



HarborMax Co., Ltd.

Company Introduction

Bay of Smart Service

Harbor MAX

Marine Digital Communication & Service

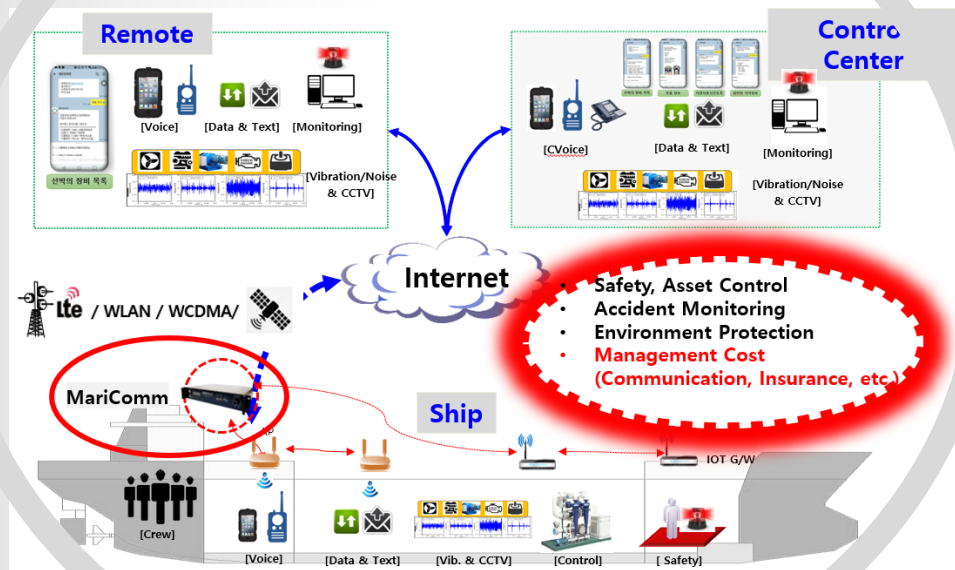
1. Company Summary



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.	President	Heewook Kang
	Gvernment Research Institute Corporation, Reg. No. 106		
Capital	250,000 USD	Employee	8
Main Service	IT Solution and Communication Service for Marine & Shibuilding (http://www.harbormax.com)		
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.		



2. Technical Background

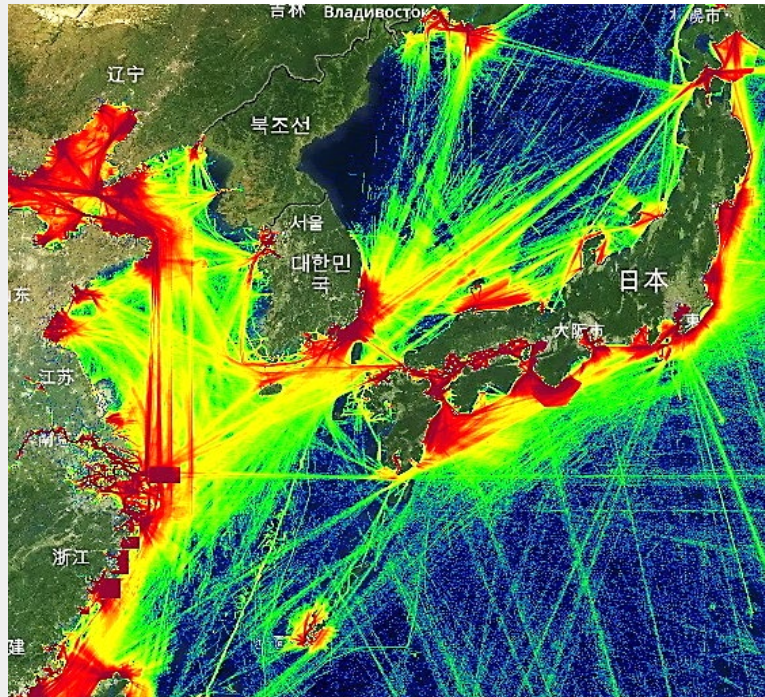
01. The Reality of Marine Traffic

- Analogue System and Very Low Internet
- **More than 95% of Marine Industries are within 100KM from the Shore**

High



Low



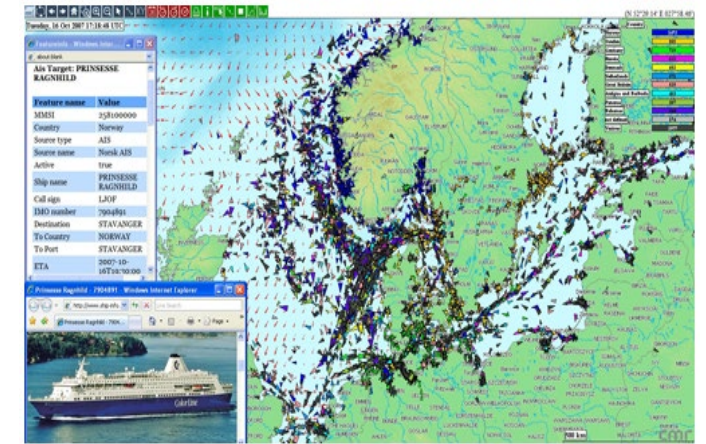
Vessel Density at Sea by AIS

Within 30km

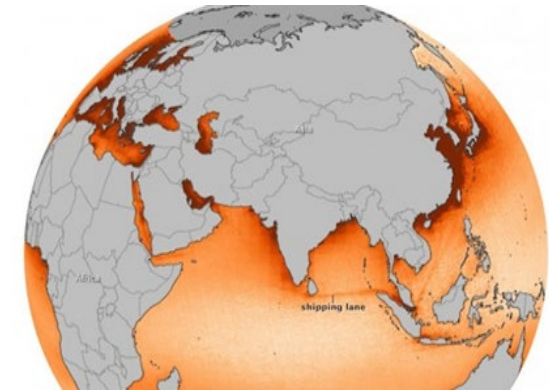
70%

Within 100km

90%



Real Time Vessels under Operation



The track of shipping pollution by the density color of NO2 Emission [2013, NASA]

02. What we use today

- Analogue System and Very Low Internet

Analog System – MF, HF, VHF



- Analogue Voice Communication
- No Data Transfer via Radio
- Unable to Monitor the Remote Site

Digital System – Satellites

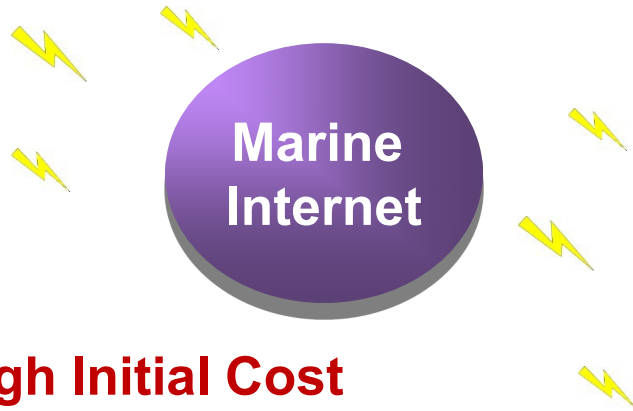


(Satellites on Geostationary Orbit: Internet)

- Extremely High Cost at Poor Speed
- Limited Capacity on Earth

03. VSAT

- Geostationary Orbit at 36,000KM above the Earth
- **Fully Saturated that enables no more connectivity improvement**



- **Low Quality, High Initial Cost**
- **Extra Expense for Base Station**
- **Short Life (10 years)**
- **Saturated Geostationary Orbit**
- **Problems at Frequency Shares, Output Power Regulation**
- **Problems at Maintenance**
- **Difficulties at Connection**
- **Reliability at Satellite Providers**
- **Time Delay, Directional Errors, Solar Noise, etc.**

04. Extended Terrestrial Band

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

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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



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MariComm Standard

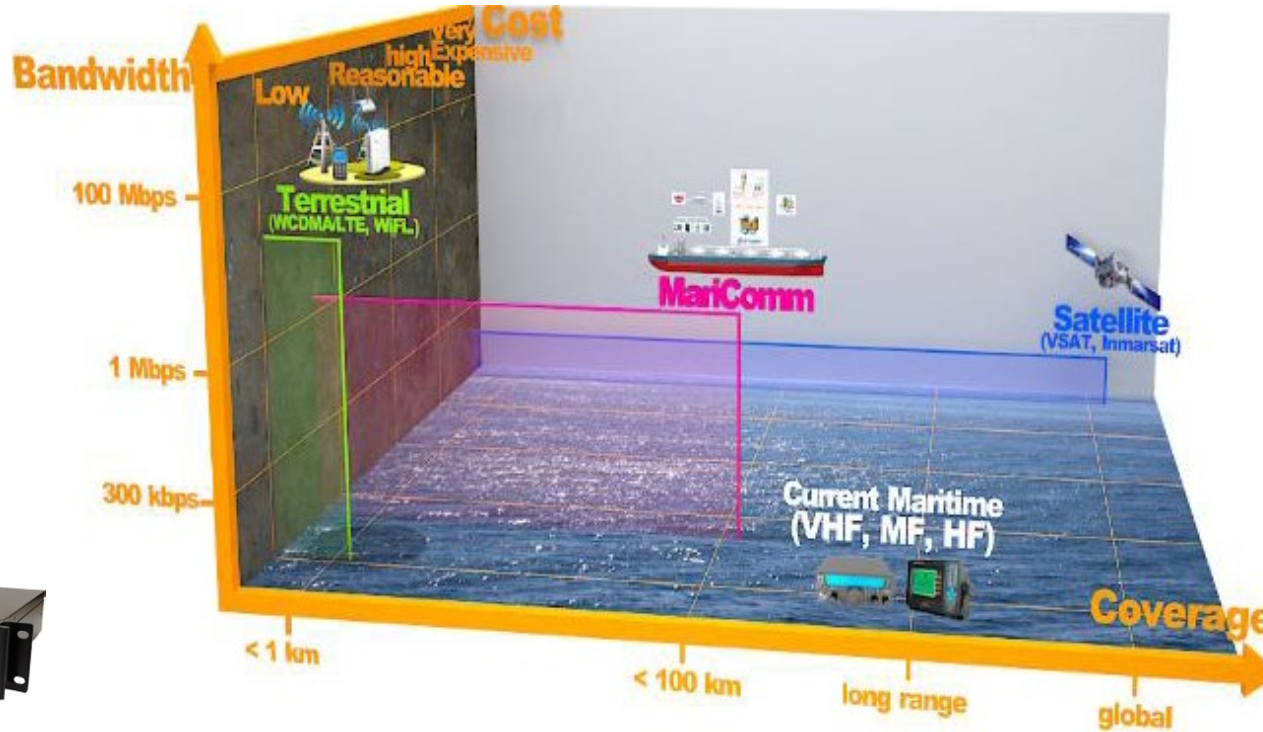
SIZE: 210(W) x 234(D) x 72(H)
 Weight: 1.83Kg
 Power: AC 100~240V(50~60Hz)
 PoE : 24Vdc 7Port (1000BASE-T)
 Storage : 128GB
 Other : VGA, USB 3.0, Web Server, SSH



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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



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4G LTE MARITIME OUTDOOR STATION

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



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LTE/WIFI SELECATABLE OUTDOOR ROUTER

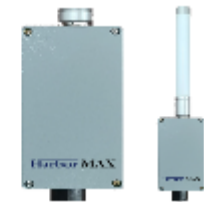
- ⊕ Plug & Play
- ⊕ High Speed
- ⊕ High Gain Antenna
- ⊕ ~100Km(LTE)
- ⊕ ~10Km(WIFI) Coverage
- ⊕ Free WIFI For Harbor.



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4G LTE MARITIME OUTDOOR STATION

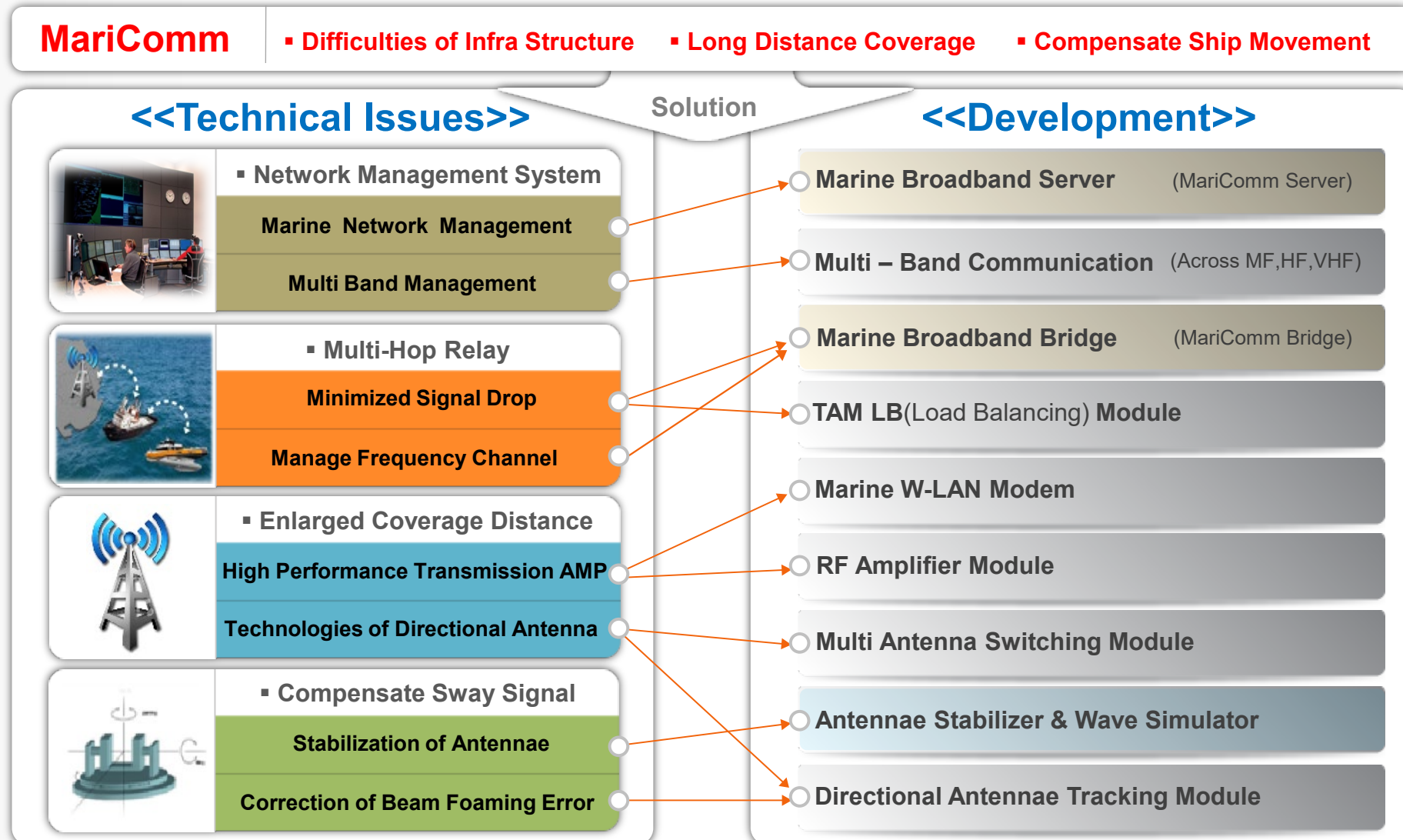
- ⊕ Plug & Play
- ⊕ High Speed
- ⊕ High Gain Antenna
- ⊕ ~80Km Coverage

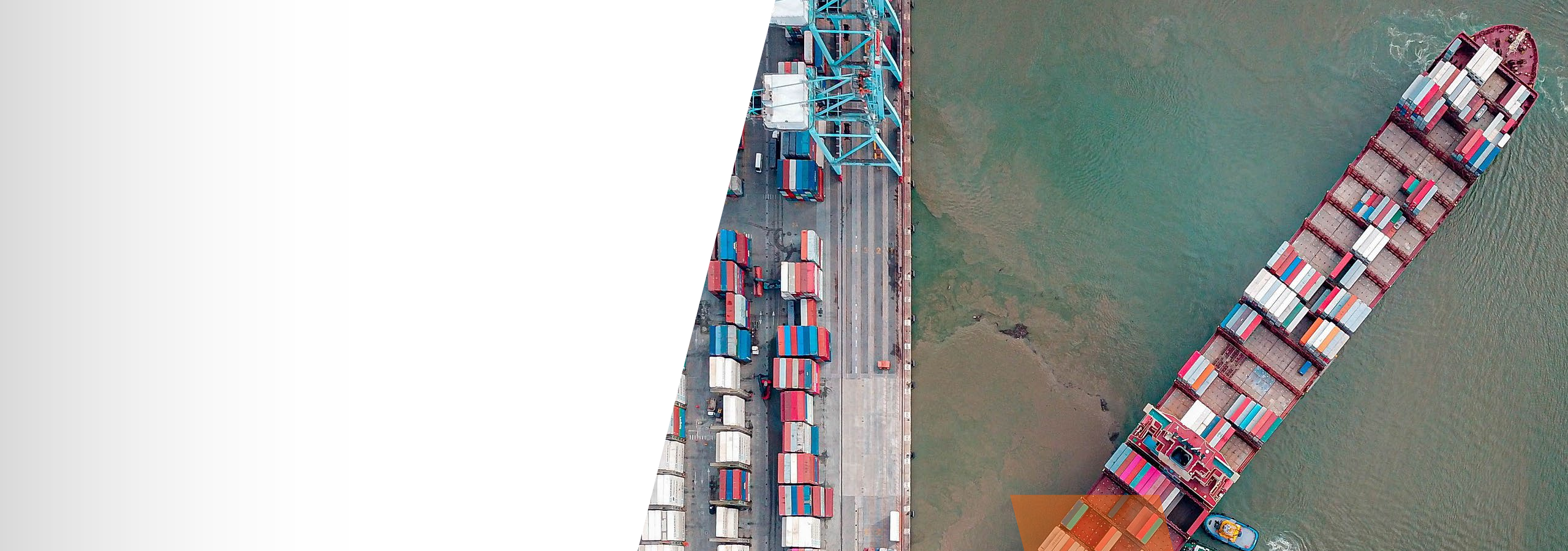


The Novel Maritime Broadband Communication System that enables Digital Data (Internet) Services over 100KM from the Shore based on the System Bridge and the Load Balancing Technologies

05. Technical Background

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

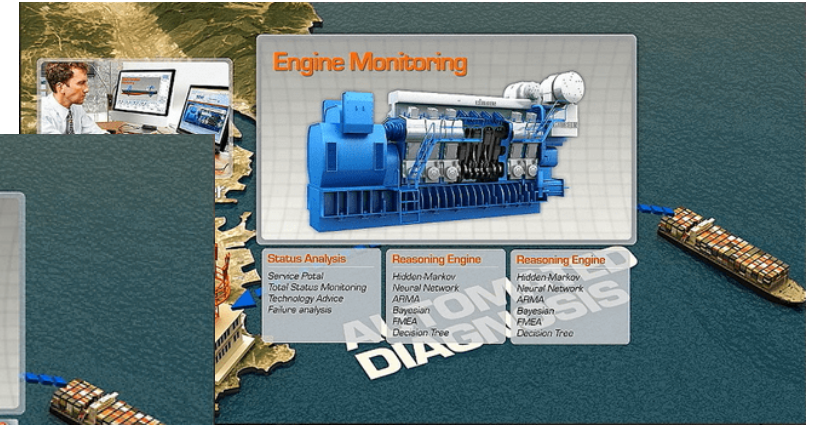
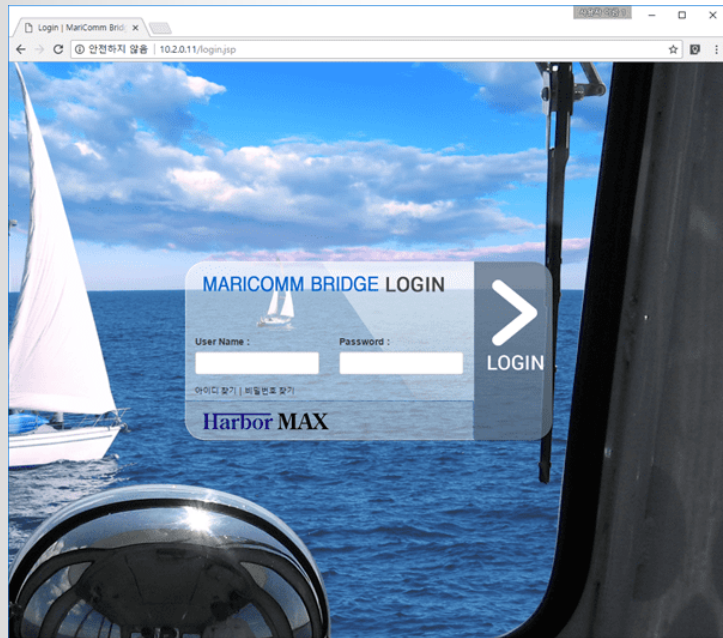




3. Application & Service

01. Extended Service

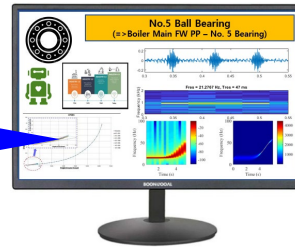
- Providing Connectivity System for Various 3rd Party Application
- Specialized Maritime Broadband Communication Technologies for various Remote Monitoring System



A screenshot of the 'Maricom 245-215 Ship's Analysis Management System' dashboard. The top left shows 'Location ECHO 16. 293'. The main display is a map with a 'WARNING AREA' and several yellow markers labeled A-2 through A-7. On the right, there are several gauges: a heading gauge showing 176.30°, a speed gauge showing 8.13 kn and 15.18 mph, and a response gauge showing 0.8 gpm. At the bottom, there are buttons for 'NAVIGATION', 'MAIN ENGINE', 'REPORT', 'RESULT', 'ALARM', and 'FAULT DIAGNOSIS'.

02. Total Management System

- Targeting Multiple Remote Ship Management System
- WEB based PMS that provides the Maximum Efficiency at the Minimum Cost



Predictive Maintenance

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



Ship Management

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



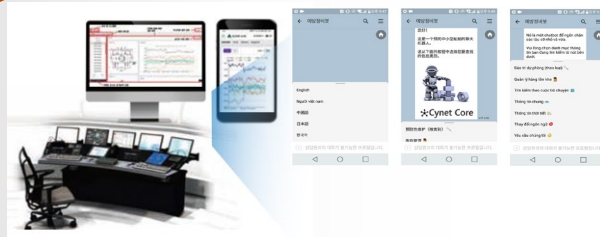
Crew Management

- HR
- Salary and Duty Service System
- Major Job Management



Integrated Monitoring

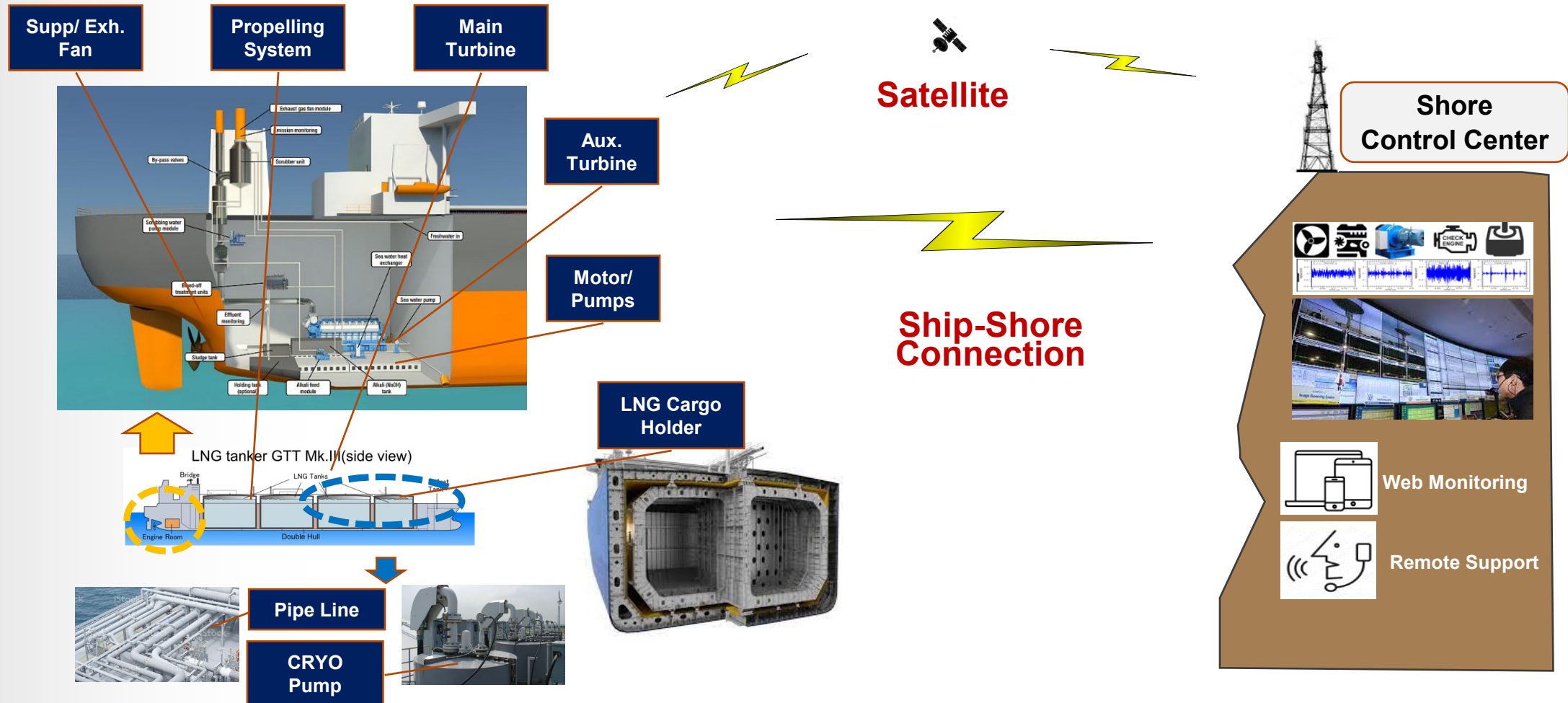
- Ship/Shore Management
- E-Mail / Auto Reports
- Web, Mobile App Extension
- Linked with Chatbot Messages



	PMS
	<ul style="list-style-type: none"> ■ Asset Management ■ Inventory Control
	SUPPLY
	<ul style="list-style-type: none"> ■ Procurement ■ Logistic ■ Budget
	QHSE
	<ul style="list-style-type: none"> ■ Document Control ■ Certificates Management ■ Audit and Inspection Management
	CREWING
	<ul style="list-style-type: none"> ■ Crew Management ■ Crew Payroll ■ Crew Manning Platform
	VOYAGE
	<ul style="list-style-type: none"> ■ Voyage Management ■ Performance ■ IMO DSC / MRV

03. Large & Luxury Vessels

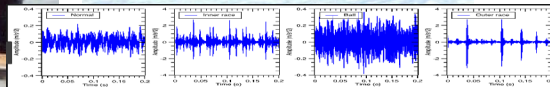
- Merged with Ship Machinery Predictive Maintenance System
- Leading Marine 4th Industry like EMISSION CONTROL



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

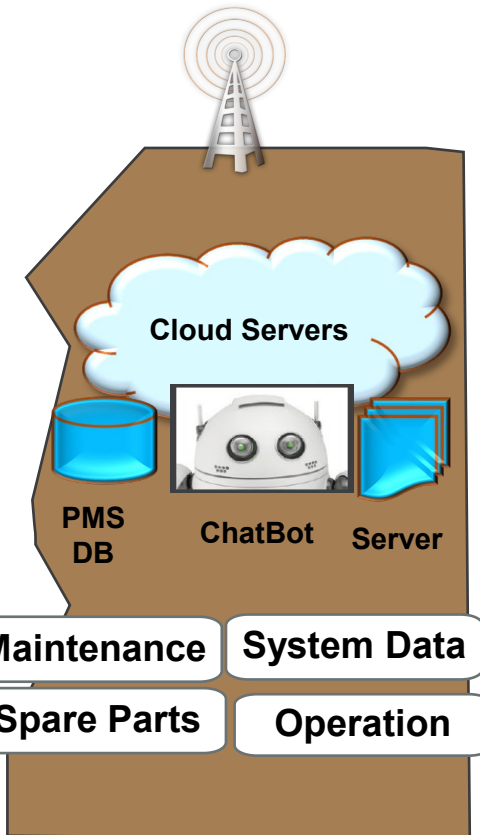


Monitoring & Diagnose

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



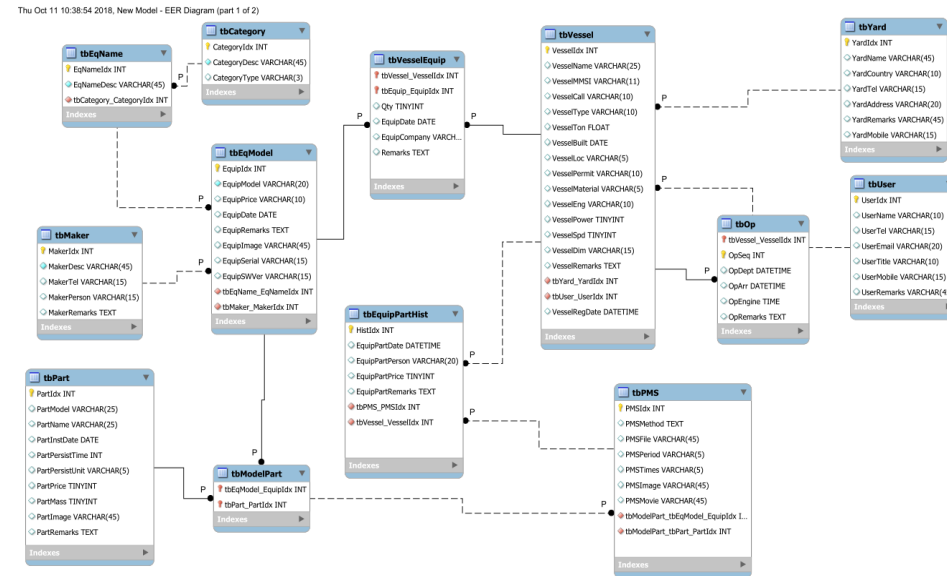
Real-Time Monitoring

Audit Program

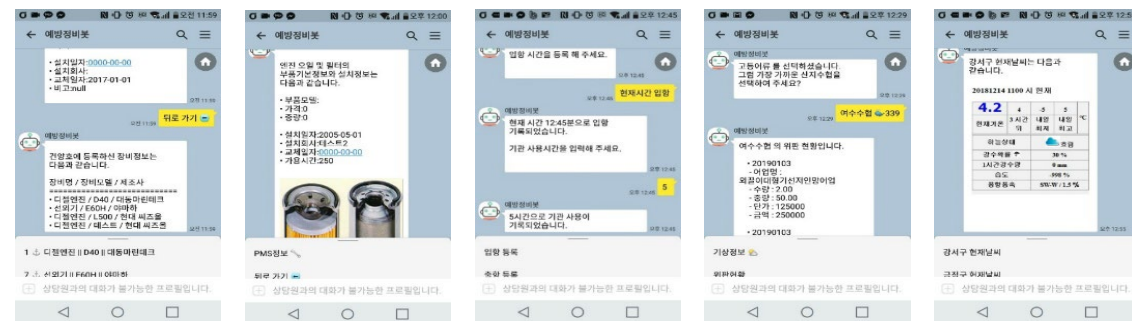
Specification

- 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



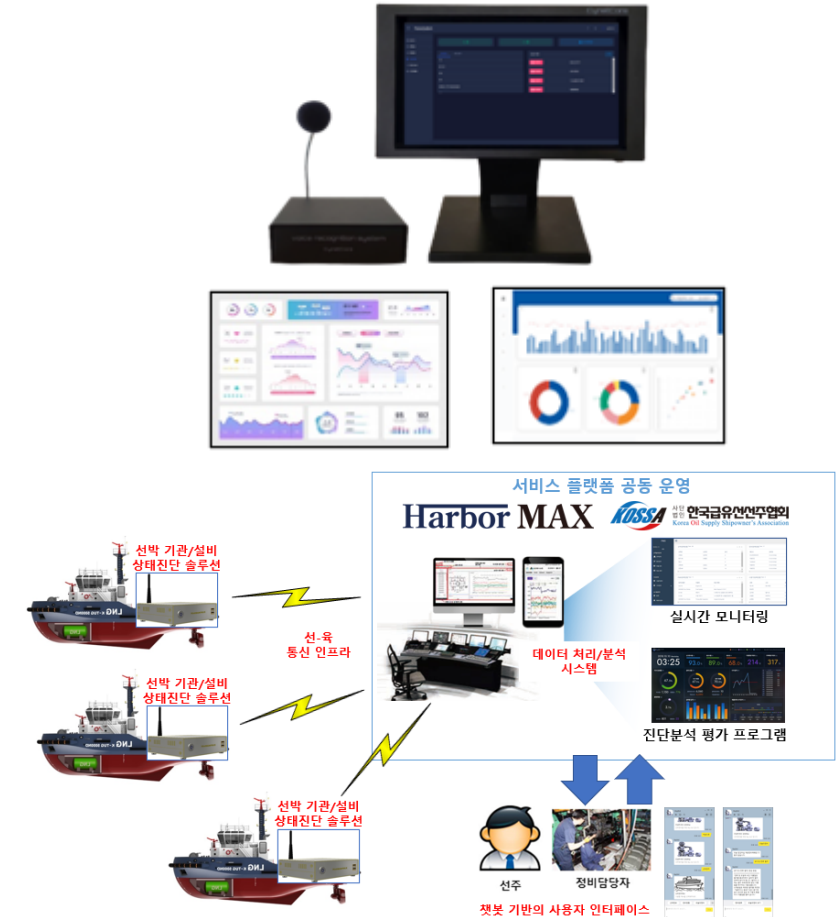
Main Screen
(Select Language)



Chinese



Vietnamese
(Menu Changes)

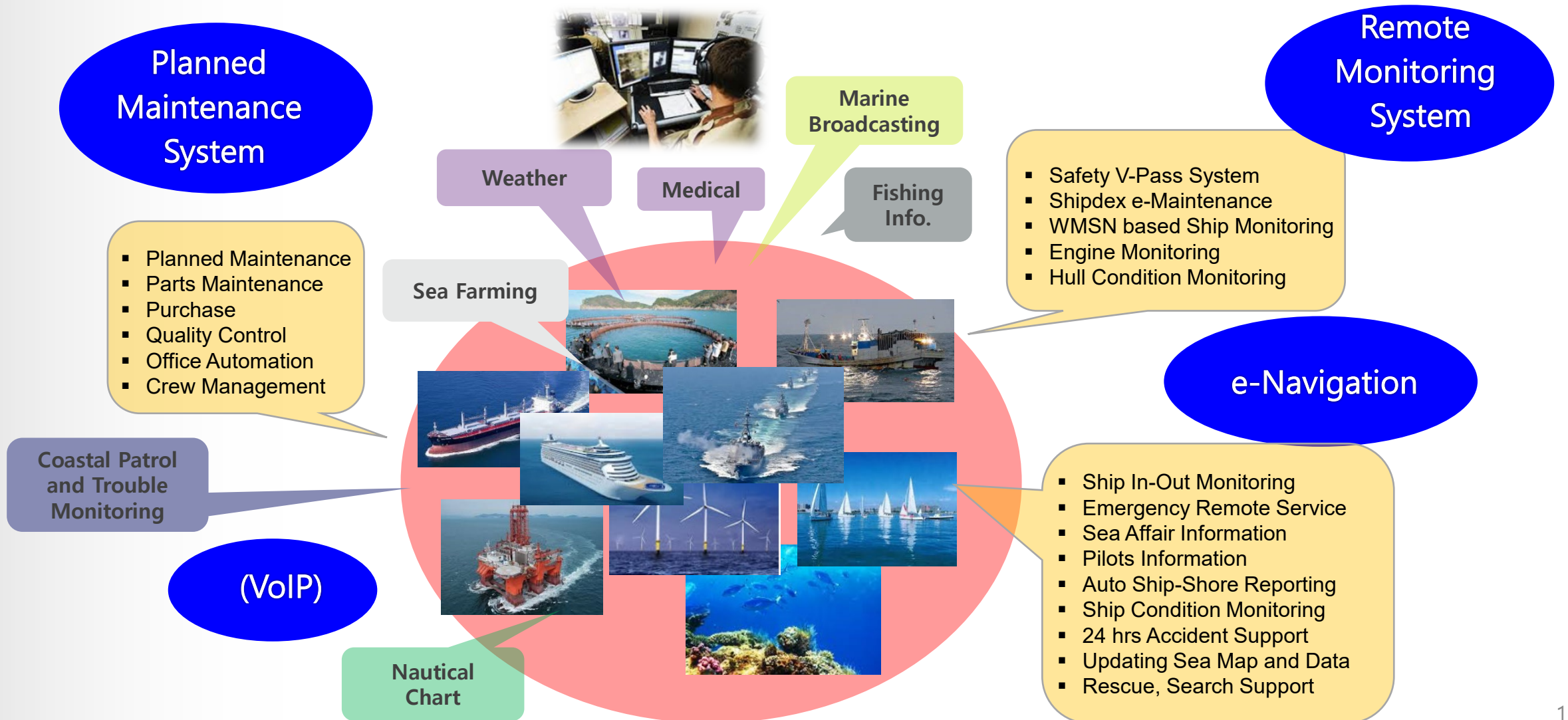




4. R & D

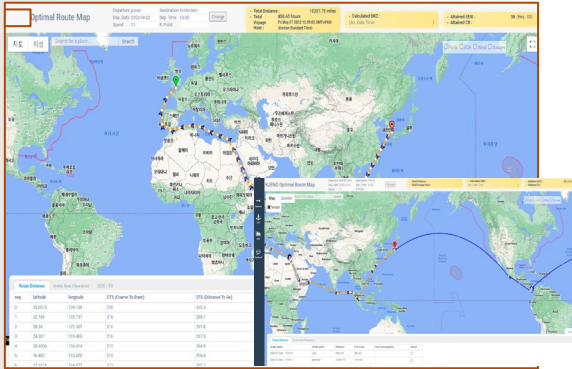
01. Marine 4th Industries

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



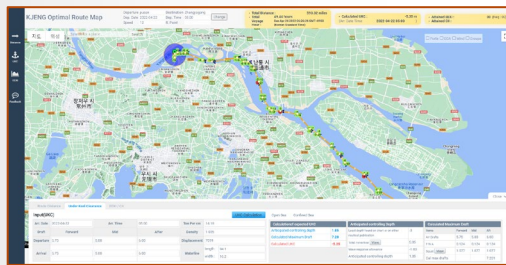
02. Solution for Environment

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



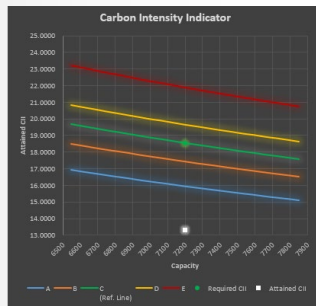
- **Routes and Distance Calculator**

- 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. Global Cooperation

- World's First AIS2.0 (VDES) Commercial Service with Satellite (Sternula A/S, Denmark)
- Service Agreement for GMDSS (2024. 02, danphone A/s, Denmark)

Consortium

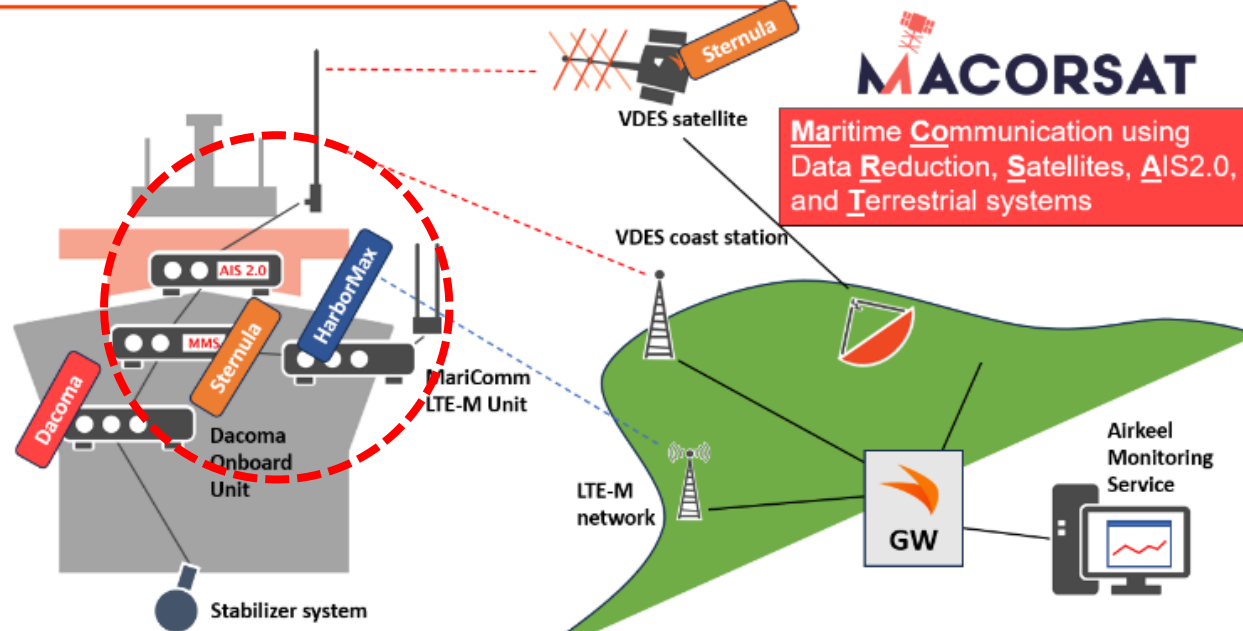
Sternula is world leader in AIS 2.0 (VDES)

- 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/>



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.

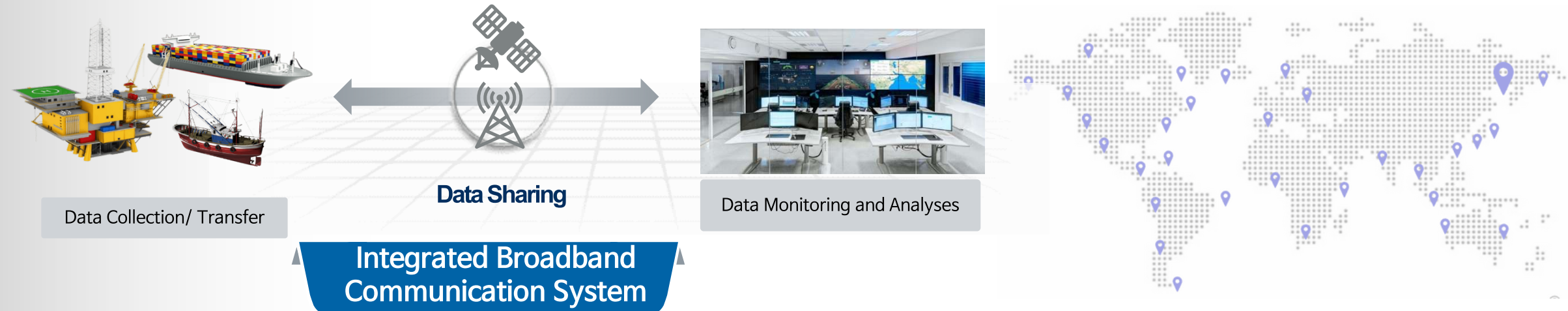
Claus Falk, Peter Ditlev Nødbak, Andy Reynolds

#Aalborg #MaritimeSafety #Collaboration #Innovation #MaritimeTech



04. Integrated Platform

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



Integrated Broadband Communication System

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

05. Marine Digital Twin

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

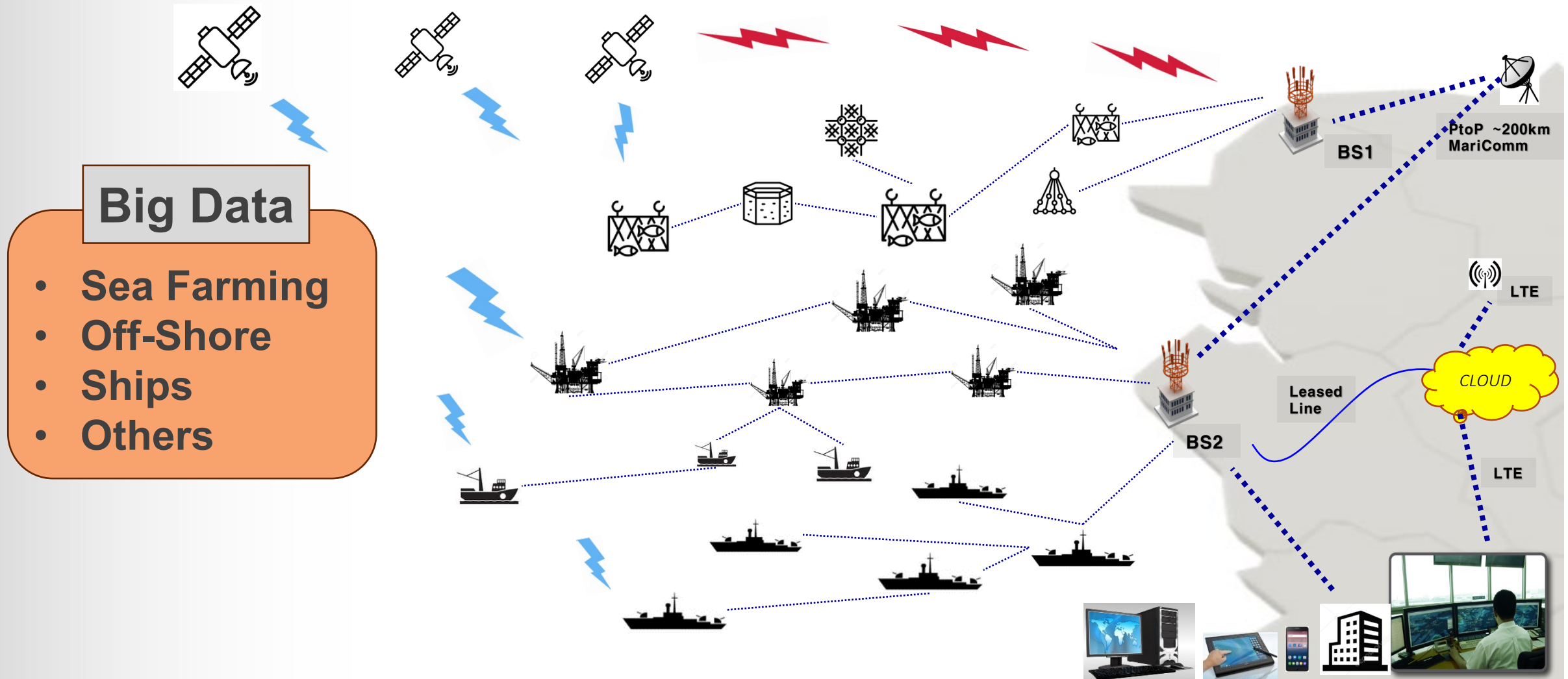




5. Extended Application

01. Mesh Digital Networking

- Ad-Hoc Connection provides the New Way of the Remote Services at all Marine Assets
- Integrated Connectivity for Fixed Asset and Moving Vessels of the Global Coastline



02. Voyage Support

- Parts Supply & Repair through the Global Networking(Engine/ Generator/ Boiler/ Purifier, etc.)
- Satellites, Radar, Ship Networking and other ICT System and Upgrade



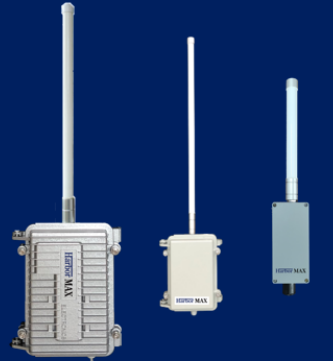
03. Global Data Roaming

- Extended Coverage of 3G/ 4G/ 5G and WiFi for Anchorage, Quay Side and Coastal Voyage
- Data Packages for Ship Management System with Satellites Connection

Harbor MAX


For Your Global Data Service at All Ports & Coasts

3G, 4G, 5G Terrestrial Connection with Satellites



Voice	Video	E-MAIL
Internet	PMS	CCTV
GPS	Diagnose	Messages

* Router Design may be decided to the latest Product Model



Harbor MAX

For Your Communications Over the World

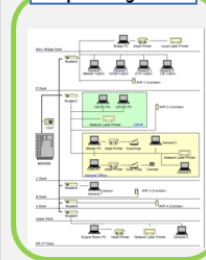
Technical Advantages

- For VSAT Redundancy
- Stable 3G/ 4G/ 5G Service
- Economical Data Package
- All over the Global Countries, Anchorage, Coastal Lines
- Linked Advantage Service with Satellite


Main Application

- Internet (Web, Voice, Video)
- Indoor WIFI (AP) onboard
- Real Time Information (Weather, Fishing, etc.)
- Real Time Voyage Monitoring
- CCTV monitoring of the Ship


Ship Management




Internet



Remote Diagnoses




Baybot PMS



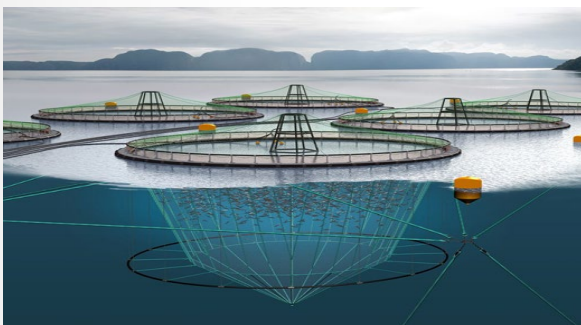
Data Package, Country Selection can be easily done at <http://www.bayoss.com>

HarborMax Co., Ltd.
 Tel : 051-626-9451 / Fax : 051-626-9459
 Homepage : www.harbormax.com
 E-MAIL : info@harbormax.com

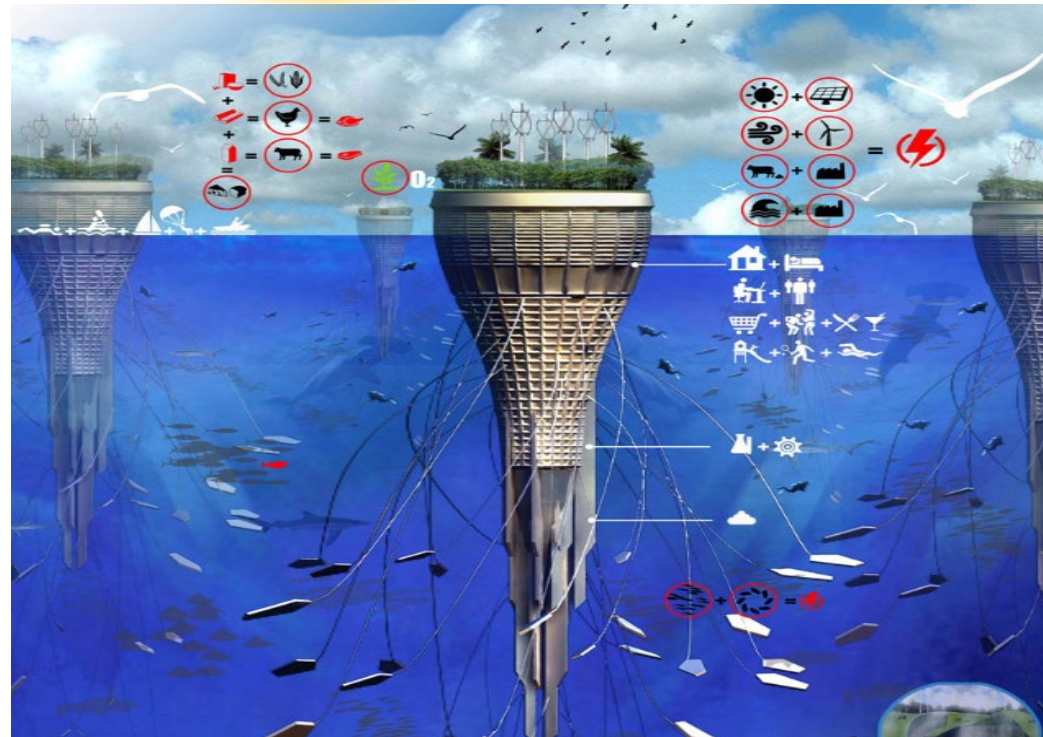


04. Smart Farm

- Real Time Monitoring over the various costal farming



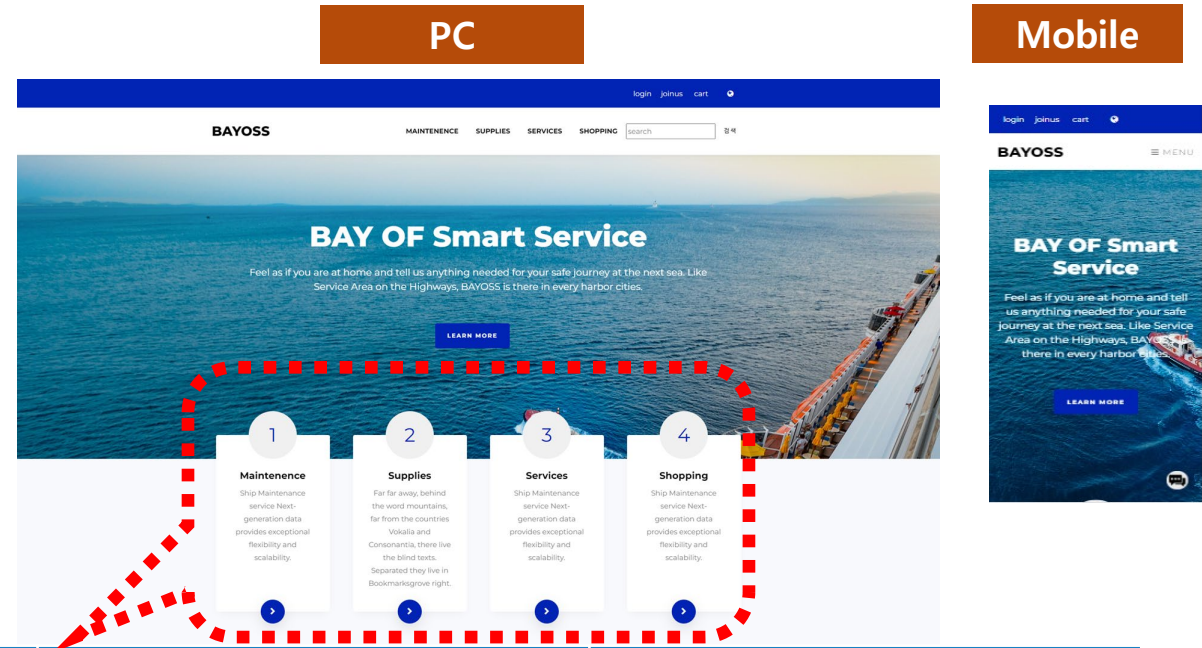
Various Remote Monitoring!!!



Future Aqua Farm Sample (Internet)

05. Smart Service of the Port

- Highest Competitiveness through the Networking of Ship Service Providers
- Integrated Service for Port Business Units for B2B, B2C Platform



VOYAGE	SUPPLIES	SERVICE	SHOPPING
<ul style="list-style-type: none"> - ICT/ Control System - Machinery - AI Monitors - Ports Routing - Ship Management - Anomaly Detect 	<ul style="list-style-type: none"> - Bunkering - Spare Parts - Consumables - HSE & Safety - Foodstuff - Internet 	<ul style="list-style-type: none"> - Pick-Up - Quick Drone Delivery - Medical Care - Tour - Event 	<ul style="list-style-type: none"> - Cosmetics - Accessories - Nutrient - Medicals - Apparel - Sundries

CONTACT US



PHONE NUMBER

+82-51-626-9452

EMAIL

info@harbormax.com