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Smart Port Challenge garners over 200 proposals from 35 countries

PIER71™ start-ups ecosystem extends global reach

The Maritime and Port Authority of Singapore (MPA) and NUS Enterprise, the entrepreneurial arm of the National University of Singapore (NUS), held the annual PIER71™[1] Great Circle 2024[2] today at the Suntec Singapore Convention and Exhibition Centre.

2. Dr Amy Khor, Senior Minister of State, Ministry of Transport and Ministry of Sustainability and the Environment opened the event as the Guest-of-Honour which featured the 8th edition of the Smart Port Challenge (SPC) Grand Finals and a MarineTech Start-up Innovation Showcase. Over 400 participants attended the event, including local and international start-ups, venture capitalists, researchers, and members of the maritime community.

3. Since its inception in 2018, PIER71™ has nurtured over 140 MarineTech start-ups[3], supported by a robust network of over 60 corporate partners. These start-ups have raised over S$80 million in investments from venture capitalists, with 10 start-ups raising close to S$17 million in 2024.

Record Number of Maritime Innovation Proposals for Smart Port Challenge 2024

4. Smart Port Challenge goes global, with eight international roadshows held earlier this year in key maritime hubs across America, Asia, and Europe to expand its each to overseas start-ups. SPC2024 attracted a record number of close to 200 proposals from start-ups in 35 countries[4] responding to the 14 challenge statements[5] on key issues facing the global maritime industry.

5. Twenty-eight start-ups[6] were selected to join the 12-week PIER71™ Accelerate programme. This structured accelerator programme helps start-ups test and validate business

[1] Port Innovation Ecosystem Reimagined @ BLOCK71 (PIER71™) was jointly established in 2018 by MPA and NUS Enterprise

[2] The event is inspired by the principles of great-circle navigation, which determines the shortest route between two points on the globe. This symbolism reflects the guiding ethos of PIER71™, steering start-ups on the most direct course towards maritime innovation

[3] Refer to Annex A for success stories of Smart Port Challenge alumni

[4] The countries include Australia, Brazil, Canada, China, Croatia, Estonia, Finland, France, Germany, Hong Kong S.A. R., India, Indonesia, Ireland, Israel, Italy, , Japan, Luxembourg, Malta, New Zealand, Netherlands, Norway, Pakistan, Poland, Qatar, Russia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, United Kingdom, United States of America, Vietnam and Uruguay

[5] Refer to Annex B for the list of Challenge Statements

[6] Refer to Annex B for the full list of Smart Port Challenge finalists

model and go-to-market strategies for their proposed solutions, guided by mentors and industry domain experts.

6. Twenty start-ups have secured 30 letters of intent for collaboration with Singapore-based companies, qualifying them for grants of up to S$100,000 for proof-of-concept or pilot projects with maritime companies and additional funding' of up to S$250,000 for new product development through the MPA Maritime Innovation and Technology (MINT) Fund. A pre-event session also connected Smart Port Challenge finalists with potential funding partners.

7. Three participating start-ups, Sweden-based Cetasol, Hong Kong S.A.R-based Clear Robotics, and South Korean-based Mapsea Corporation, have also established offices in Singapore as part of their regional expansion plan.

Winners of Smart Port Challenge Grand Finals 2024

8. Clearbot, Open Ocean Robotics, and GT Wings emerged as the first, second and third placed winners respectively and Thiospark Energy received a Special Mention based on quality of innovation, market potential in Singapore and the region, industry relevance, and team experience.

9. The judging panel comprised Mr Cyril Ducau, Chief Executive Officer, Eastern Pacific Shipping; Mr Teo Eng Dih, Chief Executive, MPA; and Associate Professor Chai Kah Hin, Associate Provost (Masters' Programmes and Lifelong Education) and Vice Dean (Office of Graduate Programmes), College of Design and Engineering, NUS.

10. For the first time, additional awards of S$10,000 were awarded to Mapsea for Artificial Intelligence (supported by Amazon Web Services (AWS)), GT Wings for Maritime Sustainability Innovation (supported by OCBC Bank) and Planys Technologies for Smart Port (supported by PSA Singapore).

11. Mr Teo Eng Dih, Chief Executive, MPA, said, "We are glad that the Smart Port Challenge is supported by global partners across innovation hubs in America, Asia and Europe. With PIER71™ expanding its outreach, this will help grow the start-up enterprise and innovation ecosystem in Singapore serving the global maritime community. I congratulate this year's finalists and winners and look forward to seeing their solutions come to fruition."

12. Professor Chen Tsuhan, Deputy President (Innovation and Enterprise), NUS, said, "PIER71™ has been evolving its programmes to stay ahead of the changing global maritime industry. By expanding our network of mentors, domain experts, and partners worldwide, we help start-ups gain better access to market validation and growth opportunities. We also value our strong partnership with MPA, our co-founding partner, as we continue to work together to drive research, innovation, talent development, and entrepreneurship across the maritime sector."

13. Ms Elsie Tan, Worldwide Public Sector Country Manager, AWS, said, "AWS is proud to be the Artificial Intelligence theme sponsor for the MPA Smart Port Challenge. This initiative brings together visionary thinkers and innovators to transform the maritime industry through cutting-edge technology. At AWS, we believe AI has the power to revolutionize port operations,

drive efficiency, and foster sustainability. We're excited to support the development of innovative solutions that will shape the future of the maritime sector."

14. Ms Angeline Teo, Head of Global Transportation, Global Corporate Banking, OCBC, said, “We are thrilled to sponsor this year's Smart Port Challenge. This collaboration underscores OCBC’s commitment to driving maritime innovation globally and supporting our clients on their journey towards net-zero emissions. As the first Southeast Asian bank to adopt the Poseidon Principles—a global framework for assessing and disclosing the climate alignment of the shipping sector to promote its decarbonisation —we are excited to support the talented start-ups in the PIER71 cohort and industry partners to co-develop innovative decarbonisation solutions. Together, we can pave the way for greener oceans and transform maritime operations for generations to come.”

15. Mr Alvin Foo, Head of PSA unboxed, Technology & Sustainability Solutions, PSA, said, “PSA is proud to support Smart Port Challenge 2024 as we believe that innovation is essential for transforming the future of port operations. Through the PSA Smart Port Prize, we aim to foster breakthrough solutions that elevate efficiency, sustainability, and resilience across the supply chain. This partnership underscores PSA’s commitment to collaborating with technology pioneers who can drive impactful change and prepare our industry for a more dynamic and sustainable future.”

16. A recording of PIER71™ Great Circle 2024 will be available on the PIER71™ YouTube channel.

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About PIER71™

Founded by the Maritime and Port Authority of Singapore (MPA) and the National University of Singapore (NUS), through its entrepreneurial arm NUS Enterprise, PIER71™ (Port Innovation Ecosystem Reimagined at BLOCK71) aims to grow Singapore's maritime innovation ecosystem. PIER71™ boosts innovation in the maritime and maritime-related industries by attracting talents, creating opportunities for the exchange of knowledge and ideas, attracting investments into start-ups and accelerating ventures.

PIER71™ designs and delivers programmes to uncover opportunities within the industry and supports entrepreneurs from ideation to acceleration of their ventures. PIER71™ provides access to various markets, demand drivers, technology solution providers, investors and more. PIER71™ also represents a budding and increasingly vibrant ecosystem of stakeholders who are keen to digitalise and create the next wave of maritime innovation.

For more information, please visit https://pier71.sg

About the Maritime and Port Authority of Singapore (MPA)

MPA was established on 2 February 1996 with the mission to develop Singapore as a premier global hub port and international maritime centre, and to advance and safeguard Singapore's strategic maritime interests. MPA is the driving force behind Singapore's port and maritime development, taking on the roles of port authority, maritime and port regulator and planner, international maritime centre champion, national maritime representative and a champion of digitalisation and decarbonisation efforts at regional and international fora such as at the International Maritime Organisation. MPA partners industry, research community and other agencies to enhance safety, security and environmental protection in our waters, facilitate maritime and port operations and growth, expand the cluster of maritime ancillary services, and develops maritime digitalisation and decarbonisation policies and plans, R&D and manpower development. MPA is responsible for the overall development and growth of the maritime domain and Port of Singapore. In 2022, Singapore remained one of the world's busiest transshipment hubs with a container throughput of 37.3 million 20-foot equivalent units (TEUs).

For more information, please visit https://www.mpa.gov.sg.

About National University of Singapore (NUS)

The National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 16 colleges, faculties and schools across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established more than 20 NUS Overseas Colleges entrepreneurial hubs around the world.

Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and

complex issues relevant to Asia and the world. Researchers in our faculties, research centres of excellence, corporate labs and more than 30 university-level research institutes focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

For more information on NUS, please visit www.nus.edu.sg.

About NUS Enterprise

NUS Enterprise, the entrepreneurial arm of NUS, plays a pivotal role in advancing innovation and entrepreneurship at NUS and beyond. It actively promotes entrepreneurship and cultivates global mindsets and talents through the synergies of experiential entrepreneurial education, active industry partnerships, holistic entrepreneurship support and catalytic entrepreneurship outreach. Its initiatives and global connections support a range of entrepreneurial journeys and foster ecosystem building in new markets. These initiatives augment and complement the University's academic programmes and act as a unique bridge to industry well beyond Singapore's shores.

For more information, please visit https://enterprise.nus.edu.sg.

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Annex A – Success Stories of Smart Port Challenge Alumni

Since its inception in 2018, the Smart Port Challenge has supported many successful start-ups. Examples include:

1. **Portcast (2018)**
   Portcast, headquartered in Singapore, recently completed its Series A funding round, raising S$8.5 million.Specializing in predictive visibility and demand forecasting for global supply chains, , Portcast is one of the first Southeast Asian companies to establish a presence at NUS Enterprise's newly launched BLOCK71 Nagoya, which serves as a gateway for Southeast Asian start-ups looking to expand into Japan.

2. **mVizn (2020)**
   mVizn, a deep-learning machine vision technology provider, has been instrumental in enhancing safety at Tuas Mega Port Terminals. Their solution has been rapidly deployed to PSA city terminals to help alleviate port congestion, ensuring operational safety and bolstering supply chain resilience.

3. **MagicPort (2021)**
   MagicPort is developing a digital marketplace and collaboration platform that enhances operational visibility and coordination for suppliers and services. The start-up is partnering with the Coastal Sustainability Alliance to improve the use of e-tugs in electric harbourcraft, advancing the decarbonisation of the coastal supply chain.

4. **Avetics Global (2022)**
   Avetics Global played a key role in Singapore's methanol bunkering trials this year, using drones equipped with volatile organic compound detectors and infrared cameras to remotely monitor potential leaks. This technology has enhanced MPA's capabilities in the Emergency Operations Centre and is supporting the industry's move toward a multi-fuel bunkering future, contributing to efforts in decarbonisation.

Annex B: Smart Port Challenge 2024 Challenge Statements

Maritime Green Technologies	
1	Managing ammonia risk
2	Improving crew safety in handling methanol as a fuel
3	Enhancing charging and battery performance
4	Developing next generation wind assist technology to improve fuel efficiency
Smart Shipping	
5	Strengthening situational awareness
6	Securing critical business data
7	Man overboard in port waters
8	Shipboard sensor kit for harbour craft
Next Generation Ports	
9	Enhancing connectivity for digital port services
10	Improving autonomous truck performance
11	Building a circular ecosystem
12	Remote pilotage
Digitalisation (Artificial Intelligence, Cybersecurity, Cloud)	
13	Building maritime cybersecurity resilience
14	Improving charging optimisation using predictive modelling

Annex C – List of Winners for Smart Port 2024

No.	Ranking	Start-up	Country	Description	Category
1	Winner	Clear Robotics Pte. Ltd.	Hong Kong S.A.R	Clearbot offers zero-emission, autonomous unmanned surface vessels designed to perform a range of marine services on inland waterways and oceans. These versatile vessels can handle marine refuse collection, surveillance, inspections, and more. Controlled remotely, Clearbot's technology reduces manpower requirements and fuel costs, all while providing real-time data transmission.	Next Generation Port
2	Second place	Open Ocean Robotics	Canada	Open Ocean Robotics deploys autonomous, uncrewed surface vehicles (USVs) equipped with AI and long-endurance capabilities. Their technology detects small craft, unusual behaviours, and provides real-time alerts for enhanced maritime safety and surveillance.	Smart Shipping
3	Third place	GT Green Technologies Ltd	United Kingdom	GT Wings delivers disruptive wind propulsion technology for the commercial shipping industry. Their patented AirWing system generates substantial thrust while maintaining a lightweight design, offering a more sustainable solution for powering vessels.	Maritime Green Technologies
4	Special Mention	Thiospark Energy Pte. Ltd.	Singapore	Thiospark Energy's storage solution extends electric vessel travel times while reducing battery weight. By using waste from oil refineries, they cut battery costs and enhance safety and durability, supporting sustainable maritime operations.	Maritime Green Technologies
A	Corporate Sponsored Prizes	Mapsea Corporation	South Korea	Artificial Intelligence Prize by Amazon Web Services Mapsea provides a portable pilot application that offers a comprehensive solution for remote piloting at sea. Using advanced AI and IoT technology, it integrates weather, ship, and traffic data for real-time decision-making, helping improve operational efficiency and safety.	Next Generation Ports
B		GT Green Technologies Ltd	United Kingdom	Maritime Sustainability Innovation Prize by OCBC Bank GT Wings delivers disruptive wind propulsion technology for the commercial shipping industry. Their patented AirWing system	Maritime Green Technologies

				generates substantial thrust while maintaining a lightweight design, offering a more sustainable solution for powering vessels.	
C		Planys Technologies Pte. Ltd.	India	Smart Port Prize by PSA Singapore Planys Technologies uses AI and robotics to enhance safety and efficiency in inspecting marine assets. By reducing the need for human divers, their technology minimises environmental damage and provides more accurate measurements.	Next Generation Ports
1	Grand finalist	Clear Robotics Pte. Ltd.	Hong Kong S.A.R	Clearbot offers zero-emission, autonomous unmanned surface vessels designed to perform a range of marine services on inland waterways and oceans. These versatile vessels can handle marine refuse collection, surveillance, inspections, and more. Controlled remotely, Clearbot's technology reduces manpower requirements and fuel costs, all while providing real-time data transmission.	Next Generation Port
2	Grand finalist	Ecomarine Technologies	Canada	Ecomarine Technologies' remotely operated vehicle (ROV) addresses biofouling and pre-emptive maintenance. The AI-driven technology reduces the carbon footprint of marine transport by achieving up to 22% savings in fuel consumption, contributing to a greener maritime industry.	Maritime Green Technologies
3	Grand finalist	GT Green Technologies Ltd	United Kingdom	GT Wings delivers disruptive wind propulsion technology for the commercial shipping industry. Their patented AirWing system generates substantial thrust while maintaining a lightweight design, offering a more sustainable solution for powering vessels.	Maritime Green Technologies
4	Grand finalist	Open Ocean Robotics	Canada	Open Ocean Robotics deploys autonomous, uncrewed surface vehicles (USVs) equipped with AI and long-endurance capabilities. Their technology detects small craft, unusual behaviours, and provides real-time alerts for enhanced maritime safety and surveillance.	Smart Shipping
5	Grand finalist	Planys Technologies Pte. Ltd.	India	Planys Technologies uses AI and robotics to enhance safety and efficiency in inspecting marine assets. By reducing the need for human divers, their technology minimises environmental damage and provides more accurate measurements.	Next Generation Ports

6	Grand finalist	Sheco	South Korea	Sheco has developed a marine pollution treatment robot that uses remote control for oil recovery. This technology replaces traditional, labour-intensive methods and helps minimise the spread of pollutants.	Next Generation Ports
7	Grand finalist	Thiospark Energy Pte. Ltd.	Singapore	Thiospark Energy's storage solution extends electric vessel travel times while reducing battery weight. By using waste from oil refineries, they cut battery costs and enhance safety and durability, supporting sustainable maritime operations.	Maritime Green Technologies
8	Grand finalist	Zelim	United Kingdom	Zelim provides technology to improve safety in oceans, seas, and waterways. Their solutions assist in locating, recovering, and protecting people and assets, helping make maritime environments safer and more secure.	Smart Shipping
9	Finalist	C-Loop	Norway	Specialising in creating sustainable, circular solutions for the maritime industry, C-Loop repurposes retired maritime consumables in collaboration with vessel operators. Their services, including material recovery, reverse logistics, and lifecycle tracking, aim to minimise waste and recover valuable resources. Using AI and blockchain technology, C-Loop connects shipping companies with industries capable of processing and reusing materials, fostering a more sustainable maritime sector.	Next Generation Ports
10	Finalist	Cetasol AB	Sweden	Cetasol creates data-based digital twin models of vessels, using operational data to optimise energy use and streamline charging needs. These models help improve vessel energy efficiency and manage operations effectively.	Digitalisation
11	Finalist	KinetixPro	Singapore	KinetixPro offers a computer vision platform that integrates with CCTV infrastructure to detect safety and security risks. The AI detection system monitors a variety of categories, such as personal protective equipment (PPE) and facility control, to improve safety and compliance.	Maritime Green Technologies
12	Finalist	Mapsea Corporation	South Korea	Mapsea provides a portable pilot application that offers a comprehensive solution for remote piloting at sea. Using advanced AI and IoT technology, it integrates weather, ship, and traffic data for real-time decision-making, helping improve operational efficiency and safety.	Next Generation Ports

13	Finalist	Mely.AI	Canada	Mely.ai's AI software helps businesses accelerate their digital transformation by providing services like document extraction, knowledge management, and predictive analytics. Its focus on data transparency, efficiency, and safety enhances project success rates.	Next Generation Ports
14	Finalist	Marine Hound Limited	Malta	Marinehound™ is pioneering a sulphur sensing system that helps maritime authorities comply with sulphur cap regulations. Their remote pollution sensing technology is both sustainable and cost-effective, aiding the shipping industry's greener future.	Maritime Green Technologies
15	Finalist	Nexus Ocean	Singapore	Nexus Ocean is revolutionising maritime workforce management with Generative AI personas that replicate the expertise of maritime professionals, addressing the critical shortage of skilled personnel in the sector.	Digitalisation
16	Finalist	Ohceans Pte. Ltd.	Singapore	Ohceans develops digital solutions for the maritime industry, providing integrated software for managing mixed cargo in terminals. Their technology simplifies complex logistics challenges and helps improve operational efficiency.	Smart Shipping
17	Finalist	SgNaPlus Pte. Ltd.	Singapore	Specialising in sodium-ion batteries, SgNaPlus offers a safer, cost-effective energy storage solution for the maritime sector. Their innovative battery chemistry promises greater thermal resilience and is more affordable than conventional lithium-based options.	Maritime Green Technologies
18	Finalist	Sostratus Energy	United Kingdom	Sostratus Energy has created a kinetic energy harvesting system for heavy goods vehicles (HGVs) in ports. Their system captures energy from HGV traffic, converting it into electricity for local use.	Maritime Green Technologies
19	Finalist	STAX Engineering, Inc.	United States of America	STAX's patented emissions capture system helps ports and shipping terminals reduce their environmental footprint. Their technology captures and filters emissions from vessels, enabling compliance with stringent air quality standards without creating hazardous waste.	Maritime Green Technologies
20	Finalist	Tidewise	Brazil	Tidewise offers a smart, uncrewed monitoring system for ports. Their solution helps digitalise port activities, collect real-time data, and reduce the need for personnel in high-risk operations.	Next Generation Port