
Design and implementation of civil ship management system

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Abstract

The application of management information system provides great convenience to all units, and also creates economic value and social benefit. This paper is written based on ship management information, detailed discusses the starting from the demand analysis, the whole ship management system to the system design, and then to the whole process of system implementation and system test. In this paper, the development and implementation process of the variable ship management module is introduced in detail. The development and implementation process of the system procurement module is described with the spare part information transmission module as an example. The development of modules such as crew management, fuel management, and certificate management is briefly introduced. Through the synchronous updating and management of data, a bridge is built for the ship-shore separation state inherent in ship management software, and data sharing is achieved through data transmission functions.

Keywords

Management module; certificate management; synchronous updating.

1. Introduction

To strengthen ship management, improve office efficiency, in this paper, we imagine a ship management system based on workflow, and gives the system modular development and develop process. Managers can through the custom work processes to promote the effective implementation of management decisions, motivate staff to complete various tasks. The management and cooperation of ships need to be based on information transmission. This paper designed a set of services in ship maintenance and scientific management of the ship management system, the system mainly includes the crew management module, the fuel management module, vessel command module and data management module four parts, to every part of task decomposition in detail. On this basis, using C# language and SQL database, the software of ship management system for water transport engineering construction is written. The information transmission system can realize synchronous data update and management, and establish a bridge for ship-shore information exchange. Through the real-time updating of this information, ship and shore data sharing can be achieved and the scientific management of ships can be promoted.

2. Ship Management System

This paper is written based on ship management information. It elaborates on the entire process of the entire ship management system from requirements analysis to system design, to system implementation and system testing. First, the paper adopts a structured analysis method to draw a hierarchical data flow diagram of the system and gradually refines the abstract function model. Then, the paper applies a top-down and detailed design method, and divides and designs the functional modules of the system in detail. In the third step, the paper presents the typical program flowchart and main algorithm implementation of the ship management information system. Finally, the paper

gives the main testing process of the system. This article describes the system using the software engineering prototype method to develop, to the user for a long-term understanding of the needs, to achieve the database design, user interface design, program code design, combined with simulated annealing algorithm to assist users in the decision-making support for the transport program, automatic Choosing and taking out appropriate fleets to organize and transport fleets and adopting reasonable algorithms to carry out decision-making support for carrying tasks have certain reference value for improving the information management level of ships.

The ship information management system includes the ship-side module and the company-side module that can exist independently, and all the systems can be collectively referred to as a whole through the communication module. The system includes public interface, ship parameter maintenance interface, ship equipment information maintenance and inquiry, spare parts management module, material management, company system file management module, ship-related electronic data management module, equipment maintenance and year-month maintenance plan module, spare parts materials procurement Management module; ship repair management module; crew information management module; oil management module; ship certificate management module; expense management module; ship shore information interaction module, etc.

Through the establishment of the ship management information system, the ship plan maintenance system is realized, which can shorten the time for decision-making, improve the efficiency and equipment maintenance quality, realize the real-time communication between the company's client and ship - ship information management and crew deployment, and accurately monitor the ship equipment. Operational status and safety status, effective management of ship spare parts and materials, and enhancement of maintenance and repair of ships to keep ships in good condition, play an important role in ensuring safe navigation of ships and reducing management costs.

This article mainly researches and develops the ship's information management system based on the actual situation. This system is a distributed system and is divided into a company-side (shore-side) and a series of ships. Each subsystem can exist independently, and all systems can be collectively referred to as a whole through the communication module. The ship side completes the data terminal function of the ship side; the company side completes the data control and decision-making functions; and the communication module completes the ship shore data communication functions. The functions of the system can also be explained by the following diagram:

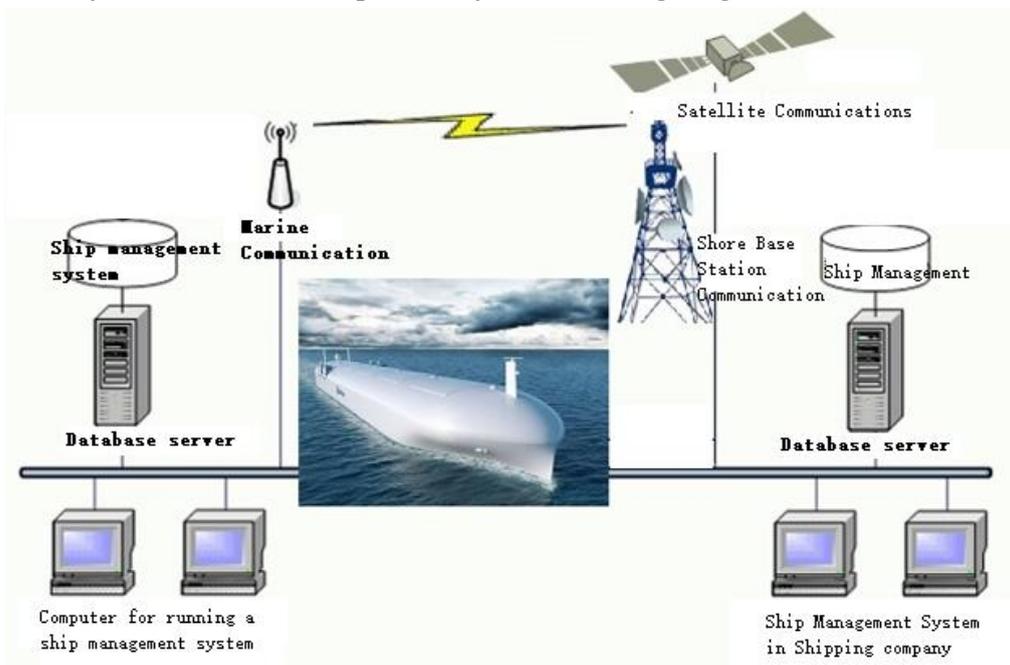


Fig.1 The flow chart of the company's decision-making and communication

3. Synchronous Management Module Design

The purpose of developing the data synchronization module of the ship management system is to establish a bridge for the ship-shore separation state inherent in the ship management software. Through the functions of this module, ship and shore data sharing can be achieved. The synchronization module program should be deployed on the server side of the ship management software. It consumes less resources and can run on a single machine or on a database server. The data of all ship management software business systems are collected and processed and transmitted to the management shipping company management system through the communication system to realize real-time ship management.

In the paper, the database method was used to develop ship-shore synchronous data management module of ship information management system. This software module has two operating modes: automatic mode and manual mode. In the automatic mode, the system runs automatically without human intervention, but the sending content is small. In the manual mode, manual operation is required. The advantage is that large-capacity information such as pictures and description files can be sent.

According to the analysis, the hierarchical structure of the synchronization system is divided into the following four levels: the file transfer layer, the file formation layer, the database operation layer, and the interface operation layer. as shown in picture 2.

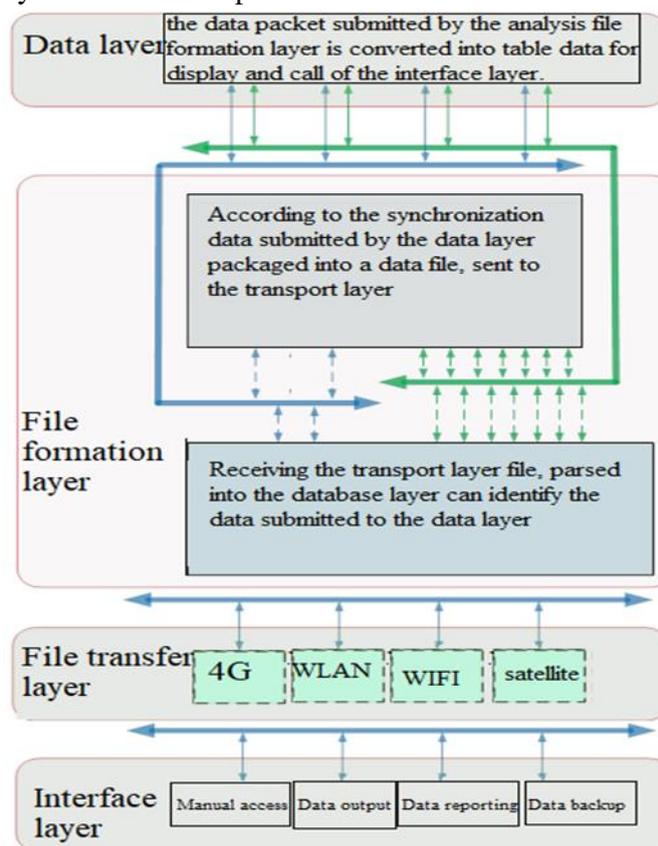


Fig. 2 The flow chart of synchronous data management

File transfer layer: Pass the required files through the existing network conditions (Internet, satellite, manual removable storage media, etc.) and transfer the file submitted by the file layer to the other end;

File formation layer: According to the synchronization data submitted by the data layer packaged into a data file, sent to the transport layer; Receiving the transport layer file, parsed into the database layer can identify the data submitted to the data layer;

Data layer: According to the data processing submitted by the front-end interface operation layer, the data packet is processed and transmitted to the file formation layer according to the user's

requirements; the data packet submitted by the analysis file formation layer is converted into table data for display and call of the interface layer.

Interface layer: After the interface user operates, data packets of the operation data are submitted to the data layer for processing; the data of the data layer is displayed and displayed to the user in a friendly manner.

4. Summary

In order to meet the practical needs of civilian ship management, combined with the actual conditions of the existing ship equipment, the ship information management system developed has the following advantages:

Instant sharing of information and automatic intelligent transfer of information - sharing shortcuts without truncating user operations and one party's data loss can be complemented by the other party's data (boats and shores can lose data at the same time).

Clear division of responsibilities - strict authority management, management to specific data.

Process Safeguards - Administrator must review the process, expiration cannot be filled.

Data security- Data transmission encryption, automatic data backup, and centralized data management are not lost due to client crashes.

The basic information of equipment management is relatively rich: equipment basic information, equipment parameters, work information, spare parts, spare parts maps, and other manuals can be maintained.

The concept of a device type exists, leading all devices of the same type. In particular, materials such as spare parts, instructions, and drawings can be linked together.

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