Open Source based Smart Ship
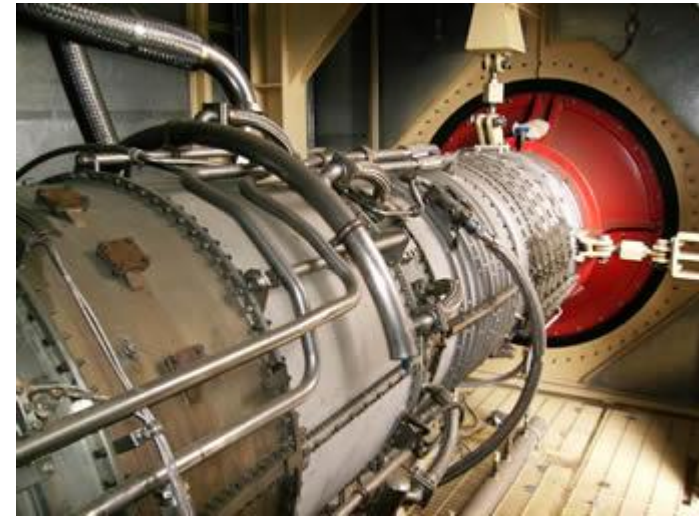
Industry 4.0 powered by Open Source

Manufacturing Companies

Siemens

General Electrics

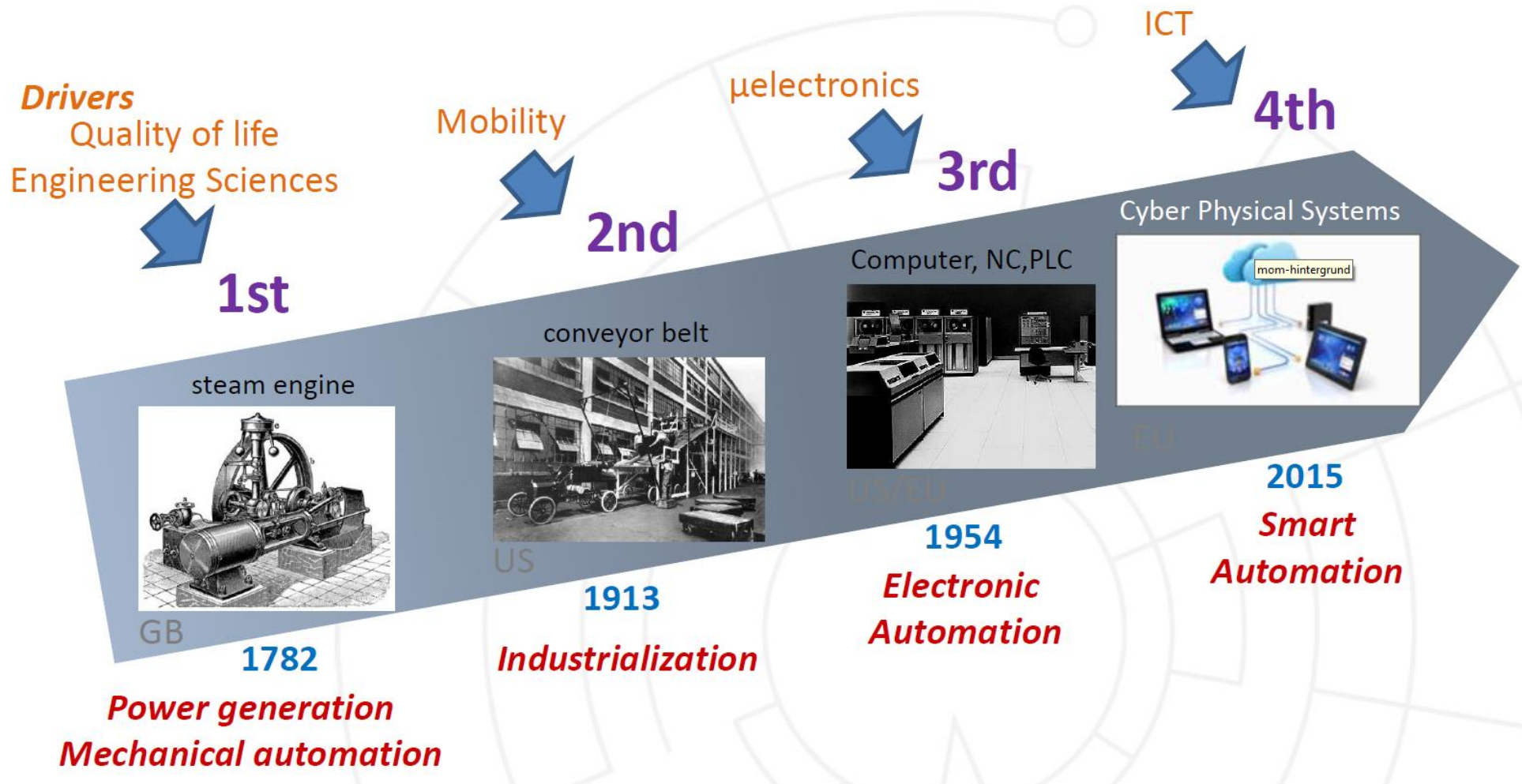# Are They Manufacturing Companies?

Google Self-Driving Car

Tesla Motors

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The 4th Industrial Revolution - „Industry 4.0"

Drivers
Quality of life
Engineering Sciences

Mobility

μelectronics

ICT

1st

2nd

3rd

4th

steam engine

conveyor belt

Computer, NC,PLC

Cyber Physical Systems

GB

US

US/EU

USA

1782

1913

1954

2015

**Power generation
Mechanical automation**

Industrialization

**Electronic
Automation**

**Smart
Automation**

Industry 4.0 Drivers

- **After 2008 financial crisis, relighting of manufacturing industry and re-industrialization**

- Increasing retirements in industrially developed countries and

- ICT(ICBM) based 4th industrial revolution
    - Rapid development of IoT/M2M, BigData, Cloud computing, Smart Robot technologies

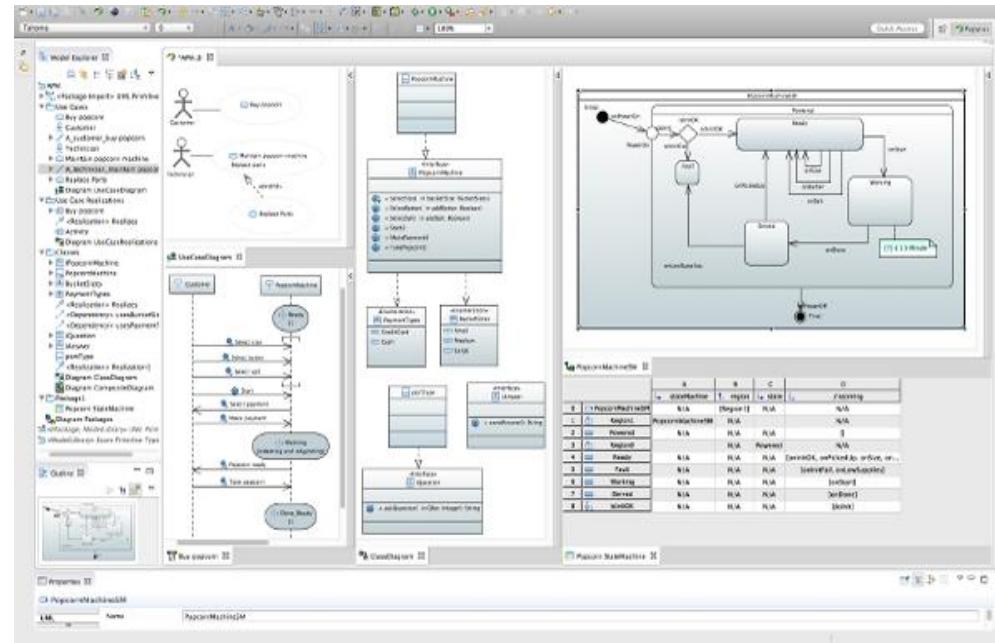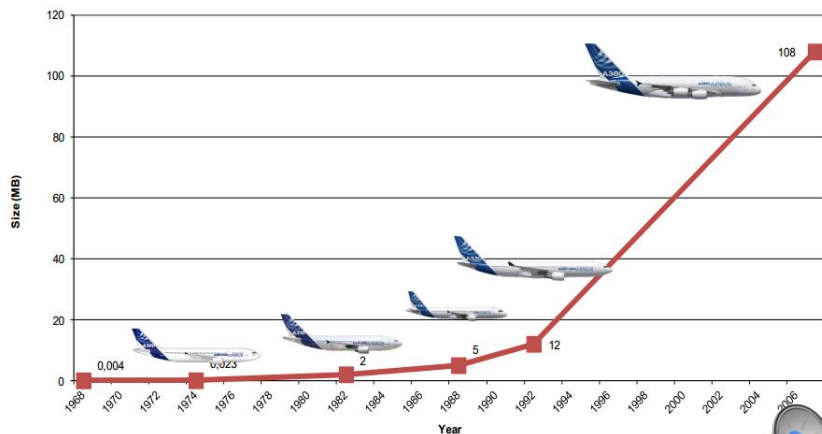- Capable of connecting manufacturing eco-system and societies
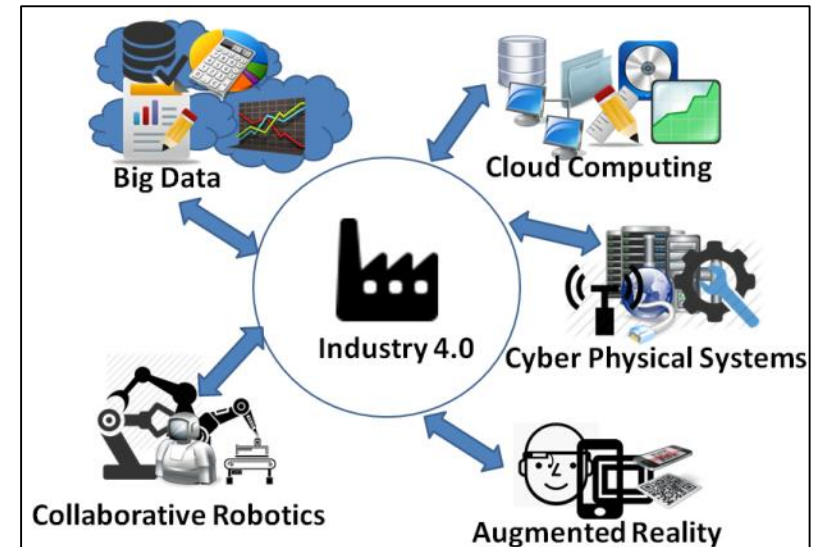
How Open Source help Industry 4.0?

Smart Ship Case Study

Open Source Case Study in Manufacturing, "Polarsys"

- Many closed software drawbacks in safety related industries
  - Increasing embedded software
  - Long-term(30~70 years) maintenance is crucial ➔ Open Technology is required
- Open Source project for safety related industries lead by Airbus and Eclipse Foundation
- Design and development tools, embedded software for Aerospace, Defense, Transportations, Communications, Energy, Healthcares

Airbus Aircraft Embedded Software

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VESSEL DATA
- Location / Direction / Speed
- Hull Stress & Motion
- Engine & Component Conditions

Hyundai Heavy Industries ON-SHIP PLATFORM

Hyundai Heavy Industries VESSELS

ACCENTURE CONNECTED PLATFORMS AS A SERVICE

SHORE CENTER

For Shipbuilders: Product differentiation and additional service revenue
For Ship Owners: Increased economic value from vessel lifecycle
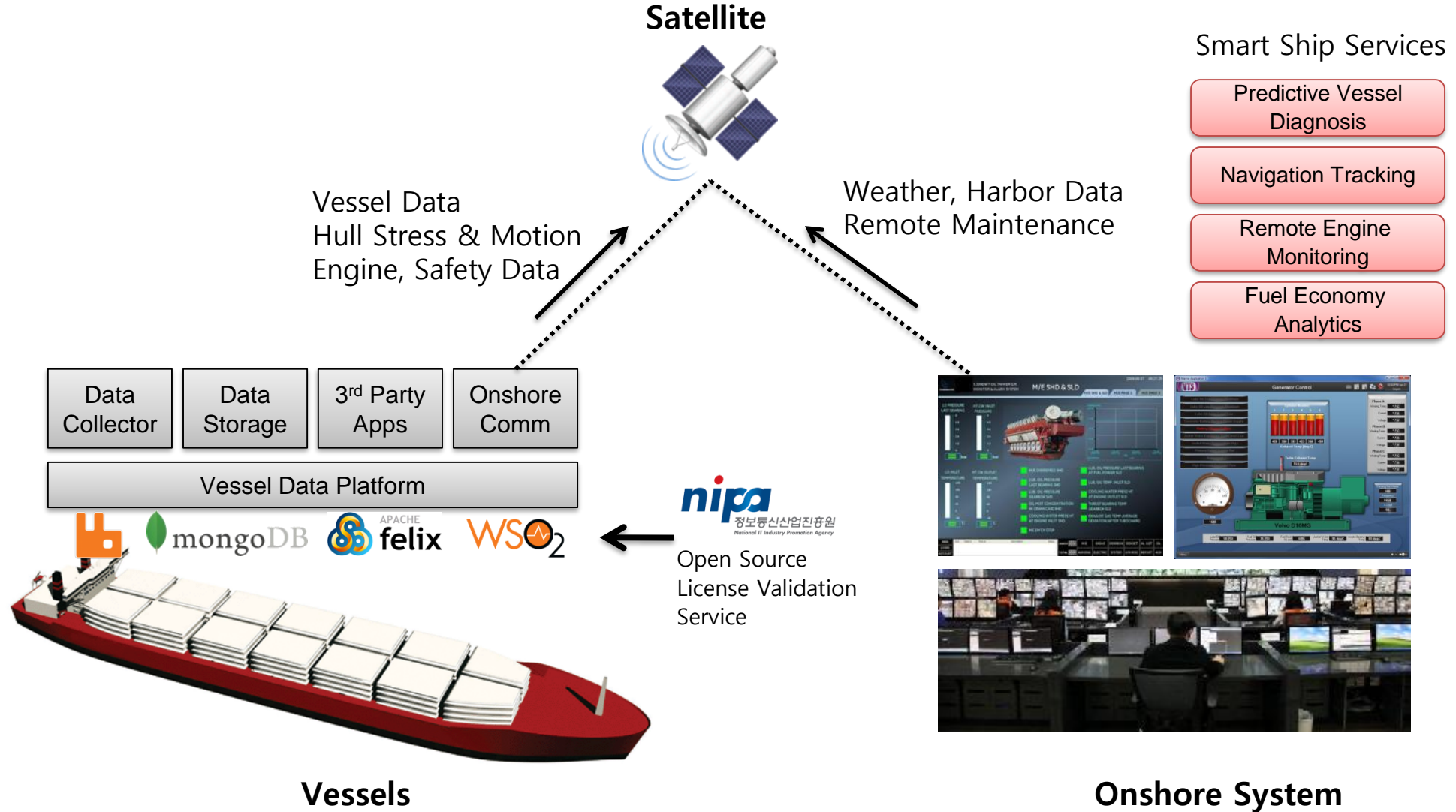
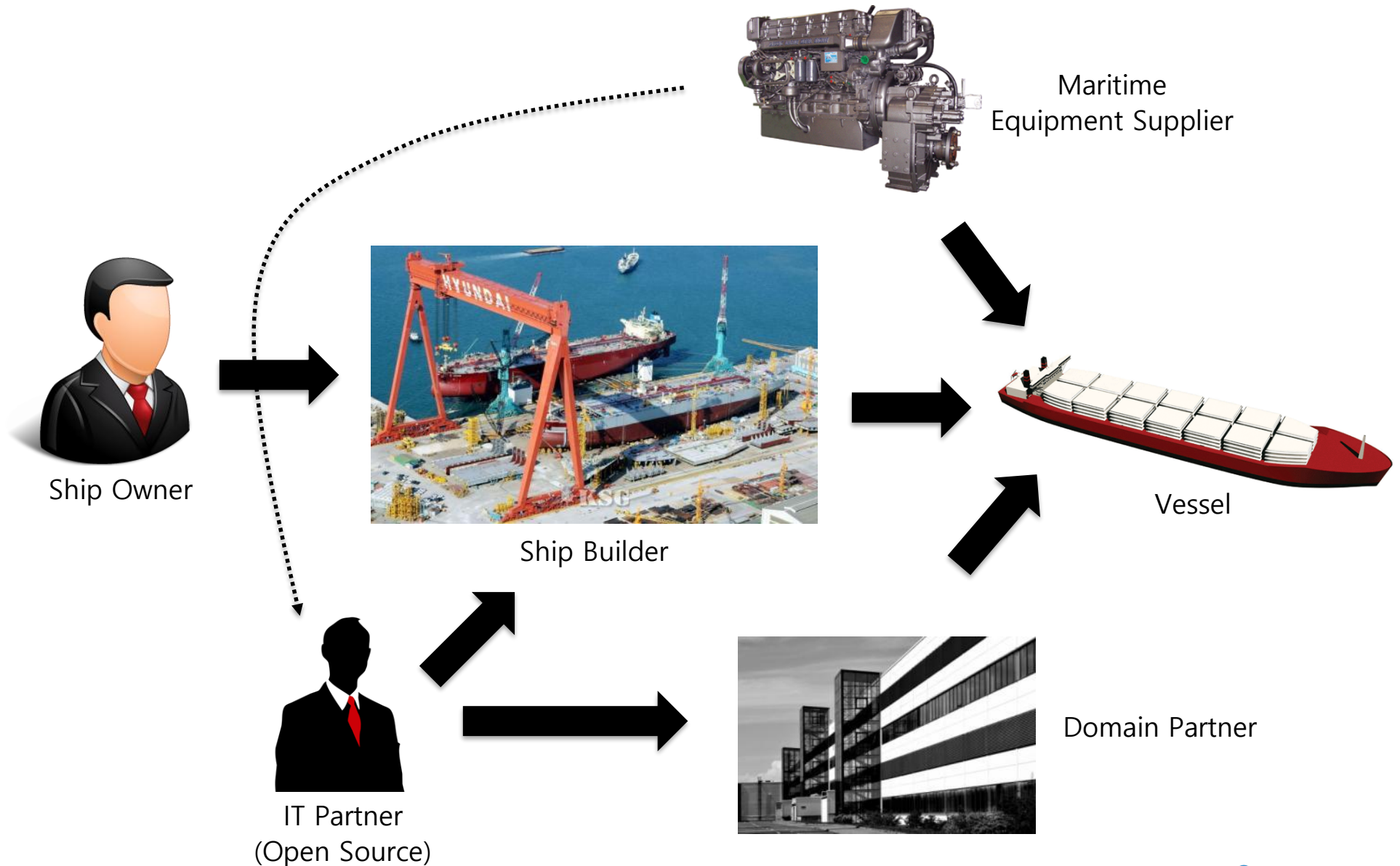OPEN SOURCE CONSULTING

Hyundai Heavy Industry

- The world largest Shipbuilding company
  - Containership, Drillship, LNG Carrier
  - FPSO, Semi-submersible
    (Offshore Engineering)
  - Marine Engine
  - Power Plant, Oil & Gas Production Facility

- Large Open Source House
  - Open Source is widely used in IT
  - Development Framework
  - OpenFOAM
  - Linux
  - Bigdata

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Open Source based Smart Ship Platform

Satellite

Smart Ship Services

- Predictive Vessel Diagnosis
- Navigation Tracking
- Remote Engine Monitoring
- Fuel Economy Analytics

Vessel Data
Hull Stress & Motion
Engine, Safety Data

Weather, Harbor Data
Remote Maintenance

Data Collector | Data Storage | 3rd Party Apps | Onshore Comm

Vessel Data Platform

mongoDB | APACHE felix | WSO2

nipa 정보통신산업진흥원
National IT Industry Promotion Agency

Open Source License Validation Service

Vessels

Onshore System

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Shipbuilding Industry Ecosystem

Maritime Equipment Supplier

Ship Owner

Ship Builder

Vessel

IT Partner
(Open Source)

Domain Partner

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Summary

What does Open Source help?

Lower Cost, Shorter Project, but More Stable System

Open Source provides Industry 4.0 IT Infrastructures

New Opportunities for S/W Company

Strengthening Competitiveness of Manufacturers

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