HarborMax Co., Ltd.

Company Profile

HarborMAX

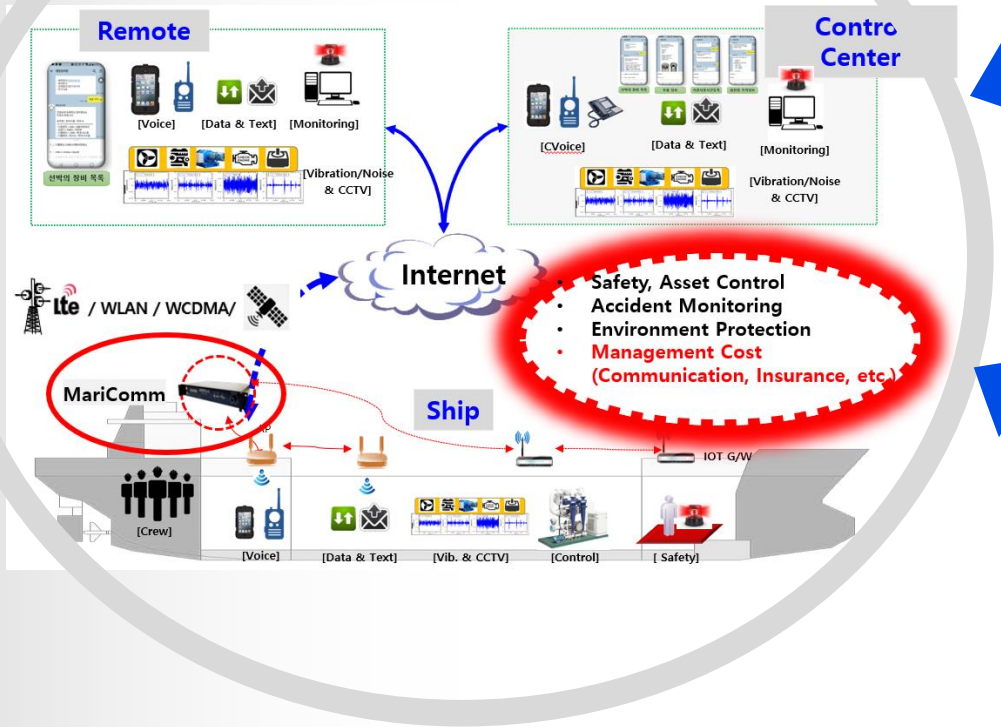
Marine Digital Communication & Service

1. Summary

01. Total Marine Service

- Over 20 Years Global Service for Shipping Companies
- Leading Smart Port Service through ICT Integration

Over 20 Years Global Service



Customers

- BP Shipping: More than 100 Vessels
- TVL: New Mobile & 5G Service
- Yang-Ming: Network, VSAT
- Wan-Hai: Network, VSAT

Services

- SI, ICT, Ship Networking
- VSAT, Inmarsat, VHF, Gyro Compass
- Control for Engine, Boilers, Steering System

Contents

- AI Voyage System
- Ship Management System
- Emission Monitoring & Reporting
- Smart Service & Supply System

02. Structure

- Research Institute Corporation of Korea

Company Name	**HarborMax Co., Ltd.**
	Research Institute Corporation of ETRI (Government Reg. No. 106)
Main Service	ICT Solution Service for Marine & Shibuilding (http://www.harbormax.com)
Partners	- BP Shipping (British, Fleet IT System), CMR (France, Alarm Monitoring System), Analyze Corp. (USA, Bigdata) - VietTel (Vietnam, ISP), Danphone (Denmark, GMDSS Radio Service), Sternula (Denmark, Satellite), Bionic Solutions (Nordic Radar Solution),
Head Office	Room 209, 23rd Student Hall Bldg., Bu-kyung University, Sinseon-Ro 365, Nam-Gu, Busan, Korea Tel: +82 51 626 9451 / Fax: +82 51 626 9459 e-Mail: info@harbormax.com
Investors	ETRI Holdings Co., Ltd.
	Sunbo Angel Partners Co., Ltd.
	Busan United Holdings Co., Ltd.

- **ETRI: Electronics and Telecommunication Research Institute of Korea**

03. Key Technologies

- Ad-Hoc based 3G, 4G, 5G, WLAN and Satellite Bridge Unit **MariComm**
- Global Data Roaming Long Distance **Shipset LTE Router** and **Shore WiFi Repeater**

Harbor MAX

MariComm Compact

SIZE: 190(W) x 123(D) x 67(H)
Weight: 0.94Kg
Power: AC 100~240V(50~60Hz)
PoE : 24Vdc 4Port (1000BASE-T)
Storage : 128GB
Other : VGA, USB 3.0, Web Server, SSH

Harbor MAX

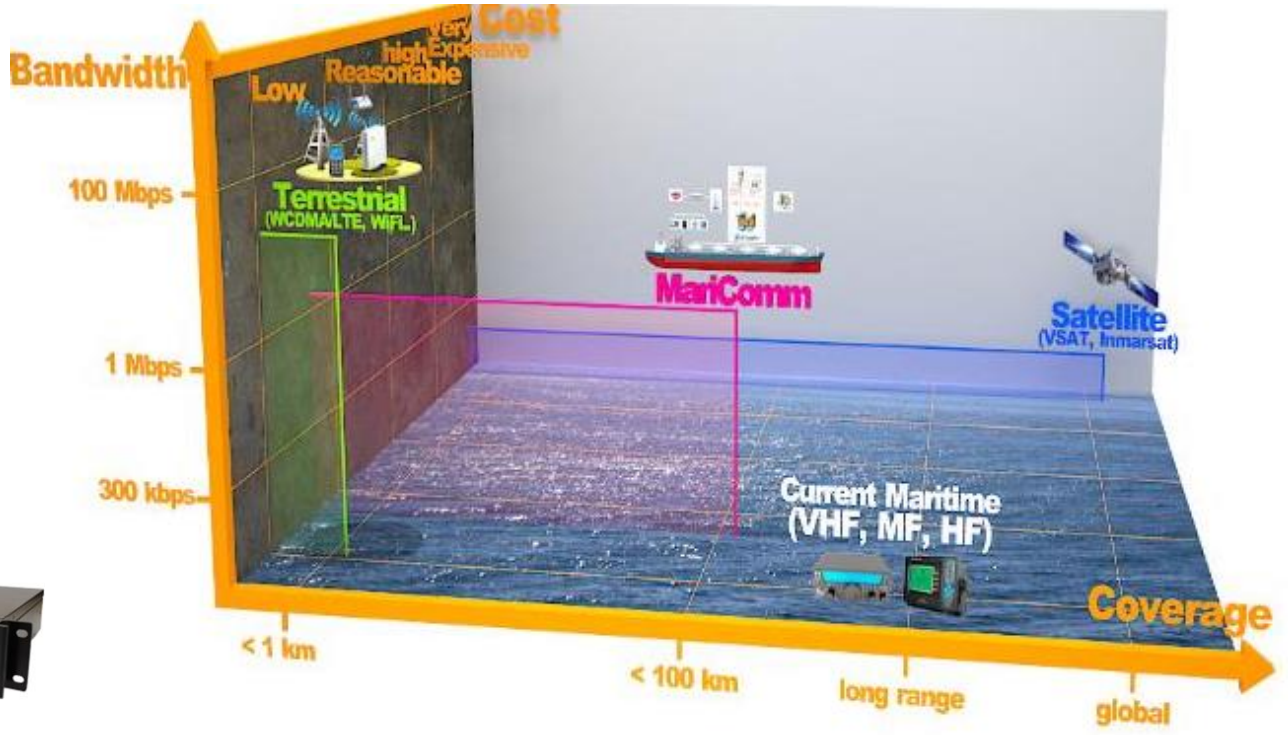
MariComm Standard

SIZE: 210(W) x 234(D) x 72(H)
Weight: 1.83Kg
Power: AC 100~240V(50~60Hz)
PoE : 24Vdc 7Port (1000BASE-T)
Storage : 128GB
Other : VGA, USB 3.0, Web Server, SSH

Harbor MAX

MariComm Deluxe

SIZE: 428(W) x 280(D) x 67(H)
Weight: 4.25Kg
Power: AC 100~240V(50~60Hz)
PoE : 24Vdc 7Port (1000BASE-T)
Storage : 128GB
Other : VGA, USB 3.0, Web Server, SSH



Harbor MAX

4G LTE MARITIME OUTDOOR STATION

- Plug & Play
- High Speed
- High Gain Antenna ~100Km Coverage

Harbor MAX

LTE/WIFI SELECATABLE OUTDOOR ROUTER

- Plug & Play
- High Speed
- High Gain Antenna ~100Km(LTE) ~10Km(WIFI) Coverage
- Free WIFI For Harbor.

Harbor MAX

4G LTE MARITIME OUTDOOR STATION

- Plug & Play
- High Speed
- High Gain Antenna ~80Km Coverage

The Novel Maritime Broadband Communication System that enables Seamless Digital Data (Internet) Services over 100KM from the Shore, being linked with the Satellite System

04. Technical Background

- All the problems for the Terrestrial Communication System to be serviced at Sea was solved
- Load Balancing & System Bridge Technologies and Others

MariComm ▪ Difficulties of Infra Structure ▪ Long Distance Coverage ▪ Compensate Ship Movement

Solution

<<Technical Issues>>

▪ Network Management System
- Marine Network Management
- Multi Band Management

▪ Multi-Hop Relay
- Minimized Signal Drop
- Manage Frequency Channel

▪ Enlarged Coverage Distance
- High Performance Transmission AMP
- Technologies of Directional Antenna

▪ Compensate Sway Signal
- Stabilization of Antennae
- Correction of Beam Foaming Error

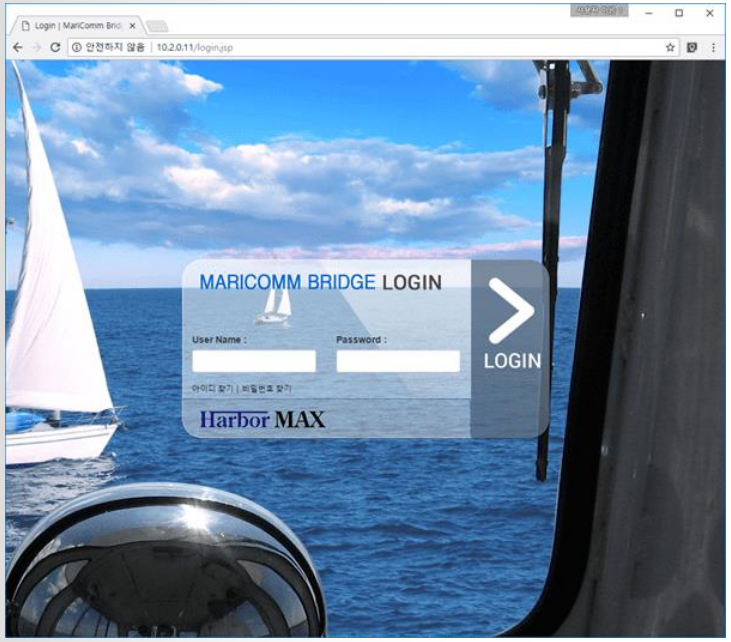
<<Development>>

- **Marine Broadband Server** (MariComm Server)
- **Multi – Band Communication** (Across MF,HF,VHF)
- **Marine Broadband Bridge** (MariComm Bridge)
- **TAM LB**(Load Balancing) **Module**
- **Marine W-LAN Modem**
- **RF Amplifier Module**
- **Multi Antenna Switching Module**
- **Antennae Stabilizer & Wave Simulator**
- **Directional Antennae Tracking Module**

2. Application & Service

01. Extended Solutions

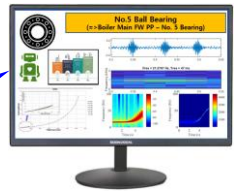
- Providing Connectivity System for Various 3rd Party Application
- Specialized Maritime Broadband Communication Technologies for various Remote Monitoring System



02. Ship Services

- Remote Ship Management System
- WEB based PMS that provides Multilinguistic Mobile Chatbot System for all the users

VDES, Cellular, Wifi, 3G/4G...



AI Diagnostic System

- AI based Anomaly Detects and Operation
- Major Machinery of the ships
- Linked with Thermal Sensor & CCTV

Ship Management

- Purchase Management
- Maintenance Record and Parts Control
- In and Out Bounding Management

Crew Safety

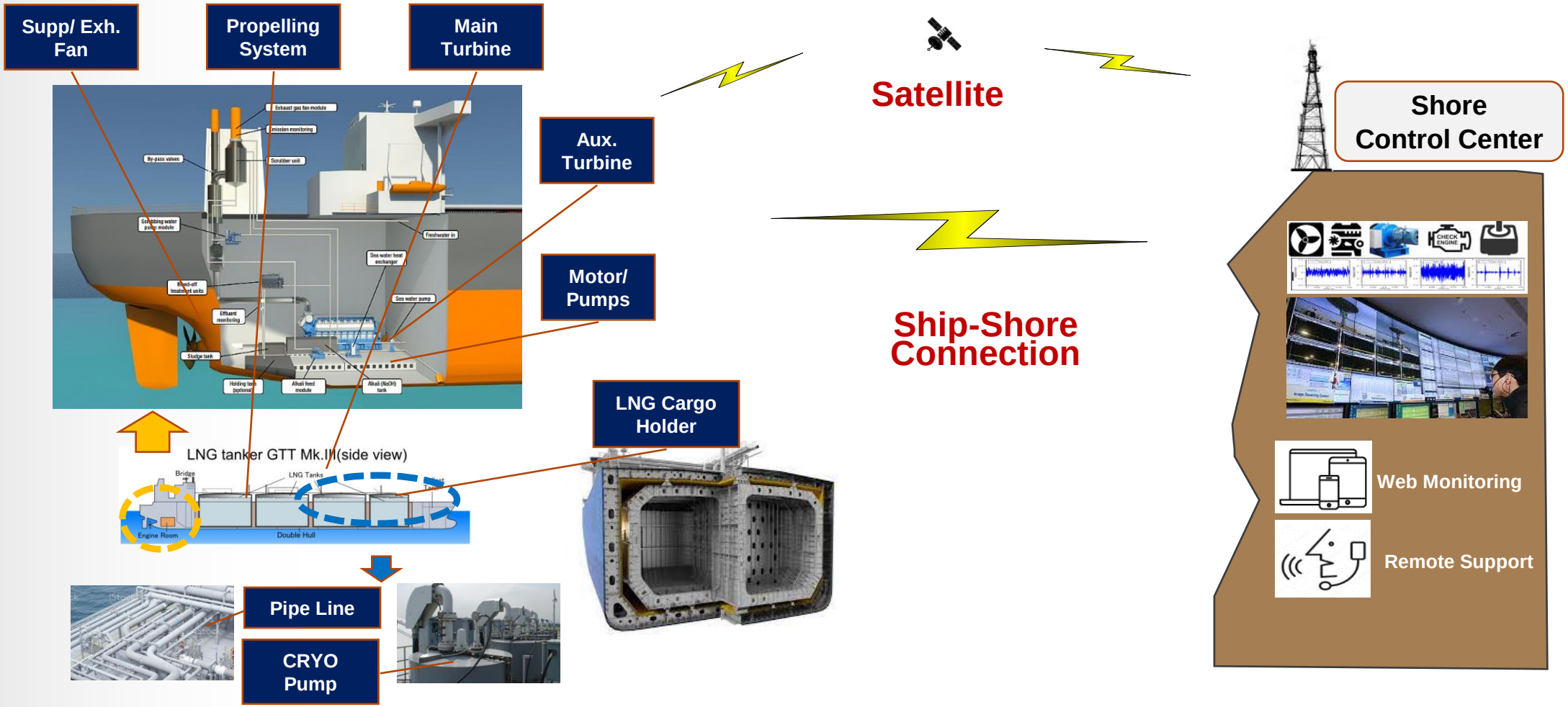
- Welfare through Internet
- Ship Stuff Delivery and Emergency Measurement

Remote Monitoring

- Ship/Shore Management
- E-Mail / Auto Reports
- Web, Mobile App Extension
- Linked with Chatbot Messages

03. Large & Luxury Vessels

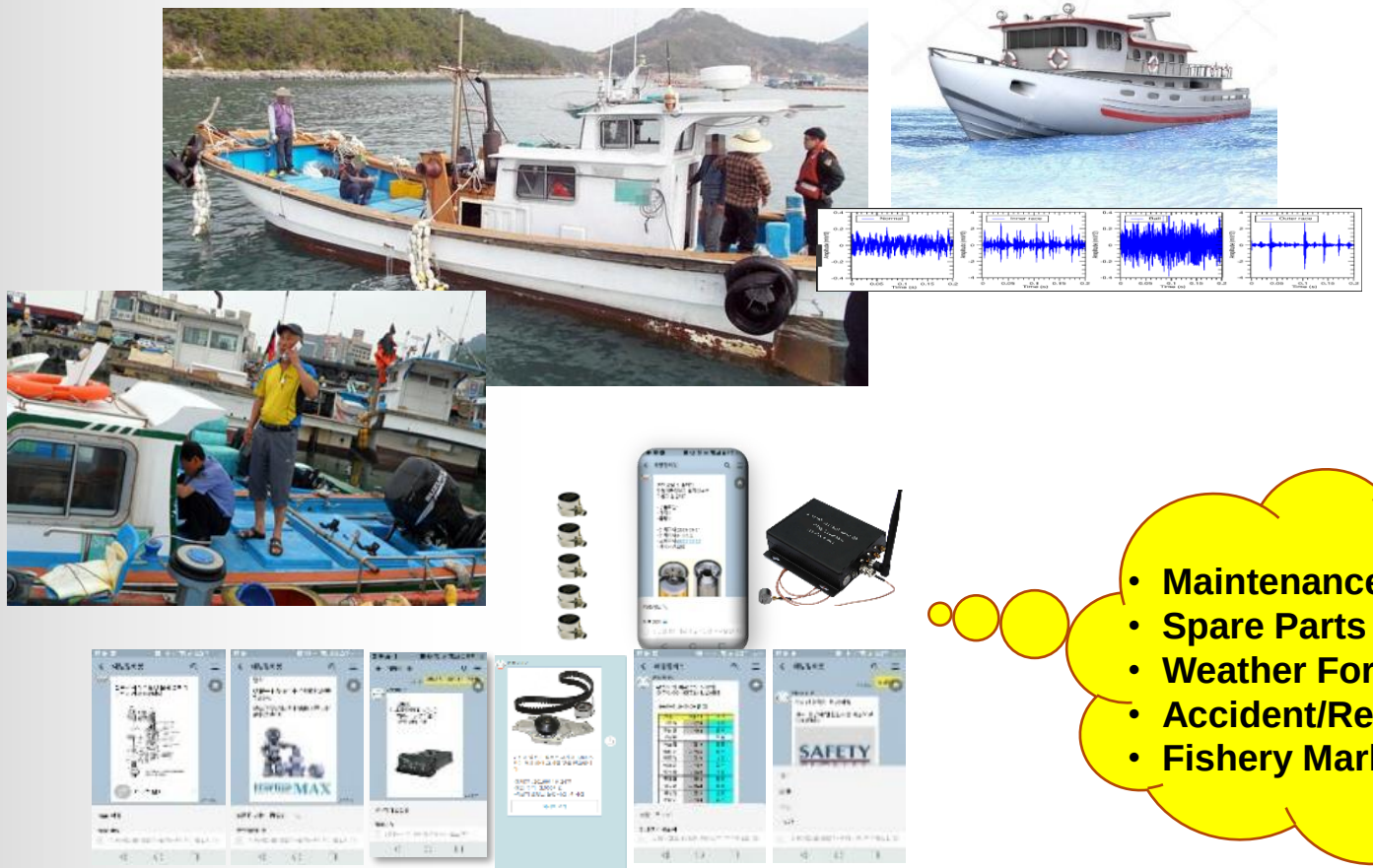
- Merged with Ship Machinery Predictive Maintenance System
- Leading Marine 4th Industry like EMMISSION CONTROL



04. Medium & Small Vessels

- Marine Assets Remote Maintenance System for most of Middle & Small Boats
- Not enough space, not enough engineers, and not enough time to use ICT system onboard

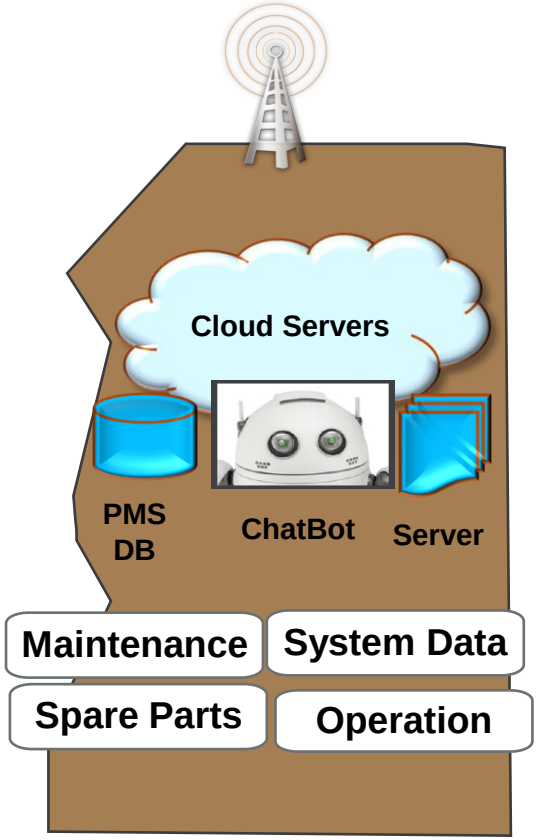
Key Machineries



Monitoring & Diagnose

MariComm (Mobil Phone)
(3G, 4G, Wifi..)

Ship-Shore Connection



- Maintenance Warning
- Spare Parts Alarm
- Weather Forecast
- Accident/Rescue Signal
- Fishery Market Information

05. Easy Mobile Solution

- SMS; Shipboard Management System at ordinary mobile phone

Real-Time Monitoring

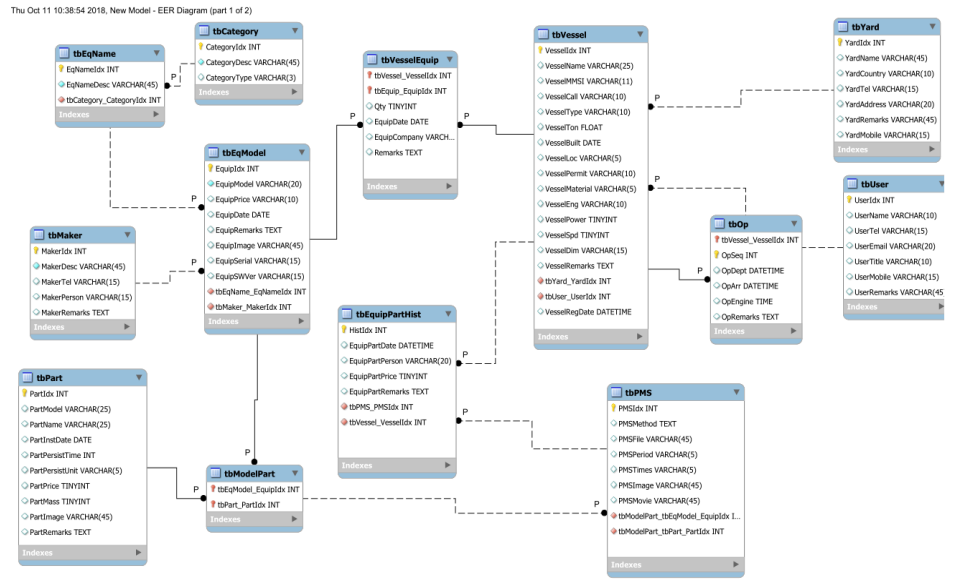
Audit Program

Specification

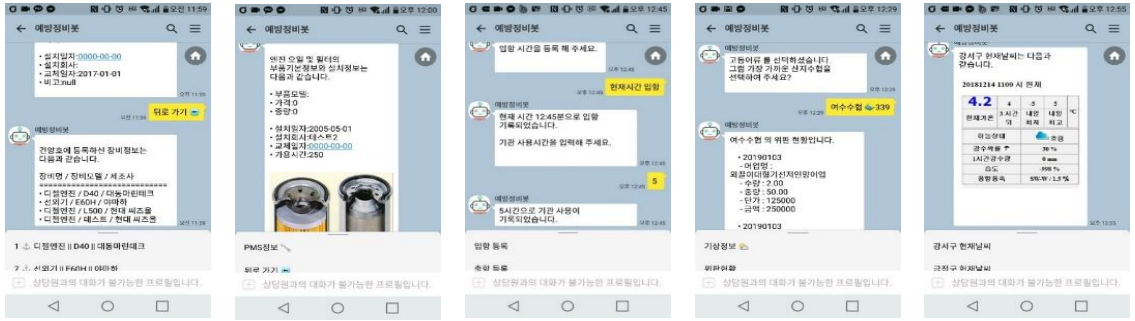
- Total Monitoring System
  Real-Time Machinery Management
  Reports RMS Trend
  Anomaly Detects and Monitoring
  Data History, Event History Archives
  AI Based Efficient Unit Maintenance

- **Cost Down by PMS Interface**
  Smart Management based on Deep Learning
  Preventive Maintenance System
  Perfect Safety Control & Management
  Cost Down

Management DB



Chatbot at Mobile-Phone



06. Maximized User Interface

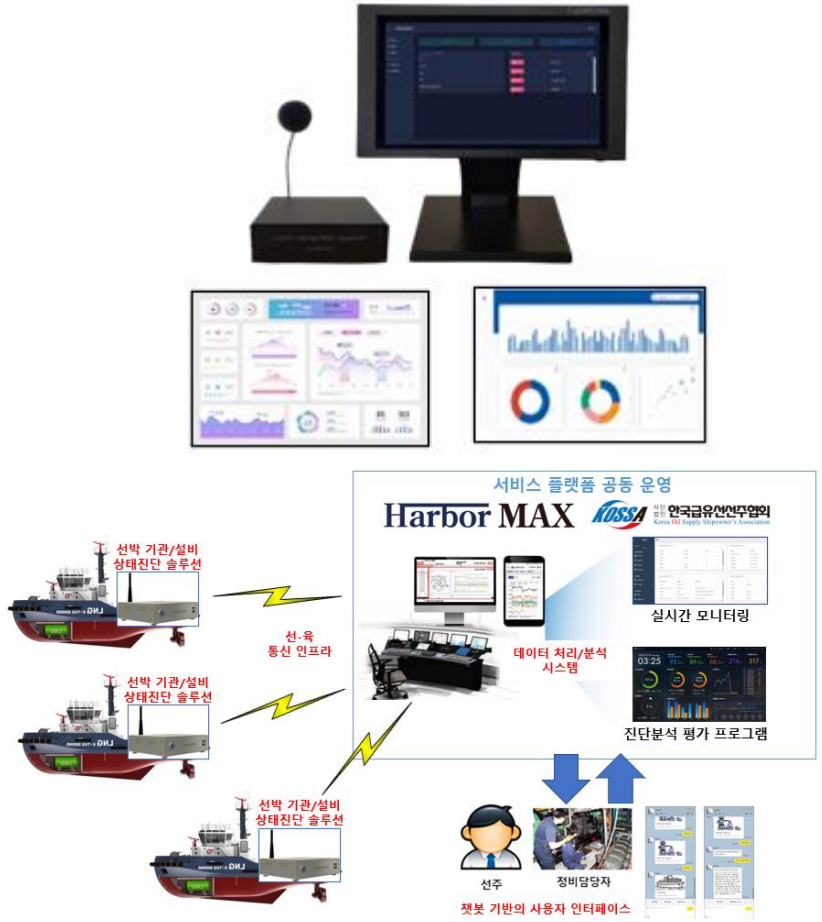
- Improve the Poor Environment of Coastal Business Units and Safety Management
- Voice Recognized Multilinguistic System

Mobil Phone Multilinguistic Application

Main Screen (Select Language)

Chinese

Vietnamese (Menu Changes)



3. Expansions

01. Marine 4th Industries

- Various New Industries based on the Digital Communication System
- Higher Demand for Connectivity Services for the Remote Monitoring

Planned Maintenance System

- Planned Maintenance
- Parts Maintenance
- Purchase
- Quality Control
- Office Automation
- Crew Management

Weather

Medical

Marine Broadcasting

Fishing Info.

Sea Farming

Coastal Patrol and Trouble Monitoring

(VoIP)

Nautical Chart

Remote Monitoring System

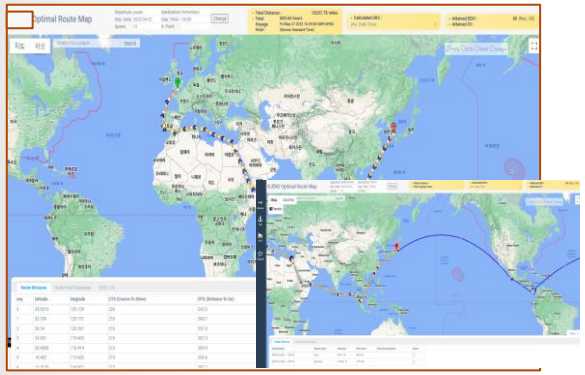
- Safety V-Pass System
- Shipdex e-Maintenance
- WMSN based Ship Monitoring
- Engine Monitoring
- Hull Condition Monitoring

e-Navigation

- Ship In-Out Monitoring
- Emergency Remote Service
- Sea Affair Information
- Pilots Information
- Auto Ship-Shore Reporting
- Ship Condition Monitoring
- 24 hrs Accident Support
- Updating Sea Map and Data
- Rescue, Search Support

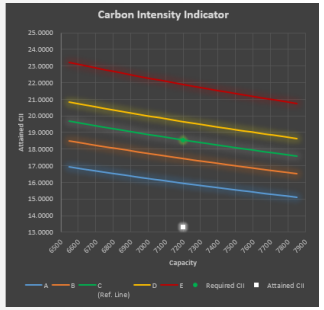
02. Solution for Environment

- Key Solution against the Global Warming
- Voyage Management, Exhaust Control, Under Keel Clearance



- Routes and Distance Calculator
  - when a departure port and destination port selected, create an optimal route
    - Distance, Estimated Time of Arrival
    - Grate Circle or Rhumb Line navigation and port navigation method
    - Finding optimal path by reinforcement learning (weather and sea conditions)
    - Alternative routes by choke points

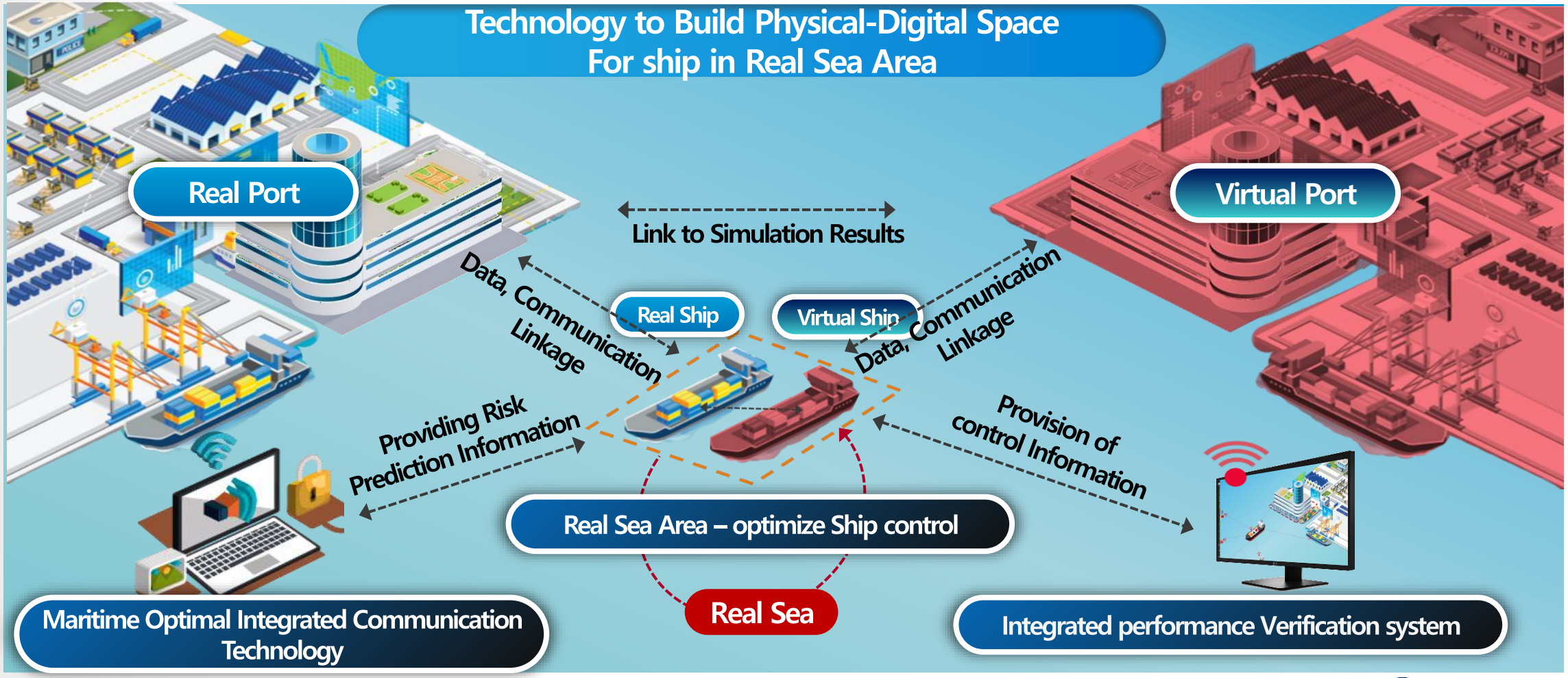
- Under Keel Clearance
  - Calculation of allowable water depth at port of arrival at the expected date of arrival
    - Calculation of allowable water depth at port of arrival at the expected date of arrival
    - Open Sea and Confined Sea
    - Known depths, tides, and weather
    - Fresh Water Allowance, Squat by speed



- CII and EEXI
  - Calculation of EEXI and CII by ship's type
    - Ship type, DWT, fuel type, fuel consumption by IMO DCS, annual track distance
    - Attained CII, Required CII, CII Grade
    - Attained EEXI, Required EEXI

03. Project in Ulsan, Korea

- Development of Digital Port Technology through 4S (Ship2Ship, Ship2Shore) Communication
- 1st Step: 2022~2023/ 2nd Step: 2024~2026 for the Full Connectivity Services of HarborMax



04. Global Cooperation

- World's First AIS2.0 (VDES) Commercial Service with the Satellite
- Marine Single Window

Consortium

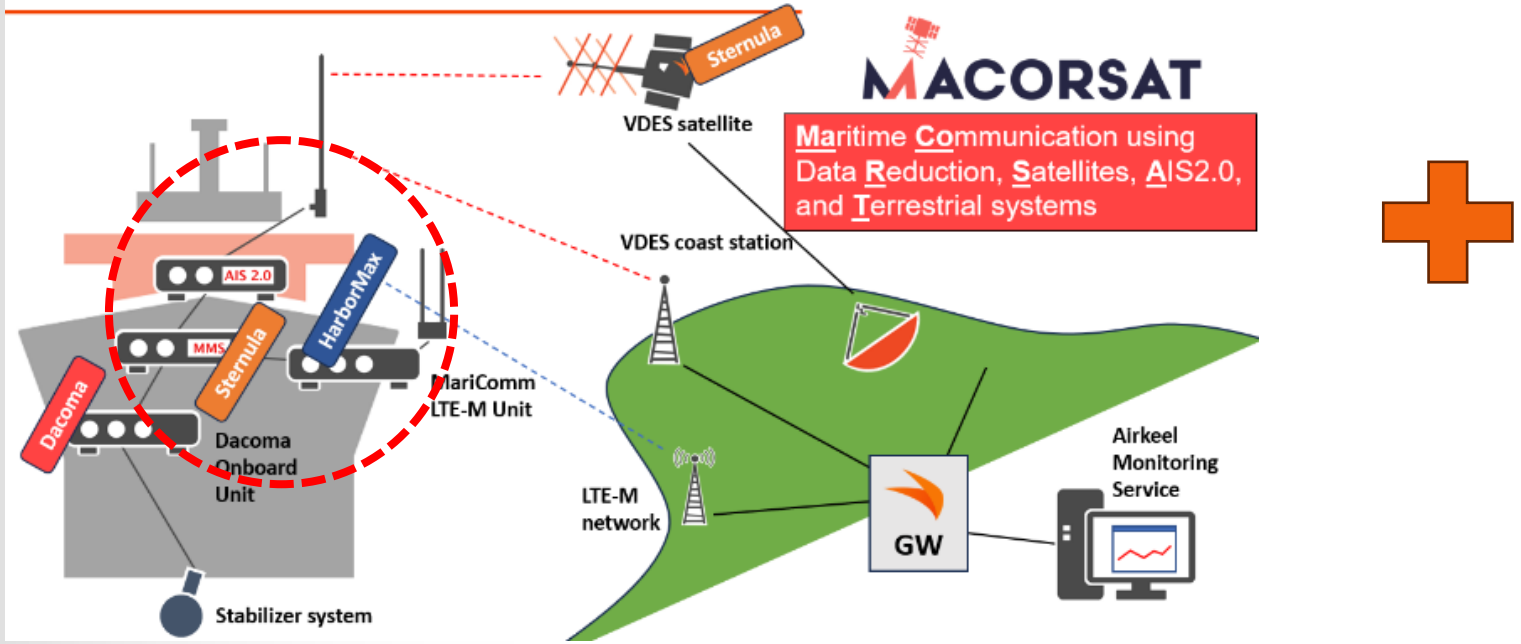
Sternula is world leader in AIS 2.0 (VDES)

- World's first commercial VDES satellite on 3rd January 2023
- Active in VDES standardization (IALA, ITU, IMO)

HarborMax provides advance maritime communications solutions

- MariComm platform for cost-effective shore-based communication up to 100 km.

Dacoma provides innovative "air keel" for



https://www.linkedin.com/feed/update/urn:li:activity:7156604401300713472/

Danphone A/S
팔로워 709명
1주

We always love having people over, whether they are familiar faces or guests sharing the same maritime passion as us.

Recently, we have had the pleasure of hosting Jakob Weibrecht and Marika Jensen from Sternula, alongside the esteemed HarborMAX. Known for their communication solutions spanning 2G to 5G. During HarborMAX's visit, inspiring discussions unfolded regarding the future of VDES, as well as conversations relating to our GMDSS and Port Systems.

At Danphone A/S, sharing knowledge and technological advancements is integral to our daily life, so we are always delighted to engage in dialogues with innovative companies.

Claus Falk, Peter Ditlev Nødbak, Andy Reynolds

#Aalborg #MaritimeSafety #Collaboration #Innovation #MaritimeTech

05. Integrated Platform

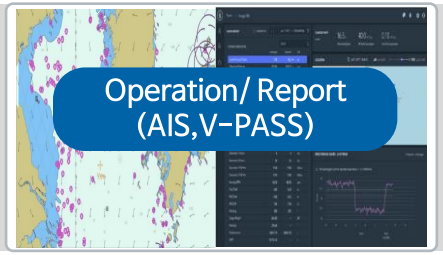
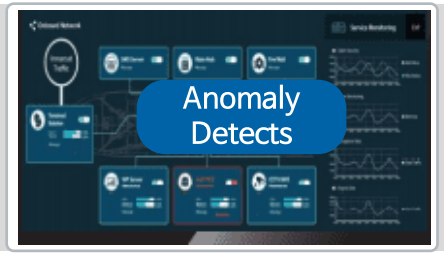
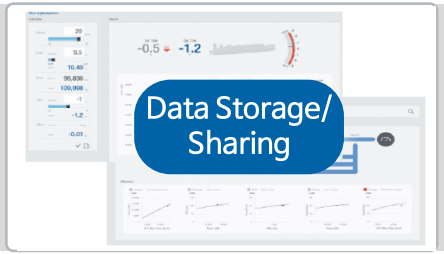
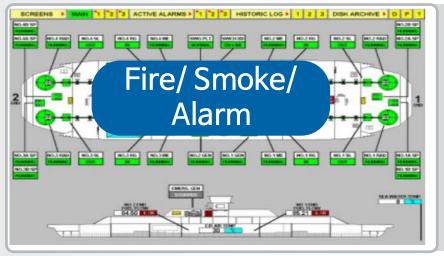
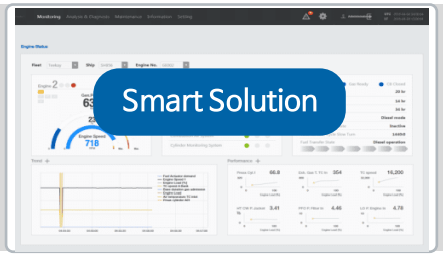
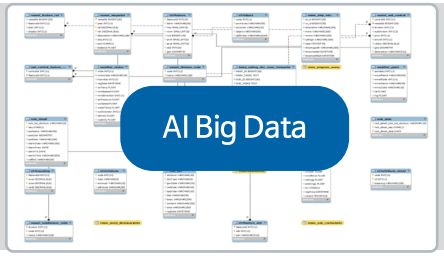
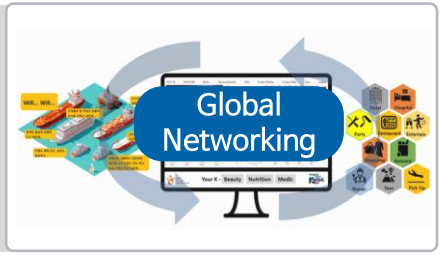
- Convergence of Marine Connectivity at Eco Smart Ulsan Port
- Linked with Satellites for **New Marine Digital Communication**

Data Collection/ Transfer

Data Sharing

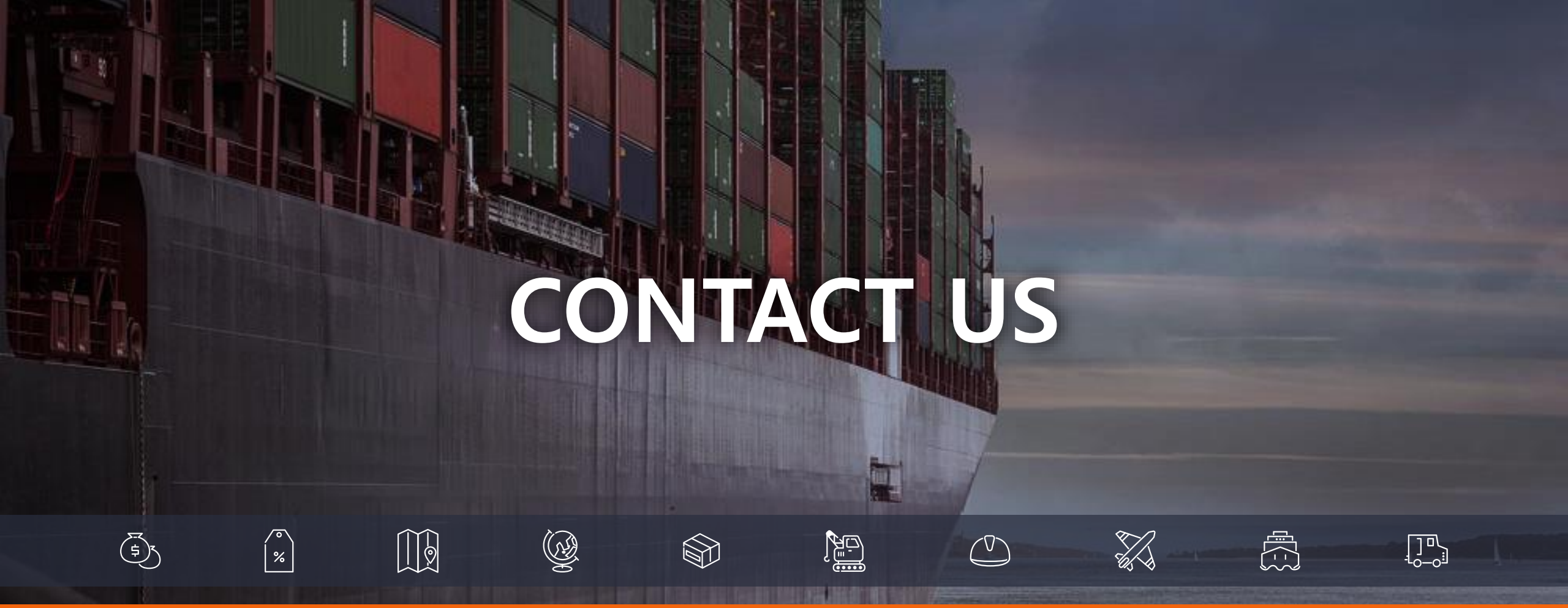
Data Monitoring and Analyses

Integrated Broadband Communication System

Safety Control	Voyage Control	Asset Management	Data Storage/ Analyses	Service/ Supplies
 CCTV	 Operation/ Report (AIS,V-PASS)	 Anomaly Detects	 Data Storage/ Sharing	 Ship Supplies/ Smart Service
 Fire/ Smoke/ Alarm	 Smart Solution	 Asset Management (PMS/WMS)	 AI Big Data	 Global Networking

06. Marine Digital Twin

- Cutting Edge Technologies for Marine Asset Management (Ulsan Smart Port)
- New Challenges for **Marine Single Window**



CONTACT US

PHONE NUMBER

+82-51-626-9452

EMAIL

info@harbormax.com