

Monitoring and Management System For Indonesian Marine Fishery



1 Application background

2 Demand Analysis

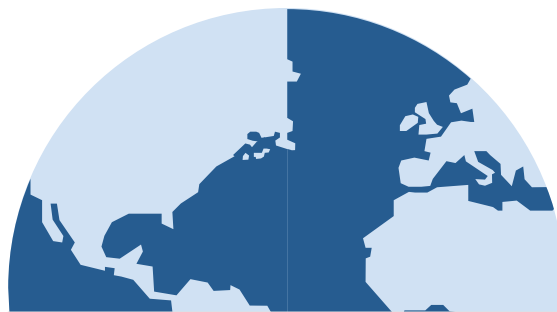
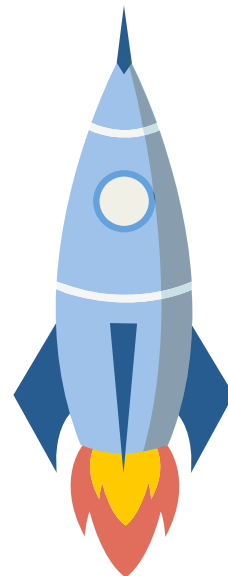
3 Overall architecture

4 Subsystem introduction

5 Typical applications

6 Implementation plan

7 Overall benefit analysis





Application Background



Marine development plays a great strategic role in Indonesian economic development

The 21st century is a new age for human beings to take a challenge to the sea. Over the next 50 years, the worldwide and large-scale development and utilization of marine resources will become the main point of international competition. The ocean is the treasure resource and the final space for human existence and development. As a result, international marine competition has become increasingly competitive. Competitive fields include the development of new marine energy resources, development of marine mineral resources, seafood obtaining, development of new marine drug resources and marine transport.

A modern fishery monitoring and management system is to be established for the purpose of strengthening the overall monitoring and management of sea areas and ports in Indonesia and supporting the government to establish a proper **licensing system**. The proposed system will bring substantial economic income for Indonesia and relieve regional dispute, fishing vessel dispute and other negative effects, thereby carrying out an orderly and controllable marine development in Indonesia.

Application Background



Situation monitoring, fishery law enforcement and management, control & service of fishing vessels are three issues now plaguing the orderly development of fishery in Indonesia:

- The overall sea situation cannot be effectively monitored;
- Except only a few law enforcement vessels, there is no other law enforcement tool;
- Each fishery practitioner almost always works independently, and the government fails in monitoring them and providing other information service.

Other issues:

- Incomplete VTS development;**
- Lack of tools for obtaining marine information about ocean current, fishing message and the like;
- Lack of notification means for disastrous marine weather information.

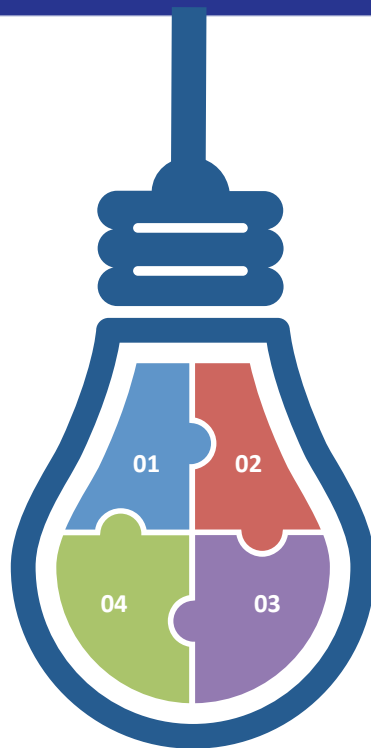
Application Background



Indonesia has the vast sea area and abundant marine resources, which reveal huge development potential. As a result, the vigorous development of marine economy will play a great strategic role in enhancing the overall competitiveness of national economy and accelerating the transformation of the way of economy development.



The proposed system can effectively guarantee normative, orderly and safe operation of authorized practitioners as well as provide early warning and basis for identification and law enforcement against unauthorized practitioners for various potential safety risks.



A modern marine fishery monitoring and management system will provide a multi-method, all-around and three-dimensional means for sea situation monitoring and fishing vessel management, including monitoring and detection of ports and economic zones, monitoring and management of fishing vessels, identification, location and law enforcement of unauthorized fishing vessels, and information, financing, early warning and rescue service of authorized fishing vessels.



In addition, a large number of marine data collected by the system can provide important marine information for the government, military, coastguard and commercial vessels

CONCLUSION



Demand Analysis



LAW ENFORCEMENT DEMANDS

There are only a few law enforcement vessels for fishery in Indonesia. Law enforcement activities in 200 nautical miles of exclusive economic zones and territorial waters are mainly carried out by the air and naval forces of Indonesian armed forces, and some professional law enforcement officers of government authorities participate in the law enforcement.

Situation awareness of marine vessels

During law enforcement, it is necessary to master the overall situation of vessels in the waters under law enforcement, and early detect, locate and identify vessels in order to provide accurate and efficient law enforcement means for driving illegal vessels away, rescuing vessels and issuing a early warning to law enforcement vessels from other countries.

Enhancement of law enforcement capacity

To improve law enforcement efficiency by promoting communication and information exchange among existing law enforcement vessels; to increase the number of law enforcement units by purchasing new law enforcement vessels; to achieve all-around law enforcement by purchasing UAVs.



DEMANDS OF FISHING VESSELS

Indonesia has over 400,000 fishing vessels in total and over 6 million practitioners

Mitigation of operational risks

- To protect fishing vessels from being harassed by any law enforcement vessel of other countries and from typhoon, sea waves and pirate attacks;
- To identify authorized and unauthorized vessels and to timely give an alarm and obtain a rescue.

Other demands

- Fish detection
To rapidly detect commercial fishes and thus to improve fishing efficiency and save fuel.
- Marine financial service
Due to limitations on financial payment channel, marine dealings are conducted in cash, which causes great potential risks to fishermen. The establishment of a marine mobile information service platform can realize marine cashless dealing of fishes and avoid risks resulting from cash deals.



MARINE TRANSPORT REQUIREMENTS

Fishing vessel

Due to a long coastal line and plenty of fishing vessels, Indonesia is facing an arduous task in waters monitoring, management, safety rescue, cracking down on against illegal fishing and other aspects

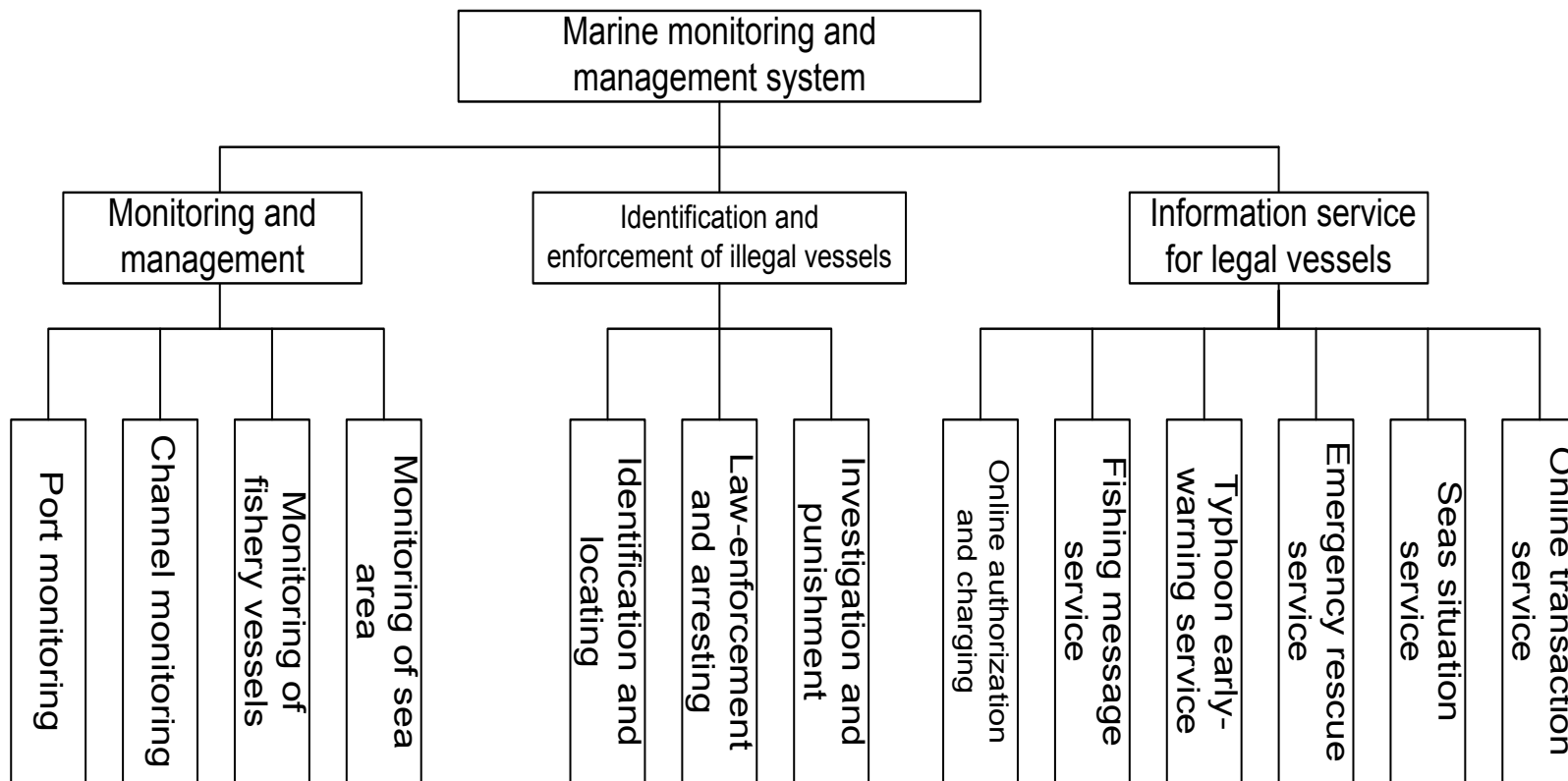
Transport vessel

The demands of transport vessels involve two aspects: communication and safety. In Indonesian waters, pirates still exist currently. For transport vessels passing the waters, communication and safety are their.

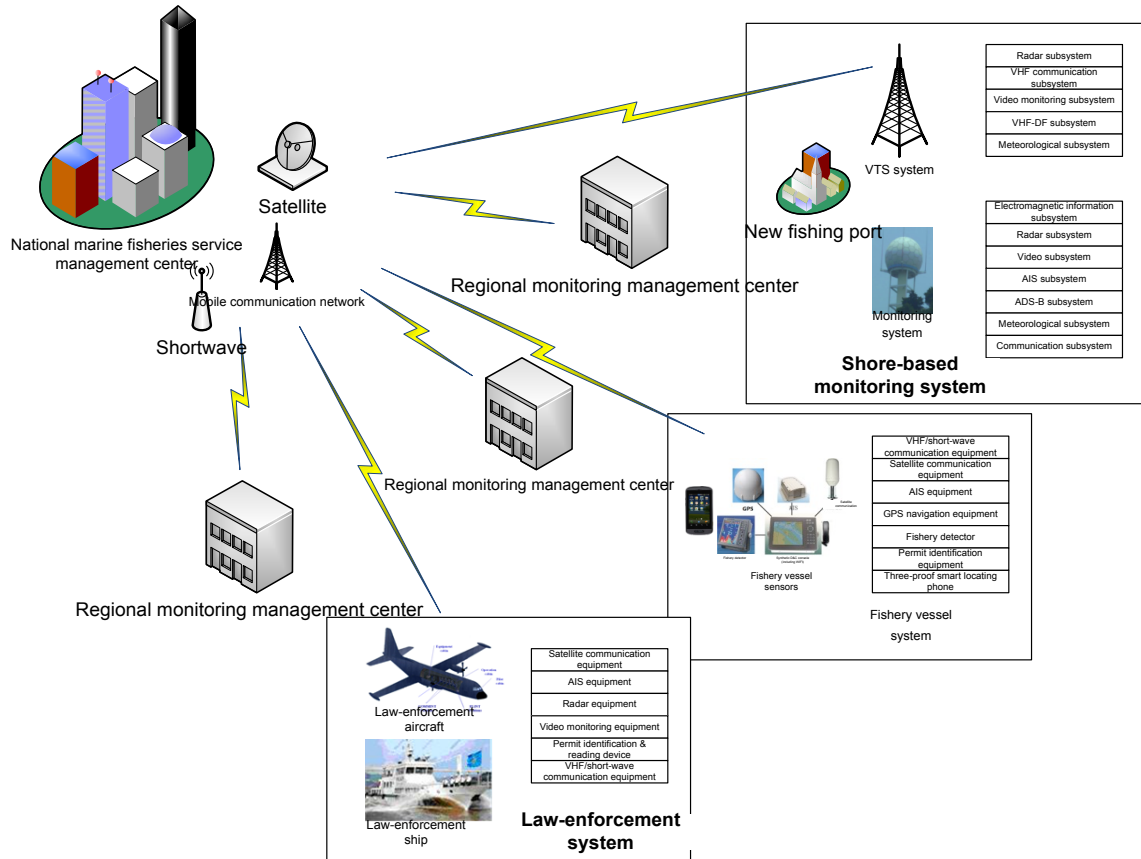


Overall Architecture

Overall Architecture-Functional composition diagram



System Architecture



System Architecture

Nation



NMSC3

Sector



SMSC3



Company



SCP



Sensor



Sensors

Satellite & Mapping

Subsystem Introduction-Composition



Subsystem Introduction-Control Center



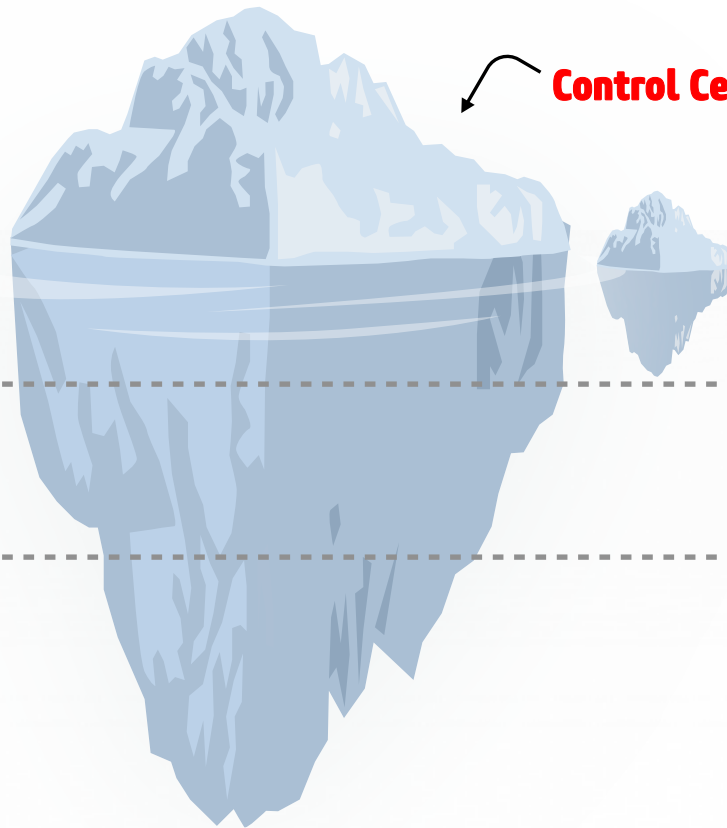
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Control Center

The Control Center summarizes the data from all business systems, and classify and arrange such data, thus implementing data storage and application according to respective subjects and purposes.

The Control Center is mainly applied to normalize information criterion and data integration, and realize vertical application of data through deep analysis of such data.

The Control Center can, by virtue of database-related technology like data mining, report analysis, display the data statistics results in the form of report or diagram after summarizing such data from more than one perspective .

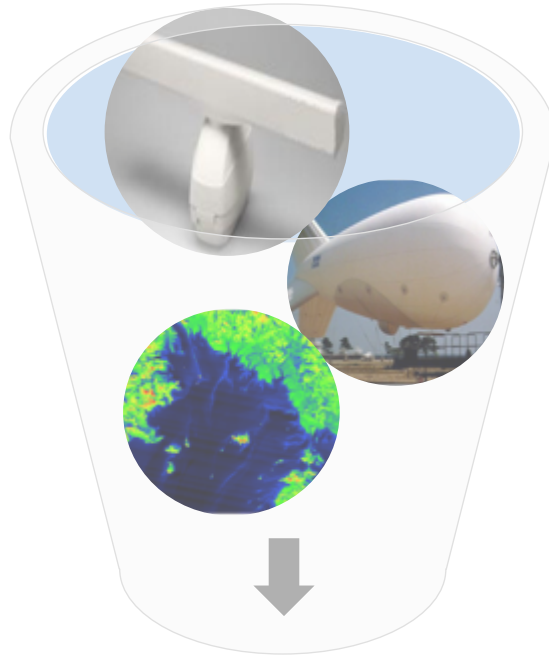
Subsystem Introduction-Target Monitoring Subsystem

VTS Sub-system

Shore-based radar subsystem

Aerostat radar subsystem

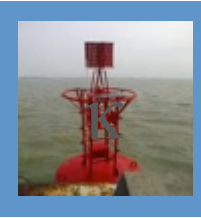
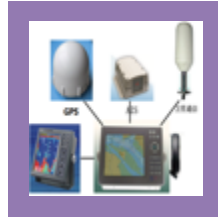
Remote satellite monitoring subsystem



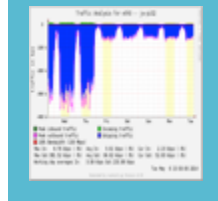
Target Monitoring Subsystem

Subsystem Introduction-Location Monitoring Subsystem

**AIS BASE STATION
SUBSYSTEM**



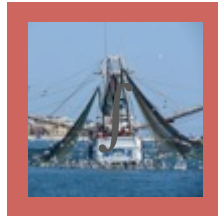
**Fishing vessel
overall information**



**ADS-B base
station subsystem**



**Fishing vessel satellite
phone & location report
subsystem**

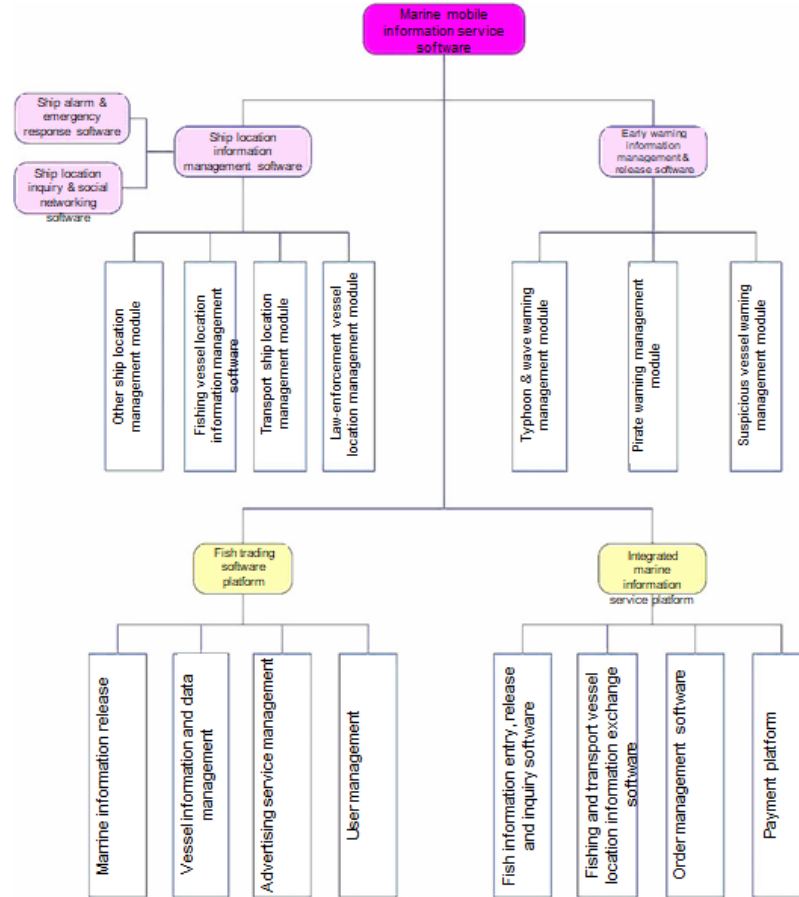


**Beidou satellite navigation &
locating subsystem**

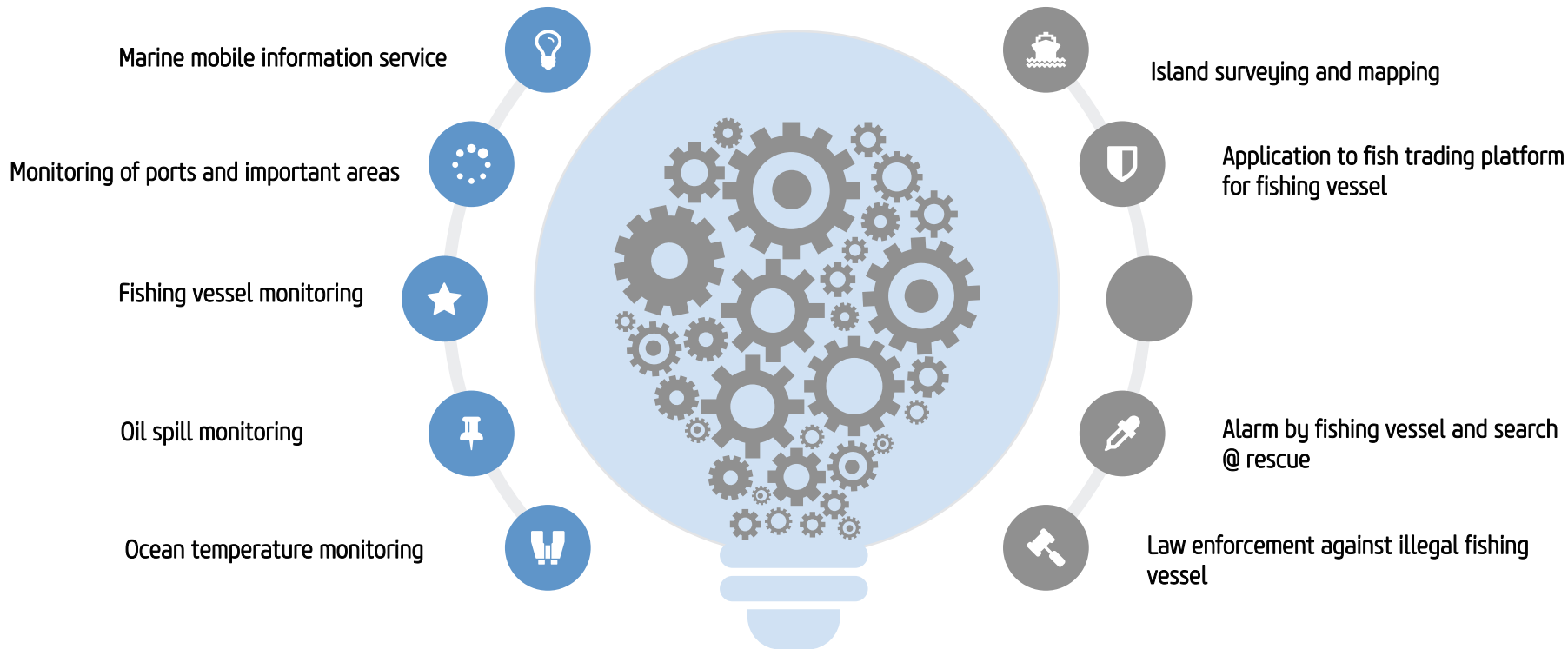


Subsystem Introduction- Marine Mobile Information Service

To fuse the radar detection data, electromagnetic spectrum monitoring data, AIS data, ADS-B data, fish finding sonar data, video data, infrared monitoring data, active radar detection data and other sensor data acquired by sensing layer with the marine forecasting data sent by national and regional three-level marine forecast stations in Indonesia and marine forecast stations in other countries, so as to provide real-time information service for fishing vessels, law enforcement vessels and transport ships.

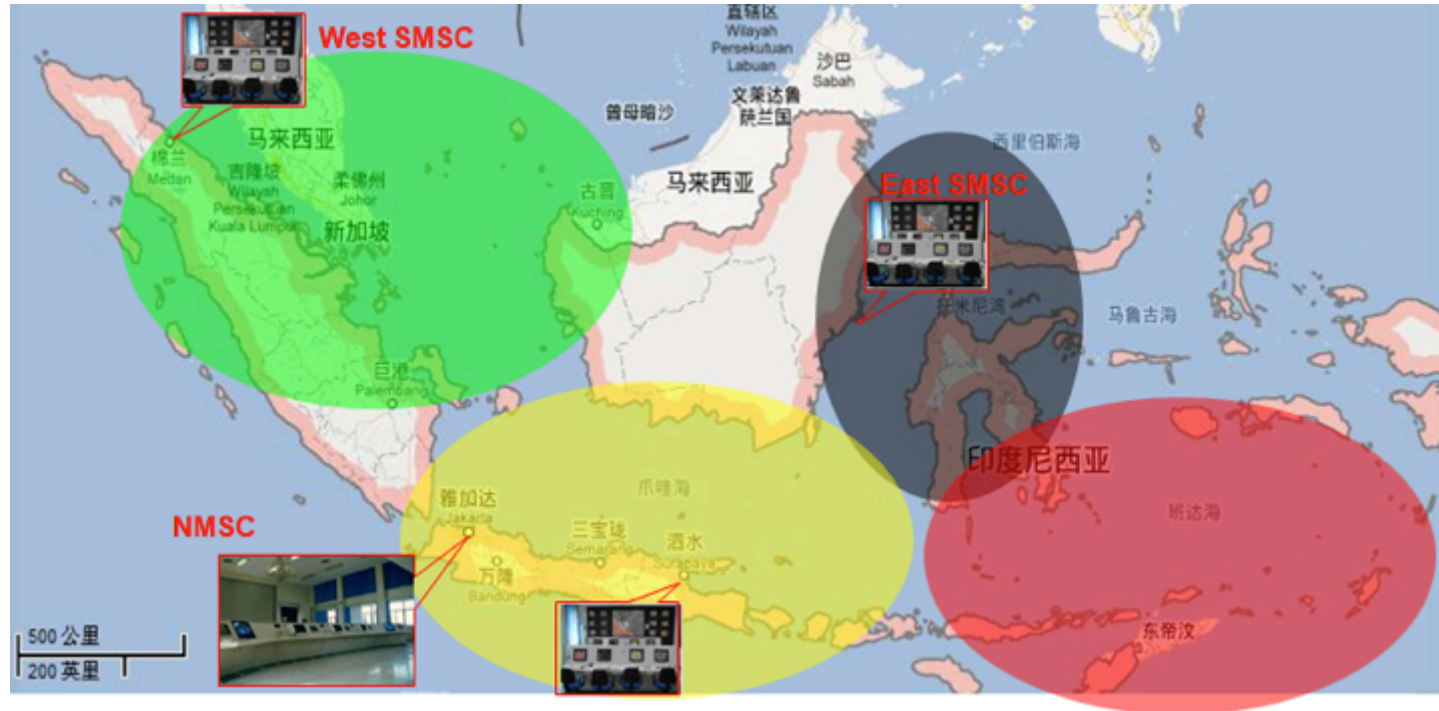


Typical Applications



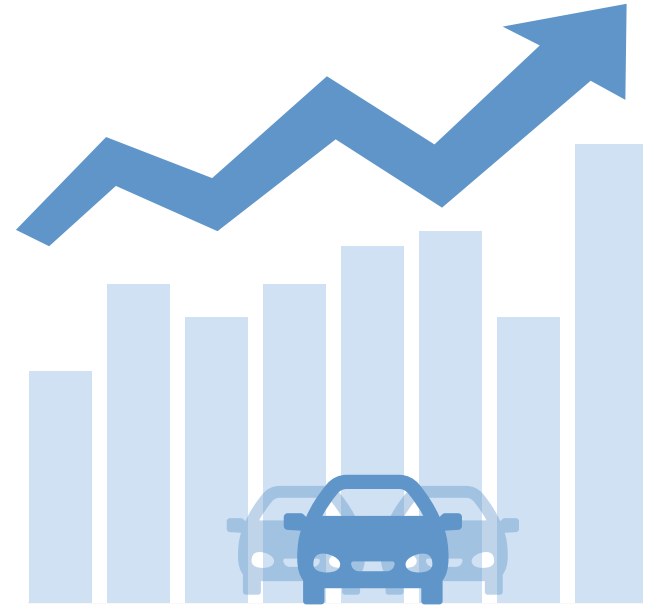
Implementation Plan

The overall monitoring coverage is achieved by means of a national center. Three sub-centers respectively for the west east and middle regions. As well as marine fishing vessels and law enforcement vessels.



Indonesian fishery production is currently around 4 million tons. Generating a sales revenue of USD 8 billion per year according to conservative estimation.

There are mainly four charging modes: sharing communication fee/charging vessel information services/sharing commission fee from bank card swiping transactions and sharing fish trading fee.



Sharing communication fee (USD 604/year/vessel)

Charging vessel information services (USD 1526/year/vessel)

Sharing commission fee from bank card swiping transactions (USD 16 million/year/vessel)

Sharing fish trading fee (USD 72 million/year/vessel)



Thank you

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