FLEET MANAGEMENT SYSTEM(Software)

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Abstract

Fleet Management is the sum of technologies and systems which allows a company to have full control of its vessels. The operation of such a system is designed to optimize several individual business processes to audit and consequently, reduce costs and better allocate the company's resources. This work shows up the architecture and the simplest form of a fleet management information system based on ICT. Finally, a reference is made to the conclusions and future extensions of the system.

Keywords

Fleet management, Information and communication technology (ICT)

I. INTRODUCTION

Fleet Management is the sum of technologies and systems which allows a company to have full control of its vessels. The operation of such a system is designed to optimize several individual business processes to audit and consequently, reduce costs and better allocate the company's resources. The purpose of fleet management is to exploit all the data of vessels so as to optimize the way the business operations. This is achieved by providing more efficient ways of calculating critical sizes of the business, while making use of modern and effective tools. Fleet Management offers a comprehensive range of ship management services that tailors to each vessel owner's needs. These include technical and engineering services, crew training and management, insurance, independent surveys, superintendence, audits and commercial management.

II. FLEET MANAGEMENT SYSTEMS

2.1 Fleet

A Fleet contains a number of Ships of different types (e.g. tankers, bulk-carriers) and can be subdivided according to geographical/topological criteria (Mediterranean fleet, Atlantic fleet etc.). A ship can be a member of several fleets.

2.2 Current State

Ship owners and operators are facing increasing competition worldwide and to be successful necessitates improved efficiencies in all aspects of ship operations in order to reduce operating costs and to maximise profits and the returns on capital investments. The trend is for highly efficient and automated shipboard management (enabling reduced crew levels) and similar approaches for shore based operations (which results in reduced staffing levels) which leads to increased reliance on ICT (both on-board and shore-based). Many ship owners and operators are therefore investing in ICT based ship operational management systems to help reduce the operating cost and to provide a competitive edge in the world market. Large shipping companies are already investing in their own ICT systems with software packages such as accounting software, documentation management software and some have their own intranet. However, the flow of information between the shipping companies and other various maritime stakeholders has been limited in the past because of the incompatibility of their IT systems to communicate efficiently with each other because each stakeholder has its own dedicated IT network.

On the commercial side of ship operations, the use of web-based software applications is gaining in importance both in terms of e-commerce generally and in fleet management processes such as spares procurement, generating bills of laden and e-commerce such as booking services, ticketing, and tracking/tracing of cargo. Integration and utilisation of web based services will become an essential part of fleet management in the future.

Real time asset management is essential in today's competitive markets and in the maritime sector ship owners and operators must be able to manage their fleets in real time and hence fleet management has become more complex. Owners and operators must deal with globalization, regulatory compliance, environmental requirements and ever-changing business and market conditions. Control and monitoring of individual vessels, during their voyage, to ensure that each is operating with optimised efficiency and safety is now possible because of the availability of the latest ICT and modular software packages becoming available and making it possible to estimate through life support and vessel life cycle costs of different vessels in a fleet.

Shipwide information collection is now possible and this can be transmitted in real time to shore based operation centres. Large quantities of real time, accurate data can be made available on each individual vessel concerning the

voyage/route, Ports of call, state of health, performance, cargo-related information, etc which can be analysed and the results used in the business processes of the owners/operators to optimise efficiency, reduce costs and risks, and improve safety. This enables operators to manage and plan their fleet operations from ashore and to take any necessary actions as the need arises Fleet management systems also enable operators to establish common operating standards and procedures across their fleet of ships to ensure industry compliance, consistent performance and safe, reliable and environmental friendly operations.

III. ARCHITECTURE

All this could not happen if there were no suitable technologies to support the project. For the basic operation of such a system it is necessary to collect information about vessels and transmit them to one specially formulated software for editing and exporting results.

The data is usually transmitted over the GSM network, or through the service SMS messages, or using GPRS. Of course, there are cases in which the GSM network is not used. For example, a ship in the peaceful ocean is impossible to access the network unless it is close to land. In such cases, satellite connections are used. Positioning is usually done using a satellite network. In the majority of cases the GPS network is used, but there are also other similar systems for the same purpose (GLONASS, Compass, IRNSS).

3.1 The simplest form of a Fleet Management System

The architecture of this application is divided into:

- The telematics device that is the GPS-GPRS unit for vessel communication with your company's office.

- The software together with Microsoft SQL Server 2008 Standard, Workgroup, Enterprise Edition) installed on the central server of the system. The information related to the corporate fleet of vessels is collected, processed and stored on the server.

- The software installed on the Fleet Management and Fleet Management User's computer.

Fleet management software now becoming available from ICT suppliers incorporates some or all of the individual and discrete software packages and functionality listed below:

- Administration and Documentation management Vessel Drawings/Handbooks

- Financial management

- Chartering

- Fleet Scheduling

- Loading/Unloading

- Maintenance and Repair

- Purchasing and Inventory

- Crew Management and Payroll

- Voyage Management

- Fleet Management

- Quality and Compliance

IV. OVERVIEW

An integrated fleet management system should essentially be a comprehensive suite of software (which should include all the required discrete software packages described in section 3.1) seamlessly integrated to provide shore based management, onboard crew, other vessels and shore based authorities with the relevant information to ensure optimised fleet efficiency and safety. It should be possible to customise the generic software suite to suit individual company's specific requirements, for example, in terms of vessel type, cargo, environmental conditions, shipboard machinery/systems, and internal company procedures and policies. Ship owners should be able to select and procure an integrated suite of modular software packages that provides a single solution to satisfy all main areas of their operations and business.

4.1 Benefits

The benefits of implementing integrated fleet management systems based on the latest ICT technologies include:

- Provide user friendly man-machine interfaces

- Enable common operating standards and procedures to be applied across the fleet.

- Provides an efficient and cost effective means of process improvement and bench marking

- Ensure compliance with the increasingly maritime regulations

- Provides a means of sharing common information

V. CONCLUSIONS AND RECOMMENDATIONS

- Maritime industry is slow to invest in the latest ICT technologies and information systems with the result that current methods of information retrieval and usage are slow, expensive in manpower and potentially a source of errors which could affect safety and security.

- While significant strides have been made in recent years in simplifying and automating maritime administration and business information, the major stakeholders do not operate as a cohesive group and tend to operate separately

- The current state of the art in fleet management systems is such that there are several suppliers which claim to provide 'integrated fleet management systems' but while these combine many of the software applications which go to make up a total system, few provide a full set of fully integrated software.

- The market is essentially made up of smaller software companies which provide specific application packages (e.g. planned maintenance systems (PMS)) which have to be interfaced with software from other suppliers to make up a composite fleet management package. This often results in ship owners purchasing application packages from several suppliers to make up their own fleet management systems which can result in inefficient and sometimes incompatible systems.

- Future fleet management systems must be capable of operating on legacy ICT equipment while having a future proof capability and must be capable of interfacing with existing standard back office ICT (e.g. purchasing, accounts).

- Adoption of information exchange standards are essential for the efficient and cost effective integration and operation of fleet management systems with other maritime information systems. In terms of messaging formats, a version called Shortsea XML, specifically adapted for the maritime sector, is being proposed as the preferred messaging format and is being supported by EU initiatives such as SSN and e-Maritime.

- The EU Initiatives put in place to ensure the future of maritime transport, such as e- Freight, e-Customs, e-Navigation and in particular, the over-riding e-Maritime Initiative, will facilitate the change to the use of ICT, and integrated electronic information management and exchange.

Both the EU's e-Navigation and e-Maritime Initiatives and the IMO promote the concept of a single window approach for common reporting and ease of access to information in order to reduce the manual paperwork which reduces potential errors.

European policy and strategy should facilitate

- The harmonisation of standards in terms of information exchange

- Achieving an interoperable environment in maritime information systems

- Encourage the seamless deployment of ICT across the maritime industries

- Raising of awareness of developments and legislation in maritime related information management systems.

- Interoperability and standardisation are crucial for optimised performance in the future maritime scenario and therefore industry adoption of Service Oriented Architecture technologies is important.

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