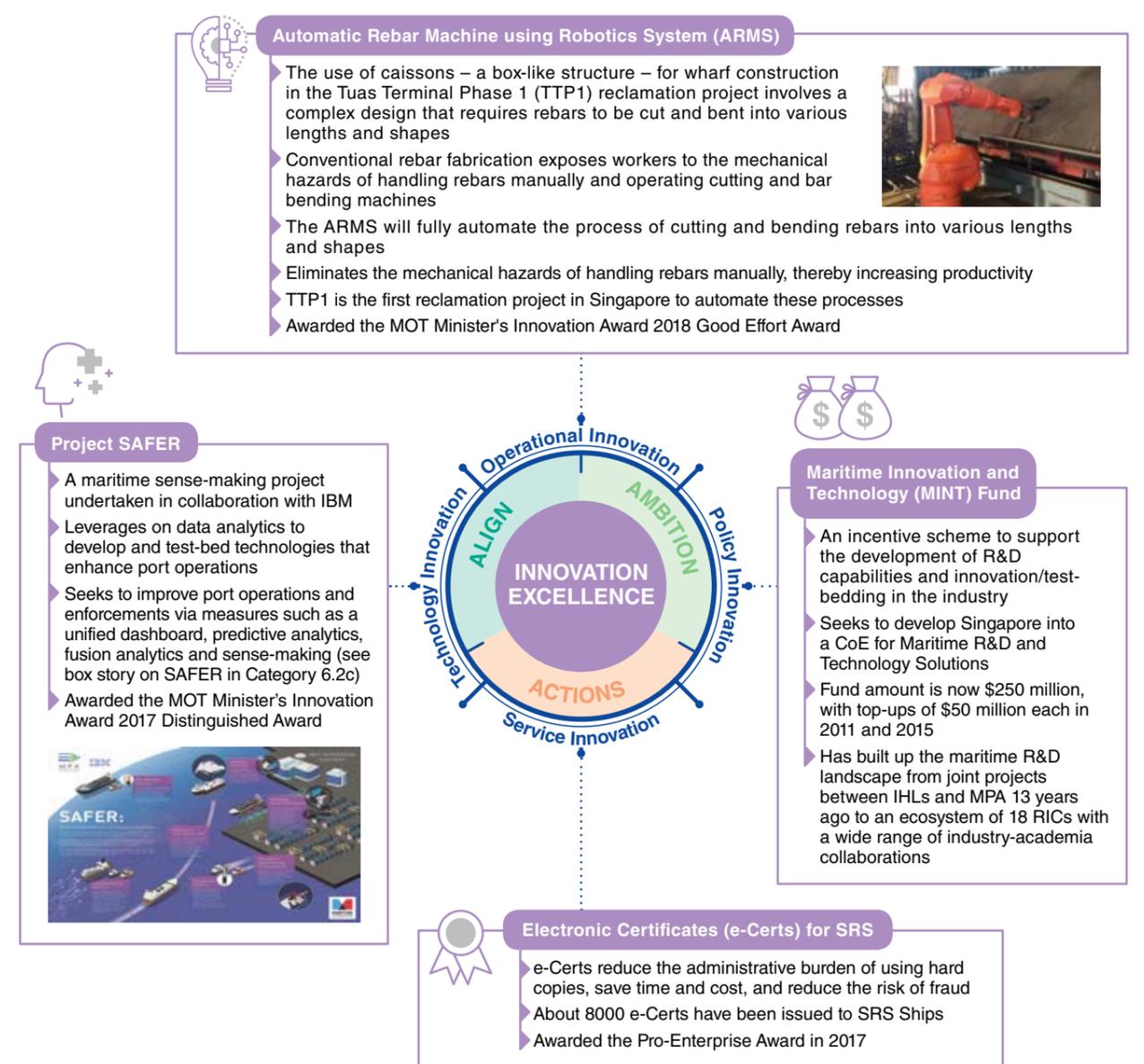
// Fig 5.1.2 MPA Ecosystem Approach to Innovation //

Strategy	Key Initiatives
Create an enabling environment for innovation	The MLL created a real operating environment with sufficient scale, which technology developers and other industry stakeholders can plug into for the co-development and piloting of innovative solutions in 4 focus areas: <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Autonomous Systems & Robotics</p>  </div> <div style="text-align: center;"> <p>Smart & Innovative Infrastructure</p>  </div> <div style="text-align: center;"> <p>Data Analytics & Intelligent Systems</p>  </div> <div style="text-align: center;"> <p>Safety, Security & Environment</p>  </div> </div>
Grow maritime technology enterprises to develop innovative solutions	PIER71 establishes a strong pool of partnerships with globally renowned organisations in strategic areas to support Singapore's curated technology start-ups. SPC, MINT Fund and the availability of key industry partners for support (through MOUs) help maritime technology enterprises to address industry challenges with their technologies. <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Smart Port Challenge</p>  </div> <div style="text-align: center;"> <p>PIER71</p>  </div> <div style="text-align: center;"> <p>MINT Fund</p>  </div> <div style="text-align: center;"> <p>Partnerships with Key Industry Players</p>  </div> </div>
Deepen maritime R&D capabilities	Work with partners to set up CoEs to deepen maritime R&D competencies in 4 focus areas, with funding support through the NRF: <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Safety & Security</p>  </div> <div style="text-align: center;"> <p>Operations & Logistics</p>  </div> <div style="text-align: center;"> <p>Environment & Energy</p>  </div> <div style="text-align: center;"> <p>Info-Comm & Technology</p>  </div> </div>

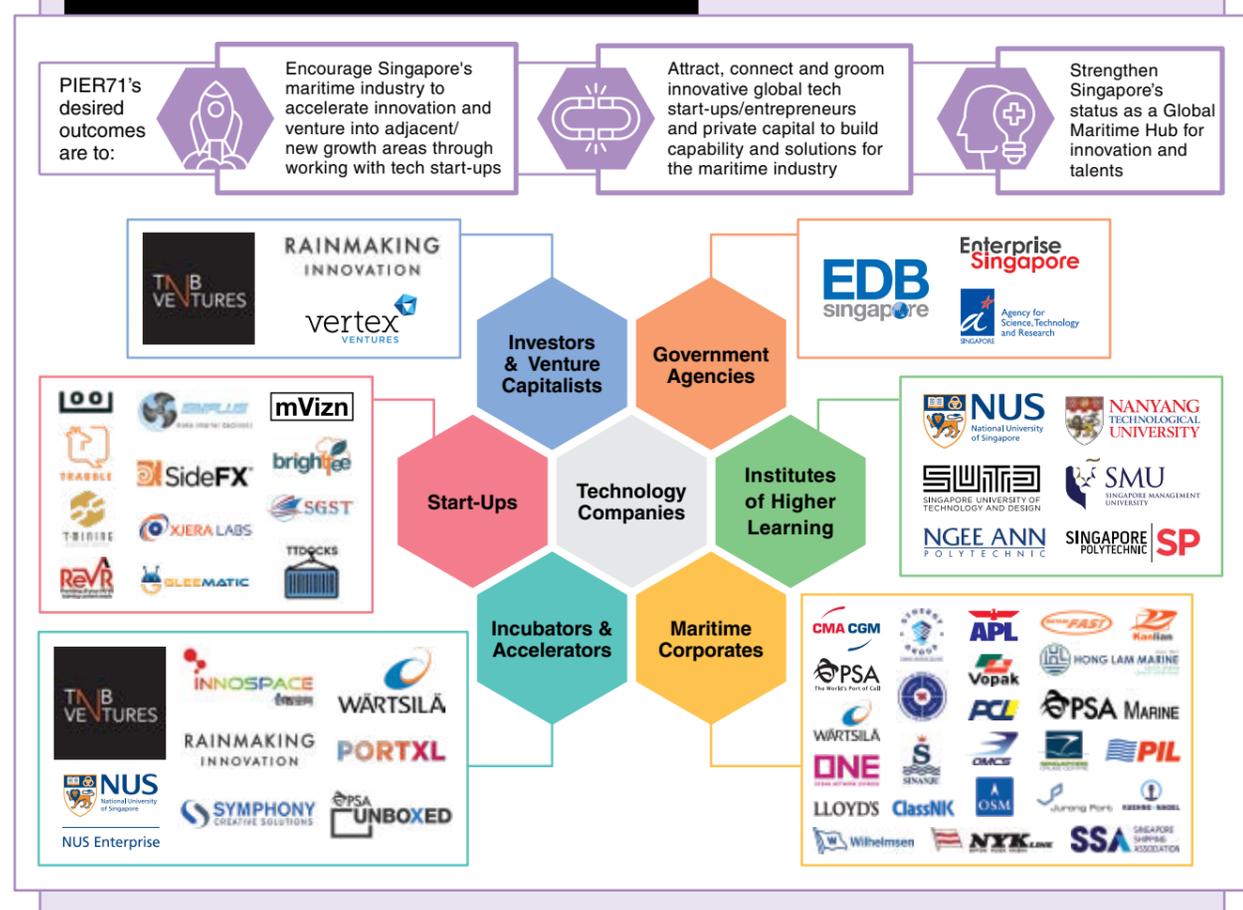
5.1c Develops processes to implement timely innovation and achieve breakthrough improvements in key processes, products and services

Many of MPA's innovation projects are guided by the principles of the STEER process, allowing the organisation to bring new ideas to fruition quickly and effectively. Figure 5.1.3 below highlights some notable examples.

// Fig 5.1.3 Examples of Innovation Projects which Adopted the STEER Process //



Port Innovation Ecosystem Reimagined (PIER71)



5.1d Manages and incorporates emerging trends into its key processes in driving innovation

MPA constantly looks out for how it can incorporate emerging trends into its efforts to drive innovation. This fact is clearly articulated in the STEER process (see Figure 5.1.1). Some indicative examples are listed in Table 5.1.1.

// Table 5.1.1 Examples of Initiatives that Incorporated Emerging Trends //

	 Digitalisation	 MPA Living Lab	 Next Generation Port (NGP)
Aim of the initiative	To increase the number of companies using digitalisation to trim processes and increase efficiency	To collaborate with key players to develop cutting-edge technology solutions that strengthen Singapore's maritime competitiveness	To shape the development plans of the NGP at Tuas
	<p>To ensure that Maritime Singapore remains competitive, MPA has been implementing various digitalisation initiatives.</p> <p>One initiative is the expansion of Marinet online services for ship registration. This expansion encourages a paradigm shift from a paper-intensive industry to a digital one. Given that MPA receives approximately 5000 applications for ship registration, manager appointments and WRC annually, the Marinet expansion helps to reduce both application time by 70% and the possibility of errors.</p>	<p>MPA has linked up with A*STAR, industry partners and local universities to test-bed new capabilities within a regulatory sandbox.</p> <p>There are 3 specific technological areas:</p> <ol style="list-style-type: none"> Maritime Autonomous Surface Ships (MASS): MPA is supporting several pilot projects relating to autonomous tug boats and ocean-going vessels. Concurrently, a regulatory framework is being developed to ensure that Tuas Terminal will be ready for MASS if the technology takes off. UAV: MPA has set up a Maritime Drone Estate to test drone operations. It will be operational by end-2019. MPA is also working with CAAS, DSTA, and RSAF on a nation-wide Centralised Flight Management System for a clearer overview of drones operating in Singapore. Additive Manufacturing (AM): There are many opportunities in the nascent exploration of AM or 3D printing amongst maritime companies here. Riding on Singapore's status as a hub for marine supplies, MPA has partnered SSA to push for the technology's adoption. A rapid fabrication facility is being set up in collaboration with PSA, NAMIC and 3D Metalforge. 	<p>The NGP 2030 Initiative was established with 4 key thrusts: an Efficient Port, an Intelligent Port, a Safe and Secure Port and a Green and Community Oriented Port.</p> <p>It is led by the NGP 2030 Steering Committee, which drives the overall master planning and development of the Port of Singapore. This includes the conceptualisation, design and implementation of Tuas Port based on the 4 strategic thrusts.</p> <p>The MPA NGP Office organised 2 mission trips to gain insights from major ports in China, Japan, Germany and the Netherlands on the latest port operations technology and their port master planning policies. These learning journeys have helped to shape the development plans of the NGP at Tuas. They also provided opportunities for international collaborations between Singapore and the host countries, enhancing the gathering of emerging trends and their integration into ongoing innovation efforts.</p>

5.2 Process Management

5.2a Manages key and support processes to meet customer and operational requirements

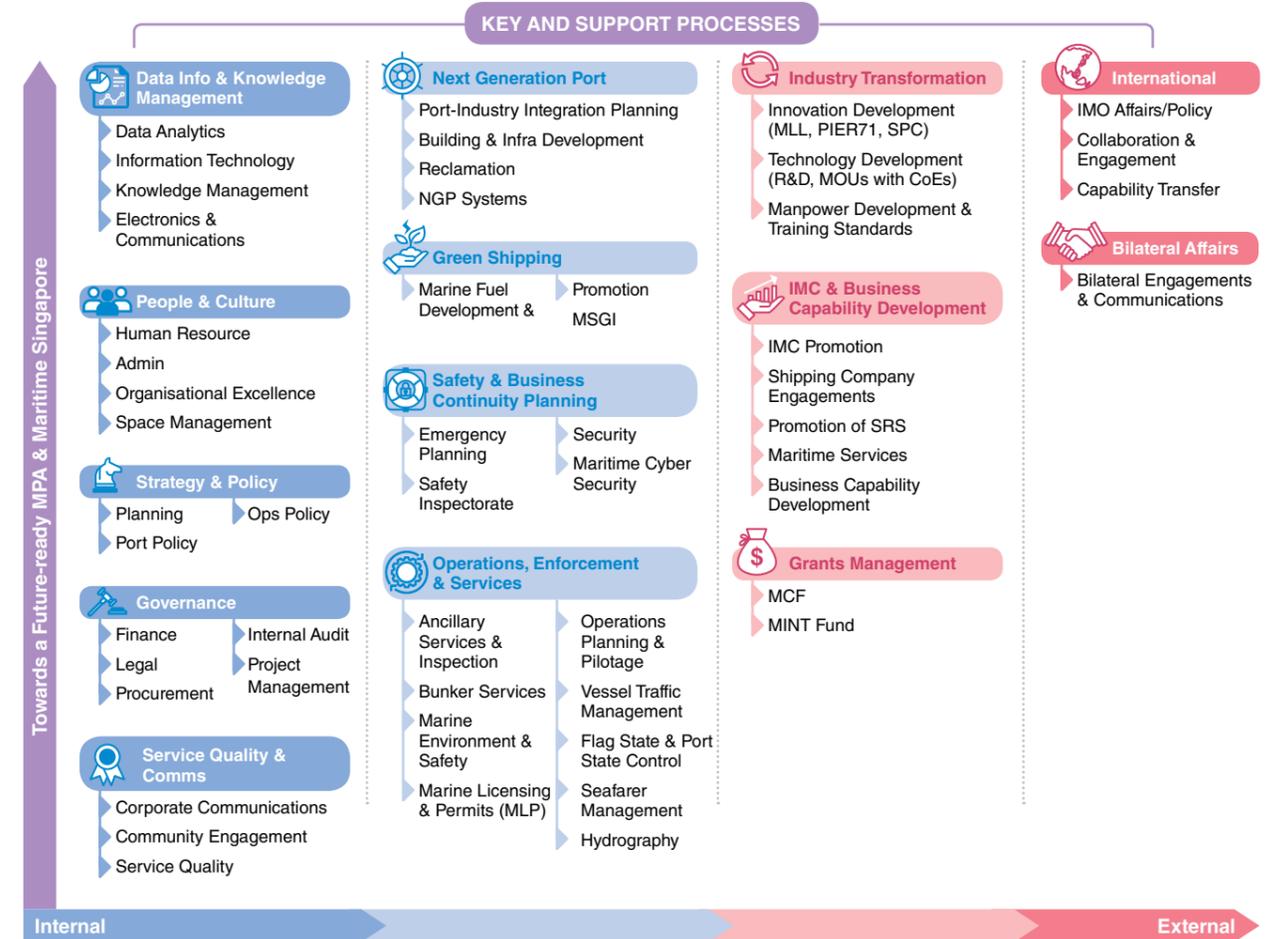
5.2d Manages key and support processes to achieve innovation outcomes

5.2e Evaluates the value of innovations based on organisational objectives

To support its Mission and Vision, MPA manages key and support processes in an integrated manner (see Figure 5.2.1).

// Fig 5.2.1 Key Processes Map //

Mission: To develop and promote Singapore as a premier global hub port and an international maritime centre, and to advance and safeguard Singapore's strategic maritime interests



MPA sets goals and devises divisional workplans to achieve each key and support process. To ensure that the processes are heading in the right direction and performing well, MPA sets KPIs to:

-  Monitor the success of initiatives and schemes launched
-  Track whether a particular key or support process is fulfilling MPA's strategic thrusts or meeting customers' expectations
-  Measure the productivity of key and support processes

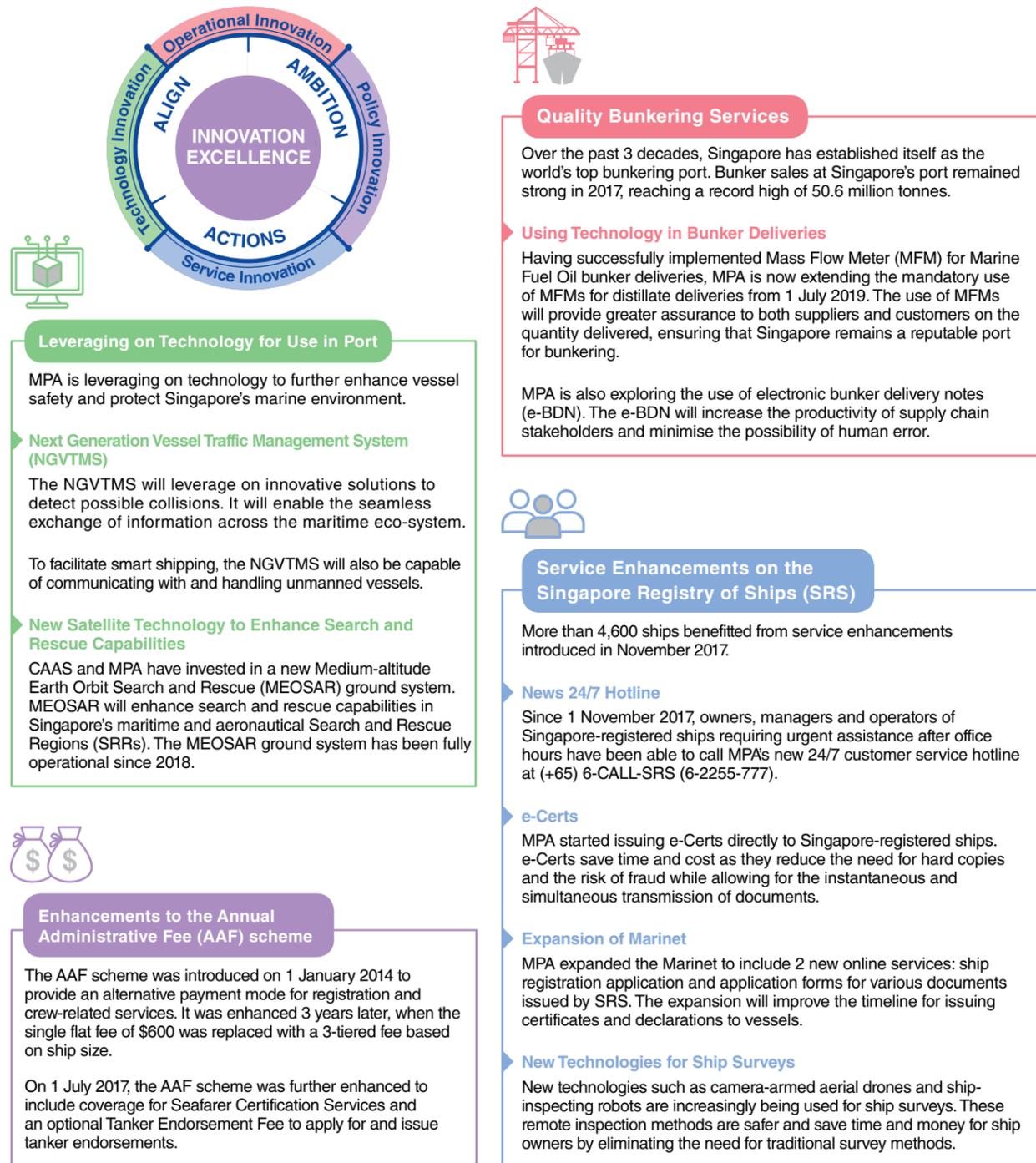
5.2b Drives process improvement to enhance productivity and achieve higher organisational performance

At a macro-level, the Sea Transport ITM builds on MPA's strategic long-term plans to develop Singapore's NGP and enhance the IMC. The Sea Transport ITM's key

thrusts are to catalyse innovation and drive productivity improvements for both Maritime Singapore and MPA.

Internally, process improvements are driven both at the workplan level, as well as grounds-up through the WITs process. As a result, MPA has put in place many process improvement initiatives to enhance productivity and efficiency (see Figure 5.2.2 for examples).

// Fig 5.2.2: Examples of Process Improvement Initiatives //



Enhancing Productivity through Robotic Processing Automation (RPA)

RPA technology has been successfully used in recent years across various industries to automate administrative tasks. With RPA, repeatable and rule-based workflows can be automated to provide fast and accurate services that customers have come to expect. As a quality and customer-orientated registry aiming to continuously deliver better services to shipowners, the SRS has also started exploring the use of RPA in some of its work processes.

verification checks required before the WRC certificates are issued.

In 2018, MPA has conducted 2 POCs for SRS processes:

POC with NCS - MPA receives an average of 120 COE applications per day. These COEs are Singapore's endorsement of foreign Certificates of Competency (COC) issued by other flag administrations, and are required for seafaring officers to sail onboard Singapore ships. To assist with the volume of applications processed by staff on a daily basis, MPA successfully completed a POC with NCS using RPA to verify COE applications submitted for COCs issued by China, the Philippines, Indonesia and India.

POC with Gleetrees - The Wreck Removal Convention (WRC) Certificate is renewed on a yearly basis, and the SRS receives more than 2000 such applications per year. MPA successfully completed a POC with Gleetrees, winner of the 2017 SPC, to automate the

MPA will be putting up a tender to build and implement an RPA solution for the 2 above mentioned processes. The RPA solution is expected to be implemented in 2019.

5.2c Sustains key processes in times of emergency to ensure business continuity

Singapore is one of the world's busiest ports. Ensuring that MPA and its partners have the means and ability to respond to any emergencies and contingencies is key for business continuity.

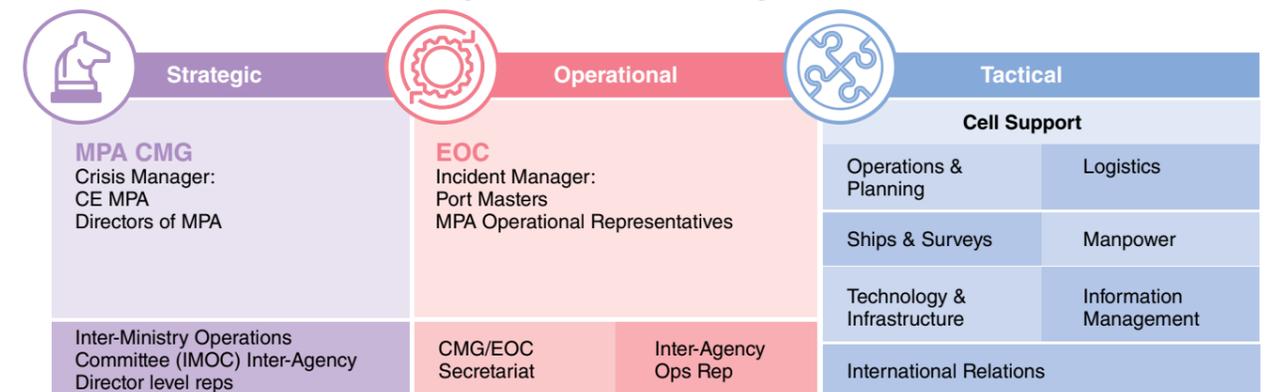
operations, as well as exercises command and control over all assigned resources.

Additionally, auxiliary members will join the EOC depending on the nature of the crisis. These members can include representatives from government and commercial resources.

Headed by the CE and comprising the various Directors (see Figure 5.2.3), the MPA Crisis Management Group (CMG) provides policy guidance to the Emergency Operations Committee (EOC) on the conduct of rescue

In the event of a major maritime emergency, it is usually the stricken vessel's responsibility to provide the first-wave of response, unless events escalate to a level high enough to warrant the activation of the contingency plan. MPA has adopted a phased approach to crisis management with clear lines of responsibility and established protocols for prompt and coordinated response.

// Fig 5.2.3: MPA Crisis Management //



MPA has put in place a comprehensive Business Continuity Management (BCM) Framework (see Figure 5.2.4) to ensure business continuity in the event of crises.

MPA has been participating in annual exercises both as the lead and a participating agency to test inter-agency readiness in responding to the different emergency scenarios, and also to share best practices and test new technologies (e.g. for combating oil spills). In 2017-2018, MPA organised 10 such exercises and participated in 18 others.

// Fig 5.2.4: MPA's Business Continuity Framework //

External Focus	Internal/External Focus	Internal Focus
MARSEC Plans Scenarios: Terrorist attacks on port facilities; sensitive vessels; piracy	Business Continuity Plans Scenarios: Pandemics and infectious diseases; labour strikes or infrastructure failures	Business Continuity Plans Scenarios: Disruption of Port operations; weak port enforcement regime
Crisis Management Scenarios: Vessel collisions; POCC disruptions; Port Terminal strikes; marine oil spills		IT Disaster Recovery Plans Scenarios: Virus; network failure; sabotage; physical loss of system; cyber attacks

To prepare better for such situations, MPA has also identified response contractors to assist its response during emergencies. They are listed below:

- Oil clean-up and chemical spill operations: Singapore Oil Spill Response Centre (SOSRC), Ardent Maritime

Singapore Pte Ltd, Oil Spill Response Ltd (OSRL), Singapore Salvage Engineers Pte Ltd (SSE)

- Infectious disease pandemic operations: Parkway Shenton Pte Ltd (temperature screening), Chye Thiam Maintenance Pte Ltd (cleaning/decontamination)

5.3 Supplier and Partner Management

5.3a Identifies and manages key suppliers and partners to achieve organisational goals

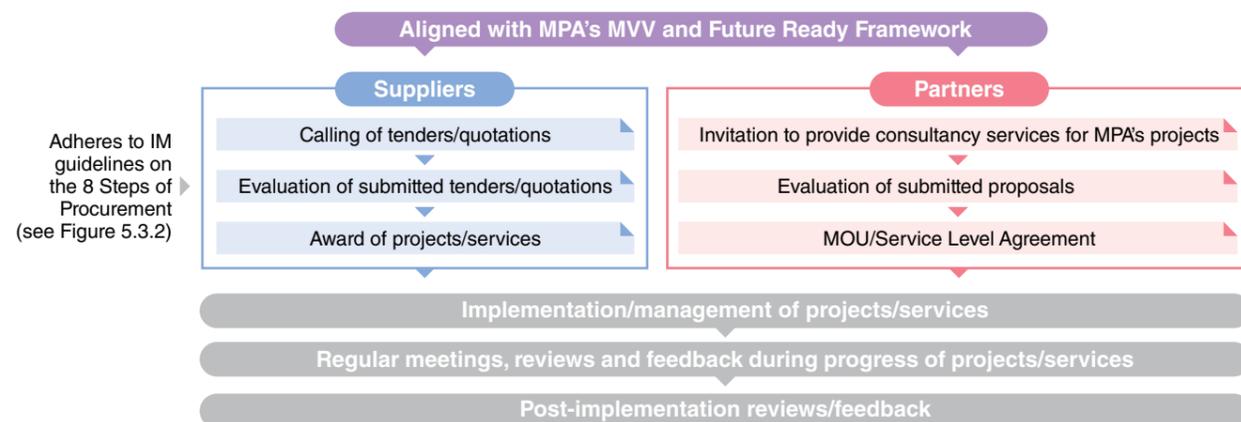
MPA works with suppliers to enhance its capabilities and efficiency, as well as to realise its Mission and Vision. One of its core principles is for identified key partners and suppliers to align their organisational objectives with MPA's Mission and Vision.

MPA works with 2 groups of partners: capability development partners and regulated partners (see Figure 5.3.1).

Capability development partners are organisations that MPA collaborates with to develop the capabilities of Maritime Singapore. In particular, MPA partners tertiary and research institutes to enhance its maritime R&D capability and innovation yields.

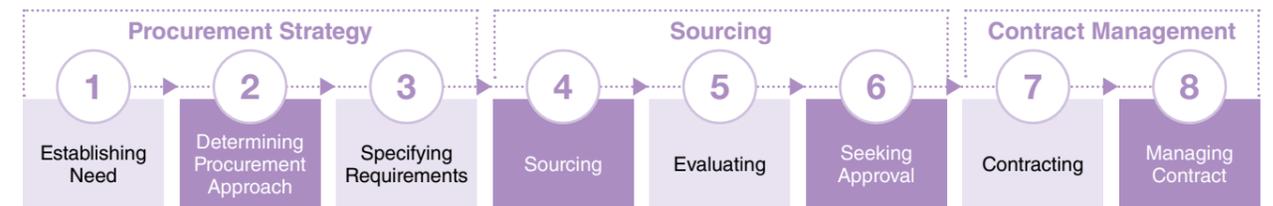
Regulated partners are associates that MPA manages in its role as industry regulator. They are required to meet key performance indicators.

// Fig 5.3.1: Identification and Management of Key Suppliers and Partners //



The 8 steps of procurement can be summarised as shown in Figure 5.3.2.

// Fig 5.3.2: Procurement Steps //



Building Drone-related Capabilities

MPA supported Wilhelsen Ship Services and Airbus to conduct drone trials for shore-to-ship delivery services. MPA collaborates with URA, SLA, NParks and CAAS to develop a Maritime Drone Estate for drone R&D, and works with RSAF, CAAS and DSTA on the national concept of operations for the Centralised Flight Management System.



Suppliers play a key role in intensifying, developing and sustaining Singapore's maritime ecosystem. MPA has a pool of key suppliers, consultants and contractors involved in implementing its projects and supporting its activities.

All Government Procuring Entities (GPEs) purchasing goods and/or services by contractual means operate within the system of Government Procurement (GP). MPA adheres to GP's 3 key principles:



Transparency

MPA subscribes to an open and transparent regime across all stages of the procurement cycle. MPA's procurement objectives, criteria and procedures are made known to suppliers as far as possible.



Open and Fair Competition

An open and competitive environment will encourage suppliers to present their best offers. Suppliers are given equitable access opportunities and compete on a level playing field.



Value For Money

MPA procures from sources that best meet its requirements and offer the best value. Value for money is derived from the optimal balance of benefits and costs on the basis of total cost of ownership. As such, a tender does not necessarily need to be awarded to the lowest bidder.

5.3b Engages key suppliers and partners to co-create products and services

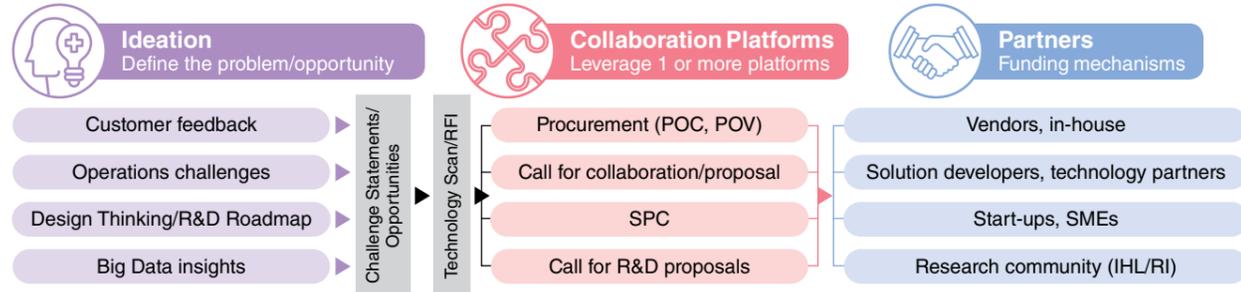
MPA has a structured process in place to engage partners to co-create innovative products and services for the industry (see Figure 5.3.3).

MPA's procurement guidelines have been updated to facilitate the procurement of products and services for developing innovation solutions (see Figure 5.3.4).

// Figure 5.3.4: Approach to Adopt for Innovation Solutions //



// Fig 5.3.3: MPA Innovation Mechanism //



The delivery of many of MPA's innovative products and services have been made possible due to collaborations and co-creations with key suppliers and partners.

Key Innovations Used to Construct the Next Generation Port

Innovations in the construction of the Tuas Terminal include the usage of caissons, and a specially designed and fitted vessel called the "TEMAROCK," a next-generation, all-in-one rock mound construction vessel.

The caisson is a prefabricated box-like concrete structure, around the height of a 10-storey HDB block, that creates deep foundational results and improves the quality of the wharf structure. The caisson fabrication facility pre-fabricates the structures on land before they are transported offshore.

The "TEMAROCK" vessel automates rock laying, rock compacting and underwater surveying, resulting in safer operations, less manpower costs (including a 75% reduction in diving time), reductions in material wastage and a 50% reduction in caisson installation time. Cost savings achieved are expected to be around S\$2 billion.

These were done in partnership with Surbana Jurong Infrastructure Pte Ltd and DIAP-Daelim.

The project was awarded the MOT Minister's Innovation Award 2018 Distinguished Award.



06

KNOWLEDGE



Analytics

6.1 Knowledge Management

6.2 Analytics for Performance Management



Data Governance



Organisational Learning



Comparisons and Benchmarking

MPA and PoR share the same ambition - to deliver an efficient, smart, safe, secure, green and community-oriented port. Through the sharing of collaborative experiences via interactive platforms such as lectures and round-table discussions, we can expand on solutions for the development of our ports. Throughout our long-standing partnership with MPA, we've shared the goals of leveraging technologies and the exchange of new ideas to develop cutting-edge solutions for the port industry.

Mr Allard Castelein
President, Port of Rotterdam

Proper recordkeeping is an important business function to support not only MPA's core business but Singapore's national interests as well.

Information and records are important assets that provide critical evidence of past decisions and actions. I recall in our territorial dispute with one of our neighbours, MPA's past records were effectively used to back Singapore's claim to its rights over Pedra Branca. As more and more records are being created in a fast-paced work environment, MPA is proactive in implementing best recordkeeping practices for instance, by ensuring that important records are identified upfront for permanent preservation through National Archives' approved Records Retention Schedule and by complying with the requirements set out in IM4L. I congratulate MPA for persevering in this endeavour!

Ms Kwek-Chew Kim Gek
Senior Archivist/Records Management,
National Archives Singapore

In all of SMU's interactions with MPA, whether in offering the Maritime Economics track or the Maritime Business and Operations track, I have found the MPA team and leaders to be most innovative in their ideas, involved and responsive in interactions and definitely very industry-focused when it comes to building impact and relevance for the maritime sector.

Prof Annie Koh
Vice President of Business Development, V3 Professor of Family Entrepreneurship
& Professor of Finance (Practice), Singapore Management University

It is impossible to imagine the growth of any maritime country without a developed shipping industry, and the forum organised by MPA is essential for understanding the vital role of shipping, which is indispensable to the world.

Rear Admiral Angel Alfredo Tello Gilardi
General Director,
Coast Guard Operations,
Commander Captaincies
& Coast Guard (Peru)

Maritime Sector Cyber-Readiness Maturity is assessed to be above average when compared to other Critical Information Infrastructure sector leads.

Mr S. Iswaran
Minister for Communication & Information
Minister-in-Charge of Cybersecurity

06 KNOWLEDGE

6.1 Knowledge Management

6.1a Collects and manages information for strategy development, decision-making and organisational learning

Knowledge Management (KM) Framework

For effective strategy development, decision-making and organisational learning, MPA has established a KM

Framework to structure the way it collects and manages information and knowledge (see Figure 6.1.1).

Externally, MPA collects market and customer insights both directly from customers and stakeholders (e.g. discussions, feedback forms) and indirectly from market research companies and IHLs (e.g. market research reports, benchmarking reports). This feeds into the organisation's environment scan to better feel the industry's pulse.

e-Registry

The MPA e-Filing System serves as MPA's institutional memory, where various documents and emails intrinsic to its collective knowledge are gathered from all divisions and departments.

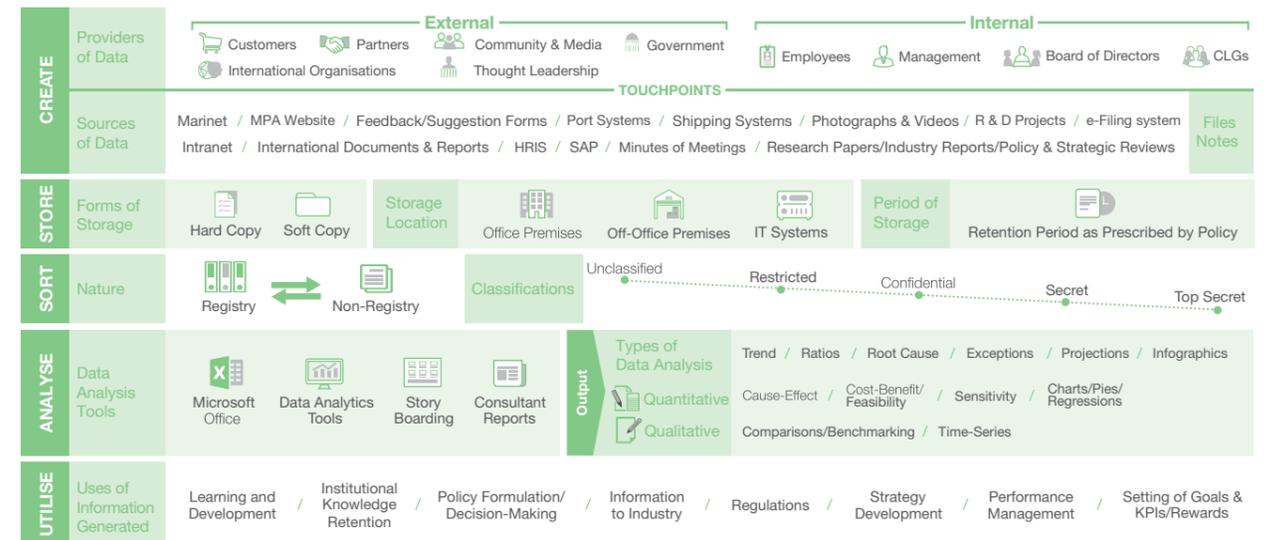
The e-Registry collects archive-worthy documents as identified by the National Archives of Singapore (NAS) for long-term retention and posterity.

The e-Filing system also aims to digitise hard copy documents and records to enable MPA to go paperless.

Oral History and MPA Senior Executive Alumni (SEA) Network

Lessons learnt and experiences from the past remain relevant to Maritime Singapore despite changes in its operating environment. MPAA documents oral history interviews with key maritime pioneers and personalities to capture and archive their tacit knowledge. These accounts are then stored in NAS for ease of reference.

// Fig 6.1.1: Knowledge Management Framework //



6.1b Ensures the accuracy, accessibility and security of information

The MPA Systems Architecture ensures that the flow of data and information within MPA is managed effectively, only a single source of truth exists for organisational/customer data, and stakeholders have access to the information that they need.

Accuracy of Information

Apart from ensuring compliance to WOG guidelines (e.g. IM4L, IM8 and other GovTech requirements), issues on data integrity and protocol, accessibility, integration, retention time frame and disaster recovery are deliberated upon and monitored by the KM working committee and guided by MPA's KM Instruction Manual.

Accessibility

MPA communicates and makes information accessible to both external and internal stakeholders to facilitate business operations, decision-making and engagement (see Tables 1.1.1 and 1.1.2). MPA continues to review these processes to ensure ease of access.

Security

Apart from ensuring security of information, MPA also takes the lead within the maritime sector for cyber security.

The Maritime Cybersecurity Operation Centre (MCOC) was established in 2018 by MPA to lead the maritime sector in enhancing its response against cyber threats. The MCOC augments MPA's capabilities for early detection, monitoring, analysis and response to cyber-attacks, and also oversees the protection of the maritime industry's critical information infrastructures (CIIs). With Maritime Singapore's rapid pace of digitalisation, a new

'Security by Design' approach has been introduced and integrated with new Infocomm Technology projects to minimise system vulnerabilities and points of attack. To maximise cyber security efforts, MPA also included PSA's and Jurong Port's CIIs within the expanded monitoring scope of its 24/7 Maritime Cybersecurity Operation Centre.

Additionally, a 2-day cyber readiness exercise, known as Cyber Ark, was conducted by the Cyber Security Agency (CSA) for Maritime CII to assess its cyber security capabilities and surface areas for improvement. To educate and shape the right behaviours for its staff, MPAA has also been organising Cyber Security Awareness Courses.

6.1c Captures information and knowledge related to innovation

To provide a clear focus for investing the industry's innovation resources and efforts, information and knowledge from stakeholders, business operations, service journeys and big data are synthesised and challenge statements are developed (see Figure 5.3.3). This enables the tech industry to participate in the innovation process.

MPA also shares data and information it owns with the rest of industry to facilitate developments of new applications, products and services to address the business needs of Maritime Singapore. This is done through exhibitions, forums and other platforms such as the SG-MDH.

6.1d Protects knowledge and the intellectual property generated from innovation projects

Government IM2L clearly spells out the provisions and guidelines for staff to obtain formal IP rights registration (e.g. patents, trademarks and industrial designs) for innovations, and the circumstances where staff should receive a portion of the commercialisation revenue. Staff and vendors are also reminded to abide by Singapore's Copyright Law, IP Management Guidelines for the Public Sector and the Official Secrets Act.

Collaborations with IHLs and RIs on innovation projects and initiatives are formalised either through MOUs

or innovation procurement processes (see Figure 5.3.4). Rights to IP are protected in these contractual arrangements. MPA and the involved parties protect innovations through patents to prevent exploitation.

An MOU defines the expectations and responsibilities of MPA and its partners, ensuring that the knowledge and IP of innovation projects are kept between the involved parties. A recent example is the MOU signed between MPA and Lloyd's Register on Maritime Technologies R&D. This MOU will build upon strong existing collaborations on ship sustainability and safety, and optimise design for real-time monitoring, unmanned systems and robotics. Through this MOU, MPA is able to safeguard its IP and knowledge.

6.2 Analytics for Performance Management

6.2a Leverages on information and knowledge to create new value

MPA constantly leverages on information and knowledge to create value for the maritime industry. Some examples are listed in Table 6.2.1.

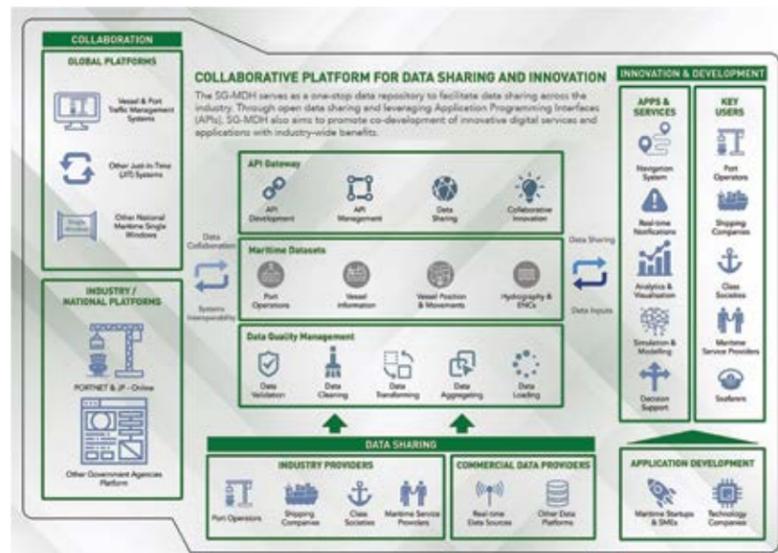
Table 6.2.1 Examples of How MPA Leverages on Information and Knowledge to Create Value

Project	Description
e-Navigation	e-Navigation is a harmonised digital information exchange system that improves the organisation and exchange of data between systems on ship and shore. The system can lead to improved global navigational safety, protect the marine environment and reduce maritime incidents.
VHF-based Data Exchange System (VDES)	<p>VDES facilitates real-time data transfer between shore and ships in the port. With better data exchange infrastructure, VDES allows for the development of predictive analysis to forecast traffic hotspots and collisions. It also enables shared situational awareness pictures between shore and ships, thereby enhancing navigational safety.</p> <p>To complement terrestrial VDES, MPA is supporting research and innovation to develop satellite VDES under the Maritime Transformation Programme. Working in partnership with IHLs, RIs and local industry partners, the satellite VDES will complement terrestrial VDES and allow the VDES as a whole to have global coverage. MPA plans to deploy the VDES solutions to pilot real-time maritime traffic and asset tracking. VDES will complement and progressively replace AIS over the next 10 years, enabling two-way data exchange and unlocking new applications such as e-Navigation. These enhancements will improve safety & security at sea and enhance the operational efficiencies of shipping and port.</p> <p>Both the terrestrial and satellite VDES will benefit the shipping community as they allow two-way communications, are more cost-effective and can transfer data faster between ship and shore.</p>
Singapore Maritime Trail (SMT)	<p>MPA readily shares its knowledge through outreach and awareness events. In conjunction with the Singapore Bicentennial this year, one such event is the launch of a new SMT. Building upon the SMT 1 and 2, SMT 3 will explore Singapore's Maritime Legacy.</p> <p>This trail will explore the influence of maritime trade and activities that have shaped Singapore's culture, language and identity, focusing on the areas of Telok Ayer and Kampong Glam.</p>

Singapore Maritime Data Hub (SG-MDH)

The recently launched SG-MDH acts as a one-stop repository to promote co-development of innovative digital services and applications with industry-wide benefits. With a platform that shares data with the public and leverages Application Programming Interfaces (APIs), MPA exchanges innovation and development

data using applications and services such as real-time notification, and with key users such as maritime service providers. To assist users in retrieving their required data, MPA has publicised an API user guide on its website. This user guide provides comprehensive step-by-step instructions for users to navigate through the data hub.



MPA Living Lab (MLL)

The MLL consists of both physical and digital aspects to serve as a co-creation platform for innovation. The Maritime Innovation Lab is a facility purpose-built to create an environment that enables experimentation and the test-bedding of innovative port services and intelligent ship operations. It offers access to the world's busiest port and waterways, as well as one of the harshest operational conditions, to stress-test solutions and ready them for the global marketplace.

17 organisations, including ST Engineering and Kongsberg, are onboard this journey to co-create innovative solutions for the maritime industry.



6.2b Uses comparative and benchmarking knowledge to improve performance

6.2c Uses comparative and benchmarking information to drive innovation outcomes

MPA regularly conducts benchmarking exercises and comparative analysis to set performance standards that help to better gauge and improve its performance. Findings and best practices from such exercises are assimilated into workplans where appropriate.

Comparative and benchmarking studies are vital to the improvement of MPA's performance and the attainment of new levels in performance and drive innovation.

In addition, MPA has organised several study missions and learning journeys, both abroad and

within Singapore to learn about and adopt relevant and useful practices or cultures. To enhance its understanding of other organisations' innovation capabilities, MPA conducted learning journeys to innovative organisations like 3M (2015), the State Courts and Cold Storage (2016), Singapore Civil Defence Force (2017), National Library Board (2018) and Land Transport Authority (2019). These journeys have enriched staff's perspectives and infused fresh ideas to help MPA navigate towards the future.



Singapore Remains Top in the Leading Maritime Capitals of the World Report 2019

Singapore has maintained its top position ahead of 14 other leading maritime capitals. Despite a weak trade cycle in traditional shipping and offshore oil and gas markets having yet to recover, Singapore was able to retain its lead in 3 of the 5 pillars of the ranking: Shipping, Ports and Logistics as well as Attractiveness and Competitiveness. The criteria included both soft and hard infrastructure, as well as access to world-class talent and services – all key components that maritime businesses need to thrive in their chosen locations.

"Maritime Singapore's continuous effort to strengthen its attractiveness as an international maritime centre has been well received by the industry. The strong results on both the objective indicators and expert assessments indicate its relevance as a critical node within the maritime sector regionally and globally," said Shahrin Osman, Regional Head of Maritime Advisory, DNV GL.

6.2d Analyses data and information of current performance to identify opportunities for innovation

To level up whole-of-MPA capability development for data analytics and build a professional core analytics team, MPA is embarking on a 5-year Data Analytics implementation plan that focuses on big data systems and infrastructure. This plan is aligned with the WOG Digital Government Blueprint in areas like Ministry Family Digitalisation Plans, Government Data Strategy and End-to-end Digital Government Services.

The Data Analytics implementation plan is also aligned with MPA's key objectives, supporting key pillars of

Maritime Singapore such as the NGP 2030, IMC 2030, and the Sea Transport ITM.

Some examples of the innovative outcomes are projects such as the SG-MDH and JIT Planning and Coordination System. SG-MDH facilitates data sharing amongst the industry and aims to promote co-development of innovative digital services and applications with industry-wide benefits. The JIT is a platform that shares critical information amongst stakeholders in the vessel passage plan. This includes MPA, ICA, ship agents, marine service providers and terminal operators. The end goal is to allow ships to berth on arrival, consume services in time and enjoy faster turnarounds.

Sense-making Analytics for Maritime Event Recognition (SAFER)

Project SAFER is a collaboration between MPA and IBM to develop and test new analytics-based and machine-learning technologies. It is aimed at improving port operations and enforcements to support Singapore's growth in vessel traffic and ensure that the Port of Singapore is safe, secure and efficient.

SAFER is an analytics-based system that integrates real-time data from multiple sources to help the POCC make better decisions. Predictive analytics will help forecast vessel arrival timings and traffic density. By applying advanced data analytics, sense-making, fusion and machine learning technologies, the system can also uncover new ways of detecting the unusual behaviour of ships, preventing illegal activities.

SAFER has been recognised both internationally and locally:

- CAPAM Innovation Incubation programme – 1 of 3 finalists
- INFORMS Innovative Application in Analytics Award – Awarded the 2nd prize



- Minister's Innovation Award 2017 Distinguished Award
- ExCEL Innovation Project Award 2018

Project SAFER was featured at the PST Exhibition 2018 held at Resorts World Convention Centre, as well as in the local production 'Destiny of a Maritime Nation'.

GLOSSARY

Abbreviation	Description
AAF	Annual Administrative Fee
ACE	Assistant Chief Executive
AGV	Autonomous Guided Vehicle
AIS	Automatic Identification System
AM	Additive Manufacturing
AML	Advanced Maritime Leaders Programme
AMSS	Annual Marine Services Survey
AO	Action Officer
APSN	APEC Port Services Network
ARFO	Association of Regional Ferry Operators
A*STAR	Agency for Science, Technology and Research
AtoN	Aids to Navigation
AUSBE	Amalgamated Union of Statutory Board Employees
BCC	Bunker Convention Certificate
BCM	Business Continuity Management
BOA	Berthed on Arrival
BSC	Balanced Score Card
CAAS	Civil Aviation Authority of Singapore
CAG	Changi Airport Group
CAPAM	Commonwealth Association of Public Administration and Management
CDO	Chief Digital Officer
CE	Chief Executive
CII	Critical Information Infrastructure
CLC	Civil Liability Convention
CMG	Crisis Management Group
COC	Certificate of Competency
COE	Certificate of Endorsement
CoE	Centre of Excellence
CPF	Central Provident Fund Board
CRM	Customer-Relationship Management
CRR	Cost Recovery Ratio
CSC	Civil Service College
DD	Deputy Director
DSTA	Defence Science and Technology Agency
EES	Employee Engagement Survey
ENC	Electronic Navigational Chart
EOC	Emergency Operations Committee
ERM	Enterprise Risk Management
ESG	Enterprise Singapore
FEREX	Ferry Rescue Exercise
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GP	Government Procurement
GPEs	Government Procuring Entities
GPP	Green Port Programme
GRI	Global Reporting Initiative
GT	Gross Tonnage
GTP	Green Technology Programme
HOD	Head of Department
HR	Human Resource
HRIS	Human Resource Information System
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
ICA	Immigration and Checkpoints Authority
IDP	Industry Digital Plan

Abbreviation	Description
IE Singapore	International Enterprise Singapore
IG P&I	International Group of Protection & Indemnity
IHL	Institute of Higher Learning
IHO	International Hydrographic Organisation
IM	Instruction Manual
IMC	International Maritime Centre
IMDA	Info-communications Media Development Authority
IMO	International Maritime Organisation
IoT	Internet of Things
IP	Intellectual Property
IRAS	Inland Revenue Authority of Singapore
IRCC	Inter-Regional Coordinating Committee
ISO	International Organisation for Standardisation
ISPS	International Ship and Port Facility Security
ITM	Industry Transformation Map
ITTD	Innovation, Technology and Talent Development Division
IWC	Innovation Working Committee
JIT	Just-in-Time
JPPL	Jurong Port Pte Ltd
KDE	Key Domain Expertise
KIP	Kids In Play
KM	Knowledge Management
KPI	Key Performance Indicator
LEAD	Leadership Development
LNG	Liquefied Natural Gas
LRM	Learning Roadmap
LSCI	Liner Shipping Connectivity Index
LTA	Land Transport Authority
MASS	Maritime Autonomous Surface Ships
MCF	Maritime Cluster Fund
MCF-BD	Maritime Cluster Fund-Business Development
MFM	Mass Flow Metering
MINDEF	Ministry of Defence
MINT	Maritime Innovation and Technology
MLJ	MPA Learning Journey
MLL	MPA Living Lab
MLP	Marine Licensing and Permits
MOF	Ministry of Finance
MOH	Ministry of Health
MOM	Ministry of Manpower
MOT	Ministry of Transport
MOU	Memorandum of Understanding
MPA	Maritime and Port Authority of Singapore
MPAA	MPA Academy
MPF	Maritime Policy Forum
MPLP	Maritime Public Leaders' Programme
MSC	Maritime Safety Committee
MSGI	Maritime Singapore Green Initiative
MSI	Maritime Singapore Incentive
MSI-AIS	Maritime Singapore Incentive – Approved International Shipping
MSI-ML	Maritime Singapore Incentive – Maritime Leasing

Abbreviation	Description
MSJCE	Malaysia-Singapore Joint Committee on the Environment
MSM	Ministerial Staff Meeting
MSMD	Minimum Safe Manning Document
MSW	Maritime Single Window
MTI	Ministry of Trade and Industry
MTP	Maritime Transformation Programme
MTWG	Maritime Transport Working Group
MVV	Mission, Vision and Values
NAS	National Archives of Singapore
NEA	National Environment Agency
NGP	Next Generation Port
NGVTMS	Next Generation Vessel Traffic Management System
NMSSC	National Maritime Safety at Sea Council
NOA	Notification of Arrival
NRF	National Research Foundation
NTM	Notice to Mariners
NTU	Nanyang Technological University
NUS	National University of Singapore
OED	Organisational Excellence Department
OSDC	One-Stop Document Centre
PAR	Port Authorities Roundtable
PCG	Police Coast Guard
PEP-SBF	Pro-Enterprise Panel – Singapore Business Federation
PER	Pro-Enterprise Ranking
PIER71	Port Innovation Ecosystem Reimagined @ Block 71
PMET	Professionals, Managers, Executives and Technicians
PMP	Port Management Programme
POC	Proof of Concept
POCC	Port Operations Control Centre
PSAB	PSA Building
PSAC	PSA Corporation Ltd
PSC	Port State Control
PST	Public Service Transformation
QSM	Quality Service Manager
ReCAAP	Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia
RI	Research Institute
RICs	Research and Innovation Centres
R&D	Research and Development
RPA	Robotic Processing Automation
RSF	Republic of Singapore Air Force
RSEs	Research Scientists and Engineers
RSN	Republic of Singapore Navy
SAFER	Sense-making Analytics for Maritime Event Recognition
SAR	Search and Rescue
SAREX	Search and Rescue Exercise
SCDF	Singapore Civil Defence Force
SCMA	Singapore Chamber of Maritime Arbitration
SG-MDH	Singapore Maritime Data Hub

Abbreviation	Description
SGX	Singapore Exchange
SIBCON	Singapore International Bunkering Conference
SISC	Service Excellence and Innovation Steering Committee
SLA	Singapore Land Authority
SM	Senior Management
SMA	Singapore Maritime Academy
SME	Small and Medium Enterprise
SMF	Singapore Maritime Foundation
SMI	Singapore Maritime Institute
SMM	Senior Management Meeting
SMT	Singapore Maritime Trail
SMTCC	Singapore Maritime Technology Conference
SMU	Singapore Management University
SMW	Singapore Maritime Week
SOMS	Straits of Malacca and Singapore
SP	Singapore Polytechnic
SPC	Smart Port Challenge
SRS	Singapore Registry of Ships
SSA	Singapore Shipping Association
SSG	SkillsFuture Singapore
STCW	Standards on Training, Certification and Watch-keeping for Seafarers
SUTD	Singapore University of Technology and Design
TBS	Total Business Spending
TCTP	Total Company Training Plan
TEU	Twenty Foot Equivalent Unit
TMSS	Tripartite Maritime Scholarship
TSD	Training Standards Department
TSP	Training Service Provider
TTX	Tabletop Exercise
UAV	Unmanned Aerial Vehicle
UKHO	United Kingdom Hydrographic Office
UNCTAD	United Nations Conference on Trade and Development
URA	Urban Redevelopment Authority
USCG	United States Coast Guard
VDES	VHF-based Data Exchange System
VFM	Value-for-Money
VHF	Very High Frequency
VTIS	Vessel Traffic Information System
VTM	Vessel Traffic Management
VTMS	Vessel Traffic Management Services
VTS	Vessel Traffic Services
WEF	World Economic Forum
WITs	Work Improvement Teams
WOG	Whole-of-Government
WOW	Well-on-Worklife
WRC	Wreck Removal Convention
WSH	Workplace Safety and Health
WT	Waiting Time

MPA inks contract for Tuas Terminal Phase 2

Record number of agreements signed at conference in industry-wide push for digitalisation and innovation

Singapore's Maritime and Port Authority (MPA) has signed a record number of agreements with industry partners at a conference in Singapore, marking a significant step in the port's digitalisation and innovation journey.

The MPA signed 11 agreements with various industry players, including technology firms, academia, and government agencies. These agreements cover a wide range of areas, from smart port initiatives to cybersecurity and digitalisation.

The agreements were signed during the Smart Port Challenge 2021, a competition that encourages innovation in the port sector. The MPA aims to create a smart port that is more efficient, secure, and sustainable.

BT Infographics

The strong, silent type

An automated port can operate 24 by 7 – this translates to room for improved service consistency, a trait sought after by mega shipping lines Singapore

The Maritime and Port Authority of Singapore (MPA) is investing in automation to improve port operations. The agency has announced a plan to automate 24 out of 28 berths at the Tuas Terminal by 2025.

The automation will allow the port to operate 24 hours a day, seven days a week. This will improve service consistency and reduce waiting times for ships.

Singapore's smart port initiative attracts more start-ups

The Maritime and Port Authority of Singapore (MPA) is continuing to boost innovations in shipping and port operations as its ongoing initiatives seek out new start-ups to develop new talent and ventures for the maritime sector.

The MPA has launched several initiatives to attract start-ups, including the Smart Port Challenge and the Maritime Innovation Ecosystem. These initiatives provide start-ups with access to funding, mentorship, and industry connections.

Installing the caisson seawall

The first, second and third place winners of this year's SPC were Ocean Ring, which received cash prizes of S\$10,000, S\$500,000 and S\$500,000 respectively.

The Smart Port Challenge (SPC) is a competition that encourages innovation in the port sector. The MPA aims to create a smart port that is more efficient, secure, and sustainable.

Phase I of Tuas port on course for 2021 launch

Construction work near completion, first two berths set to start operations in two years

The Maritime and Port Authority of Singapore (MPA) has announced that the construction of Phase I of the Tuas Terminal is on track for a 2021 launch. The first two berths are expected to start operations in two years.

The MPA is investing in automation to improve port operations. The agency has announced a plan to automate 24 out of 28 berths at the Tuas Terminal by 2025.

A glimpse into the future Tuas port

UNMANNED DRONES
A fleet of unmanned drones that operate autonomously in the air will be used to inspect the port's infrastructure and monitor the sea.

ROBOTIC ARM FOR THIRST
A robotic arm will be used to fill water bottles for port workers.

SMART GLASSES
Smart glasses will be used to provide port workers with real-time information about the port's operations.

SMART VESTS
Smart vests will be used to monitor port workers' health and safety.

SMART HELMETS
Smart helmets will be used to provide port workers with real-time information about the port's operations.

Port will tap tech, data to optimise ops

The Maritime and Port Authority of Singapore (MPA) is investing in technology and data to optimise port operations. The agency has announced a plan to use artificial intelligence and machine learning to improve port efficiency.

MPA's first woman CEO wants to change perception of sector

Ms Quah says maritime industry is more than just seafaring and port operations.

Ms Quah, the first woman CEO of the Maritime and Port Authority of Singapore (MPA), wants to change the perception of the maritime sector. She believes the sector is more than just seafaring and port operations.

By Chuang Peck Ming

Singapore's public relations handlers present her as the first woman chief executive of the Maritime and Port Authority of Singapore (MPA). What they ought to highlight is that Quah Lay Hoon is in charge of regulating and promoting a sector that's not only dominated by men, but also shunned by some men who find it too tough.

Ms Quah says maritime industry is more than just seafaring and port operations.

Secretary under the Prime Minister's Office, Mr. Chan, said the maritime sector contributes about 7.0 per cent to our GDP (gross domestic product) and has 5,000 international shipping groups and global maritime service providers employing more than 170,000 people.

Installing the caisson seawall

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NEWS ARTICLE

Maritime and Port Authority of Singapore supports use of drones for trial maritime delivery

With a quicker response rate and turnaround time of up to 6 times, UAS drone delivery has the potential to lower shore-to-ship delivery costs by up to 90%.

The Maritime and Port Authority of Singapore (MPA) recently announced that it is pleased to support the pilot trial of drone delivery to ships at sea. The trial is a collaboration between Airbus and the MPA.

MPA, Namic ink MOU to develop 3D printing applications for maritime sector

The Maritime and Port Authority of Singapore (MPA) and the National Additive Manufacturing Innovation Cluster (Namic) have inked a memorandum of understanding to develop maritime applications related to digitalisation and advanced manufacturing in the private sector.

WONG KAI YI

The Maritime and Port Authority of Singapore (MPA) and the National Additive Manufacturing Innovation Cluster (Namic) have inked a memorandum of understanding to develop maritime applications related to digitalisation and advanced manufacturing in the private sector.

Innovation key to transforming sector

Leading this process is the Maritime and Port Authority of Singapore, which works closely with industry players.

The Maritime and Port Authority of Singapore (MPA) is investing in innovation to transform the port sector. The agency has announced a plan to use artificial intelligence and machine learning to improve port efficiency.

COMMENTARY

Digital innovation key to maritime industry's future

By Dorte Bech Vizard

DIGITISATION is for all of us, from the CEO to the youngest man on the deck," said Ibrahim Gokcen, AP Moller Maersk's first ever chief digital officer, about the company's digital vision last June. I agree. Our traditional industries are forced to search for digital innovation to support such success as government partnerships, it is a matter of survival.

3D printing facility to be set up at PSA's Pasir Panjang Terminal

The world's first 3D maritime printing facility will be built at PSA's Pasir Panjang Terminal, to create parts that can be used for port equipment.

The Maritime and Port Authority of Singapore (MPA) signed an agreement on Wednesday to set up the facility. It will feature state-of-the-art 3D printing technology supported by blockchain technology for increased security of file transfers.

MPA to set up new cybersecurity centre to enhance response against threats

The Maritime Cybersecurity Operation Centre will be established by the third quarter of this year, says the Maritime and Port Authority of Singapore.

SEE ALSO: New programme to develop advanced manufacturing applications services for maritime sector

Namic is a national programme initiative in Singapore, led by NTUitive, the Inn and Enterprise Company of Nanyang Technological University, to translate 3D printing research into commercial applications.

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MPA IN THE NEWS

Fund to help ship agency, harbour craft sectors with digital solutions

Singapore FIRMS in the ship agency and harbour craft sectors in the maritime industry can now tap a \$53.7 million fund for digital solutions. The fund is part of the Sea Transport Industry Digital Plan (IDP), which aims to help small and medium-sized part of the SMEs Go Digital Programme. MPA chief executive Quah Ley Hoon said efforts such as the IDP can help firms to kick-start their digitalisation journey, and that the agency hopes that such efforts can bring the maritime sector to a new level.

Electronic navigation charts the way to safer Straits

Can you tell me how to get to Sesame Straits? Four years ago, the Maritime and Port Authority of Singapore (MPA) did just that. It partnered with Norwegian agencies on the Secure, Efficient and Safe Maritime Traffic Management in the Straits of Malacca and Singapore (Sesame Straits) project to develop new operating concepts for the world's most congested waterways. Yesterday, Senior Minister of State for Transport Lam Pin Min said MPA will launch Sesame Solution II, in partnership with the Sesame consortium. "Leveraging technology and digitalisation can help us to manage the traffic in the Straits of Malacca and Singapore more effectively, and to ensure that the waterway remains safe and secure for all users," he said.



Innovation among key issues at S'pore Maritime Week

Industry faces challenges, including need to draw talent: MPA chief

Singapore Maritime Week 2019, which is the largest maritime industry event in the region, kicked off yesterday at the Singapore Convention and Exhibition Centre. MPA chief executive Quah Ley Hoon said the industry faces challenges, including the need to draw talent. "We are working to attract more talent to the maritime sector, and to ensure that the industry remains competitive in the long term," he said. The week-long event, which is co-organised by the Maritime and Port Authority of Singapore (MPA) and the Singapore Maritime Industry Association (SMIA), will feature a series of seminars, workshops, and networking opportunities. Quah said that the industry must embrace innovation and digitalisation to remain competitive. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The event will also feature a series of seminars and workshops, including one on the future of shipping and one on the future of maritime technology.

Harness technology, go where the trade flows are: Chan Chun Sing

Singapore can also boost its maritime service offerings through sister sectors, such as finance and logistics. Singapore Trade and Industry Minister Chan Chun Sing said at the annual Singapore Maritime Lecture on Monday. "We are working to harness technology and go where the trade flows are," he said. Chan said that the maritime sector is a key part of Singapore's economy, and that the government is committed to supporting the sector's growth. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The lecture, which is the largest maritime industry event in the region, will feature a series of seminars, workshops, and networking opportunities. Chan said that the industry must embrace innovation and digitalisation to remain competitive. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

S'pore maritime sector looks ahead

MPA chief executive Quah Ley Hoon said at the annual Singapore Maritime Lecture on Monday. "We are working to harness technology and go where the trade flows are," he said. Quah said that the maritime sector is a key part of Singapore's economy, and that the government is committed to supporting the sector's growth. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The lecture, which is the largest maritime industry event in the region, will feature a series of seminars, workshops, and networking opportunities. Quah said that the industry must embrace innovation and digitalisation to remain competitive. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

MPA investing \$650k in 13 start-ups to solve maritime challenges

The Maritime and Port Authority of Singapore (MPA) is investing \$650,000 in 13 start-ups to develop innovative solutions to maritime challenges. The MPA said that the funding is part of its Maritime Innovation Fund, which is designed to support the development of new maritime technologies. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The fund will be used to support a range of start-ups, including those that are developing new shipping technologies, those that are developing new maritime services, and those that are developing new maritime infrastructure. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

S'pore unveils innovation lab for self-sailing ships

Senior Minister of State for Transport Lam Pin Min said that the MPA's latest lab would support the transport industry map, which will boost the maritime industry and technology. The lab, which is the largest maritime industry event in the region, will feature a series of seminars, workshops, and networking opportunities. Lam said that the industry must embrace innovation and digitalisation to remain competitive. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

S'pura perlu fikir semula strategi maritim untuk hadapi cabaran, peluang

"Kita tahu sistem itu tidak sempurna. Namun, kita mesti membina asas yang lebih kukuh untuk menghadapi cabaran dan peluang masa depan," kata Menteri Pengangkutan, Lam Pin Min. Lam said that the maritime sector is a key part of Singapore's economy, and that the government is committed to supporting the sector's growth. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The lecture, which is the largest maritime industry event in the region, will feature a series of seminars, workshops, and networking opportunities. Lam said that the industry must embrace innovation and digitalisation to remain competitive. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

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Ship agency and harbour craft SMEs can tap \$3.7m digitalisation fund

The Maritime and Port Authority of Singapore (MPA) is investing \$3.7 million in a digitalisation fund to help small and medium-sized enterprises (SMEs) in the ship agency and harbour craft sectors. The MPA said that the fund is part of its Maritime Innovation Fund, which is designed to support the development of new maritime technologies. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The fund will be used to support a range of SMEs, including those that are developing new shipping technologies, those that are developing new maritime services, and those that are developing new maritime infrastructure. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

MPA invests \$7.2m in projects on autonomous shipping

The Maritime and Port Authority of Singapore (MPA) is investing \$7.2 million in a series of projects to develop autonomous shipping. The MPA said that the funding is part of its Maritime Innovation Fund, which is designed to support the development of new maritime technologies. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The projects will include the development of new autonomous shipping technologies, the development of new autonomous shipping services, and the development of new autonomous shipping infrastructure. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

Innovation Is Key For Maritime Singapore To Stay Ahead

With support from the government, more maritime players in Singapore are digitalising their operations to drive amid technological disruption. Innovation is key for Maritime Singapore to stay ahead in a rapidly changing industry. The Maritime and Port Authority of Singapore (MPA) is investing in research and development, and is working to attract more talent to the maritime sector. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The MPA is also working to support the development of new maritime technologies, and is working to attract more talent to the maritime sector. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

陈振声：要维持枢纽地位 须重新思考我国海事战略

新加坡海事及港口局行政总裁陈振声在周一举行的新加坡海事论坛上表示，新加坡必须重新思考其海事战略，以维持其作为全球海事枢纽的地位。陈振声表示，新加坡必须投资于研究和开发，并吸引人才到海事部门。"我们正在投资于研究和开发，并吸引人才到海事部门，"他说。陈振声还提到，新加坡必须投资于研究和开发，并吸引人才到海事部门。"我们正在投资于研究和开发，并吸引人才到海事部门，"他说。陈振声还提到，新加坡必须投资于研究和开发，并吸引人才到海事部门。"我们正在投资于研究和开发，并吸引人才到海事部门，"他说。

SEA TRANSPORT INITIATIVE

The Maritime and Port Authority of Singapore (MPA) is launching the Sea Transport Initiative (STI) to support the development of new maritime technologies. The MPA said that the STI is part of its Maritime Innovation Fund, which is designed to support the development of new maritime technologies. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The STI will be used to support a range of start-ups, including those that are developing new shipping technologies, those that are developing new maritime services, and those that are developing new maritime infrastructure. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

Ship agency and harbour craft SMEs can tap \$3.7m digitalisation fund

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Positioning Singapore's maritime sector for the future

Public needs to boost other sectors of the shipping economy to tackle challenges ahead. Singapore's maritime sector is a key part of the country's economy, and the government is committed to supporting its growth. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The government is also working to support the development of new maritime technologies, and is working to attract more talent to the maritime sector. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

S'pore tops maritime capital ranking again

Singapore has again clinched the top spot in a biennial ranking of the world's leading maritime capital cities, the fourth time it has topped the list. The Republic has consistently topped the Leading Maritime Capitals of the World survey, released once every two years by risk management firm GL and consultancy firm Economics & Statistics. Singapore's ranking was boosted by its strong performance in the survey, which ranked cities based on their maritime capital indicators. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said. The survey also ranked cities based on their maritime capital indicators, and Singapore topped the list for the fourth time. "We are investing in research and development, and we are working to attract more talent to the maritime sector," he said.

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Singapore seeks maritime digital transformation

The 20 Nov 2018 by Ed Martin, reporting from Singapore

Print story Email us



The first day included a panel discussion on how to increase adoption of digital solutions

The inaugural Maritime Digital Innovation Summit took place in Singapore on 14 and 15 November with speakers and delegates from Singapore, southeast Asia and further afield coming together to discuss pressing issues related to digitalisation in the maritime sector.

A range of topics were covered but strong trends throughout the two-day conference were cyber risk, additive manufacturing, autonomous shipping and how to increase the uptake of digital solutions. Singapore Solutions was in attendance and in this first of two articles on the conference, we pick out key takeaways from the first

Port authority aims for tech boost

Sirin Ngai
Principal Journalist, Singapore

As shipping begins to embrace digitalisation, Singapore intends to ride the transformative wave and position itself as a key international maritime centre for technology.

"The maritime industry has been around for a long time and many of the practices are carried over from the past. Age-old practices cannot be changed overnight," Kenneth Lim, chief technology officer and director of research and technology and industry development at the Maritime and Port Authority of Singapore (MPA), told *Forbes*.

"However, the pace of change has accelerated with the advent of technologies such as digitalisation and automation, and this trend is likely to pan [out] across all sectors of the economy," he said.

Lim believes the maritime sector needs to catch up with such developments, adding that the MPA can create an enabling environment through research and development of technologies in order to spur innovation within the maritime industry.

"I believe there is no better time for the industry to work alongside government to drive the development of technology and innovation. By working together, we can collectively reduce the risks [as] with innovation and try out new ideas and concepts."

In January, Singapore unveiled the Sea Transport Industry Transformation Map, which aims to grow the maritime sector's value by SGD4.5 billion (USD3.4 billion) and create more than 5,000 jobs by 2025.

The initiative builds on the MPA's long-term development plans and its role as an international maritime centre, outlining three broad areas:

First, Singapore aims to boost its connectivity to other maritime clusters to remain a vital part of the global maritime network. Second, it plans to use technology to enhance productivity and spur innovation, and third, to develop a future-ready workforce.

By engaging the more forward-looking players in the industry, the MPA plans to chart the industry's direction, including, but not limited to, class societies, shipowners and managers, bunkering companies, shipping agents, and port terminal operators.

Lim provided examples of how digitalisation and automation can transform Singapore's maritime sector to enhance operational efficiencies and deliver greater value to clients that use the city state.

A key example is the use of electronic certificates on board Singapore-flagged vessels since 2016. This transformation has reduced the administrative burden and costs associated with the traditional paper variety, while slashing the risk of fraud.

In a similar vein, the MPA, Singapore Customs, and the Singapore Shipping Association are making a joint attempt to digitalise trade and maritime documentation, with an eye on the electronic bill of lading.

Most notably watched is Singapore's ongoing construction of its Tuas mega port, which is scheduled to come on line in 2040 and double Singapore's handling capacity to 65 million teu. Lim said the new facility will also be more automated than its current terminals.

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Tan turns focus on technology and finance to continue growth

April 18th, 2019 17:00 SGT
By Jonathan Brown
Articles in LEGAL

Attracting foreign shipping companies to Singapore has been a key factor in its growth into an international maritime center.

Tan Beng Tee, the assistant chief executive of development at the Maritime and Port Authority of Singapore (MPA), believes this trend reflects a global change and is not just specific to the city state. She points out that widespread industry consolidation has led to a reduction in the number of owners across the board.

"If you look worldwide, there are no new shipowners coming into the industry," she says. "The new companies we see are usually started by people who have left other companies to start on their own, or are trading companies that are setting up their own shipping arm."



Lion City's 'first lady of shipping' continues to lead from front

"We have a good share of local companies that are doing well. Perhaps high capital costs are what are preventing new shipowner-operators from coming up."

With Singapore firmly established with a mature shipowning and services cluster, Tan says the MPA has started the next phase of development to keep the Lion City firmly on the global shipping map.

"Our vision for Singapore as an IMC [international innovation and talent] is for it to be a global maritime hub for connectivity, maritime centre] is for it to be a global maritime hub for connectivity, innovation and talent," she says.

"We need to deepen and expand the cluster to take into account what is happening in the world. We must be able to plug ourselves into the changes happening in supply chain management, technology, connectivity and finance."



New Maritime Control System (MCS) system enables the operations of nearly 100 container port cranes

The Singapore maritime industry is harnessing digitalisation to increase visibility and transparency as lines are increasingly merged across the shipping and logistics sectors. REPORT BY SIRIN NGAI

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Gearing up for change

The year's Singapore Maritime Week (SMW) - being held from April 21 to 29 - will address the crucial challenges facing the global maritime industry and how it is preparing for future growth.

Preparing future-ready skilled workforce

Maritime talent development is the key focus of government and industry and a lot of investment is going into it. REPORT BY ANNELORE ASSUMPTI

A Singaporean graduate who is expected to graduate with a degree in maritime studies in the next few months, is likely to find a job in the maritime industry. This is because the industry is currently facing a shortage of skilled workforce, and the government and industry are investing heavily in training and development to address this gap.



Portrait of a man

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Group of men in suits

S'pore to stick to one operator when Tuas port opens

Karamjit Kaur
Senior Correspondent

Singapore, which is building a new mega port in Tuas, has ruled out having a second operator to manage the larger facility, which will open progressively from 2021. This is to ensure that the port, which faces strong competition from rivals in the region, continues to operate efficiently, said the Maritime and Port Authority of Singapore (MPA). Coordinating for the first time publicly that PSA Singapore will remain the only operator when the port starts operating, an MPA spokesman told *The Straits Times* that this "will help ensure the most efficient use of our resources and allow us to achieve scale and synergies in our port operations."

Before this, there was some uncertainty within the industry as to whether, when the port moved to Tuas, PSA would continue to run it alone.

Industry experts noted that some major ports such as those in Rotterdam in the Netherlands, Hong Kong and Busan in South Korea have multiple terminal operators. To prepare for growing traffic, the Tuas port, which will be twice the size of the current port, is designed to handle up to 65 million twenty-foot equivalent units (TEUs) of cargo a year when it is fully completed by 2040. Last year, container throughput rose to 33.7 million TEUs, from 30.5 million in 2016.

Tuas will eventually house port operations now dispersed across Pasir Panjang, Tanjong Pagar, Keppel and East Coast container terminals.

Ms Carrie Png, chief executive of Crucial Perspective, a specialist in Asian transportation equity research, said that while having two port operators in Singapore could result in more competitive charges, the reality is that "competition is already stiff from the neighbouring countries in the region."

Having a second operator could also backfire if it leads to duplication of resources, overcapacity and "under-utilised white elephants", she said. Ms Png added: "The key is to have a top-of-the-line regulatory framework to ensure competitive pricing and ensure high service levels to safeguard Singapore's port competitiveness."

While Singapore is the world's second busiest container port after Shanghai, there are challenges ahead, experts said.

In a report last year, Mr Philip Morris Engleberg, a research analyst at the S. Rajaratnam School of International Studies' Institute of Defence and Strategic Studies, noted that ports in Indonesia and Malaysia are underlining, or plan to underline, large scale investments to compete for transshipment and bunkering business.

Though not all projects can directly compete with Singapore, the market of competitors might pose problems for Singapore's port in the long run, he wrote.

"Ultimately, maritime trade and shipping are tied to the state of the global economy. The ability of Singapore to provide an ecosystem of comprehensive end-to-end port services and bunkering services will be the key to stay ahead of the competition," he said.

PSA is "fully prepared" to take on the future scale of operations in Tuas and is already preparing for the expansion, its spokesman said. Automation will be key, he added. "We are constantly looking for technologies that can improve overall port operations and planning. Tuas Port gives PSA the opportunity to leverage these new technologies and collaborate with research institutions and technology partners to develop new systems that will increase port productivity."

The expansion and move to Tuas also provides opportunities for PSA to recruit and upgrade their skills to fit higher-value and more complex jobs, he said, adding that PSA is collaborating with local educational institutions to identify future skills and grow the talent pool.

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Jurong Port to use video analytics to safeguard container cargoes

By Tan Hwee Hwee
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@HweeTan

TECHNOLOGY is giving Singapore a leg up in the fight against tainted container cargoes after they pass through the port nation's X-ray scanning checkpoints.

In the second half of this year, the use of video analytics to detect anomalies in container trucks entering Singapore via the West Gate, Jurong Port will enter full production.

Jurong Port would reach a decision in June on when to kick off this full production phase for the application of the X-Transpore software, which has gone on trial at the West Gate for about three months now.

The startup behind this technology, Xtralis, was named a winner at the Maritime and Port Authority's (MPA) Smart Port Challenge last September, and has won a S\$50,000 grant to solve the issue.

The X-Transpore system seeks to detect anomalies in container trucks entering Singapore via the West Gate, Jurong Port will enter full production.

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Founder and CEO Ethan Chu said the startup had responded to a call from Jurong Port to provide a solution that will effectively track container trucks after they leave the Jurong Port's X-ray scanning station for the West Gate.

The aim is to ensure these trucks that have had their containerised cargoes scanned will exit the West Gate, Jurong Port without making any detours that may facilitate loading of illicit cargoes.

About 70,000 containers enter Singapore annually through West Gate. Jurong Port has deployed four full-time staff stationed at West Gate, who have been manually monitoring the movements of passing trucks. But doing so effectively is challenging on rainy days, when a clear line of vision is not possible or traffic is heavy.

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'Digital twin' to test upcoming Tuas mega port's design

Lin Min Zhang

A "digital twin" of the upcoming Tuas mega port is being developed to help researchers evaluate the impact of various design and operational scenarios on the efficiency of port operations.

The digital twin is a virtual representation of the port's physical infrastructure and operations, allowing researchers to simulate and test various scenarios before construction begins.

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MPA Global Internship Award Sees Record 45 Internships with 30 Companies

By Barkhan Mithra - May 16, 2019



The MPA Global Internship Award (GIA) was awarded to a record 45 students...

Roadmap to create S\$4.5b in value-add and over 5,000 jobs for maritime sector by 2025

It will build on existing strategies to prepare the Singapore port to grab new growth opportunities

By Jacqueline Woo

A new plan has been mapped out to set the course for Singapore's maritime industry over the next decade.

The Sea Transport Industry Transformation Map (ITM) unveiled on Friday...

Speaking at the launch of the ITM at the annual Singapore Maritime Foundation...

While 2017 was a better year than the last, we watch with cautious optimism as the road ahead remains challenging.

We must also capture new growth opportunities and strengthen our value proposition to the world.

To drive digitalisation and boost overall productivity, the MPA is developing technology platforms such as the Maritime Single Window.

展望未来，新加坡将在海上运输业积极推动数字化，扩展连通性，及提升员工技能。

新加坡海事及港务管理局希望到了2025年，为我国海运业制造超过5000个新就业机会。

交通部卫生部长高文彦在日前举行的新加坡海事基金会（Singapore Maritime Foundation）的周年会上致辞时，总结了我国海事业和港务业去年的整体表现。

通过落实海运产业转型蓝图，新加坡

Industry transformation map wins support of maritime companies

Jacqueline Woo

The Sea Transport Industry Transformation Map (ITM) has earned backing from firms in the industry.

Why It Matters Timely push for maritime sector



Jacqueline Woo

The new road map to ready Singapore's maritime industry for the future comes with ambitious goals.

The Sea Transport Industry Transformation Map (ITM), launched last Friday, aims to grow the industry's value-add by \$4.5 billion and create more than 5,000 good jobs by 2025.

Key strategies of Sea Transport ITM

Connectivity

1. Expand and deepen maritime cluster and invest in future hubs port

2. Strengthen interlinkages with adjacent industries and overseas maritime clusters

3. Build a vibrant maritime ecosystem

4. Build capabilities of local talent

5. Foster collaboration between industry and academia

6. Drive digitalisation of port operations

7. Build a future-ready maritime global mindset

8. Develop industry-recognised skills from academia

9. Strengthen quality of maritime workforce

10. Foster collaboration between industry and academia

"Our staff used to do some of the data entry and analysis manually, which took up a lot of time and also made room for human errors," he said.

"So, we got a third-party technology developer to come up with a structured, digital tool for us. In three months, it came up with the tool, which has been able to reduce the number of man-hours for data processing by 30 per cent."

Other industry players, and even those from adjacent sectors, have given the new road map the nod.

Mr Teo Siang Seng, managing director of home-grown shipping line Pacific International Lines, noted that the initiative was developed with strong tripartite partnership in the maritime industry, and will help position it for growth.

"It is through this strong partnership that the ITM initiatives will continue to be refined and sharpened to meet the changing needs of respective industries," he said.

Mr Robert Yap, executive chairman of logistics giant YCH Group, added that the ITM will bring Singapore one step closer to cementing its position as a leading logistics and supply chain management hub.

He noted that the Logistics ITM itself has seen good progress, with 45 firms from the newly founded Supply Chain and Logistics Academy participating in the Logistics Professional Conversion Programme, of which 80 per cent are small and medium-sized enterprises.

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Sea Transport ITM

Deepen maritime cluster and invest in port

Strengthen interlinkages with adjacent industries and overseas maritime clusters

Build a vibrant maritime ecosystem

Build capabilities of local talent

Foster collaboration between industry and academia

Drive digitalisation of port operations

Build a future-ready maritime global mindset

Develop industry-recognised skills from academia

Strengthen quality of maritime workforce

Foster collaboration between industry and academia

Deepen maritime cluster and invest in port

Strengthen interlinkages with adjacent industries and overseas maritime clusters

MPA has spent S\$26m to date to promote LNG as marine fuel

By Tan Hwee Hwee

AHEAD of the implementation of a green shipping regulation, the Maritime and Port Authority of Singapore (MPA) has dished out S\$26 million to kick-start the use of liquefied natural gas (LNG) as a cleaner burning marine fuel.

MPA deputy director for port services Alan Lim disclosed the up-to-date investment made by the maritime regulator at the second LNG bunkering roundtable held in Singapore on Monday.

This investment has gone towards stimulating demand for LNG in Singapore

LNG as marine fuel. Some S\$18 million in all or up to S\$2 million per ship has gone to co-fund the building of LNG-powered ships, with the first unit having entered operations a few months ago.

Another S\$6 million went to two licensed suppliers, Pavilion Gas and FuelNG, a joint venture between Shell Eastern and Keppel Offshore & Marine, for the construction of LNG bunker vessels to perform ship-to-ship transfer of the marine fuel.

MPA has spent a further S\$2 million to build up LNG trucking capabilities at SLNG Terminal to perform truck-to-ship bunker operations

The International Maritime Organization (IMO) as the overarching regulatory body for international shipping, will enforce a 0.5 per cent sulphur content in mar 2020. The intent is to cut of harmful sulphur dioxide, which is emitted by the burning of fossil fuel among the pollutants for shipowners to comply with the 2020 global

Beyond the oil-based already in use, panelists roundtable described

Environment and Water Resources Minister Masagos Zulkifli at the Sustainable Business Awards last night. Nearly 70 of Singapore's largest firms entered the contest and nearly half of the winners across all categories were Singaporean.



Firms recognised for green efforts

Jose Hong

Property giant City Developments has long championed sustainability, but which have a big impact on their local communities.

The Best Social Enterprise award went to The Bliss Group, which works with marginalised employees and trains them to work in catering.

For their efforts, both firms were last night crowned the overall winners of the Sustainable Business Awards, the region's leading sustainability awards. Nearly 70 of Singapore's largest firms entered the contest, organised by event and producer Global Initiatives, and nearly half of the winners across the region were Singaporean.

to recognise organisations that are not always acknowledged for sustainability, but which have a big impact on their local communities.

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Speaking at the presentation ceremony at the Fullerton Hotel, Minister for the Environment and Water Resources Masagos Zulkifli said that since their inception in 2012, the awards have played an important role in encouraging the positive impact that private companies can have on the environment.

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Singapore to embrace greener alternatives to LNG in marine-fuel mix

MPA will set aside S\$5m for R&D into biofuels and other cleaner-burning alternatives

The co-funding represents a step-up in the MPA's efforts to comply with green shipping rules being rolled out by the IMO.

MPA has already invested S\$26 million to kick-start liquefied natural gas (LNG) bunkering in Singapore, which would comply with the IMO global cap restricting sulphur content in marine fuel to just 0.5 per cent.

The MPA's S\$5 million R&D into development of biofuels, methanol and other cleaner burning alternatives today - would not meet the IMO's ambitious target for carbon emissions.

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Singapore's shipping industry aims to achieve cleaner fuel target ahead of 2020 global deadline

Singapore, a major marine oil supplier, is accelerating plans to move towards cleaner and alternative fuels.

The Maritime and Port Authority of Singapore (MPA) is working closely with stakeholders to ensure that Singapore is ready to supply low-sulphur compliant fuels ahead of a January 1, 2020, global deadline set by the International Maritime Organisation (IMO), said Senior Minister of State for Transport and Health Lam Pin Min on Wednesday (October 3).

The United Nations agency will cap sulphur in marine fuels at 0.5 per cent worldwide from the date.

In Singapore, the MPA will make available the list of licensed bunker suppliers of low-sulphur fuels by mid-2019, Dr Lam said at the 20th Singapore International Bunkering Conference and Exhibition at Resorts World Convention Centre.

To support the local bunker industry's efforts in developing innovative marine fuel solutions, the MPA has allocated S\$5 million under the Green Energy Programme to support the development and use of cleaner alternative marine fuels such as biofuels and methanol, he said.

Companies can tap the fund to conduct research and development in alternative fuels to meet future greenhouse gas emissions regulations.

Speaking at the same event, Matt Bergeron, vice-president of Asia Pacific Fuels Business at ExxonMobil, said that the firm is considering a multi billion dollar investment at its Singapore refinery.

"Should the project proceed, we plan to carry out proprietary technologies that will convert lower value by-products into cleaner higher value products including 0.5 per cent sulphur fuels that we believe will be the compliant option for the vast majority of the marine sector," he said.

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What's needed to beat maritime manpower crunch

The maritime sector has struggled to attract and retain talent for many years, and addressing this will require collaboration among stakeholders and retraining of experienced staff, said Senior Minister of State for Transport and Health Lam Pin Min at the opening ceremony of Sea Asia 2019 at the Sands Expo and Convention Centre yesterday.

Dr Jellal, who noted that the manpower crunch applies to both seafaring and shore-based jobs, said "Singapore is very used to looking at manpower as a significant constraint on economic growth."

"But if we can get the management and interventions correct, it becomes a competitive advantage," he was speaking at the opening ceremony of Sea Asia 2019 at the Sands Expo and Convention Centre.

The three-day event, with debates and discussions, aims to future-proof maritime leaders amid changes in technology as well as regulations.

Dr Jellal said one key manpower challenge for maritime firms is retraining their workforce to take advantage of digital technologies.

"The kids that are coming through our education system will adopt it," he added. "But what we need to look at is the older workers, the mature workers who are really

very experienced. They have domain knowledge, they have industry expertise, but they need new skills to take advantage of digital technologies to make them more effective in the future."

He also said the authorities will continue to partner key stakeholders, such as the labour movement and institutes of higher learning, to address new talent and improve the skills of existing workers.

One such initiative is the Maritime Cluster Fund for Manpower Development, which is administered by the Maritime and Port Authority of Singapore.

The fund helps to support training for more than 5,000 people each year.

Dr Jellal noted that manpower issues, the impact of digitalisation and tighter environmental regulations are the three key challenges facing the maritime sector.

"All three - are not things we can solve on our own, we have to have collaboration, we have to have partnerships," he added.

"A focus like today's is an opportunity to bring the world to Singapore, and let Singapore see what the world is doing so that we can

copy these challenges together."

In terms of digitalisation, Dr Jellal said it can also open the door to growth opportunities. For the drive towards cleaner energy, he said this would increase costs, but Singapore has hatched itself to adapt.

On the complexity of complying with low sulphur fuel of coming into effect next year, he said "We are prepared for this implementation in Singapore and we hope to ensure minimal disruption to the industry."

Memastikan Singapura kekal BIRU & HIJAU

Melindungi lanskap laut negara

Usaha pehara lanskap laut tanggungjawab semua

Pelan Biru suar pehara, fadangi budayakan laut Pulau Senikau

Peran BIRU suar pehara, fadangi budayakan laut Pulau Senikau

Peran BIRU suar pehara, fadangi budayakan laut Pulau Senikau

Peran BIRU suar pehara, fadangi budayakan laut Pulau Senikau

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海警局高球慈善活动 筹得近30万元善款

新加坡海事与港务管理局和本地海事社群通过两年一度的高尔夫球慈善活动，为公益金及两家慈善机构筹得29万7800元善款。

这两家慈善机构分别为新加坡救世军的“Kids in Play”计划，以及接触（REACH）家庭服务中心，是海事局认证的慈善团体。

海事局昨天发文告指出，这笔近30万元的善款中，有10万元是新加坡赛马博彩管理局配合其庆祝成立30周年而捐出。

参与这场慈善活动的有来自海事局及35个机构的约140人。

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Singapore hosts 44th ASEAN Ports Association Meeting

2018-11-27 24:44 By: xinde marine news



Hasrat kerja dalam bidang kelautan tercapai hasil gigih peringkat diri



BERKESIHAN kemahiran dan semangat untuk mencapai hasrat bekerja dalam bidang kelautan yang berprestasi tercapai oleh pegawai MPA, Tan Hwee Hwee. Beliau telah berjaya memperolehi ijazah Sarjana Muda dalam bidang Kelautan dari Universiti Singapura pada tahun 2018.

Mahu terus raih kemahiran baru, sedia hadapi masa depan yang berubah-ubah



Singapore pledges to help with IMO's capacity building

SINGAPORE will pledge an enhanced technical cooperation and training package valued at US\$5 million for the International Maritime Organization (IMO) and its member states.

Minister for Transport Khaw Boon Wan launched the package on Wednesday in the presence of IMO Secretary General Lim Kit-choo at the 2nd Maritime Administrators' Forum organised by the MPA Academy.

'Chemical contamination' contained in joint exercise at Tanah Merah Ferry Terminal



'Octopus' takes part in oil spill exercise

Skimmer system deployed for first time in biennial drill led by MPA

Capacitated large skimmer skimmer system 'Octopus' participated in the world's largest and first biennial oil spill exercise in the waters of the Singapore Strait.

Unions actively supporting talent development

THE labour movement has been actively engaging companies as well as workers in the maritime sector to upskill and reskill with the aim of upgrading and talent development in this important industry.

Mr Lim speaking at the Sea Transport Industry Transformation Map Seminar on the need for economic and industry transformation for sustainable growth, also shared about the labour movement's efforts and plans to help operationalise the plans for workers.

MPA signs pact to develop future-ready seafarers

MOU aims to identify gaps, train and upskill maritime workforce

MOU aims to identify gaps, train and upskill maritime workforce

MOU aims to identify gaps, train and upskill maritime workforce



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SINGAPORE

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