

INFORMATION PROCESSING SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to an information processing system, and more particularly relates to an information processing system for monitoring real-time sailing state of multiple ships to be managed owned by a shipping company.

BACKGROUND OF THE INVENTION

[0002] In the current shipping management execution field, due to the fragmented and uncoordinated sources of relevant information concerning ship sailing, such as ship location, ship speed, ship course, equipment operation, weather information and harbor information, management personnel is unable to effectively monitor real-time sailing information of multiple ships to be managed simultaneously, resulting in reduced management efficiency. Moreover, conventional shipping management technologies also lack mechanisms for alerting or warning about high-risk sailing areas, and as a result, the management personnel or ship crew members cannot receive real-time notifications to response accordingly.

SUMMARY OF THE INVENTION

[0003] Therefore, one objective of the present invention is to provide an information processing system for processing information of multiple ships to be

managed owned by a shipping company in real time.

[0004] In order to overcome the technical problems in the prior art, the present invention provides an information processing system for processing information of at least one ship to be managed, comprising: an information processing server having a ship-real-time-monitoring-information receiving unit, a geography-information obtaining unit, a weather-information obtaining unit and a monitoring-information processing unit, wherein the ship-real-time-monitoring-information receiving unit is provided to receive ship-sailing-real-time-monitoring information transmitted by each ship to be managed along with a ship identifier, the geography-information obtaining unit is provided to obtain geography information related to a ship routine plan of each ship to be managed, the weather-information obtaining unit is provided to obtain weather information related to the ship routine plan of each ship to be managed, the monitoring-information processing unit is connected to the ship-real-time-monitoring-information receiving unit and the geography-information obtaining unit, the monitoring-information processing unit is provided to continuously monitor the ship-sailing-real-time-monitoring information, the geography information and the weather information, and accordingly generate a monitoring information alert when a ship-sailing-real-time-monitoring alert data value of the ship-sailing-real-time-monitoring information exceeds a ship-sailing-real-time-monitoring threshold, a geography information alert data value of the geography information exceeds a geography information threshold or a weather information alert data value of the weather information exceeds a weather information threshold, and then transmit the monitoring information alert to the ship to be managed and an information transmitting server, wherein the

ship-sailing-real-time-monitoring information includes: ship speed information, ship course information, ship location information, main-engine-operation information and power-generator-operation information; the information transmitting server connected to the information processing server, wherein the information transmitting server has a sailing-information-real-time transmitting unit, a geography-information transmitting unit and a monitoring-information transmitting unit, the sailing-information-real-time transmitting unit is provided to request the information processing server to provide the ship-sailing-real-time-monitoring information according to a sailing-information requesting instruction and then transmit the ship-sailing-real-time-monitoring information after receiving the ship-sailing-real-time-monitoring information, the geography-information transmitting unit is provided to request the information processing server to provide the geography information according to a geography-information requesting instruction and then transmit the geography information after receiving the geography information, and the monitoring-information transmitting unit is provided to transmit the monitoring information alert immediately after receiving the monitoring information alert according to a continuous-monitoring-information transmitting instruction; a weather-chart charting server connected to the information processing server to receive the weather information, the weather-chart charting server being provided to chart the weather information into a weather chart according to a weather-chart charting instruction, wherein the weather chart includes a wave flow diagram, a barometric pressure diagram, a weather front diagram, a typhoon forecast path diagram, and a wind direction diagram; and a nautical-chart-and-sailing-information processing server connected to the information transmitting server and the weather-chart charting server, wherein the

nautical-chart-and-sailing-information processing server is provided to allow a terminal device to connect and accordingly display a management overview screen, the management overview screen is displayed in the form of an electronic nautical chart, and is provided with a sailing-real-time information interface, a geographic information interface and a weather chart interface, wherein the sailing-real-time information interface is provided to, after being operated by a management personnel via the terminal device, generate the sailing-information requesting instruction and transmit the sailing-information requesting instruction to the sailing-information-real-time transmitting unit of the information transmitting server, and after the ship-sailing-real-time-monitoring information is transmitted from the information processing server to the sailing-information-real-time transmitting unit, the ship-sailing-real-time-monitoring information is transmitted from the sailing-information-real-time transmitting unit to the nautical-chart-and-sailing-information processing server to display on the management overview screen, thereby allowing the management personnel to view via the terminal device, the geographic information interface is provided to, after being operated by the management personnel via the terminal device, generate the geography-information requesting instruction and transmit the geography-information requesting instruction to the geography-information transmitting unit of the information transmitting server, and after the geography information is transmitted from the information processing server to the geography-information transmitting unit, the geography information is transmitted from the geography-information transmitting unit to the nautical-chart-and-sailing-information processing server to display on the management overview screen, thereby allowing the management personnel to

view via the terminal device, the weather chart interface is provided to, after being operated by the management personnel via the terminal device, generate the weather-chart charting instruction and transmit the weather-chart charting instruction to the weather-chart charting server, and after the weather-chart charting server charting the weather chart, the weather chart is transmitted from the weather-chart charting server to the nautical-chart-and-sailing-information processing server to display on the management overview screen, thereby allowing the management personnel to view via the terminal device, and the monitoring information alert transmitted by the monitoring-information transmitting unit of the information transmitting server is transmitted to the nautical-chart-and-sailing-information processing server to display on the management overview screen to inform the management personnel via the terminal device.

[0005] In one embodiment of the present invention, the information processing system is provided, wherein the ship-real-time-monitoring-information receiving unit of the information processing server is provided to connect to each ship to be managed via satellite communication to receive the ship-sailing-real-time-monitoring information transmitted from each ship to be managed.

[0006] In one embodiment of the present invention, the information processing system is provided, wherein the monitoring-information processing unit of the information processing server has a ship-location-real-time-deviation monitoring subunit and a sailing-restriction-area monitoring subunit, the ship-location-real-time-deviation monitoring subunit is provided to continuously monitor a ship-location deviation between a ship location of the ship to be managed and a planning-sailing-routine track line of the ship routine plan and,

when the ship-location deviation exceeds a predetermined ship-location-deviation tolerance range, generate and transmit a ship-location deviating alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, and the monitoring-information transmitting unit, after receiving the ship-location deviating alert, immediately transmits the ship-location deviating alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device, and the sailing-restriction-area monitoring subunit is provided to continuously monitor a relative location relationship between the ship location of the ship to be managed and a predetermined-sailing-restriction area and, when the ship to be managed enters the predetermined-sailing-restriction area, to generate and transmit a sailing-to-restriction-area alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, and the monitoring-information transmitting unit, after receiving the sailing-to-restriction-area alert, immediately transmits the sailing-to-restriction-area alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device.

[0007] In one embodiment of the present invention, the information processing system is provided, wherein the monitoring-information processing unit of the information processing server has an arrival-harbor-speed monitoring subunit, the arrival-harbor-speed monitoring subunit is provided to continuously monitor a relative location relationship between a ship location of the ship to be managed and an arrival-harbor-deceleration area and, when the ship to be managed arrives the arrival-harbor-deceleration area and a ship speed exceeds a predetermined

arrival-harbor speed, immediately transmit a arrival-harbor-speed alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, the monitoring-information transmitting unit then transmits the arrival-harbor-speed alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device.

[0008] In one embodiment of the present invention, the information processing system is provided, wherein the monitoring-information processing unit of the information processing server has a power-usage-in-harbor monitoring subunit, the power-usage-in-harbor monitoring subunit is provided to continuously monitor a relative location relationship between a ship location of the ship to be managed and a predetermined intra-harbor area and, when the ship to be managed arrives the predetermined intra-harbor area and the amount of power generator used by the ship to be managed is less than a predetermined standard of the amount of power generator used, transmit a power-usage-in-harbor alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, which then transmits the power-usage-in-harbor alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device.

[0009] In one embodiment of the present invention, the information processing system is provided, wherein the monitoring-information processing unit of the information processing server has a ship-speed-in-warning-area monitoring subunit, the ship-speed-in-warning-area monitoring subunit is provided to continuously monitor a relative location relationship between a ship location of

the ship to be managed and a predetermined warning area and, when the ship to be managed arrives within the predetermined warning area and a ship speed of the ship to be managed is less than a predetermined warning speed, transmit a ship-speed-in-warning-area alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, which then transmits the ship-speed-in-warning-area alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device.

[0010] In one embodiment of the present invention, the information processing system is provided, wherein the information processing server further has a history recording unit and a history report output unit, the history recording unit is connected to the ship-real-time-monitoring-information receiving unit to record the ship-sailing-real-time-monitoring information, the history report output unit is connected to the history recording unit to correspondingly output history reporting information related to the ship-sailing-real-time-monitoring information according to a history-recording searching condition, the information transmitting server has a history-recording transmitting unit, the history-recording transmitting unit is provided to request the information processing server to provide the history reporting information according to a history-recording requesting instruction, and then transmits the history reporting information to the nautical-chart-and-sailing-information processing server after receiving the history reporting information, and the management overview screen of the nautical-chart-and-sailing-information processing server is provided with a history-reporting searching interface, the history-reporting searching interface is provided to, after being operated by the management personnel via the terminal

device, generate a history-reporting requesting instruction related to the history-reporting searching condition and transmit the history-reporting requesting instruction to the history-recording transmitting unit of the information transmitting server, and after the history reporting information is transmitted from the information transmitting server to the history-recording transmitting unit, the history-recording transmitting unit transmits the history reporting information to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby allowing the management personnel to view via the terminal device.

[0011] In one embodiment of the present invention, the information processing system is provided, wherein the nautical-chart-and-sailing-information processing server is further provided to, after the management personnel selects the ship-sailing-real-time-monitoring information on the management overview screen via the terminal device, display, in real time, amount-of-power-generator-in-use-and-power-usage information indicating a bow thruster of the ship to be managed activated.

[0012] In one embodiment of the present invention, the information processing system is provided, wherein the nautical-chart-and-sailing-information processing server is further provided to display, in real time, wind-speed-and-wind-direction information for a location where the ship to be managed is, pitching-and-yawing-and-rolling information for ship's motion, ship-fuel-consumption information, ship-loading information, ship-ballast-water-amount information, ship-draught-and-propeller-immersion-percentage information and ship-gravity-center-height information in sailing after the management personnel selects the ship-sailing-real-time-monitoring information on the management

overview screen via the terminal device.

[0013] In one embodiment of the present invention, the information processing system is provided, wherein the nautical-chart-and-sailing-information processing server is further provided to display, in real time, harbor information related to the ship routine plan of the ship to be managed after the management personnel selects the ship-sailing-real-time-monitoring information on the management overview screen via the terminal device, and the harbor information includes a harbor name, a harbor code, harbor longitude-and-latitude and past-ship-accident information.

[0014] With the technical means adopted by the information processing system of the present invention, the technical effects described as below can be obtained. The information compilation for the ship-sailing-real-time-monitoring information, the geography information and the monitoring information alert, and the charting for the weather information are processed respectively to improve the information processing efficiency. Furthermore, the information mentioned above and the weather chart are integrated and displayed on the management overview screen, thereby allowing the management personnel to view via the terminal device and facilitating real time monitoring of ship sailing information of multiple ships to be managed of the ship company to enhance the management efficiency. In addition, the present invention provides the monitoring information alert to the management personnel and the ships to be managed so that the management personnel can be aware of the situation in real time and ship crew members are informed in real time to facilitate response.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

Fig. 1 is a schematic block diagram illustrating an information processing system according to one embodiment of the present invention;

Fig. 2 is a schematic block diagram illustrating an architecture of an information processing server of the information processing system according to the embodiment of the present invention;

Fig. 3 is a block diagram illustrating a connection relationship among an information transmitting server, a weather-chart charting server and a nautical-chart-and-sailing-information processing server of the information processing system according to the embodiment of the present invention;

Fig. 4 is a block diagram illustrating a connection relationship among a monitoring-information processing unit, a monitoring-information transmitting unit and the nautical-chart-and-sailing-information processing server of the information processing system according to the embodiment of the present invention; and

Fig. 5 is a block diagram illustrating a connection relationship between the weather-chart charting server and the nautical-chart-and-sailing-information processing server of the information processing system according to the embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] The preferred embodiments of the present invention are described in detail with reference to Figs. 1 to 5. The description is used for explaining the embodiments of the present invention only, but not for limiting the scope of the claims.

[0017] As shown in Fig. 1, an information processing system 100 according to one embodiment of the present invention is for processing information of at least one ship to be managed. The information processing system 100 comprises: an information processing server 1, an information transmitting server 2, a weather-chart charting server 3 and a nautical-chart-and-sailing-information processing server 4.

[0018] As shown in Figs. 1 and 2, the information processing server 1 has a ship-real-time-monitoring-information receiving unit 11, a geography-information obtaining unit 12, a weather-information obtaining unit 13 and a monitoring-information processing unit 14.

[0019] The ship-real-time-monitoring-information receiving unit 11 is provided to receive ship-sailing-real-time-monitoring information transmitted by each ship to be managed along with a ship identifier. Specifically, the ship-sailing-real-time-monitoring information includes: ship speed information, ship course information, ship location information, main-engine-operation information and power-generator-operation information.

[0020] Specifically, in one embodiment of the present invention, the information processing system 100 is provided, wherein the ship-real-time-monitoring-information receiving unit 11 of the information processing server 1 is provided to connect to each ship to be managed via satellite communication to receive the ship-sailing-real-time-monitoring information transmitted from each ship to be managed.

[0021] The geography-information obtaining unit 12 is provided to obtain geography information related to a ship routine plan of each ship to be managed. Specifically, the geography information includes: harbor information of a harbor related to the ship routine plan of the ship to be managed.

[0022] The weather-information obtaining unit 13 is provided to obtain weather information related to the ship routine plan of each ship to be managed. In detail, the weather information includes: wave flow information, barometric pressure information, weather front information, typhoon forecast path information, and wind direction information.

[0023] As shown in Fig. 2, the monitoring-information processing unit 14 is connected to the ship-real-time-monitoring-information receiving unit 11 and the geography-information obtaining unit 12. The monitoring-information processing unit 14 is provided to continuously monitor the ship-sailing-real-time-monitoring information, the geography information and the weather information. Furthermore, when a ship-sailing-real-time-monitoring alert data value of the ship-sailing-real-time-monitoring information exceeds a ship-sailing-real-time-monitoring threshold, when a geography information alert data value of the geography information exceeds a geography information threshold, or when a weather information alert data value of the weather information exceeds a weather information threshold, the monitoring-information processing unit 14 accordingly generates a monitoring information alert and then transmits the monitoring information alert to the ship to be managed and the information transmitting server 2.

[0024] As shown in Figs. 1 to 3, the information transmitting server 2 is connected to the information processing server 1. The information transmitting server 2 has a sailing-information-real-time transmitting unit 21, a geography-information transmitting unit 22 and a monitoring-information transmitting unit 23.

[0025] As shown in Figs. 1 to 3, the sailing-information-real-time transmitting unit 21 is provided to request the information processing server 1 to provide the

ship-sailing-real-time-monitoring information according to a sailing-information requesting instruction. Furthermore, the sailing-information-real-time transmitting unit 21 then transmits the ship-sailing-real-time-monitoring information after receiving the ship-sailing-real-time-monitoring information.

[0026] As shown in Figs. 1 to 3, the geography-information transmitting unit 22 is provided to request the information processing server 1 to provide the geography information according to a geography-information requesting instruction. Furthermore, the geography-information transmitting unit 22 then transmits the geography information after receiving the geography information.

[0027] The monitoring-information transmitting unit 23 is provided to transmit the monitoring information alert immediately after receiving the monitoring information alert according to a continuous-monitoring-information transmitting instruction.

[0028] As shown in Fig. 1, the weather-chart charting server 3 is connected to the information processing server 1 to receive the weather information. Furthermore, the weather-chart charting server 3 is provided to chart the weather information into a weather chart according to a weather-chart charting instruction. The weather chart includes: a wave flow diagram, a barometric pressure diagram, a weather front diagram, a typhoon forecast path diagram, and a wind direction diagram.

[0029] As shown in Figs. 1, 3 and 5, the nautical-chart-and-sailing-information processing server 4 is connected to the information transmitting server 2 and the weather-chart charting server 3. The nautical-chart-and-sailing-information processing server 4 is provided to allow a terminal device T, such as a desktop computer, a laptop, a tablet or a smartphone, to connect and accordingly display a management overview screen G. The management overview screen G is displayed

in the form of an electronic nautical chart, and is provided with a sailing-real-time information interface G1, a geographic information interface G2 and a weather chart interface G3.

[0030] Specifically, as shown in Figs. 1 to 3, the sailing-real-time information interface G1 is provided to, after being operated by a management personnel via the terminal device T, generate the sailing-information requesting instruction. Moreover, the nautical-chart-and-sailing-information processing server 4 transmits the sailing-information requesting instruction to the sailing-information-real-time transmitting unit 21 of the information transmitting server 2. After the ship-sailing-real-time-monitoring information is transmitted from the information processing server 1 to the sailing-information-real-time transmitting unit 21, the ship-sailing-real-time-monitoring information is transmitted from the sailing-information-real-time transmitting unit 21 to the nautical-chart-and-sailing-information processing server 4 to display on the management overview screen G, thereby allowing the management personnel to view via the terminal device T.

[0031] Moreover, as shown in Figs. 1 to 3, the geographic information interface G2 is provided to, after being operated by the management personnel via the terminal device T, generate the geography-information requesting instruction. Moreover, the nautical-chart-and-sailing-information processing server 4 transmits the geography-information requesting instruction to the geography-information transmitting unit 22 of the information transmitting server 2. After the geography information is transmitted from the information processing server 1 to the geography-information transmitting unit 22, the geography information is transmitted from the geography-information transmitting unit 22 to the nautical-chart-and-sailing-information processing server 4 to display on the

management overview screen G, thereby allowing the management personnel to view via the terminal device T.

[0032] As shown in Figs. 1 to 3, the weather chart interface G3 is provided to, after being operated by the management personnel via the terminal device T, generate the weather-chart charting instruction and transmit the weather-chart charting instruction to the weather-chart charting server 3. Furthermore, with reference to Fig. 5, after the weather-chart charting server 3 charts the weather chart, the weather chart is transmitted from the weather-chart charting server 3 to the nautical-chart-and-sailing-information processing server 4 to display on the management overview screen G, thereby allowing the management personnel to view via the terminal device T.

[0033] In addition, as shown in Fig. 4, the monitoring information alert transmitted by the monitoring-information transmitting unit 23 of the information transmitting server 2 is transmitted to the nautical-chart-and-sailing-information processing server 4 to display on the management overview screen G to inform the management personnel via the terminal device T.

[0034] As shown in Figs. 2 and 4, in one embodiment of the present invention, the information processing system 100 is provided, wherein the monitoring-information processing unit 14 of the information processing server 1 has a ship-location-real-time-deviation monitoring subunit 141 and a sailing-restriction-area monitoring subunit 142.

[0035] In detail, as shown in Figs. 2 and 4, the ship-location-real-time-deviation monitoring subunit 141 is provided to continuously monitor a ship-location deviation between a ship location of the ship to be managed and a planning-sailing-routine track line of the ship routine plan. Furthermore, when the ship-location deviation exceeds a predetermined ship-location-deviation tolerance

range, the ship-location-real-time-deviation monitoring subunit 141 generates and transmits a ship-location deviating alert to the ship to be managed and the monitoring-information transmitting unit 23 of the information transmitting server 2. The monitoring-information transmitting unit 23, after receiving the ship-location deviating alert, immediately transmits the ship-location deviating alert to the nautical-chart-and-sailing-information processing server 4 for displaying on the management overview screen G, thereby informing the management personnel via the terminal device T.

[0036] Moreover, as shown in Figs. 2 and 4, the sailing-restriction-area monitoring subunit 142 is provided to continuously monitor a relative location relationship between the ship location of the ship to be managed and a predetermined-sailing-restriction area. Furthermore, when the ship to be managed enters the predetermined-sailing-restriction area, the sailing-restriction-area monitoring subunit 142 generates and transmits a sailing-to-restriction-area alert to the ship to be managed and the monitoring-information transmitting unit 23 of the information transmitting server 2. The monitoring-information transmitting unit 23, after receiving the sailing-to-restriction-area alert, immediately transmits the sailing-to-restriction-area alert to the nautical-chart-and-sailing-information processing server 4 for displaying on the management overview screen G, thereby informing the management personnel via the terminal device T.

[0037] As shown in Figs. 2 and 4, in one embodiment of the present invention, the information processing system 100 is provided, wherein the monitoring-information processing unit 14 of the information processing server 1 has an arrival-harbor-speed monitoring subunit 143. The arrival-harbor-speed monitoring subunit 143 is provided to continuously monitor a relative location relationship between a ship location of the ship to be managed and an

arrival-harbor-deceleration area. Furthermore, when the ship to be managed arrives the arrival-harbor-deceleration area and a ship speed exceeds a predetermined arrival-harbor speed, the arrival-harbor-speed monitoring subunit 143 immediately transmits a arrival-harbor-speed alert to the ship to be managed and the monitoring-information transmitting unit 23 of the information transmitting server 2. The monitoring-information transmitting unit 23 then transmits the arrival-harbor-speed alert to the nautical-chart-and-sailing-information processing server 4 for displaying on the management overview screen G, thereby informing the management personnel via the terminal device T.

[0038] As shown in Figs. 2 and 4, in one embodiment of the present invention, the information processing system 100 is provided, wherein the monitoring-information processing unit 14 of the information processing server 1 has a power-usage-in-harbor monitoring subunit 144. The power-usage-in-harbor monitoring subunit 144 is provided to continuously monitor a relative location relationship between a ship location of the ship to be managed and a predetermined intra-harbor area. Furthermore, when the ship to be managed arrives the predetermined intra-harbor area and the amount of power generator used by the ship to be managed is less than a predetermined standard of the amount of power generator used, the power-usage-in-harbor monitoring subunit 144 transmits a power-usage-in-harbor alert to the ship to be managed and the monitoring-information transmitting unit 23 of the information transmitting server 2. The monitoring-information transmitting unit 23 then transmits the power-usage-in-harbor alert to the nautical-chart-and-sailing-information processing server 4 for displaying on the management overview screen G, thereby informing the management personnel via the terminal device T.

[0039] As shown in Figs. 2 and 4, in one embodiment of the present invention, the information processing system 100 is provided, wherein the monitoring-information processing unit 14 of the information processing server 1 has a ship-speed-in-warning-area monitoring subunit 145. The ship-speed-in-warning-area monitoring subunit 145 is provided to continuously monitor a relative location relationship between a ship location of the ship to be managed and a predetermined warning area. Furthermore, when the ship to be managed arrives within the predetermined warning area and a ship speed of the ship to be managed is less than a predetermined warning speed, the ship-speed-in-warning-area monitoring subunit 145 transmits a ship-speed-in-warning-area alert to the ship to be managed and the monitoring-information transmitting unit 23 of the information transmitting server 2. The monitoring-information transmitting unit 23 then transmits the ship-speed-in-warning-area alert to the nautical-chart-and-sailing-information processing server 4 for displaying on the management overview screen G, thereby informing the management personnel via the terminal device T.

[0040] As shown in Figs. 2 and 3, in one embodiment of the present invention, the information processing system 100 is provided, wherein the information processing server 1 further has a history recording unit 15 and a history report output unit 16. The history recording unit 15 is connected to the ship-real-time-monitoring-information receiving unit 11 to record the ship-sailing-real-time-monitoring information. The history report output unit 16 is connected to the history recording unit 15 to correspondingly output history reporting information related to the ship-sailing-real-time-monitoring information according to a history-recording searching condition. Furthermore, the information transmitting server 2 has a history-recording transmitting unit 24, the

history-recording transmitting unit 24 is provided to request the information processing server 1 to provide the history reporting information according to a history-recording requesting instruction, and then the history-recording transmitting unit 24 transmits the history reporting information to the nautical-chart-and-sailing-information processing server 4 after receiving the history reporting information. Furthermore, the management overview screen G of the nautical-chart-and-sailing-information processing server 4 is provided with a history-reporting searching interface G4, the history-reporting searching interface G4 is provided to, after being operated by the management personnel via the terminal device T, generate a history-reporting requesting instruction related to the history-reporting searching condition and transmit the history-reporting requesting instruction to the history-recording transmitting unit 24 of the information transmitting server 2. Furthermore, after the history reporting information is transmitted from the information transmitting server 1 to the history-recording transmitting unit 24, the history-recording transmitting unit 24 transmits the history reporting information to the nautical-chart-and-sailing-information processing server 4 for displaying on the management overview screen G, thereby allowing the management personnel to view via the terminal device T.

[0041] In one embodiment of the present invention, the information processing system 100 is provided, wherein the nautical-chart-and-sailing-information processing server 4 is further provided to, after the management personnel selects the ship-sailing-real-time-monitoring information on the management overview screen G via the terminal device T, display, in real time, amount-of-power-generator-in-use-and-power-usage information indicating a bow thruster of the ship to be managed activated.

[0042] In one embodiment of the present invention, the information processing

system 100 is provided, wherein the nautical-chart-and-sailing-information processing server 4 is further provided to display, in real time, wind-speed-and-wind-direction information for a location where the ship to be managed is, pitching-and-yawing-and-rolling information for ship's motion, ship-fuel-consumption information, ship-loading information, ship-ballast-water-amount information, ship-draught-and-propeller-immersion-percentage information and ship-gravity-center-height information in sailing after the management personnel selects the ship-sailing-real-time-monitoring information on the management overview screen G via the terminal device T.

[0043] In one embodiment of the present invention, the information processing system 100 is provided, wherein the nautical-chart-and-sailing-information processing server 4 is further provided to display, in real time, harbor information related to the ship routine plan of the ship to be managed after the management personnel selects the ship-sailing-real-time-monitoring information on the management overview screen G via the terminal device T, and the harbor information includes a harbor name, a harbor code, harbor longitude-and-latitude and past-ship-accident information.

[0044] The above description should be considered as only the discussion of the preferred embodiments of the present invention. However, a person having ordinary skill in the art may make various modifications without deviating from the present invention. Those modifications still fall within the scope of the present invention.

What is claimed is:

1. An information processing system for processing information of at least one ship to be managed, comprising:

an information processing server having a ship-real-time-monitoring-information receiving unit, a geography-information obtaining unit, a weather-information obtaining unit and a monitoring-information processing unit, wherein the ship-real-time-monitoring-information receiving unit is provided to receive ship-sailing-real-time-monitoring information transmitted by each ship to be managed along with a ship identifier, the geography-information obtaining unit is provided to obtain geography information related to a ship routine plan of each ship to be managed, the weather-information obtaining unit is provided to obtain weather information related to the ship routine plan of each ship to be managed, the monitoring-information processing unit is connected to the ship-real-time-monitoring-information receiving unit and the geography-information obtaining unit, the monitoring-information processing unit is provided to continuously monitor the ship-sailing-real-time-monitoring information, the geography information and the weather information, and accordingly generate a monitoring information alert when a ship-sailing-real-time-monitoring alert data value of the ship-sailing-real-time-monitoring information exceeds a ship-sailing-real-time-monitoring threshold, a geography information alert data value of the geography information exceeds a geography information threshold or a weather information alert data value of the weather information exceeds a

weather information threshold, and then transmit the monitoring information alert to the ship to be managed and an information transmitting server, wherein the ship-sailing-real-time-monitoring information includes: ship speed information, ship course information, ship location information, main-engine-operation information and power-generator-operation information;

the information transmitting server connected to the information processing server, wherein the information transmitting server has a sailing-information-real-time transmitting unit, a geography-information transmitting unit and a monitoring-information transmitting unit, the sailing-information-real-time transmitting unit is provided to request the information processing server to provide the ship-sailing-real-time-monitoring information according to a sailing-information requesting instruction and then transmit the ship-sailing-real-time-monitoring information after receiving the ship-sailing-real-time-monitoring information, the geography-information transmitting unit is provided to request the information processing server to provide the geography information according to a geography-information requesting instruction and then transmit the geography information after receiving the geography information, and the monitoring-information transmitting unit is provided to transmit the monitoring information alert immediately after receiving the monitoring information alert according to a continuous-monitoring-information transmitting instruction;

a weather-chart charting server connected to the information processing server to receive the weather information, the weather-chart charting server being

provided to chart the weather information into a weather chart according to a weather-chart charting instruction, wherein the weather chart includes a wave flow diagram, a barometric pressure diagram, a weather front diagram, a typhoon forecast path diagram, and a wind direction diagram; and

a nautical-chart-and-sailing-information processing server connected to the information transmitting server and the weather-chart charting server, wherein the nautical-chart-and-sailing-information processing server is provided to allow a terminal device to connect and accordingly display a management overview screen, the management overview screen is displayed in the form of an electronic nautical chart, and is provided with a sailing-real-time information interface, a geographic information interface and a weather chart interface,

wherein the sailing-real-time information interface is provided to, after being operated by a management personnel via the terminal device, generate the sailing-information requesting instruction and transmit the sailing-information requesting instruction to the sailing-information-real-time transmitting unit of the information transmitting server, and after the ship-sailing-real-time-monitoring information is transmitted from the information processing server to the sailing-information-real-time transmitting unit, the ship-sailing-real-time-monitoring information is transmitted from the sailing-information-real-time transmitting unit to the nautical-chart-and-sailing-information processing server to display on the management overview screen, thereby allowing the management personnel to view via the terminal device,

the geographic information interface is provided to, after being operated by the management personnel via the terminal device, generate the geography-information requesting instruction and transmit the geography-information requesting instruction to the geography-information transmitting unit of the information transmitting server, and after the geography information is transmitted from the information processing server to the geography-information transmitting unit, the geography information is transmitted from the geography-information transmitting unit to the nautical-chart-and-sailing-information processing server to display on the management overview screen, thereby allowing the management personnel to view via the terminal device,

the weather chart interface is provided to, after being operated by the management personnel via the terminal device, generate the weather-chart charting instruction and transmit the weather-chart charting instruction to the weather-chart charting server, and after the weather-chart charting server charting the weather chart, the weather chart is transmitted from the weather-chart charting server to the nautical-chart-and-sailing-information processing server to display on the management overview screen, thereby allowing the management personnel to view via the terminal device, and

the monitoring information alert transmitted by the monitoring-information transmitting unit of the information transmitting server is transmitted to the nautical-chart-and-sailing-information processing server to display on the management overview screen to inform the management personnel via the terminal

device.

2. The information processing system as claimed in claim 1, wherein the ship-real-time-monitoring-information receiving unit of the information processing server is provided to connect to each ship to be managed via satellite communication to receive the ship-sailing-real-time-monitoring information transmitted from each ship to be managed.

3. The information processing system as claimed in claim 1, wherein the monitoring-information processing unit of the information processing server has a ship-location-real-time-deviation monitoring subunit and a sailing-restriction-area monitoring subunit,

the ship-location-real-time-deviation monitoring subunit is provided to continuously monitor a ship-location deviation between a ship location of the ship to be managed and a planning-sailing-routine track line of the ship routine plan and, when the ship-location deviation exceeds a predetermined ship-location-deviation tolerance range, generate and transmit a ship-location deviating alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, and the monitoring-information transmitting unit, after receiving the ship-location deviating alert, immediately transmits the ship-location deviating alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device, and

the sailing-restriction-area monitoring subunit is provided to continuously monitor a relative location relationship between the ship location of the ship to be managed and a predetermined-sailing-restriction area and, when the ship to be

managed enters the predetermined-sailing-restriction area, to generate and transmit a sailing-to-restriction-area alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, and the monitoring-information transmitting unit, after receiving the sailing-to-restriction-area alert, immediately transmits the sailing-to-restriction-area alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device.

4. The information processing system as claimed in claim 1, wherein the monitoring-information processing unit of the information processing server has an arrival-harbor-speed monitoring subunit, the arrival-harbor-speed monitoring subunit is provided to continuously monitor a relative location relationship between a ship location of the ship to be managed and an arrival-harbor-deceleration area and, when the ship to be managed arrives the arrival-harbor-deceleration area and a ship speed exceeds a predetermined arrival-harbor speed, immediately transmit a arrival-harbor-speed alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, the monitoring-information transmitting unit then transmits the arrival-harbor-speed alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device.

5. The information processing system as claimed in claim 1, wherein the monitoring-information processing unit of the information processing server has a power-usage-in-harbor monitoring subunit, the power-usage-in-harbor monitoring

subunit is provided to continuously monitor a relative location relationship between a ship location of the ship to be managed and a predetermined intra-harbor area and, when the ship to be managed arrives the predetermined intra-harbor area and the amount of power generator used by the ship to be managed is less than a predetermined standard of the amount of power generator used, transmit a power-usage-in-harbor alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, which then transmits the power-usage-in-harbor alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device.

6. The information processing system as claimed in claim 1, wherein the monitoring-information processing unit of the information processing server has a ship-speed-in-warning-area monitoring subunit, the ship-speed-in-warning-area monitoring subunit is provided to continuously monitor a relative location relationship between a ship location of the ship to be managed and a predetermined warning area and, when the ship to be managed arrives within the predetermined warning area and a ship speed of the ship to be managed is less than a predetermined warning speed, transmit a ship-speed-in-warning-area alert to the ship to be managed and the monitoring-information transmitting unit of the information transmitting server, which then transmits the ship-speed-in-warning-area alert to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby informing the management personnel via the terminal device.

7. The information processing system as claimed in claim 1, wherein the information processing server further has a history recording unit and a history report output unit, the history recording unit is connected to the ship-real-time-monitoring-information receiving unit to record the ship-sailing-real-time-monitoring information, the history report output unit is connected to the history recording unit to correspondingly output history reporting information related to the ship-sailing-real-time-monitoring information according to a history-recording searching condition,

the information transmitting server has a history-recording transmitting unit, the history-recording transmitting unit is provided to request the information processing server to provide the history reporting information according to a history-recording requesting instruction, and then transmits the history reporting information to the nautical-chart-and-sailing-information processing server after receiving the history reporting information, and

the management overview screen of the nautical-chart-and-sailing-information processing server is provided with a history-reporting searching interface, the history-reporting searching interface is provided to, after being operated by the management personnel via the terminal device, generate a history-reporting requesting instruction related to the history-reporting searching condition and transmit the history-reporting requesting instruction to the history-recording transmitting unit of the information transmitting server, and after the history reporting information is transmitted from the information transmitting server to the history-recording transmitting unit, the history-recording transmitting unit transmits the history reporting information to the nautical-chart-and-sailing-information processing server for displaying on the management overview screen, thereby allowing the management personnel to view

via the terminal device.

8. The information processing system as claimed in claim 1, wherein the nautical-chart-and-sailing-information processing server is further provided to, after the management personnel selects the ship-sailing-real-time-monitoring information on the management overview screen via the terminal device, display, in real time, amount-of-power-generator-in-use-and-power-usage information indicating a bow thruster of the ship to be managed activated.

9. The information processing system as claimed in claim 1, wherein the nautical-chart-and-sailing-information processing server is further provided to display, in real time, wind-speed-and-wind-direction information for a location where the ship to be managed is, pitching-and-yawing-and-rolling information for ship's motion, ship-fuel-consumption information, ship-loading information, ship-ballast-water-amount information, ship-draught-and-propeller-immersion-percentage information and ship-gravity-center-height information in sailing after the management personnel selects the ship-sailing-real-time-monitoring information on the management overview screen via the terminal device.

10. The information processing system as claimed in claim 1, wherein the nautical-chart-and-sailing-information processing server is further provided to display, in real time, harbor information related to the ship routine plan of the ship to be managed after the management personnel selects the ship-sailing-real-time-monitoring information on the management overview screen via the terminal device, and the harbor information includes a harbor name, a

harbor code, harbor longitude-and-latitude and past-ship-accident information.