



“Smartship”

-The future of maritime innovation-

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We build a better future

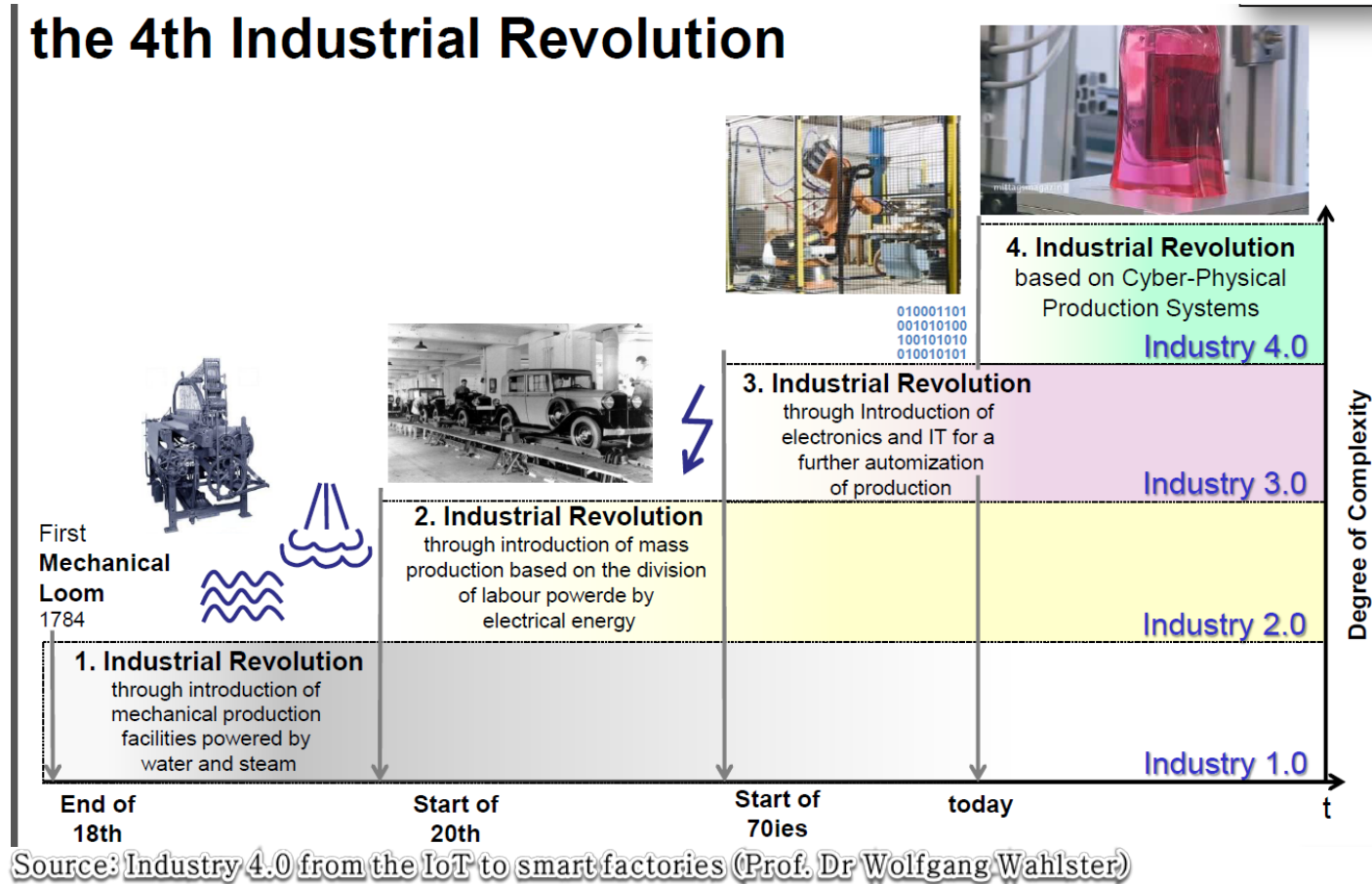
 **HYUNDAI**
HEAVY INDUSTRIES CO.,LTD.

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- Market Trend changes
 - Global trends change in manufacturing / product
 - Market trend changes in Maritime industry
- HHI's Smartship overview
 - Smartship in present
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- Smartship "The Next"

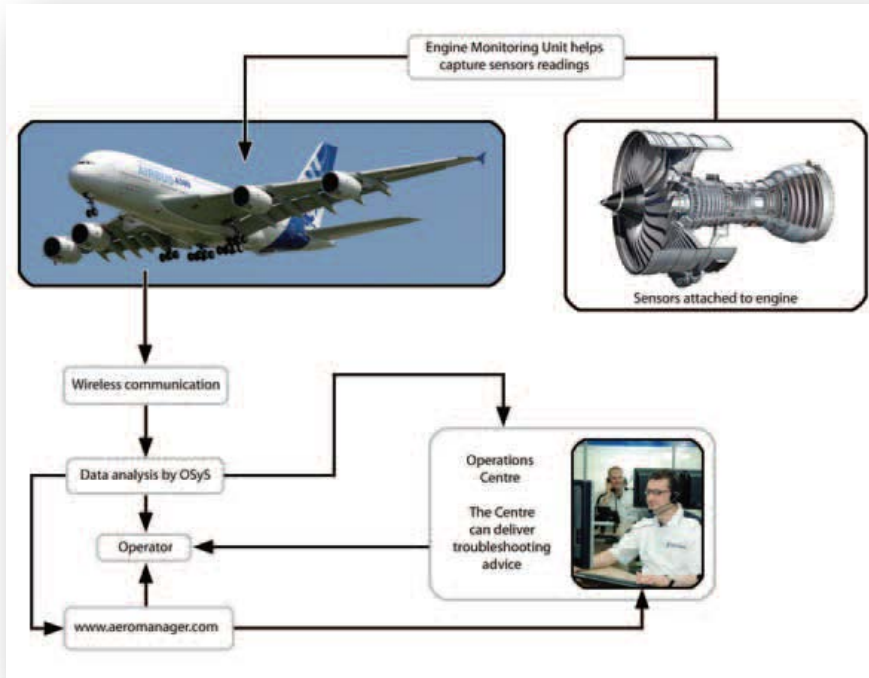
Market trends in manufacturing industry

the 4th Industrial Revolution

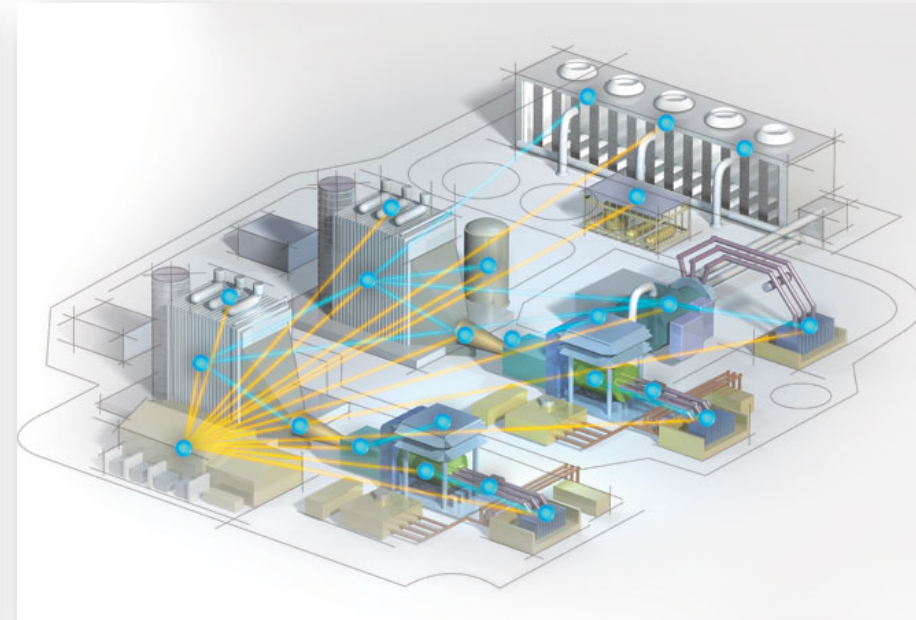


Industry continues **evolving with ICT technology**

Market trends in Product industry – O&M Services –



Rolls Royce:
Engine Monitoring System



GE :
'MyFleet' Plant Performance monitor

Create a new service **with ICT technology**

Market trends in Product industry - Safety & Automation -



Google:
An fully automated
driving car with
driverless system

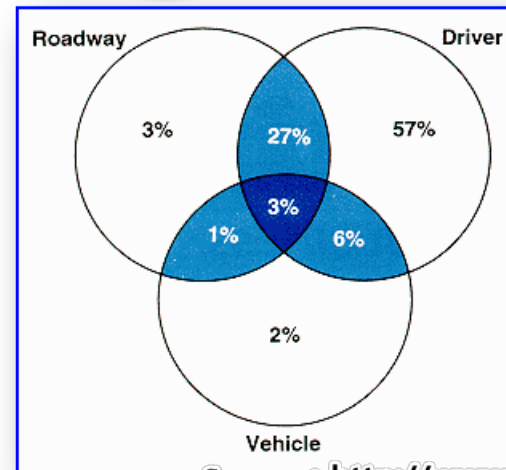
In April 2014, the team announced
that their vehicles
have now logged nearly 700,000
autonomous miles (1.1 million km)

2
Accidents
700k miles

"Google says that neither of these
incidents were the fault of Google's
car but the fault of
humans operating cars"



TESLA :
A car with integrated user
interface



Human error rate
For car accident

Source : <http://www.fhwa.dot.gov/>

Minimizing fault with **ICT technology**

Market trends in Maritime Industry – Mandatory –

Regulations

Safety : IMO e-Navigation

1. Strategy Implementation Plan (SIP)

- *S1: improved, harmonized and user-friendly bridge design;*
- *S2: means for standardized and automated reporting;*
- *S3: improved reliability, resilience and integrity of bridge equipment and navigation information;*
- *S4: integration and presentation of available information in graphical displays received via communication equipment*
- *S5: improved Communication of VTS Service Portfolio (not limited to VTS stations).*

2. Technically implement until 2019

Source : IMO MSC 85/26 annex 20 paragraph 4

Environment : Ballast water treatment

- 1. Vessels built during or after 2009 have to install a certified Ballast Water Treatment system immediately.**
- 2. Vessels built before 2009 shall install such a system latest 2014 or 2016 (depending on ballast water capacity of the vessel). Tonnage.**

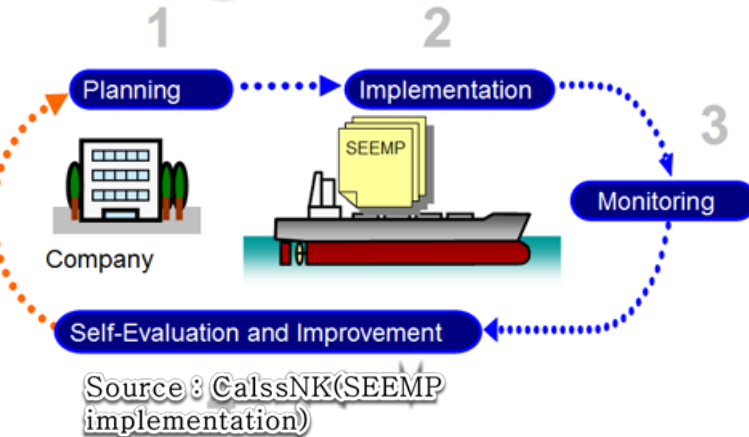
Source : IMO BWM Conf ANNEX 36

Market trends in Maritime Industry – Eco & Safety –

Demand for various maritime services for Higher CAPEX/OPEX

Eco Friendly / Economic

- SEEMP solutions
- exhaust gas control (Nox, Sox, CO2)



Safety

- Collision avoidance
- Engine Remote monitoring system



Market trends in Maritime Industry – Communication –

- Demand for various maritime services
 - Seamless communication system

~2009	2010~2014	2015~
~64Kbps	0.4~2Mbps	20Mbps~
40USD/MB	10USD/MB or Fixed	Fixed
2-3 MB / day	0.2~0.3GB / day	5~10GB / Day

Unlimited communication can sustain lots of dataflow
by various onboard services

Main concept for trend changing

Conventional industry + ICT technology convergence



Innovation with ICT technology
"The SmartShip"

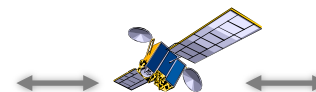
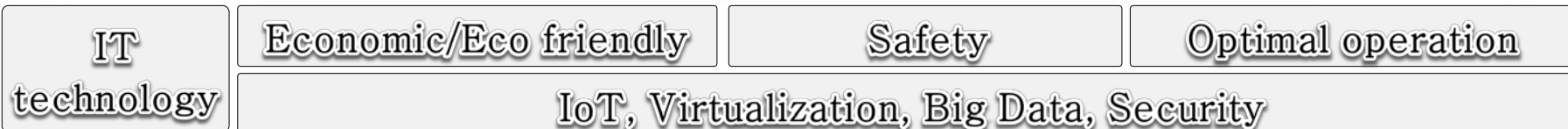
"Intelligent vessel" using ICT technology for Eco/Safe operation

Competitive vessel product

- Economic and Eco Friendly
- Risk avoidance for safety voyage

Creating new market

- Maintenance solution market
- Standardization for used vessel evaluation market



Satellite



Ground station

Integrating



SmartShip 1.0 (Applied)

Machinery sensor remote monitoring system

- Designed Ship Area Network (SAN) as an international standard (IEC 61162-450)
- Applied 157 vessels (AP Moller, SEASPAN, etc)

SmartShip 2.0 (Developing)

Application services for Eco/safety voyage

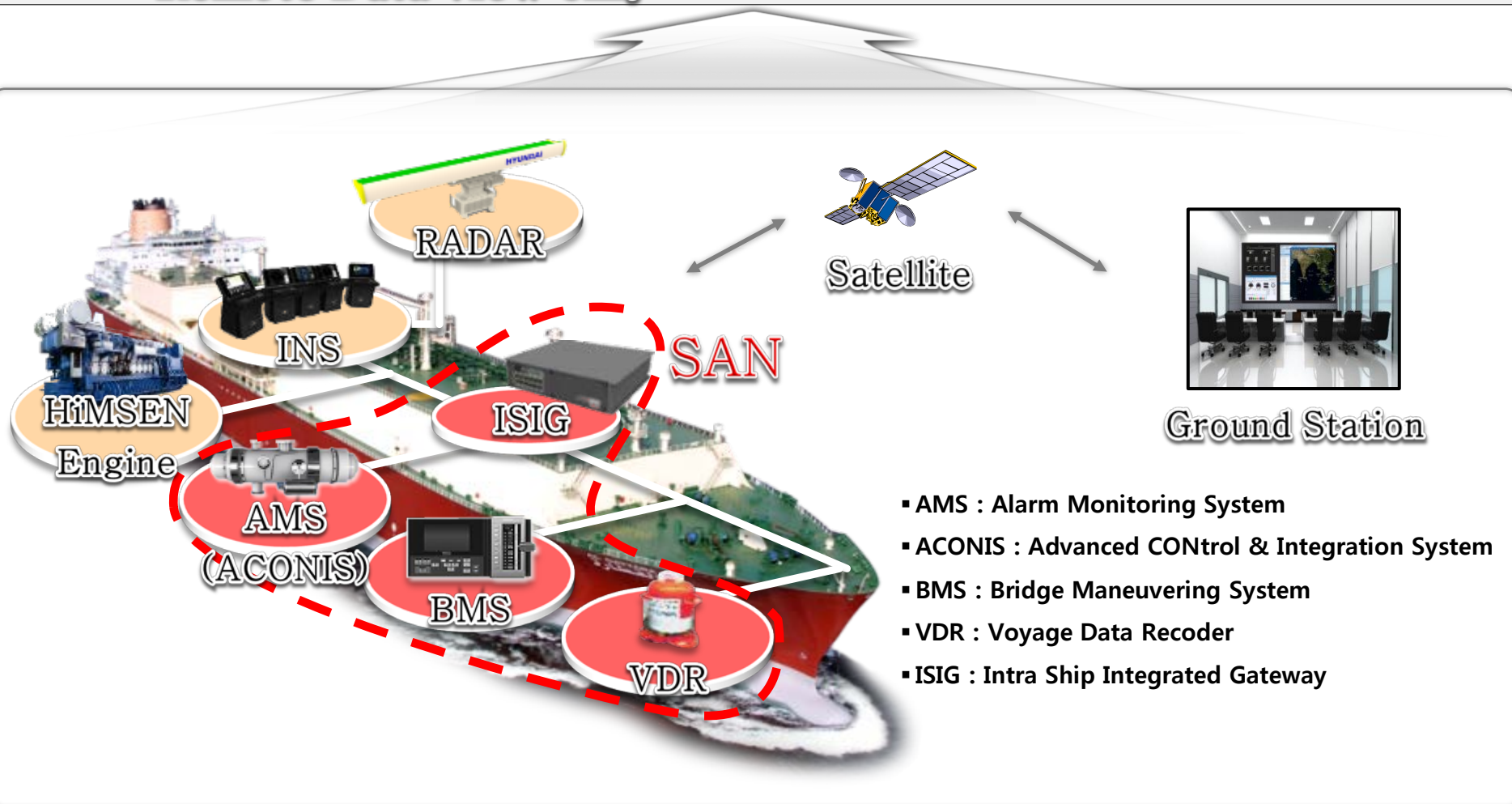
- Launching HHI INS with SSPA digital RADAR
- Launching services that using vessel integrated data with shoreside analysis.

SmartShip 2.X (Planning)

Ship-shore connected for dynamic scheduling

- Smartship with shoreside service connected
- Cooperating with other vendor for connected infrastructure and platform

- SmartShip in present - 1.0 -
 - Remote monitoring for vessel machinery status
 - Remote Data view only



- SmartShip in present - 2.0 -
 - Data analyze as a service
 - Data manipulate

Service

Eco friendly

Safety

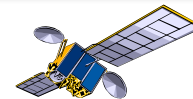
Efficiency

Platform

VaaS (Vessel As A Service)

Technology

Cloud, IoT, Big Data



Satellite



Ground Station

Integration

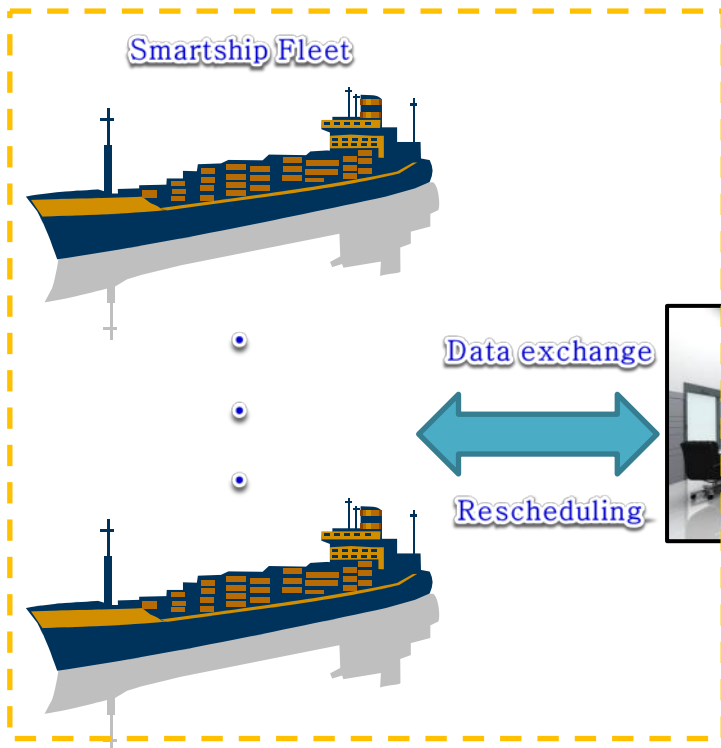
Onboard
Information

External
Information

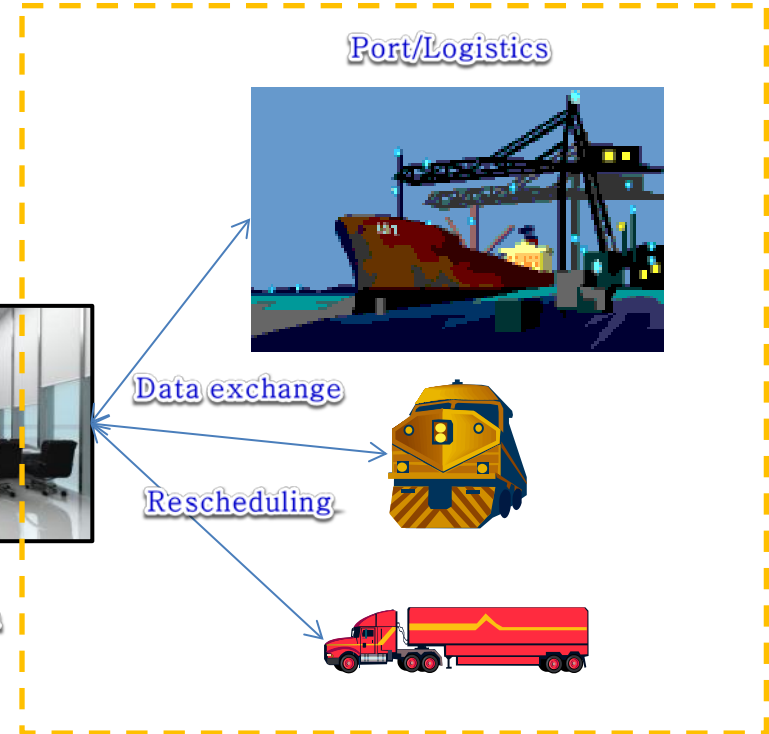
Fleet
Information

- Smartship in near future
 - Includes port/logistics information
 - Dynamic rescheduling for optimal operation

Smartship Infrastructure

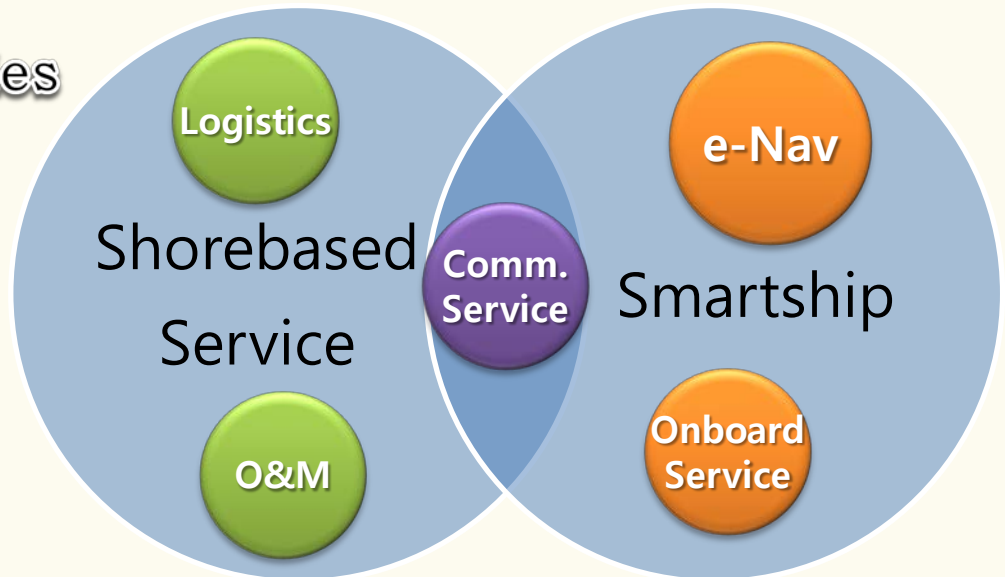


Shoreside Service



- The “KEY concept” of Smartship in future
 - Seamless and flexible vessel – shore connection
 - Easy access for each vessel

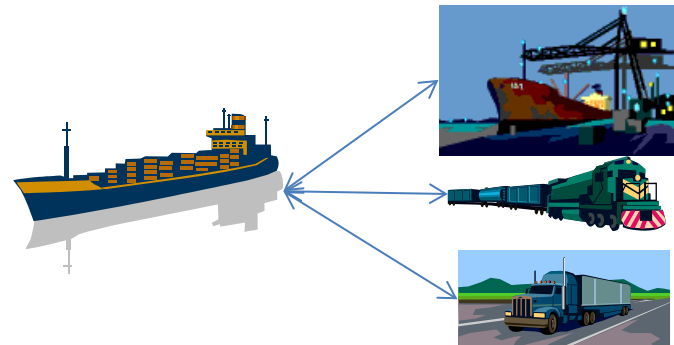
- Open platform for 3rd parties
- Conjunction with e-Nav.
- Infrastructure for O&M process (Analysis service)



Integrated services with ship-shore

Smart Ship Ultimate Goal

- Reduce fleet operation cost
- Implementing Eco friendly /safe vessels
- Integrate vessel-shore logistics chain



We lead maritime industry
Innovation for the new market.

