



Company Presentation





| | |
|-----------|---|
| Company | eMARINE Global Inc. |
| C.E.O. | Dr. J.J. Ung Gyu Kim |
| Since | 2001. 01. 02 |
| Symbol | EMRN (OTC) |
| Address | 4th Floor, 15-14, Samsan-ro 308beon-gil, Nam-gu, Ulsan, 44715 Republic of Korea |
| Employees | 36 |
| Auditor | Turner, Stone & Companies |

Dr. J.J. Ung Gyu Kim



36 years
Experience

Navigation Major (Korean Maritime & Ocean University)

MBA (Finland Alto University)

Ph.D. in Maritime Information System (Mokpo Maritime Univ.)

The 1st Officer (Navigator)

Korean Air Cargo-Info. Management Sys.

Hanjin Total Logistics Network

LG CNS Maritime Logistics SI

C.E.O. eMARINE Global Inc.

Leap

2017

- ECD DNV_GL International Certification
- ThingworX Partnership with PTC Korea

2016

- Investment Consultation Engagement with Redchip U.S.

Stability

2011 ~ 2015

- ECDIS Kernel GS Certification
- Information Communication Contractor
- Weather Information Management Certification
- KHOA ENC Distribution Right Acquired
- BWTS Filter KR Certification
- Patent : Efficient Navigation System
- Patent : Dynamic ENC Display System

Growth

2005 ~ 2010

- Name Change : e-Marine Co. Ltd.
- IHO S-64 ECDIS Manufacturer
- ECDIS DNV Certification
- Patent : Audio Recognition Ship Control & Steering Gear Control System
- Investment Agreement with Singapore Jason
- Registered as R&D Service Contractor
- ECDIS KRH Certification

Birth

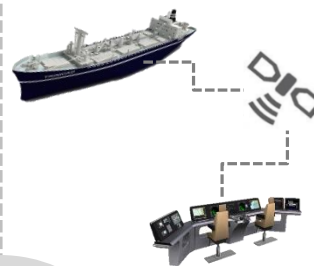
2003

- Dr. J.J. Kim as C.E.O.
- ECDIS KR & ISO 9001 Certification
- Became an official ENC Provider

2001

- Birth : DIMARS Co.
- ENC Manufacturer & Software Developer

- Navy / Coast Guard ECDIS Sales & Maintenance
- Public / Commercial Ships ECDIS Sales
- INS : RADAR + ECDIS + TCS (Track Control System)



- ISIG : Intra-Ship Integrated Gateway
- Optimal (Saving) Navigation System
- Engine Status Monitoring System
- SMART RMS : Remote Maintenance System
- Remote Ship Control & Monitoring System
- IoT / Big Data Ship Platform



ECDIS

(Electronic Chart Display & Information System)

SMART SHIP

Overseas Solutions Distribution

- CARIS : Maritime GIS S/W (Canada)
- Hatteland : Ship Computer & Monitor (Germany)
- ENC : C-MAP, UHKO (R.O.K)
- Training Simulator (ECA-Sindel)



Aids to Navigation

- Maritime Weather Signal Operating Sys.
- Maritime Weather Info. Display Sys.
- Aids to Navigation Management Sys.
- Aids to Navigation Remote Monitoring Sys.
- Weather Signal Info. Sys.
- Aids to Navigation RTU (AIS, CDMA, TRS)



Core Competence



Korea NAVY & Coast Guard

- 90% for the Retrofits
- 90% for the Newbuilding Ship; 250 new ships by 2020 (\$9.5B investment by Korea Navy)
- Maintenance Contract for 200 Ships
- Destroyer, landing ship, mine layer and mine hunter, Submarine
- Combat Management System
- Training & Education Simulators
- Korea National Security Budget 2017: \$40.4B; up 4% over 2016)



Hyundai Heavy Industries

- SMARTSHIP Solution Provider
- Value Added Before & After Service Solution
- ISIG (Intra-Ship Integrated Gateway) for RMS (Remote Maintenance System)
- ECDIS and TCS (Track Control System) for INS (Integrated Navigation System)
- Hi-CASS, Collision Avoidance System
- Hi-VASS, Vessel Data Platform
- Connected SMARTSHIP-BigData Platform Supply



Ministry of Oceans & Fisheries

- e-Navigation Solution Provider
- IMO Initiative
- Vessel IoT
- Intelligent Disaster Information System
- SMART-Navigation
- Training Ships
- Integrated Aids-To-Navigation Monitoring System
- Next Generation Integrated Navigation System
- Autonomous Ship Development

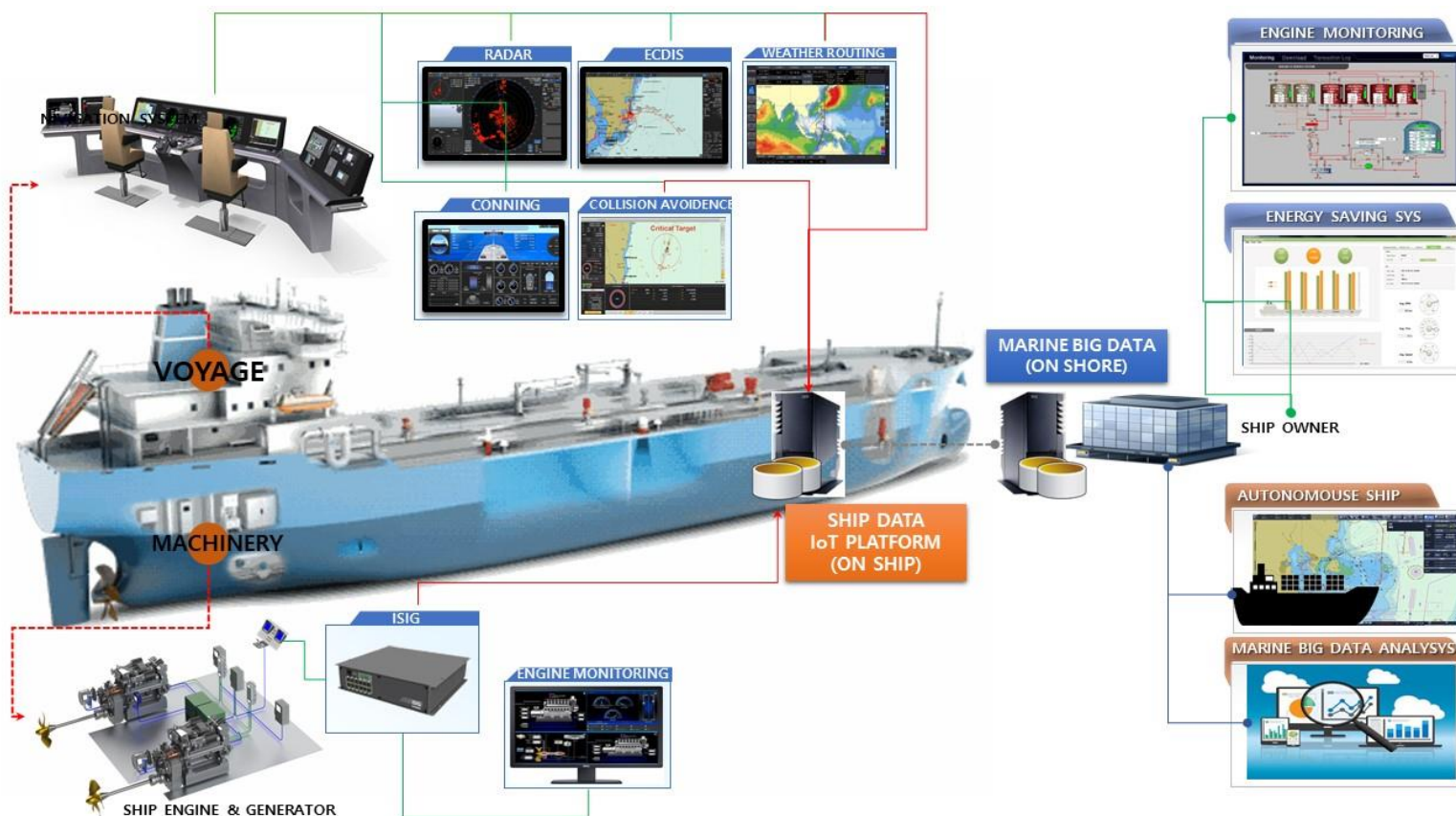




Other Customers



The Company's current focus is Smart Ship, developing maritime I.o.T. and big data technology for conventional use. The company created innovative solutions including **ISIG**, **Optimal Navigation System**, **Remote Maintenance System**. With Smart Ship solutions, the company is preparing for a new generation of maritime technology; autonomous and unmanned ship.





SMART SHIP – Marine I.o.T.

Marine I.o.T. is an ICT convergence service that comprises **Smart Sensing technology** and **Data Platform technology** to acquire, store, process, and analyze data, providing a multi-directional database network for Users and Offshore Facilities.

Vessel IoT Platform



Remote Diagnosis



Vessel Monitoring

Remote Monitoring
(Satellite)



Vessel Sensor Data
(Navigation, Engine, CCTV)



ISIG, Gateway



Sailing Vessel

AtoN IoT Platform



Weather Monitoring S/W



Mobile App

Remote Monitoring
(AIS, TRS, CDMA)



Weather Information
(Temperature, current, wind)



e-A2N AIS

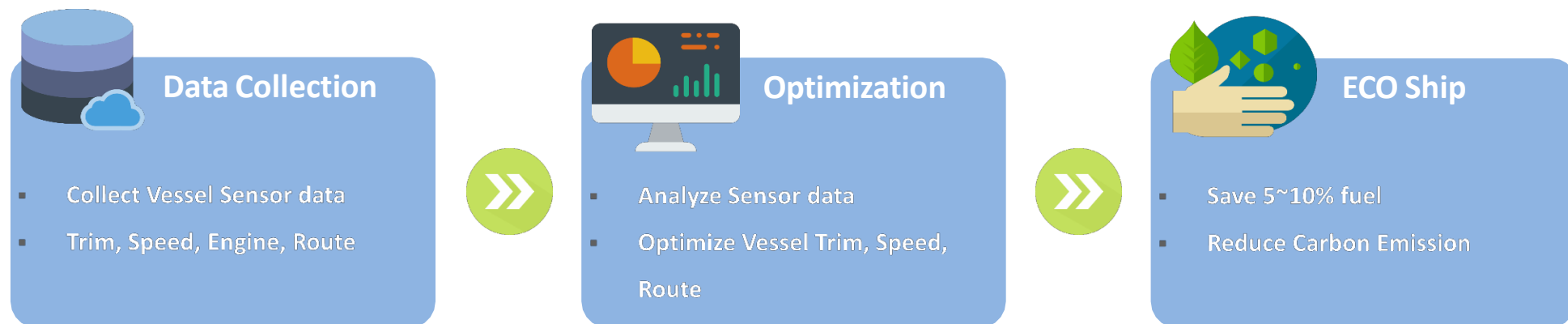


Lighthouse, Buoy, Beacon



SMART SHIP – Marine Big Data

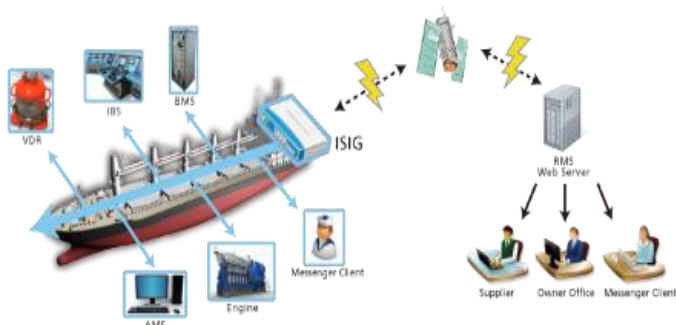
Marine Big Data includes **Optimal Voyage System** that **minimizes fuel consumption by optimizing various factors such as TRIM, Engine Operations and Route Planning**. By minimizing Fuel Consumption, we can also reduce the Cost of Operation and Carbon Emission to meet IMO's regulations.



SMART SHIP – ISIG (Intra-Ship Integrated Gateway)

Transferred from Korean ETRI (Electronics and Telecommunication Research Institute), ISIG has become one of the most important technologies eMARINE has obtained. Consisting of both hardware and software, its main function is **to send data collected from a fleet via Smart-Sensing Technology to ground control**. ISIG is the device that mostly embodies the key idea of Vessel I.o.T. Platform. eMARINE supplies average 50 ISIGs to Hyundai Heavy Industries per year and the numbers are growing.

SAN based Remote Monitoring System



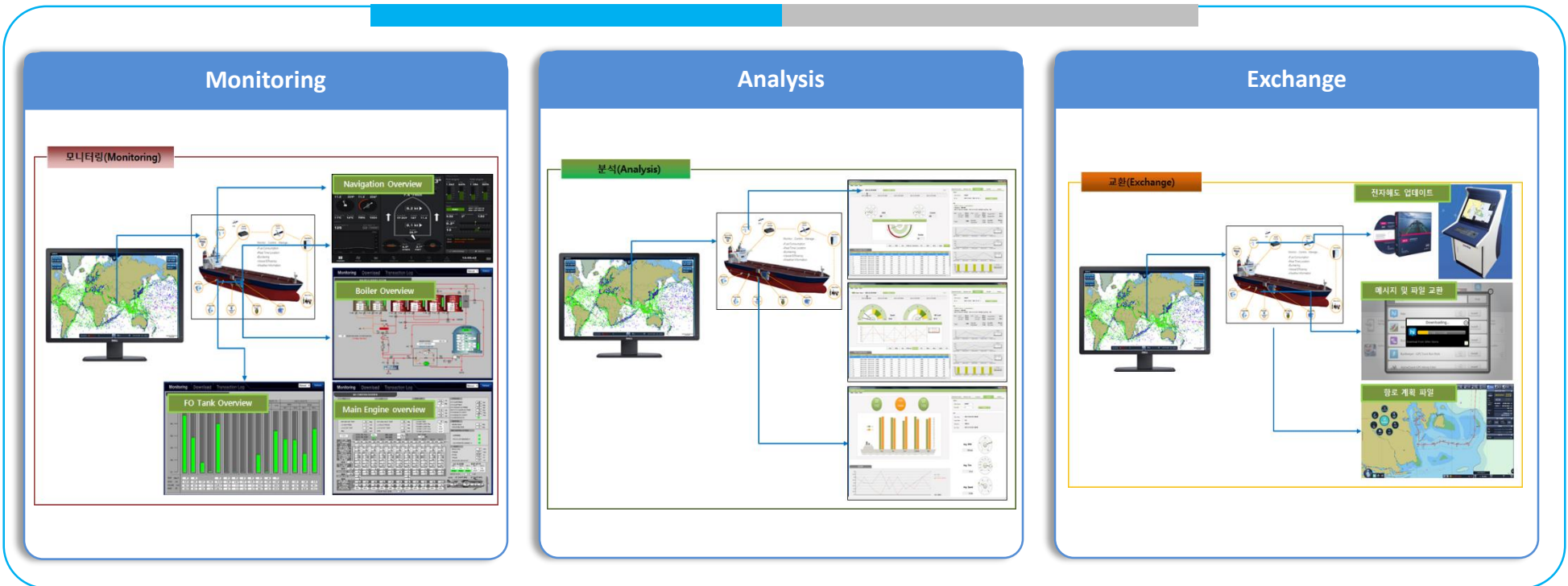
※ ISIG(Intra-Ship-Integrated Gateway), AMS(Alarm Monitoring System), VDR(Voyage Data Recorder), BMS(Bridge Maneuvering System), RMS(Remote Maintenance System)

Interface

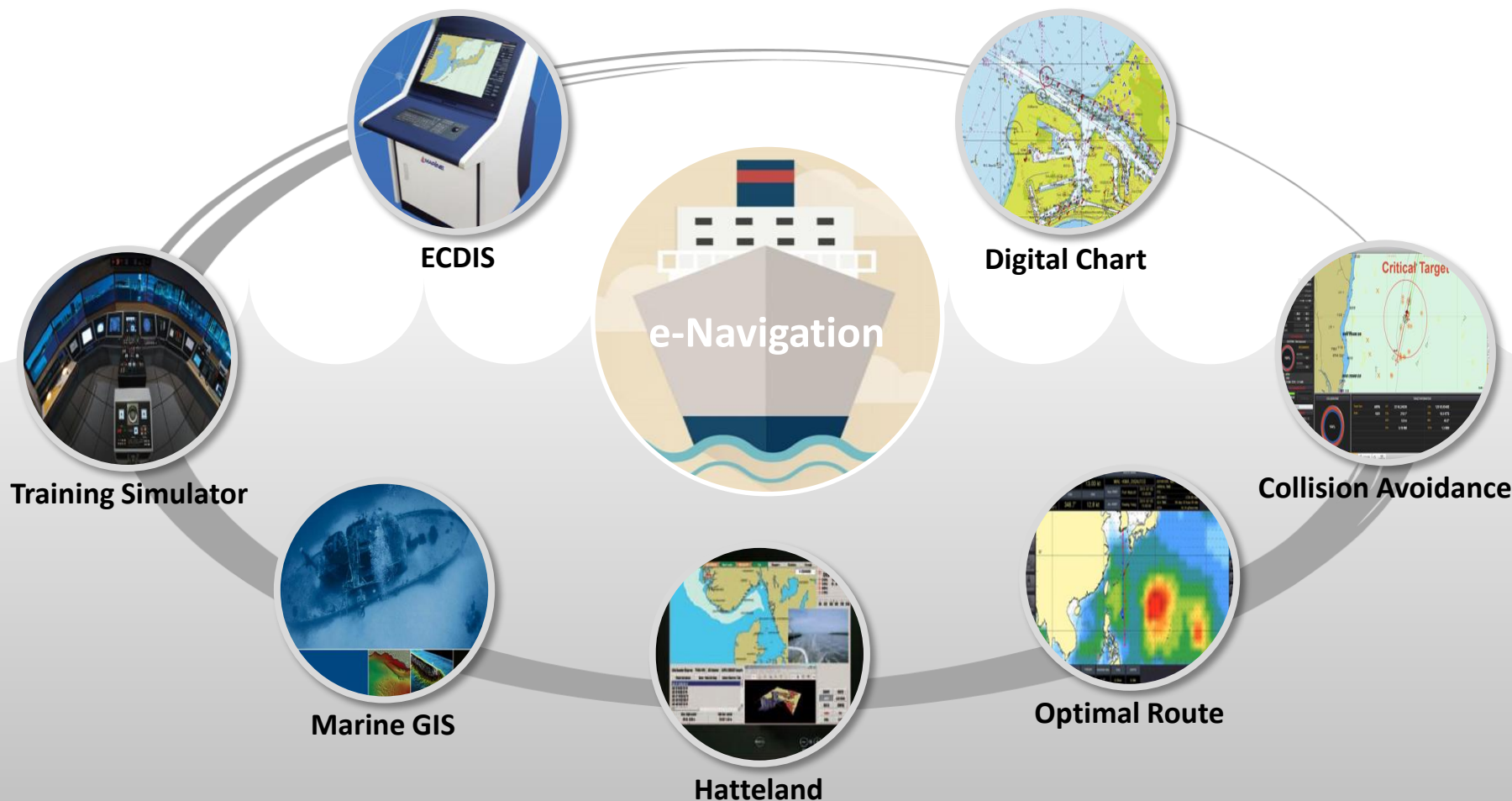


SMART SHIP – RMS (Remote Maintenance System)

RMS serves two main functions (i) **it automatically predicts and detects failures in a ship's equipment, system and machinery and reports it to operators**, and (ii) **it continuously monitors status of all parts of a ship and provides relevant information to the operators on shore**. RMS utilizes marine Big Data technology and also provides 3D modeling of ship and its parts, and software patch for remote maintenance.



eMARINE provides solutions for collection, integration and display of maritime information aboard and ashore by electronic means to enhance berth to berth navigation and related services. These solutions are the most efficient ways to secure the safety of life at sea and protect marine environment. All solutions are provided through subscription, installation, updates and/or maintenance contracts





e-Navigation – Digital Chart

Digital charts offer everything that standard navigational chart can offer, and more. **User can interact with digital chart on ECDIS, where real time information such as ship position, and target location are available.**

C-MAP

Digital Chart

- Professional+
- ENC (PAYS, FlatFee)
- PRIMAR ECDIS Service

Additional Service

- OceanView
- Weather Service
- Piracy Service
- Chart Catalog



UKHO

Digital Chart

- Admiralty Vector Chart Service
- Admiralty Raster Chart Service

Publication

- Admiralty Digital List of Lights
- Admiralty Digital Radio Signals
- Admiralty TotalTide



THE UNITED KINGDOM
HYDROGRAPHIC OFFICE

KHRA

Korea Digital Chart

- S-57, S-63 (ENC)

Korea Raster Chart

- SHP



Our ECDIS, e-Navigator, is an interactive chart display system that offer various navigational functions such as Route Planning, Route Monitoring, Voyage Data Recording, Alert Management, and others. It is compatible with multiple navigational equipment such as RADAR, GPS, and others.

Features

- Route Planning
- Route Monitoring
- Voyage Data Recording
- Voyage Monitoring
- ARPA/AIS Target Display
- Auto Pilot Interface
- Radar image Overlay
- Multi-Chart Overlay



<e-Navigator>

Interface



ARPA Radar



Echo Sounder



GPS



Speed Log



AIS



Wind Log



Radar Image



Gyro Compass

e-Navigator Navy is a **new-generation WECDIS specialized for use of the military and the police**. The advanced WECDIS supports command & control and increases situational awareness of a vessel to execute rapid and accurate decision-making during operation and battle-training

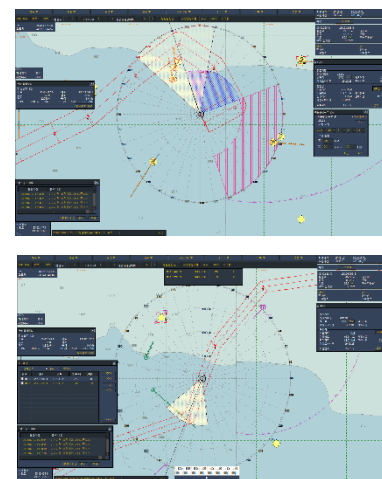
Feature

- Target Management
- Tactical Data Link
- Object Management
- Radar image Overlay
- Submarine Function
- War Game Simulation
- Mine Laying



<e-Navigator Navy>

Interface



< e-Navigator Navy Main Screen >

e-Navigation – Marine GIS Solution

Marine GIS Solutions such as CARIS, SevenCs, and dKart, are used for creating and editing navigational charts and other GIS databases. They come in different types in order to match the workflow environment.

Chart Production Workflow



CARIS

Survey Processing

- HIPS/SIPS
- Notebook
- Bathymetry DataBASE Server

Chart Production

- GIS
- S-57 Composer
- Paper Chart Composer
- HPD

Chart Distribution

- Easy View
- LOTS Article 76
- BEAMS
- PORTIS
- Spatial Fusion Enterprise

SevenCs

Chart Production S/W

- ENC Designer Enterprise
- ENC Optimizer
- ENC Analyzer
- ENC Contour Generator
- ENC Encryptor Package
- ENC Cartographer
- FME Professional

dKart

Chart Inspection S/W

- dKart Office
- dKart Inspector



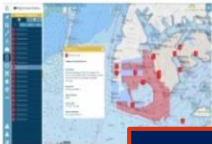
Market Opportunity – Global Market

IMO approves mandatory ship emissions data reporting requirement



The measures were approved by the were approved by the 69th session of the IMO's Marine Environment Protection Committee (MEPC) has approved mandatory requirements for fuel consumption, the first part of a three-step process of data collection and analysis that will inform

BigOceanData improves vessel tracking service



The BigOceanData as a background service upgrades have additionally been added.

Official autonomous ship test bed designated in Trondheim



Japan uses IoT to boost productivity

Japanese shipbuilding industry making attempt boost productivity utilizing technologies.

Fujitsu to Build Industry-First Maritime Big Data Platform

May 9, 2016 by MI News Network Leave a Comment

Fujitsu Limited announced that it has built a maritime big data platform for Nippon Kaiji Kyokai, an international ship classification society also known as ClassNK. The platform will be available from April, 2016.

Fujitsu has now built a platform with ClassNK that collects and accumulates machinery operational data from moving vessels, sensor data, engine data, as well as marine weather information, as big data. This enables maritime businesses such as ship operators and shipbuilders to be able, for example, operations personnel to predict malfunctions using voyage data and marine weather data.

Maritime industry, will be operated as a data center service by Fujitsu, established in December 2015. Fujitsu will support the further development of the maritime big data platform, contributing to the further development

IoT & Big Data Technology

SMARTSHIP & Eco-Ship

Energy Saving

Emission Monitoring

Autonomous/Unmanned Ship

Optimized Voyage

Aligned with Dynamic Industry Trends

Ship fuel data collection to be in force from 2016



displayed. Triggers can also be set to create notifications if the exposure

Energy Management is the Future of the Cruise Industry



Photo: Eniram

Royal Caribbean Cruises teams up with Eniram, cutting fuel costs by millions of dollars and reducing emissions

U.S. Coast Guard Approves Use of Electronic Charts

February 9, 2016 by gCaptain

2.8K
SHARES



Market Opportunity – Smart Ship

MARINE
e-Navigation &
SMART SHIP

ThingWorx
A PTC Business

HYUNDAI
HEAVY INDUSTRIES CO., LTD.

- **Research & Development partner of Hyundai Heavy Industries' Smart Ship Development Plan** (All three phases)
- **Provider of Smart Ship solutions** for HHI standard ships beginning in 2017
- Development platform 'Thingworx' based **Smart Ship solution** developing cooperator (sole partner)
- Currently in significant phases of developing and providing **main Smart Ship solutions** such as **ISIG, Remote Maintenance System, Voyage Optimization System, Engine Monitoring System** etc.



SMART SHIP

- **The World's No.1 Shipbuilder**
- **HHI is investing 3.1bn USD in Research and Development by 2021**
- Increased building volume of high value-added ships (251% up from last year)
- 2017 1st Quarter Sales 23% higher than the 1st qt of 2016
- Engine partnership agreements with MAN Diesel & Turbo and Winterthur Gas & Diesel
- HHI to support India's naval ship construction
- HHI signed MOU with Bahri, the biggest Saudi Arabian Shipping Company regarding implementation of Smart Ship solutions for their fleet.

Hyundai Electric promotes new energy solution

Published | 2017-04-20 07:15



HHI to support India's naval ship construction

Published | 2017-04-11 07:03



HHI and Bahri work together for 'smart ship'

Published | 2017-05-10 07:04



HHI inks MOU for smart ship service

HHI inks MOU for smart ship service

Published | 2016-07-07 07:03



HHI sees fifth straight quarterly surplus

Published | 2017-04-18 07:02

We build a better future
HYUNDAI
HEAVY INDUSTRIES CO., LTD.

Hyundai Heavy Industries (HHI) issued a public disclosure of its 1Q 2017 consolidated earnings on April 27.

According to a regulatory filing, during the January-March period HHI racked up 10,075.6 billion won in consolidated sales while consolidated profits were 1,075.6 billion won, up 90.3% up from last year's comparable period, posting profits for five straight quarters.

HHI mainly attributes the whopping quarterly operating profit increase to 127.1 billion won operating profits from HHI's Shipbuilding Division last year. The strong earnings of shipbuilding business were attributable to an increased building volume of high value-added ships that HHI manufactures, and cost reduction efforts.

Offshore & Engineering Division and Engine & Machinery Division posted 94 billion won of profits thanks to an optimized operation of HHI's On-engine parts while Electro & Electric Systems, Construction Equipment and Robotics Division reported 107.6 billion won of profits with cost reduction efforts.

Hyundai Oilbank and other affiliates also played a role in reporting strong earnings with 350 billion won income even with a drop in refining profits. An HHI official said, "We have been active in improving profitability and fiscal health with preemptive and comprehensive restructuring measures. We will redouble our efforts to continue to report stable profits with technology and quality-oriented management."

Market Opportunity – Domestic Market

Government Support Plan

- To build more public ships in 2 years(260) in order to strengthen maritime economy
- To encourage Korean shipbuilders
- To provide infrastructure for international competitiveness regarding innovative maritime technology trend (**Smart Ship**)

New Government Security Policy

- To strengthen Naval force (Intelligent Navigation)
- Independent Coast Guard → Expanded **Smart Ship** solution opportunities for patrol ships
- Enhancement of 'Coastal Security' after Sewol Ferry accident investigation
- Independent and increase of military force → more governmental investment

The 4th Industrial Revolution

- Innovative movement toward **ICBM(I.o.T + Cloud Computing + Big Data + Mobile)**
- Government's industrial initiative

Recent News & Opportunities

Artificial Intelligence based SMART RMS with Korean Coast Guard

- Continuous I.o.T. business meetings with **Korean Coast Guard**
- **5 ships to be in test and trial running**
- Shall be **mandatory for the basic design of new builds**
- Korean CG & eMARINE Global cooperation to promote to the allied Asian Coast Guards

Red-Tide Prediction & Monitoring System for Anti Disaster Initiative

- Red-tide Predication System is a part of National Anti-Disaster Information System.
- 6 months of development, major contract with Ministry of Oceans and Fisheries
- **3D modelling algorithm calculates the vector value to estimate the direction and time of spread of red tide**
- This marks 3 consecutive years of eMARINE participating for National Anti-Disaster initiative

SMART Ship & e-Navigation Solutions Opportunities in Latin America

- In **partnership with LIG Nex1**, major defense company operating in **Central & South America**
- LIG Nex1 is in discussion with Latin America countries, namely **Colombia for supplying eMARINE's solutions starting with WECDIS(Warship ECDIS)**, specially developed ECDIS for Navy by e-MARINE
- **Brazilian Navy** is to acquire new warships via major Korean shipbuilding companies, all in good cooperation with eMARINE.





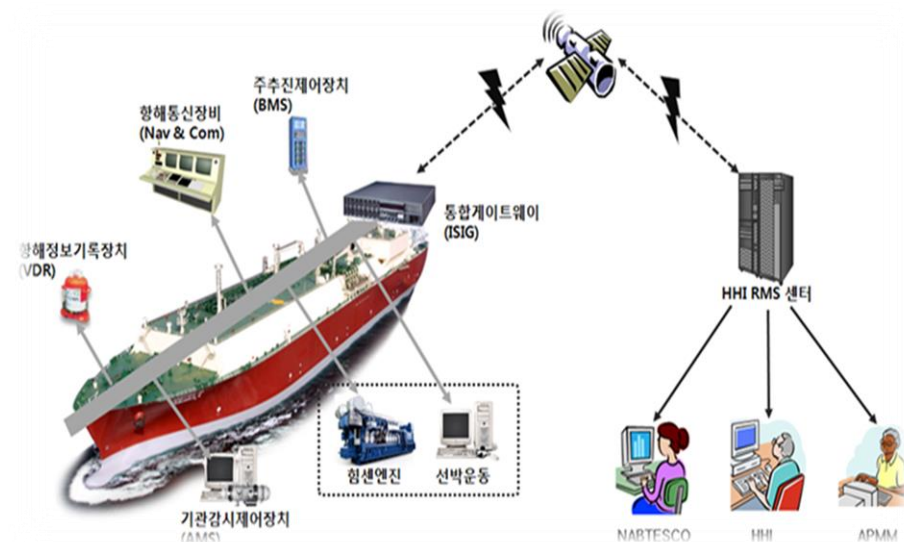
Future – Autonomous Ship



Autonomous ship is capable of operating by itself on its own remote diagnosis and use **I.o.T.(Internet of Things), big data and artificial intelligence (AI)** in order to provide information connected to onshore-bridge operator, shipowners, shippers and ports. The ship could be guided out of a busy port area by an on-shore operator in a control room using a joystick. On-board sensors would inform the controller of any potential risks or obstacles. **In open sea conditions the ship could run on fully autonomous settings, guided only by satellite connection and on-board sensors.**

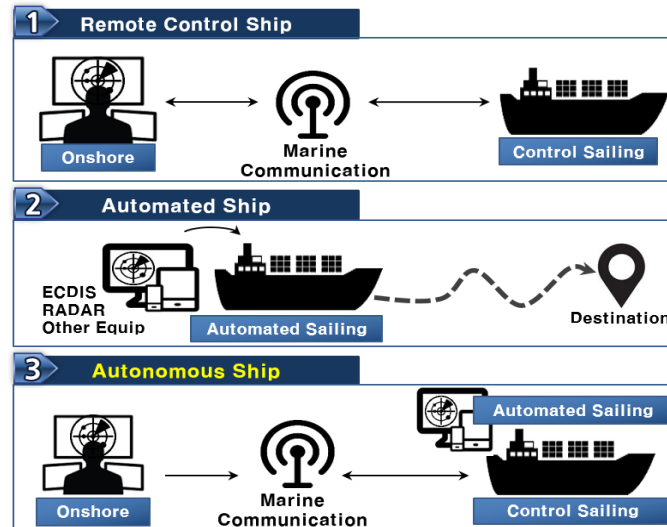
eMARINE Experiences & References

- INS integrated Navigation System components : ECDIS, RADAR, Conning Console
- Collision Avoidance System
- Vessel Motion Monitoring System
- ISIG Intra-Ship Integrated Gateway
- SMART RMS Remote Maintenance System
- Remote AMS Alarm Monitoring System
- Optimal Voyage System
- Engine Status Monitoring System
- Passenger-ship Safety Monitoring System



Future – Autonomous Ship (continued)

Procedural Steps to Autonomous Ship

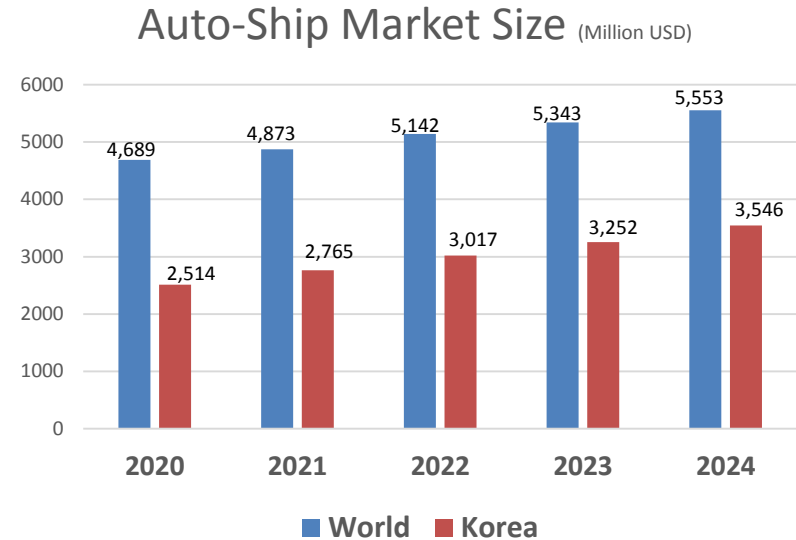


eMARINE Target Market (2020~)

AMSS Autonomous Maneuvering Support Systems

- Automated Navigation & Communication System
- On-shore Bridge
- Remote Maintenance System

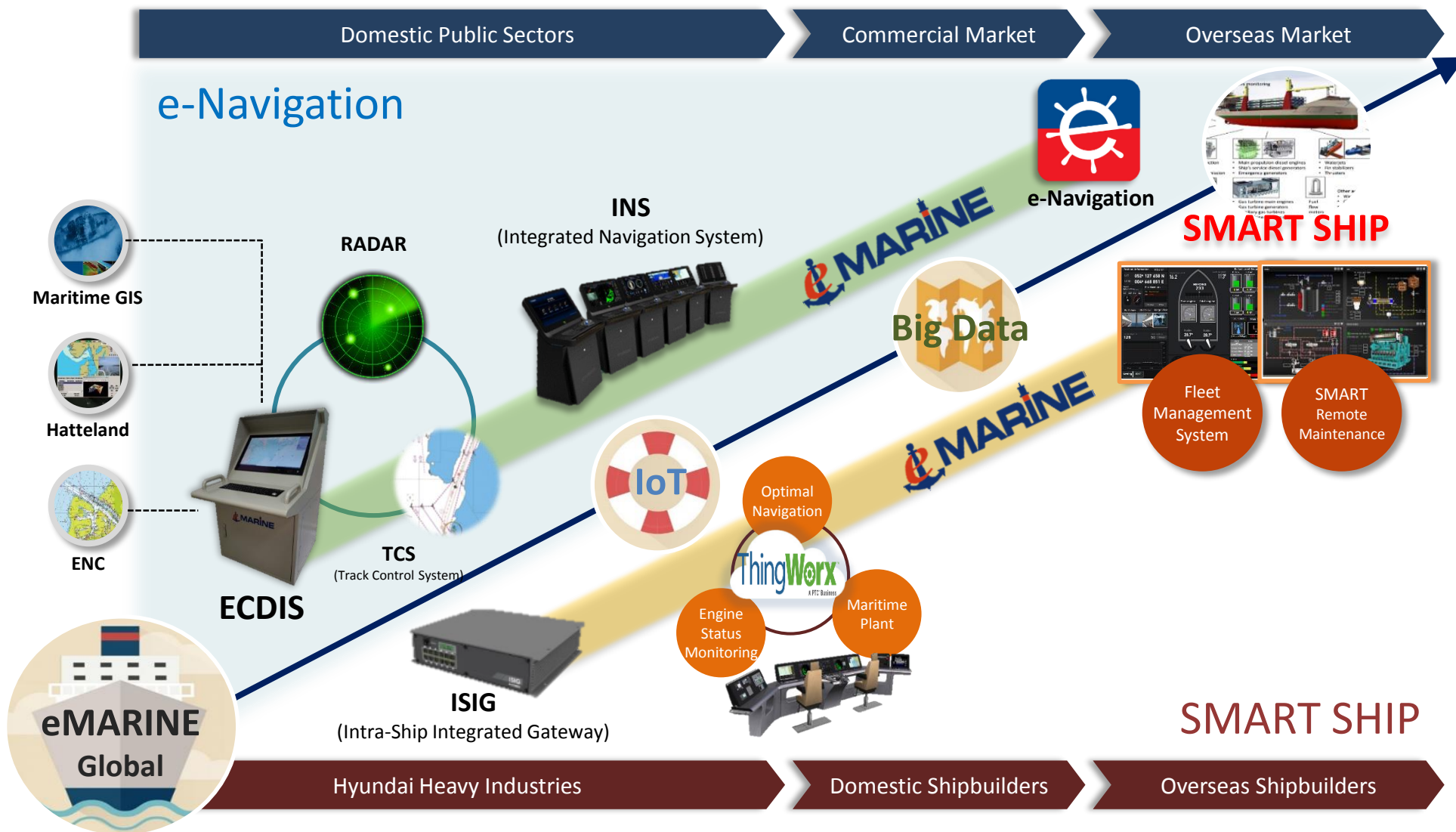
Market Projection:



- The **international** Autonomous Ship market growth rate will be est. **4.5%, starting 2020.**
- The **Korean** market growth rate will be est. **9.0%, starting 2020.**
- Investment and research for domestication of Autonomous Ship technology will increase drastically.



Growth Model – Roadmap



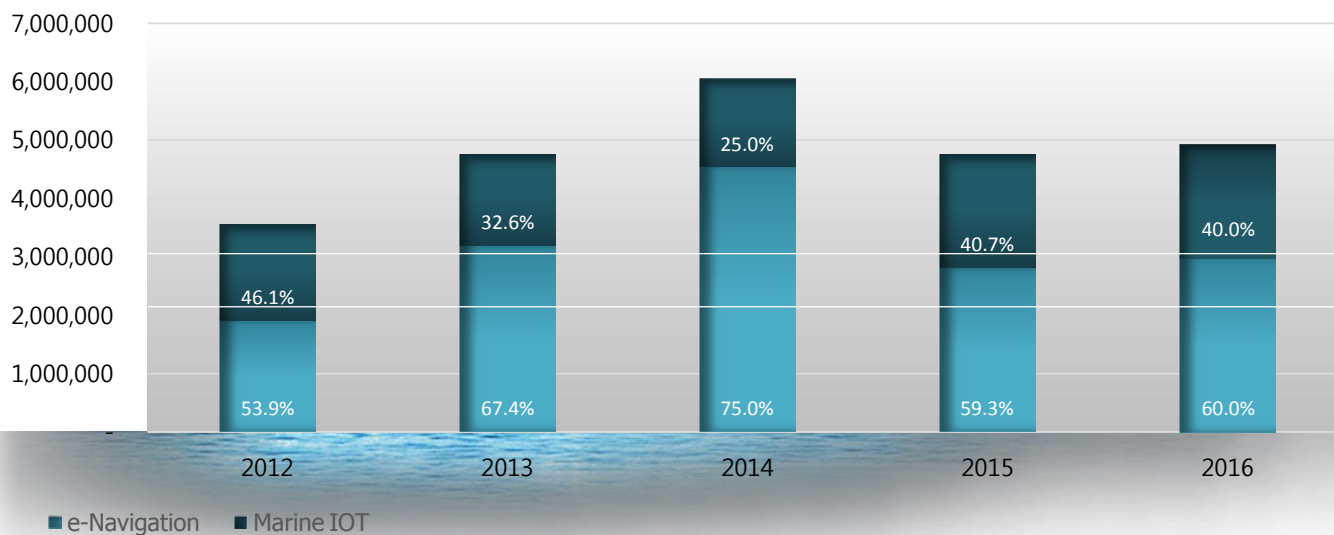


Sales Performance

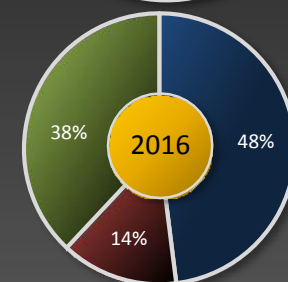
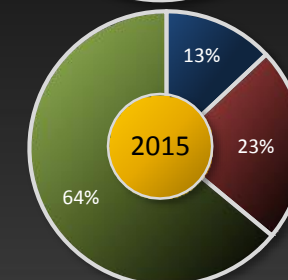
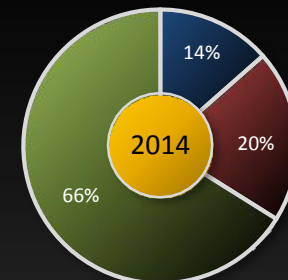
Revenue for 5 Years

(Unit : USD)

| Year | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | |
|--------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
| Category | Sales | Portion | Sales | Portion | Sales | Portion | Sales | Portion | Sales | Portion |
| e-Navigation | 1,914,426 | 53.9% | 3,201,480 | 67.4% | 4,542,467 | 75.0% | 2,812,171 | 59.3% | 2,919,084 | 60.0% |
| Marine IoT | 1,638,609 | 46.1% | 1,546,307 | 32.6% | 1,512,165 | 25.0% | 1,929,344 | 40.7% | 1,946,056 | 40.0% |
| TOTAL | 3,553,035 | 100% | 4,747,787 | 100% | 6,054,632 | 100% | 4,741,515 | 100% | 4,865,140 | 100% |



Revenue by Buyers

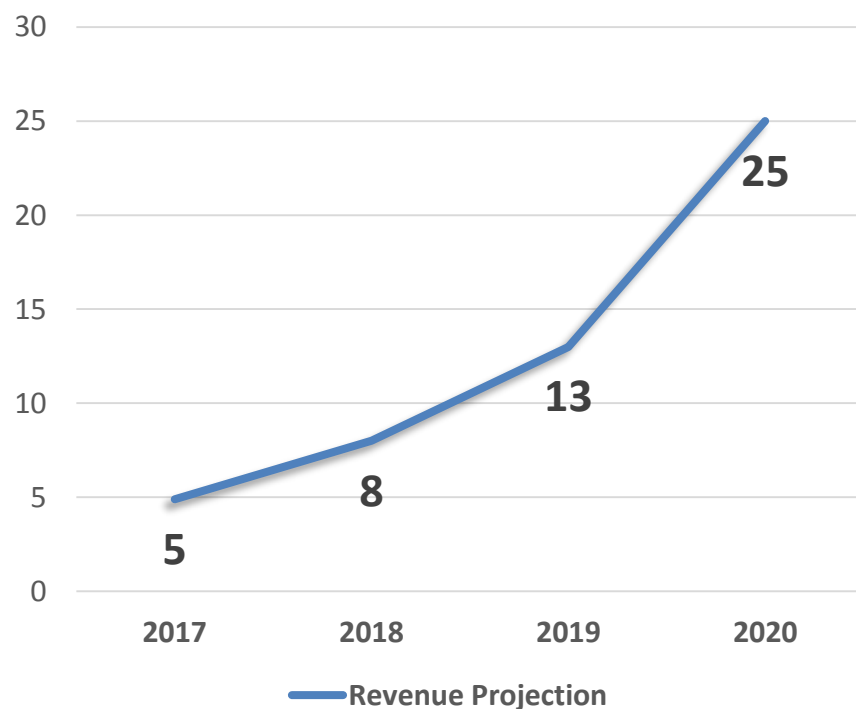


Gov. & Public Institutes
National Defense
Commercial Companies



Revenue Projection (2017 – 2020)

Revenue Projection (Million USD)



KEY FACTORS

Smart Ship & Autonomous Ship

| | 2018 | | 2019 | | 2020 |
|---------------------------------|-------------------------------|---|--|---|--------------------------|
| Optimal Voyage Solution | Supply to HHI (0.8M) | + | To other domestic shipbuilders(1.5M) | + | Overseas market(4M) |
| RMS (Remote Maintenance System) | Pilot run with KR Coast Guard | | Defense market(2M) | | Commercial market(5M) |
| Big Data & I.o.T Platform | ISIG to HHI (0.5M) | | I.o.T Platform to new built ships (1M) | | Retrofits & Overseas(4M) |

e-Navigation

| | 2018 | | 2019 | | 2020 |
|--------------|-------------------------------------|---|--------------------------------------|---|-------------------------------|
| ECDIS | Defense Market(2.7M) | + | Commercial Market (4M) | + | Overseas market(7M) |
| Oceanology | Ministry of Oceans & Fisheries (2M) | | Big Data Integrated Solutions (2.5M) | | Overseas Market(3M) |
| Distribution | CARIS + ECA Sindel (2M) | | Submarine Simulator (2M) | | Upgrades & Maintenance (2.5M) |



Patents & Certificates



AtoN Patent



Voice Control Patent



TRS Patent



Dynamic ECDIS Patent



Green & Economical Navigation
Support System(Whole)



Green & Economical Navigation
Support System(Part)



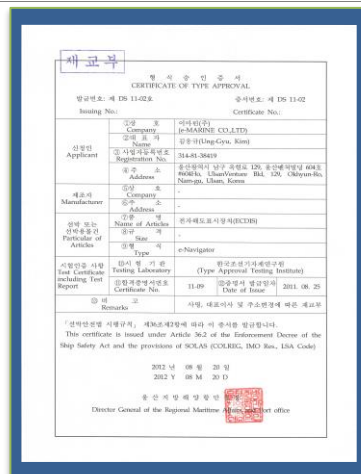
KR Cert



KRH Cert



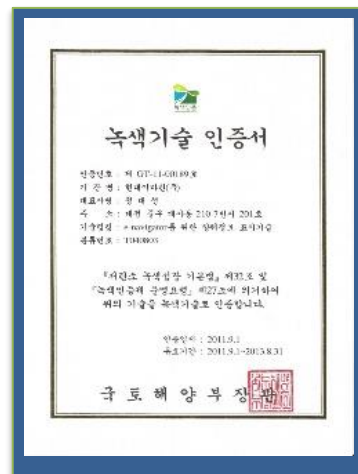
Patents & Certificates



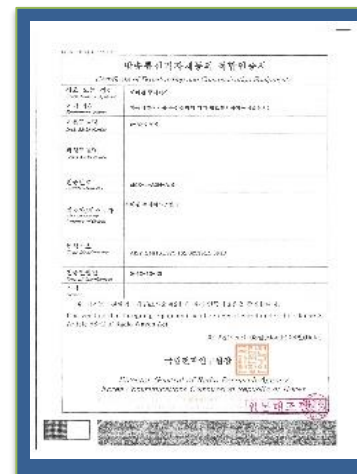
Type Approval Cert



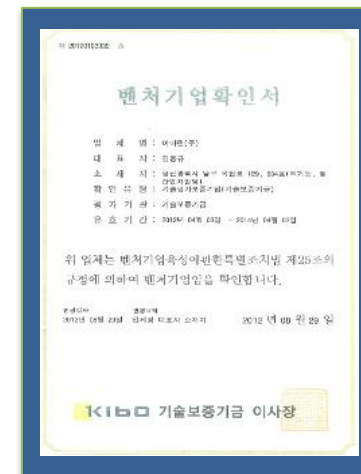
Good S/W Cert



Green-Tech Cert



Radio-Comm Cert



Venture Company Cert



ISO9001:2008



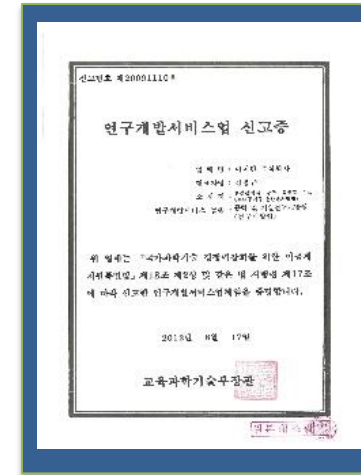
Enterprise institute



IT Construction



INNO-BIZ



R&D Service

Management Team

JJ Unggyu Kim, Ph.D - *President and Chief Executive Officer*



- CEO since 2003
- Internationally renowned maritime expert 34 years of career experience in the maritime industry
- Project leader of Korean Air & LG CNS
- Ph.D Degree in Marine Information Science from Korea Maritime and Ocean University
- Maritime Minister Award (2011), Knowledge & Economic Minister Award (2011),
- Industrial Minister Award (2014), and Maritime Safety Expert (2014).

Brian Yang

- *Chief Operating Officer*



- Joined in 2001
- Team member of digital chart development in Geo-Data
- As a founding member, devoted to eMARINE

Primo Park

- *Chief Technology Officer*



- Joined in 2002
- Granted with Minister's award from Ministry of Trade, Industry and Energy for Maritime IT field (2014)
- B.A Degree in Marine System Engineering from Korea Maritime University

Steering Digital Seaways!!



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