国家海洋信息中心
National Marine Data and Information Service

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Construction and Practice of Marine Knowledge Service System

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Outlines

1 Introduction

2 Content and organization of Marine knowledge

3 Construction and Functions of Marine Knowledge Service Platform

4 Conclusions

Introduction

- With the rapid development of Internet, 5G, artificial intelligence, Internet of Things and other technologies, as well as the acceleration of digital economy in the world, we are already in the era of “information explosion” or even “post information explosion”.
- According to the statistics and predictions of the international authoritative agency Statista, the global data volume is about to experience a larger explosion, and the global data generation will reach 2142ZB by 2035.

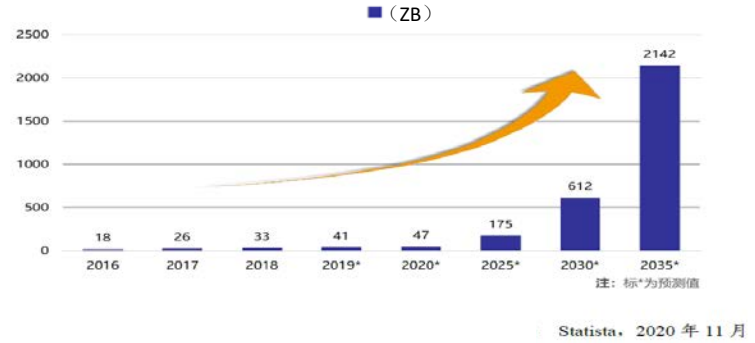
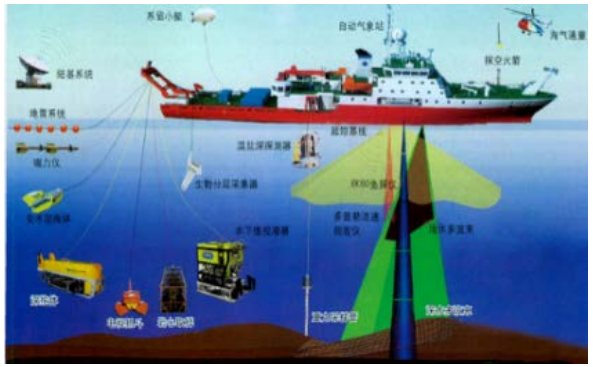
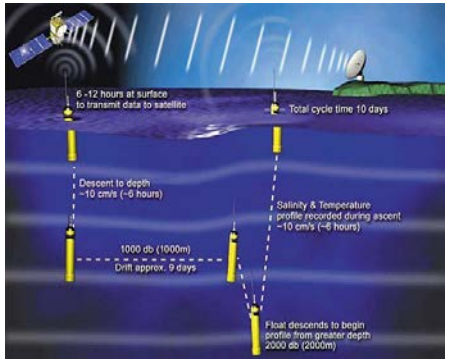


Figure. Global annual data generation estimation chart

Introduction

- Ecosystems, Earth observation, oceans, life and health, astronomical observation and other professional disciplines have generated and accumulated massive scientific data through continuous observation/monitoring.
- The data obtained through continuous, multi-source, and three-dimensional observation and monitoring methods using remote sensing, communication, and other technologies in the fields of Earth observation and ocean observation is growing at a daily terabyte rate .
- As professional data enters the era of big data, how to analyze and mine a large amount of data to obtain useful knowledge has become an important research content and a key issue that urgently needs to be solved.





Introduction

- The ocean is an important strategic space for coastal countries around the world to strive for their interests and development. With the further development of economic globalization and regional integration, the impact of the ocean on national economic development, political diplomacy, and national security is becoming increasingly significant.
- the construction and application of marine knowledge service system is carried out, Realize the integration and precise services of knowledge resources such as literature data, scientific data, expert institutions, and internet data in the marine field, and provide support services for various users to carry out marine research, marine management, and marine strategic planning.

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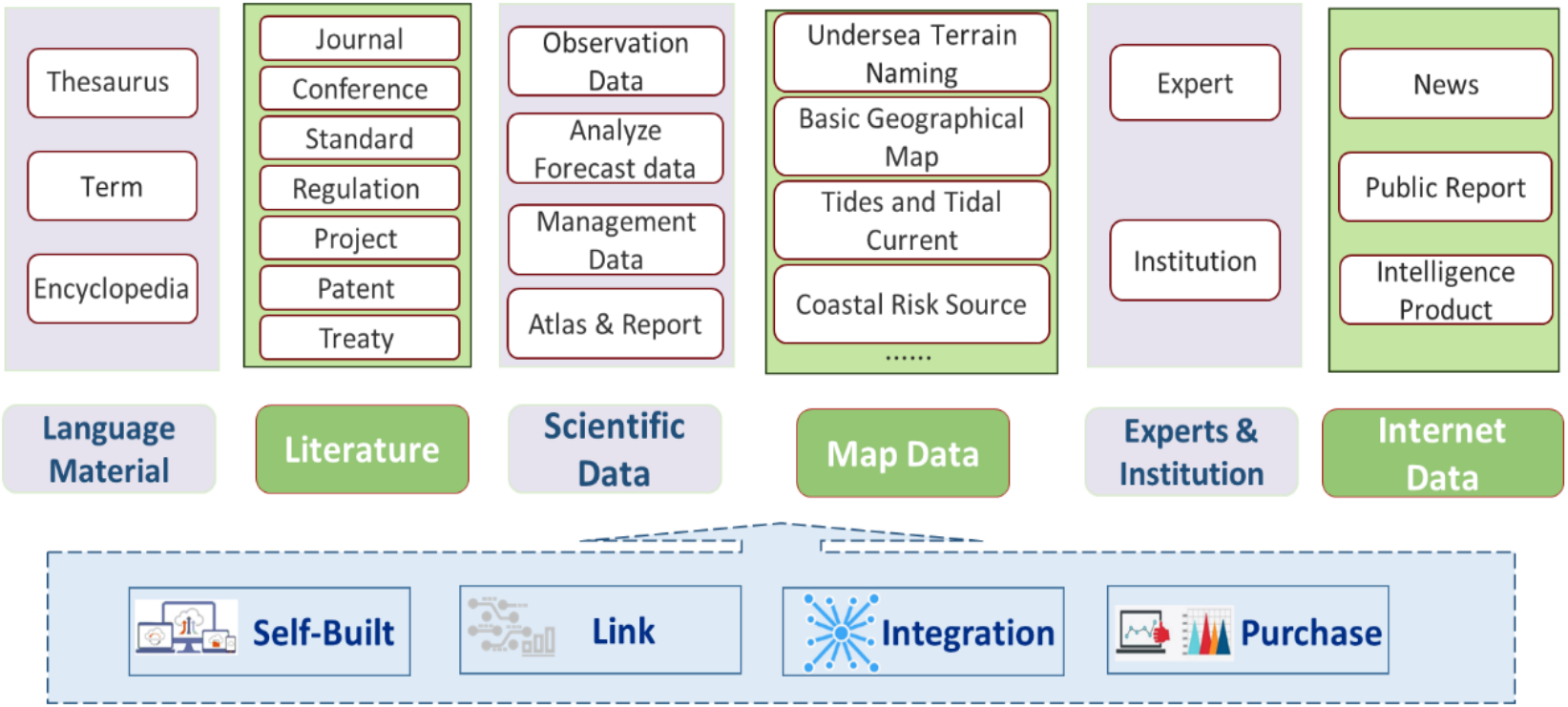
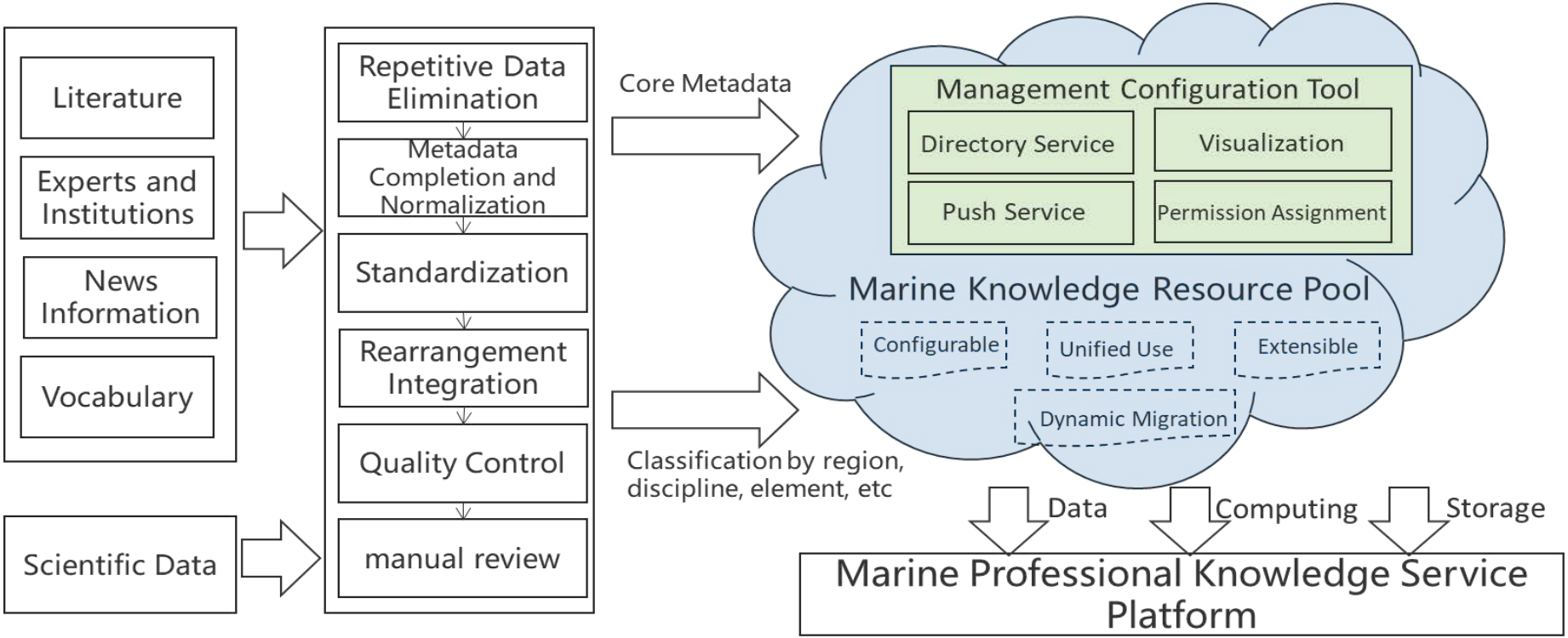
Classification of Marine knowledge resources



Management of Marine knowledge resources



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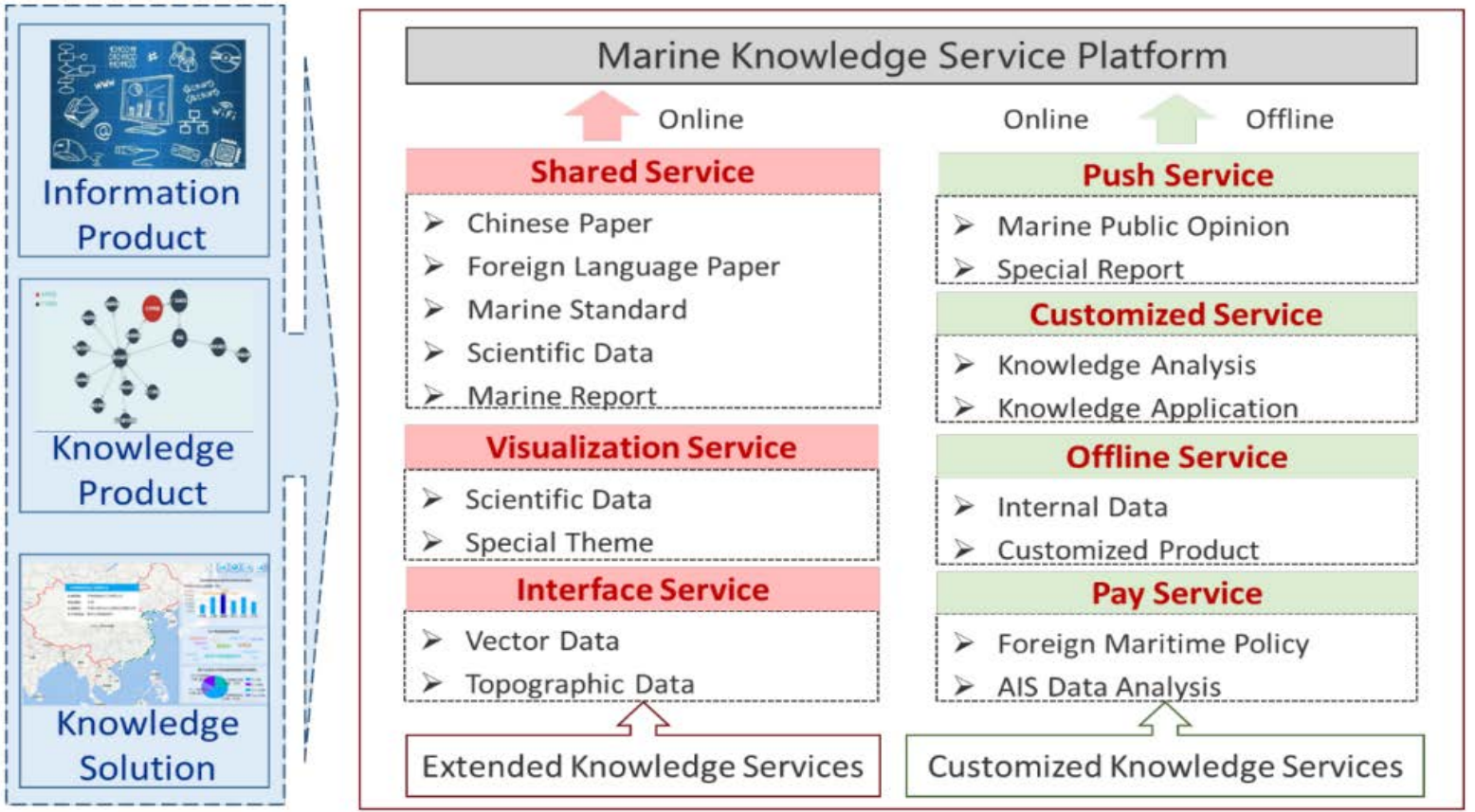
The practice of marine domain knowledge service takes the integration and collection of data, processing of information, and analysis and mining of knowledge as the chain to build a resource rich, widely used, advanced and practical marine knowledge system, and realizes the functions of integrated knowledge search, multiple service modes, accurate knowledge application, and comprehensive special topics, providing rich, accurate A three-dimensional knowledge service.

One Stop Marine Knowledge Retrieval

- The diversity of marine knowledge resources requires the establishment of a full-text index to achieve a one-stop marine knowledge search. Based on the marine vocabulary (including both Chinese and English), information extraction, filtering, indexing, text classification, word segmentation, and other processing work are carried out on the original corpus.
- The Solr full-text search engine is used to automatically sort, summarize, and create index files for the processed corpus. Through syntax analysis, internal code conversion Automatic filtering and classification, ultimately achieving classification retrieval, fuzzy retrieval, cross language retrieval, and secondary retrieval, in order to retrieve the knowledge that users need as much as possible.
- The ultimate goal is to achieve efficient discovery of multi-source heterogeneous marine data resources on the platform, as well as convenient access to original and physical data, providing users with a one-stop intelligent retrieval service of “what you need is where you are, what you see is what you get”.

Diversified knowledge service methods



Precise knowledge application

1

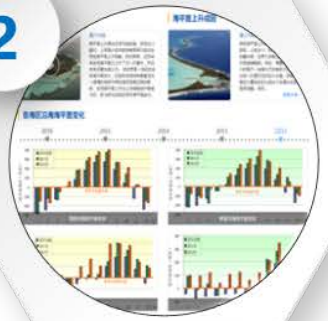
Tide and Tidal Current Forecasting

It provides tide, trend data browsing, query and visualization services for coastal ports, islands and sea areas.

It summarizes factors about how and why climate is changing, and its effect on the future marine environment, providing an access to the related data and products.

Sea Level Rise

2



3

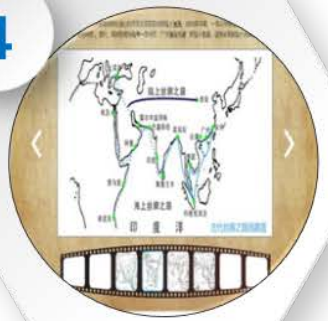
Seabed Topographical Naming

It provides services such as seabed terrain naming in China, and other countries, international organizations related to submarine naming.

It provides information on the Maritime Silk Road, such as briefings, historical backgrounds, and major routes, as well as information on the location of countries, cities, ports, customs, and tourism.

21st Century Maritime Silk Road

4



Key technologies of Marine knowledge service

- Panoramic integration technology of multi-source Marine resources

We carries out data cleaning and conversion of structured data, semi-structured data and unstructured data by making and revising metadata standards, database construction specifications, interface services and other series of standards and specifications, and forms standardized standard data. Then, through the multi-modal data association and fusion, multidimensional data integration, knowledge fusion and other technologies and methods, finally realize the panoramic integration of Marine data, laying the foundation for Marine data analysis and mining and knowledge services.

Marine Literature

Marine Science Data

Map Resource

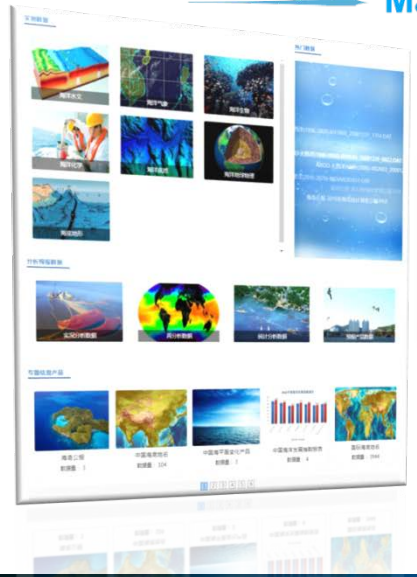
Marine Thematic Information

Marine Vocabulary

Marine Experts and Institutions

Results of construction and operation

- By the end of 2023, a system of sustainable and updated Marine knowledge resources covering 85 sub-categories in 6 categories, including scientific data, papers, standards, patent achievements, policies and regulations, and expert institutions in the Marine field has been built, totaling about 5 million pieces.
- It provides data and report support services for many academicians and dozens of national key research and development programs and local research projects.



Marine Science Data Service

9 kinds of measured data including hydrology, meteorology, ecology, chemistry, seabed topography and marine remote sensing, and 5 kinds of forecast analysis data have been released in the system.

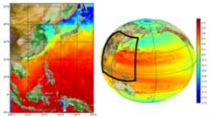
- Marine Meteorology
- Marine Hydrology
- Marine Organism
- Marine Chemistry
- Marine Geology

FORECAST ANALYSIS DATA

Statistical analysis
Live analysis
Reanalysis
Tidal current forecasting

MEASURED DATA

The total amount of data is about 225GB, and the total number of data is 1406086.



THEMATIC PRODUCTS

The ocean development index report, China sea level monthly report, nanhai atlas were contained.

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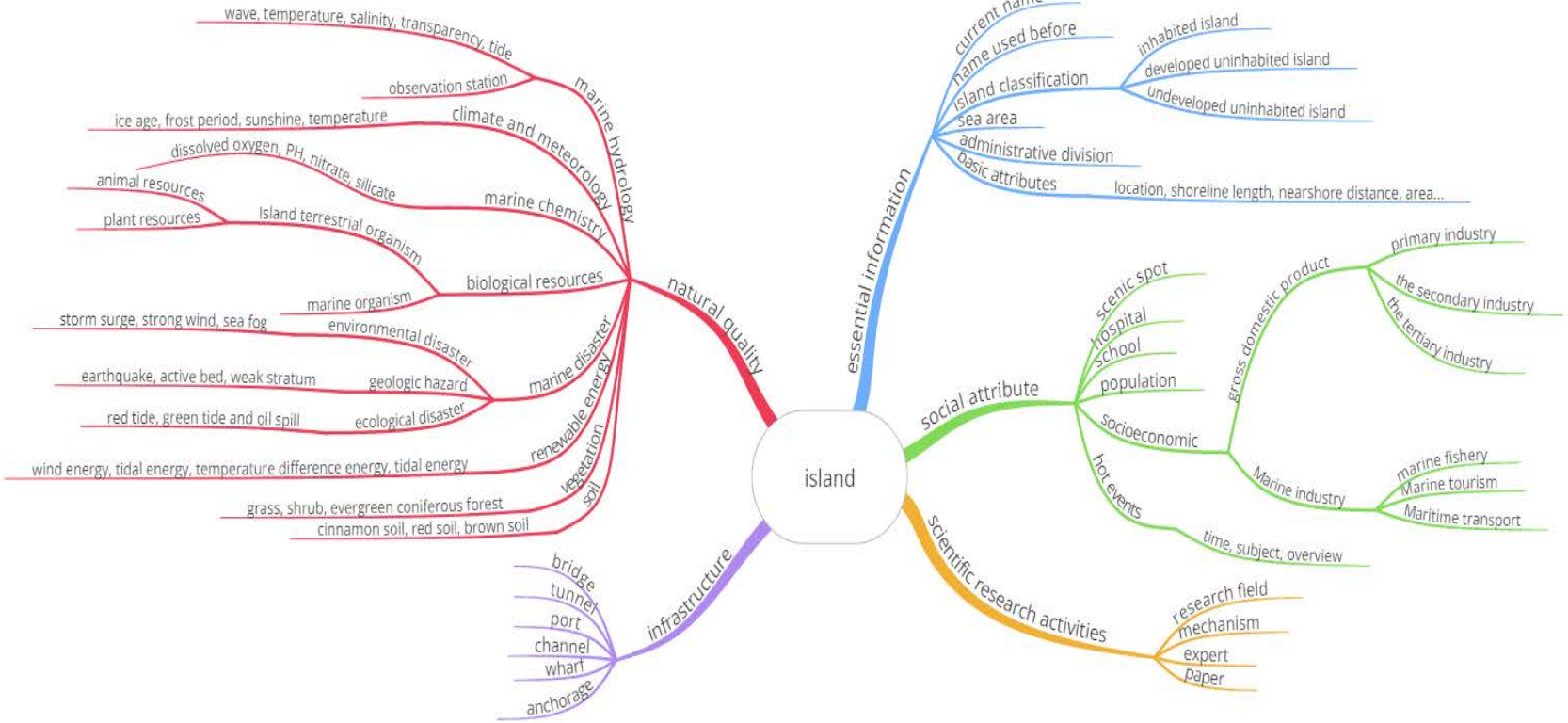
- Analyze and put forward the content and organizational management mode of Marine knowledge, focuses on the construction and practice of Marine knowledge service system from the aspects of knowledge content and organization, platform construction and function, and operation effect.
- Discussed the key technical issues such as resource integration of Marine literature data, scientific data, expert institutions, Internet data, and knowledge map construction.
- It can provide reference for the development of knowledge services in Marine and related fields.

Next plan

- Construction ocean thematic knowledge graph
- data-Information –knowledge- practice



Thank you !

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