

DESCRIPTION

PORT SERVICES SUPPORT SYSTEM, PORT SERVICES SUPPORT METHOD,
AND PORT SERVICES SUPPORT PROGRAM

Technical Field

[0001]

The present invention relates to a port services support system, a port services support method, and a port services support program.

Background Art

[0002]

Conventionally, procedures and paperwork related to a customs clearance service and a port entrance and leave operation in a marine transportation operation have been performed depending on manual works or individual systems. As a result, information sharing among related parties is inefficient, and it has been a problem in that procedures delay and document incompleteness frequently occur.

[0003]

In order to solve these problems, a system for facilitating information sharing among the related parties (consignor, marine wagon operator, customs agent, warehouse operator, land carrier, container terminal, and ship company) has been required. In recent years, a digital platform for realizing this has been developed and

introduced. Thus, this platform allows the parties to access it via the Internet to share information in real time.

[0004]

Patent Literature 1 discloses a port-related data cooperation base system. This system has an authority setting table with which, for each document, read authority and write authority are given by a computer on the basis of an operation pattern. As a result, it is possible to input new request information, select a transaction form, confirm a pattern, determine an authorized person, and browse information among a consignor, a marine wagon operator, a customs agent, a warehouse operator, a land carrier, a container terminal, and a ship company. In particular, the system has a mechanism that does not allow a person other than an authorized person to refer to information of a document, whereby security is enhanced.

[0005]

Patent Literature 2 discloses a technique for searching for estimated arrival information of an imported loaded cargo arriving at the unloading port with high accuracy. This patent document describes a means in which an imported loaded cargo tracing apparatus acquires cargo detailed information, customs clearance procedural information, and ship operation information based on cargo

specific information, and extracts estimated arrival information from these pieces of information. Specifically, this patent document describes a method of acquiring necessary information from cargo detailed information database, a customs clearance procedural information database, and a ship operation information database, and combining them to provide highly accurate estimated arrival information. With this technique, it is possible to more accurately grasp an arrival schedule of freight in the port services.

Citation List

Patent Literature

[0006]

Patent Literature 1: JP 2021-189488 A

Patent Literature 2: JP 2016-016979 A

Summary of Invention

Technical Problem

[0007]

Patent Literature 1 discloses that document information can be shared between a requester and a business operator. On the other hand, cooperation between a platform related to container distribution and other platforms is not sufficient, and it is difficult to grasp a

state of progress when the port services is viewed as a whole, and there is a problem from the viewpoint of improving operation efficiency.

[0008]

Patent Literature 2 discloses that it is possible to search for estimated arrival information of loaded freight arriving at an unloading port. On the other hand, cooperation with other platforms, in which the acquired estimated arrival information is utilized, is not disclosed, and there is a problem from the viewpoint of improving operation efficiency in the entire port services.

[0009]

A problem to be solved by the present invention is to support procedure related to port services and provide a technique related to progress management of all the services.

Solution to Problem

[0010]

[1] A port services support system including: a storage unit that stores one or a plurality of pieces of operation flow information corresponding to each of an import and export operation and a port entrance and leave operation which are port services, the operation flow information having a plurality of statuses and one or a

plurality of pieces of procedural information linked to the statuses; a registration unit that starts operation flow management by receiving registration of cargo information in accordance with the import and export operation, and linking the cargo information to cargo identification information and operation flow information corresponding to the import and export operation, and starts operation flow management by receiving registration of port entrance and leave information in accordance with the port entrance and leave operation, and linking the port entrance and leave information to ship information including ship identification information and operation flow information corresponding to the port entrance and leave operation, the port entrance and leave information including a port entrance and/or leave dates and port information; a procedure processing unit that links the cargo information to the ship information by executing, for a cargo specified by the cargo identification information, procedure processing of the procedural information linked to a status of reservation operation of a ship that transports the cargo; an acquisition unit that acquires the cargo identification information that has been assigned to the cargo and read, and the ship identification information of the ship, position information of the ship having been detected in a predetermined area set in the port

information, and coordinates the port entrance and/or leave dates of the port entrance and leave information linked to the ship identification information in accordance with a time stamp acquired together with the ship identification information; and a calculation unit that acquires the port entrance and/or leave dates of the ship associated with the cargo information, and calculates a work date for the port entrance and/or leave dates and a procedural deadline for the work date.

[2] The port services support system according to [1], in which the procedure processing unit generates a procedural document in accordance with a status of the operation flow information on the basis of the cargo information or the port entrance and leave information, and executes procedure processing of submitting the procedural document.

[3] The port services support system according to [2], in which the storage unit stores a verification check table including a law check table, the law check table storing a law corresponding to the procedural information, and a submission deadline in accordance with an item of the procedural information defined by a law is set, and the port services support system includes a verification unit that refers to the law check table, verifies a specific item of the procedural information, and outputs the

submission deadline.

[4] The port services support system according to any one of [1] to [3], in which a status of the operation flow information is defined for each stage of operation, one or a plurality of pieces of procedural information is linked to one status, and the procedure processing unit updates the status to a status of a next stage by completing procedure processing of all necessary procedures set in the procedural information associated with the one status.

[5] The port services support system according to any one of [1] to [4], including an output unit that generates a progress management screen for the cargo in accordance with a status of operation flow information related to an import and export operation for the cargo specified by the cargo identification information, and generates a progress management screen for port entrance and leave of the ship in accordance with a status of operation flow information related to a port entrance and leave operation for the ship specified by the ship identification information.

[6] The port services support system according to any one of [1] to [5], in which the cargo identification information is physically assigned to the cargo or a related document as a two-dimensional code or an electronic

tag, and the acquisition unit acquires the cargo identification information of the cargo from which the two-dimensional code or the electronic tag has been read via a reading device.

[0011]

The invention according to [1] makes it possible to obtain an appropriate schedule regarding a cargo to be transported by a ship in accordance with the situation of the ship.

[0012]

The invention according to [2] makes it possible to automatically generate a procedural document in accordance with the status of the operation flow and efficiently perform the procedure.

[0013]

The invention according to [3] makes it possible to verify a specific item of the procedural document using the verification check table, and thus makes it possible to improve the drafting accuracy of the document.

[0014]

The invention according to [4] makes it possible to appropriately update the status of the operation flow in accordance with the procedure processing of the procedural information.

[0015]

The invention according to [5] makes it possible to generate a screen display in accordance with the status, and thus the support progress management of the port services by visualizing the progress.

[0016]

The invention according to [6] makes it possible to perform an appropriate and efficient procedure in accordance with the actual state of the cargo by reading the identification information physically assigned to the cargo or the document.

Advantageous Effects of Invention

[0017]

According to the present invention, it is possible to support procedure related to port services and provide a technique related to progress management of all the services.

Brief Description of Drawings

[0018]

Fig. 1 is a block diagram of a system of the present embodiment.

Fig. 2 is a hardware configuration diagram of the present embodiment.

Fig. 3 is a schematic diagram of port services of

the present embodiment.

Fig. 4 is a block diagram of an apparatus and storage units of the present embodiment.

Fig. 5 is a schematic diagram of an operation flow of the present embodiment.

Fig. 6 is a data configuration example of operation flow information of the present embodiment.

Fig. 7 is a data configuration example of progress management information of a cargo of the present embodiment.

Fig. 8 is a data configuration example of progress management information of a port entrance and leave operation of the present embodiment.

Description of Embodiments

[0019]

The following describes a port services support system and a port services support method according to embodiments of the present invention with reference to the drawings. Note that the following embodiments are examples of the present invention, and the present invention is not limited to the following embodiments, and various other configurations can be adopted.

[0020]

In the present embodiment, a configuration,

operation, and the like of a port services support system and a port services support apparatus will be described, but port services support methods, programs, program recording media in which the programs are recorded, and the like having similar configurations can also exhibit similar operations and effects. By using a program recording medium, for example, a program can be installed in a computer. A series of processing according to the present embodiment described below is provided as a computer-executable program, and can be provided via a non-transitory computer-readable recording medium such as a CD-ROM or a flexible disk, and further via a communication line.

[0021]

The port services support system includes a plurality of computer devices. A first computer device includes an arithmetic device such as a central processing unit (CPU) and includes a storage device. The computer device executes a first program stored in the storage device with the arithmetic device, whereby the computer device can function as a port services support apparatus. In addition, a second computer device includes an arithmetic device such as CPU and includes a storage device. The computer device executes a second program stored in the storage device with the arithmetic device,

whereby the computer device can function as a user terminal. The port services support method is implemented by the processing in the computer devices including the port services support apparatus and the user terminal.

[0022]

The port services in this description includes an import and export operation and a port entrance and leave operation. The import and export operation includes reservation operations of various contractors and the like, and logistics operations such as bringing in cargos, customs clearance, ship loading, and transportation. The port entrance and leave operation includes various arrangements and application operations related to port entrance and leave of a ship to and from a port.

[0023]

Fig. 1 illustrates a block diagram of a port services support system 1. The port services support system 1 includes a port services support apparatus 2, a user terminal 3, and a storage unit 5. The port services support apparatus 2, the user terminal 3, and the storage unit 5 are each connected to a communication network NW and are configured to be communicable with each other. The storage unit 5 is configured as a database installed inside or outside the port services support apparatus 2, and is configured to be able to perform data communication with at

least the port services support apparatus 2. The user terminal 3 is carried by each port party (user), and there are a plurality of the user terminals 3.

[0024]

The port services support apparatus 2 includes, as functional components, a registration unit 21 that receives registration of various types of information, an acquisition unit 22 that acquires identification information, a procedure processing unit 23 that executes various types of procedure processing, a verification unit 24 that executes verification processing for a specific item in the procedure processing, an output unit 25 that outputs various types of information, and a calculation unit 26 that calculates a work date and a procedural deadline.

[0025]

The user terminal 3 is a terminal device operated by a party related to the port services. The user terminal 3 functions as an input and output interface to the port services support system 1. The user terminal 3 is capable of sending various types of input information to the port services support apparatus 2. In addition, the user terminal 3 is capable of receiving various types of output from the port services support apparatus 2. In addition, the user terminal 3 may include a function as a reading

device to be described later.

[0026]

The storage unit 5 stores various types of information. In the present embodiment, the storage unit 5 includes an operation flow storage unit 51 that stores therein operation flow information, a verification information storage unit 52 that stores therein verification information, a cargo information storage unit 53 that stores therein cargo information, a port entrance and leave information storage unit 54 that stores therein port entrance and leave information, and a submission information storage unit 55 that stores therein submission information. The operation flow information and the verification information are stored in the storage unit 5 as master data. The cargo information, the port entrance and leave information, and the submission information are stored in the storage unit 5 according to a registration instruction from the user terminal 3. In the present embodiment, the cargo information and the port entrance and leave information are defined as basic information.

[0027]

Fig. 2(a) is a hardware configuration diagram of the port services support apparatus 2. The port services support apparatus 2 includes, as a hardware configuration, a control device 201, a storage device 202, and a

communication device 203, and the components are connected with each other by a bus interface. In the present embodiment, as the port services support apparatus 2, a computer device such as a server device or a personal computer can be used. The port services support apparatus 2, which is configured by a plurality of computer devices, only needs to implement the above-described functional components (21 to 26), and is not limited to having the configuration in the example of the drawings.

[0028]

The control device 201 is configured by one or more processors such as a CPU, and controls the entire processing in the port services support apparatus 2 by executing a port services support program, an operating system (OS), and other applications. The storage device 202 is a hard disk drive (HDD), a solid state drive (SSD), a flash memory, a random access memory (RAM), or the like, and stores therein the port services support program and various data. The communication device 203 is a communication interface such as wired communication, wireless communication, or the like, and performs control of data communication with an external device. The communication device 203 controls communication with the communication network NW, and thus implements data communication with the external device.

[0029]

Fig. 2(b) illustrates a hardware configuration diagram of the user terminal 3. The user terminal 3 includes, as a hardware configuration, a control device 301, a storage device 302, a communication device 303, an input device 304, and an output device 305. In addition, the user terminal 3 may include a GPS communication device. In the present embodiment, as the user terminal 3, a smartphone, a personal computer, a tablet terminal, or the like can be used.

[0030]

The control device 301 is configured by one or more processors such as a CPU, and controls the entire processing in the user terminal 3 by executing a program for a terminal, an OS, and other applications. The storage device 302 is a HDD, a SSD, a flash memory, a RAM, or the like, and stores therein a browser-based application and various data. The communication device 303 controls communication with the communication network NW, and thus implements data communication with at least with the port services support apparatus 2. The input device 304 is an input interface that receives an input operation by a user, and includes a microphone, a touch panel, a mouse, a keyboard, and the like. The output device 305 includes a display or the like for display output. The GPS

communication device can acquire position coordinates of the user terminal 3 by GPS communication.

[0031]

In the present embodiment, the user terminal 3 may be configured as a reading device. The reading device includes a reading module that reads a two-dimensional code or an electronic tag. In the present embodiment, the two-dimensional code or the electronic tag is physically assigned to a cargo and records therein identification information of the cargo. Note that physically assigning to a cargo includes an aspect in which the two-dimensional code is directly assigned to the cargo, and an aspect of being assigned by being printed on a related document (for example, a procedure form, transport form, or the like) related to the cargo. The reading device includes, as a reading module, an imaging device or an optical reading device for reading a two-dimensional code, or an antenna device for reading an electronic tag, or both of these devices. The two-dimensional code includes a barcode and a QR code (registered trademark). In addition, the two-dimensional code may include a number or a symbol displayed as text, and may be acquired by optical character recognition (OCR) of the imaging device. Note that the reading device may be configured as a device different from the user terminal 3 and may transmit read identification

information to the port services support apparatus 2 via the user terminal 3, or the reading device may transmit the read identification information to the port services support apparatus 2 by wireless communication.

[0032]

In the present embodiment, the two-dimensional code including the identification information related to a cargo is not necessarily physically attached to the cargo itself. Assigning the two-dimensional code to various forms related to the cargo allows the identification processing to be similarly implemented. As a result, even in a case of difficulties in a shape or a property of a cargo or where it is difficult to attach a label, it is possible to reliably assign and acquire the identification information. The forms include a transport slip, an import and export customs clearance document, a manifest list, an inspection record, and the like, and when two-dimensional codes printed on these forms are acquired by the reading device, the cargo can be identified.

[0033]

Fig. 3 is a schematic diagram describing a flow of an import and export operation. In Fig. 3, operations at a place of export are illustrated on the left side, and operations at a place of import are on the right side. In the import and export operation, cargo is shipped by marine

transportation using a ship from an exporter to an importer. In the marine transportation, there exists a port entrance and leave operation for the ship, but details thereof are omitted in Fig. 3.

[0034]

In the import and export operation, first, a contract for import and export of the cargo is concluded between the exporter and the importer (S1). The exporter submits a ship loading request form to the forwarder (including customs agent and marine wagon operator) together with the contracted cargo (S2). The forwarder submits an export declaration form to the customs (S3). The customs issues an export permission form to the forwarder (S4). The forwarder requests ship loading work of the cargo to a shipping company on the basis of the export permission form (S5). The shipping company issues a bill of lading to the exporter (S6) and transports the cargo to the place of import by marine transportation. The exporter submits the bill of lading and a documentary bill to a bank (S7), and the bank pays a settlement amount to the exporter (S8).

[0035]

The importer pays the settlement amount at a local bank (S9) and receives the bill of lading of the cargo to be imported (S10). The forwarder submits an import

declaration form to the customs (S11). The customs issues an import permission form to the forwarder in the case of permitting import (S12). The exporter submits the bill of lading to the shipping company via the forwarder (S13). The shipping company transports the cargo to the importer via the forwarder (S14), whereby the cargo is delivered from the exporter to the importer.

[0036]

Fig. 3 is an outline of the import and export operation, and various procedures are actually carried out among more related persons. The port services support system 1 is a system that supports operations on various procedures by the user terminal 3 operated by each related party.

[0037]

The user terminal 3 is capable of sending information including an attribute of a related party of the port services (hereinafter referred to as related party attribute) to the port services support apparatus 2. The related party attribute includes an exporter, a customs agent, a marine wagon operator, a CY operator, the customs, an inspector, a shipping company, a master mariner, an importers, a bank, an insurance company, a carrier, a warehouse company, immigration bureau, a port administrator, a port traffic control room, a maritime

security department, a quarantine station, and furthermore, a company entrusted with various port services. Note that the related party attribute is not limited to these attributes, and may include an entity having a relationship such as an outsourcing contract in the port services. In addition, it is assumed that the related party attribute is capable of distinguishing the related parties of the place of export and the place of import.

[0038]

The related party attribute is used for specifying a procedurer and a procedure destination of various procedures of the port services, and for other purposes. In the various procedures, a procedurer and a procedure destination are set for each procedure type, and a predetermined procedure can be completed from the procedurer to the procedure destination through referencing of a related party attribute of the user terminal 3.

[0039]

Fig. 4 illustrates a block diagram of the port services support apparatus 2. The operation flow storage unit 51 stores therein operation flow information set by an administrator. The verification information storage unit 52 stores therein verification information set by the administrator.

[0040]

The registration unit 21 receives registration of basic information via the user terminal 3. In the present embodiment, the basic information includes at least one of the cargo information and the port entrance and leave information. Upon the registration of the basic information, the registration unit 21 links the basic information to the identification information and stores it. Receiving registration of cargo information, the registration unit 21 links the cargo information to cargo identification information and stores it in the cargo information storage unit 53. Receiving registration of port entrance and leave information, the registration unit 21 links the port entrance and leave information to ship identification information and stores it in the port entrance and leave information storage unit 54.

[0041]

The cargo information is registered at the time of sales contract between the importer and the exporter. The cargo information includes a freight system (container (FCL), container (LCL), bulk), an item name, a quantity, a consignor, a request date, a receipt date, a transport destination, a destination country, a notification date, a transportation method, and the like. When the cargo is contained in the container by the panning procedure, the cargo information is linked to the identification

information of the container.

[0042]

In the present embodiment, the identification information of the cargo information is physically assigned to the cargo as a two-dimensional code or an electronic tag. In addition, the identification information of the cargo information may be assigned as a two-dimensional code printed on a related document (form types such as a transport slip, a packing list, and a customs clearance form, for example) related to the cargo. The reading device can identify a cargo of a target by reading the two-dimensional code or the electronic tag to acquire the cargo identification information and transmitting the cargo identification information to the port services support apparatus 2.

[0043]

The port entrance and leave information is registered at the time of port entrance arrangement for the ship. The port entrance and leave information includes port information, ship information, and port entrance and/or leave dates. The port information is information related to a port where the ship enters, and includes a port name, a port location, a set area, and the like. The set area indicates an area set for detecting that the ship of the target is approaching the port on schedule. The

ship information includes the ship identification information, a ship location, and the like. The ship information may be acquired from an external database. In the present embodiment, a ship approaching a port is distinguished and managed as being in a state of being ready to enter the port.

[0044]

The container information includes a container number, a consignor, a destination place, and a transportation ship. The container number is container identification information and is physically assigned to the container by a two-dimensional code or an electronic tag. In addition, it may be configured such that a two-dimensional code is attached to a booking document, a bring-in instruction form, or the like related to the container, and identification information such as a container number is described in that document. The container information is registered at the time of booking in the import and export operation. In the booking, a ship onto which the container is loaded is specified and the container information is linked to the ship identification information.

[0045]

When the cargo information is registered, the operation flow information related to the import and export

operation is referred to, and the operation flow management is started. When the port entrance and leave information is registered, the operation flow information related to the port entrance and leave operation is referred to, and the operation flow management is started. The started operation flow information is associated with the corresponding cargo identification information or the ship identification information, and is managed as individual operation flows.

[0046]

The acquisition unit 22 acquires identification information. The identification information includes at least one of the cargo identification information and the ship identification information. The cargo and the ship are moving in the course of distribution. These require a predetermined procedure in each process of distribution. The acquisition unit 22 can specify when, where, and from whom the identification information has been acquired, thereby presenting the corresponding procedure to the user. In addition, it is possible to present to the user which process of the distribution the target is in.

[0047]

The acquisition unit 22 acquires cargo identification information of the cargo from which the two-dimensional code or the electronic tag has been read via

the reading device. The acquisition unit 22 can acquire the identification information and the time stamp of the reading device together and specify the related party attribute and the work date of the user. The acquisition unit 22 refers to a status and a schedule linked to the cargo identification information, and verifies whether they match the acquired related party attribute and the work date. In a case where they match, execution of subsequent procedure processing may be permitted, and in a case where they do not match, an error message may be output or the fact that work delay or the like has occurred may be recorded.

[0048]

The acquisition unit 22 acquires the ship identification information of the ship the position information of which has been detected in a predetermined area set in the port information. As a result, a predetermined procedure can be presented to the ship approaching the port. The acquisition unit 22 can acquire the time stamp together with the ship identification information. The acquisition unit 22 can perform processing of coordinating a port entrance and/or leave dates and a schedule of the port entrance and leave information in accordance with the acquired time stamp.

[0049]

The procedure processing unit 23 executes the procedure processing in accordance with the status of the operation flow for the target specified by the identification information. The procedure processing unit 23 generates a procedural document in accordance with the status of the operation flow on the basis of the basic information, and executes procedure processing of submitting the procedural document. In the present embodiment, the procedural document includes related documents exchanged between related parties and NACCS procedure that are applications for related administrative organizations such as the customs. The contents of each procedural document subjected to the procedure processing are linked to the cargo information or the port entrance and leave information as the submission information and stored in the submission information storage unit 55.

[0050]

The verification unit 24 refers to the verification check table stored in the verification information storage unit 52, and verifies a specific item of the procedural document to be submitted by the procedure processing unit 23. The procedure processing unit 23 can execute procedure processing of submitting the procedural document after executing verification by the verification unit 24.

[0051]

The verification check table is data in which check items to be handled are associated with each procedural document. The verification unit 24 presents information to be referred to for the check items. The verification unit 24 also outputs a classification result of input items of the procedural document based on the check items. The procedure processing unit 23 can perform procedure processing by inputting the input items with reference to the presented information and the classification result.

[0052]

The output unit 25 generates a progress management screen of the operation flow in accordance with the status and the procedural information of the operation flow of the target specified by the identification information. The progress management screen displays at least one of the status and schedule of various procedures. Note that the status and the schedule of the procedure on the progress management screen are indicated by the procedural deadline and the work date calculated by the calculation unit 26.

[0053]

Fig. 5 is a schematic explanatory diagram of the operation flow information in the present embodiment. As the operation flow information, different operation flows are set in accordance with the operation type. In the present embodiment, the operation type is roughly

classified into the import and export operation and the port entrance and leave operation. The operation type is subdivided into export > ship charter contract, export > container (FCL), export > container (LCL), import > conventional freight, import > container (FCL), import container (LCL), and port entrance and leave operation. Note that the operation type is not limited thereto, and may be further subdivided, or another type may be further provided.

[0054]

The operation flow information has an operation flow ID, an operation type, a status, and procedural information. As illustrated in Fig. 5, the operation flow of the operation type T1 has a plurality of statuses (A1, A4, and the like). The status is defined for each stage of the operation, and is used for the progress management of the operation. The status is linked to one or a plurality of pieces of procedural information (Procedures P1, P4 to P6, and the like). The procedural information indicates related documents necessary for the status and various procedures such as the NACCS procedure. The operation flow information is linked to each status and procedural information correspondingly in accordance with the operation type. The status and the procedural information are not limited in type and quantity, but those suitable

for each operation type are set correspondingly.

[0055]

The status has a work date on which work is performed. The procedural information has a procedural deadline which is a time limit for preparing the procedural information. The procedural deadline is set before the work date, and the corresponding procedural information is created by the procedural deadline. On an actual work date, operation is performed while procedural information prepared in advance is being confirmed. For example, in a case where it can be confirmed that the contents of the cargo match the procedural information, when submission procedure of the created procedural information is executed, operation corresponding to each status is completed.

[0056]

The status is roughly divided into statuses of reservation operation and logistics operation. The reservation operation includes, for example, operations related to reservation of a vessel that transports cargos, a container, and the like, and reservation of a company that undertakes docking work of the ship. The logistics operation includes, for example, operations related to logistics of cargos such as customs clearance, CY bring-in, export permission, ship loading, marine transportation,

import permission, and land transportation, and a port entrance and leave operation such as advance notification, port entrance notification, and port leave notification of the ship. In the logistics operation, operations related to logistics are performed by the target reserved in the reservation operation or by each related party. In the logistics operation in the present embodiment, the status is managed along with the movement of the target including a cargo, a container, a ship, and the like.

[0057]

Fig. 6(a) illustrates a data configuration example of operation flow information related to the operation type of export > ship charter contract. The operation flow information has a plurality of status ID, and one or a plurality of pieces of procedural information linked to the status ID.

[0058]

The procedural information has a procedure ID, a work classification, a related document, a NACCS procedure, a procedurer, and a procedure destination. At least one of the related document and the NACCS procedure is present with respect to the procedure ID. There may be a case where one of them is not present, or a case where both of them are present.

[0059]

As the procedural information, a necessary procedure is set in accordance with the cargo information. For example, in a case where an item of the cargo information corresponds to a dangerous article, related documents such as a dangerous article specification and dangerous article specification information registration and the NACCS procedure are set as necessary procedure.

[0060]

In Fig. 6(a), Status A1 indicates a status at the stage of the sales contract. Status A4 indicates a status at the stage of securing a transportation ship. The work classification is a subdivision in accordance with work content performed in each status, and one or a plurality of the work classifications are set in the status. Each of the work classifications is linked to one or a plurality of the related documents or one or a plurality of the NACCS procedures, or both of them.

[0061]

Fig. 6(b) illustrates a data configuration example of the operation flow information related to the operation type of export > container (FCL). In Fig. 6(b), Status A24 indicates a status at the stage of securing a transportation ship, and Status A25 indicates a status at the stage of ship loading procedure. Procedures P24 and P25 are procedures related to booking of making reservation

of a space of the ship. Procedure P25 is a necessary procedure in a case where a dangerous article is included in the item of cargo.

[0062]

Fig. 6(c) illustrates a data configuration example of operation flow information related to the operation type of the port entrance and leave operation. In Fig. 6(c), Status A101 indicates a procedure of each related party at the stage of port entrance arrangement, Status A102 indicates a procedure of each related party at the stage of dispatch, and Status A103 indicates a procedure of each related party at the stage before port entrance.

[0063]

Hereinafter, a mechanism for managing an operation flow with reference to the operation flow information in the port services support system 1 will be described in detail.

[0064]

<Examples of Export Operation>

Receiving basic information (cargo information) of the import and export operation, the registration unit 21 links the basic information to cargo identification information and stores it in the cargo information storage unit 53. When the cargo information is registered, operation flows of the export > ship charter contract and

export > container (FCL or LCL) are set. The set operation flows are linked to the cargo information and individually managed. The cargo information is registered by, for example, the sales contract form of Procedure P1 illustrated in Fig. 6(a).

[0065]

The status of export > ship charter contract includes a sales contract, a marine transportation request, a land transportation request, securing of transportation ship, ship loading procedure, land transportation, customs clearance work, customs clearance application, export declaration, export permission, ship loading, and marine transportation. The status of export > container (FCL) includes a sales contract, a marine transportation request, a land transportation request, securing of transportation ship, ship loading procedure, land transportation, customs clearance work, CY bring-in, customs clearance application, export declaration, export permission, ship loading, and marine transportation. The status of export > container (LCL) includes a sales contract, a marine transportation request, a land transportation request, securing of transportation ship, ship loading procedure, land transportation, customs clearance work, CFS bring-in, customs clearance application, export declaration, export permission, CY bring-in, ship loading, and marine

transportation. For each status, the part to and before the ship loading procedure corresponds to the reservation operation, and the part from and after the land transportation corresponds to the logistics operation.

[0066]

When the operation flow is set, the schedule is set to the status described above. The schedule is determined by referring to the port entrance and leave information of the ship on the basis of the procedural information of the ship charter contract registered in securing the transportation ship. The schedule includes a procedural deadline and a work date. The output unit 25 provides these schedules to the user terminal 3 as a progress management screen. In addition, the output unit 25 can output a notification to each user terminal 3 on the basis of the procedural deadline or the work date set in the schedule. Note that a screen corresponding to each of export and import is provided as the progress management screen.

[0067]

The procedure processing unit 23 executes procedure processing of the procedural information of the ship charter contract in the securing status of the transportation ship in the export > ship charter contract. The procedural information of the ship charter contract

includes the ship information of the ship that transports a cargo, and the cargo information is linked to the ship information by this procedure processing. The procedural information of the ship charter contract is, for example, the ship charter contract form of Procedure P4 illustrated in Fig. 6(a).

[0068]

The procedure processing unit 23 executes procedure processing of the procedural information of booking in the securing status of the transport vessel of the export > container. The procedural information of booking includes the ship information of the ship that transports a container, and the container information is linked to the ship information by this procedure processing. The procedural information of booking is, for example, the booking request form of Procedure P24 illustrated in Fig. 6(b).

[0069]

The procedure processing unit 23 executes procedure processing of panning in the ship loading procedure of the container (FCL). The procedural information of panning includes the container information of the container that accommodates a cargo, and the cargo information is linked to the container information by this procedure processing. The procedural information of panning is, for example, the

panning of Procedure P41 illustrated in Fig. 6(b). For the container (FCL), a set of containers after the panning is subjected to the customs clearance procedure.

[0070]

On the other hand, the procedure of panning the cargo to the container (LCL) is performed after the individual cargos are subjected to the customs clearance procedure and the export permission is issued. The panning of the container (LCL) is linked to the status of export permission, and the cargo information has been linked to the container information in the stage of export permission. In this manner, Export > Container (FCL) and Export > Container (LCL) are linked to different panning statuses, and procedures are managed following the operation flow information of each operation type.

[0071]

In the logistics operation, the acquisition unit 22 acquires the cargo identification information or the container identification information, and identifies the cargo or the container as a target. In the logistics operation, the identification information of a cargo or a container to be transported is read by a two-dimensional code or an electronic tag via a reading device. The procedure processing unit 23 generates a procedure screen (not illustrated) on the basis of the identification

information of the cargo or the container, the related party attribute of the transmission source, and the status, and presents the procedure screen to the user terminal 3. In a case where the procedure processing of all necessary procedures of the procedural information associated with the status has been completed, the procedure processing unit 23 receives an update instruction to the status via the procedure screen and updates the status.

[0072]

The procedure in the panning of the container (LCL) will be described as a specific example. The procedure processing unit 23 executes procedure processing of the panning in the status of the export permission of the container (LCL). At this time, the acquisition unit 22 acquires the cargo identification information via the reading device operated by a stevedoring company, and the procedure processing unit 23 generates the procedure screen of the panning when the cargo is in the status of the export permission. In a case where an export permit (related document) and a bring-out confirmation registration (NACCS procedure) associated with the status of export permission have been submitted by the marine wagon operator to the customs, the procedure processing unit 23 receives registration of the procedural information of panning (related document) and panning information

registration (NACCS procedure). As a result, the panning procedure is completed, the status of export permission is completed, and the status is updated to the status of CY bring-in.

[0073]

When the status of the ship loading is completed, the procedure processing unit 23 executes the procedure processing related to the issuance of the bill of lading from the shipping company to the exporter, updates the status from the ship loading to the marine transportation, and completes the operation flow of the export operation.

[0074]

As described above, the export operation from the sales contract to the marine transportation is managed by updating the status, and the cargo is exported.

[0075]

<Examples of Import Operation>

In the import operation, operation flows of import > conventional freight and import > container (FCL or LCL) are set on the basis of the cargo information registered in the export operation.

[0076]

The status of import > conventional freight includes marine transportation, unloading, customs clearance application, import declaration, import permission, pickup,

and land transportation. The status of import > container (FCL) includes marine transportation, unloading, CY bring-in, customs clearance application, import declaration, import permission, CY bring-out, pickup, and land transportation. The status of import > container (LCL) includes marine transportation, unloading, CY bring-in, CFS bring-in, customs clearance application, import declaration, import permission, pickup, and land transportation. Each status of the import operation corresponds to the logistics operation.

[0077]

The acquisition unit 22 acquires the ship identification information of the ship the position information of which has been detected in a predetermined area set in the port information. The procedure processing unit 23 extracts the cargo information and container information associated with the acquired ship identification information. The procedure processing unit 23 sends the procedural information of arrival notification associated with the status of marine transportation for the extracted cargo information and the container information to the user terminal 3 of the shipping company. The procedure processing unit 23 receives registration of procedural information including an arrival notice via the user terminal 3, executes the procedure processing, and

updates the status from marine transportation to unloading.
[0078]

In addition, the procedure processing unit 23 extracts the cargo information associated with the ship identification information acquired by the acquisition unit 22, and executes procedure processing of the procedural information related to freight delivery. The freight delivery is procedure performed from the importer and the CY operator to the customs agent, and includes submission procedure of the related document including the bill of lading and delivery instructions.
[0079]

The procedure processing unit 23 executes various types of procedure processing for a cargo of a target on the basis of the cargo identification information acquired via the reading device for procedure related to each status of unloading, CY bring-in, customs clearance application, import declaration, import permission, pickup, and land transportation. When the land transportation is completed, the operation flow of the import operation is completed.
[0080]

As described above, the import operation from the marine transportation to the land transportation is managed by updating the status, and the cargo is transported to the importer.

[0081]

<Examples of Port Entrance and Leave Operation>

Receiving basic information (port entrance and leave information) of the port entrance and leave operation, the registration unit 21 links the basic information to ship identification information and stores it in the port entrance and leave information storage unit 54. When the port entrance and leave information is registered, an operation flow of the port entrance and leave operation is set. The operation flow of the port entrance and leave operation is managed by the ship identification information. The port entrance and leave information is registered by the procedure request of Procedure P101 illustrated in Fig. 6(c).

[0082]

The status of the port entrance and leave operation includes port entrance arrangement, dispatch (entrance), before port entrance, after port entrance, dispatch (leave), and after port leave. The statuses of the port entrance arrangement and the dispatch (entrance or leave) correspond to the reservation operation, and the statuses before port entrance and after port entrance, and after port leave correspond to the logistics operation.

[0083]

When the operation flow of the port entrance and

leave operation is set, the schedule including the procedural deadline and the work date is set to the status described above. The output unit 25 provides these schedules to the user terminal 3 as a progress management screen. In addition, it is possible to notify each user terminal 3 of the procedural deadline and the work date.

[0084]

The procedure processing unit 23 receives registration of procedural information for each related party and executes the procedure processing, in the statuses of the port entrance arrangement and the dispatch related to the reservation operation. In the dispatch, the procedure of arrangement of respective contractors of insurance, loading items, a pilot of docking work, an attendant board, a tag boat, and stevedoring work is performed.

[0085]

The acquisition unit 22 acquires the ship identification information of the ship the position information of which has been detected in a predetermined area set in the port information. The procedure processing unit 23 enables execution of procedure processing for procedure of statuses before port entrance, after port entrance, and after port leave of a ship specified by the acquired ship identification information.

[0086]

The procedural information associated with the status before port entrance includes guarantee contract information, ship security information, advance notification, application for permission for entrance into and departure from closed port, application for permission to use mooring facility, etc., mooring facility use notification, quarantine notification, route notification, application related to loading of dangerous goods, and the like. The procedural information associated with the status after port entrance includes a port entrance notification (customs, port administrator, harbor master, immigration bureau, maritime declaration of health), report of matters related to a crew and passengers, ship item record, report of matters related to load, application for crew member's landing permit, and the like. The procedural information associated with the status after port leave includes a port leave notification (customs, port administrator, harbor master, immigration bureau), tax payment and declaration, movement notification, and the like.

[0087]

The schedule of the port entrance and leave operation of the ship varies depending on a navigation delay or the like. Therefore, various necessary procedures

are presented at appropriate timings in response to the actual approach of the ship to the harbor portion, so that it is possible to efficiently support the port entrance and leave operation.

[0088]

The verification unit 24 refers to the verification check table for a verification item corresponding to each piece of procedural information, and thus performs verification processing. The verification information storage unit 52 has a law check table and an item check table.

[0089]

The law check table stores a law corresponding to the procedural information. The verification unit 24 refers to the law check table, and thus verifies a verification item of a corresponding piece of procedural information. For example, a submission deadline of the procedural information related to the port entrance and leave operation is determined to a predetermined period before a ship enters a port, for example. In addition, the submission deadline may vary depending on items of procedural information such as a ship type, a gross tonnage, a port of call, a port of entry, a navigation sea area, a length of the ship, and a type of a dangerous article to be loaded. The verification unit 24 can output

the submission deadline of each procedure by verifying these verification items.

[0090]

The item check table stores a table for determining whether the item of the cargo information corresponds to a dangerous article or determining which item classification of the customs clearance application corresponds to the item of the cargo. The verification unit 24 refers to the item check table and outputs a classification result of an item. The verification unit 24 outputs a warning notification in a case where the item corresponds to a dangerous article on the basis of the classification result. The verification unit 24 outputs a tax rate or a tax amount of each item classification as a result of classification.

[0091]

Fig. 7 illustrates a schematic diagram of progress management information of a cargo. The progress management information is used for schedule management for a procedural deadline and a work date. The progress management information of the cargo includes the schedule information illustrated in Fig. 7(a) and the procedural progress information illustrated in Fig. 7(b). The progress management information is generated in accordance with the status of cargo information and the procedural

information. The output unit 25 generates a progress management screen on the basis of the progress management information and outputs the progress management screen to each user terminal 3. As a result, the user can check the schedule of the cargo as a target and the state of progress of the procedure.

[0092]

The calculation unit 26 can calculate a work date and a procedural deadline included in the progress management information. The calculation unit 26 acquires the port entrance and/or leave dates included in the port entrance and leave information, and calculates a work date of port services corresponding to each status. The calculation unit 26 acquires the work date of each status and calculates a procedural deadline corresponding to each piece of procedural information. The operation flow storage unit 51 stores work date calculation data in which work dates with respect to port entrance and/or leave dates are set and procedural deadline calculation data in which a procedural deadline with respect to the work date is set. The work date calculation data can set different work dates for each status. In addition, procedural deadline calculation data can set different procedural deadline for each procedural deadline. In a case where there is a change in the port entrance and/or leave dates or the

status, the calculation unit 26 can reflect the change in the schedule with reference to the work date calculation data and the procedural deadline calculation data.

[0093]

As illustrated in Fig. 7(a), the schedule information includes cargo identification information (cargo ID), an item name, and a schedule of each status. The schedule is indicated as a completion date or a scheduled date (work date) of the work of the status. When completing the procedure of each status, the procedure processing unit 23 records the date as the completion date. In the present embodiment, the schedule corresponding to each status includes container arrangement (securing of an export ship), export permission, receipt (land transportation), CFS (CFS bring-in), CY (CY bring-in), customs clearance date (customs clearance application), ship loading completion, port leave date, port entrance date, CY, CFS, import permission, customs clearance date, delivery (pickup), transport (land transportation), and bring-in (land transportation completion). For the port leave date and the port entrance date, the port entrance and leave information of the ship associated with the cargo information may refer to.

[0094]

As illustrated in Fig. 7(b), the procedural progress

information includes cargo identification information, an item name, and a procedural situation of each status. The procedural situation becomes "completed" when the procedure processing of all necessary procedures of the procedural information set for each status of the cargo information of the target is completed. Note that the procedural situation may indicate uncompletion of each piece of the procedural information of the cargo information of the target. In addition, in the illustrated example, the procedural situation indicates the name of a related party as a procedure destination. The procedural situation may further indicate a procedural deadline.

[0095]

Fig. 8 illustrates a schematic diagram of progress management information of the port entrance and leave operation of a ship. The progress management information of the port entrance and leave operation includes the schedule information illustrated in Fig. 8(a) and the procedural progress information illustrated in Fig. 8(b). The progress management information is generated in accordance with a status of port entrance and leave operation and procedural information. The output unit 25 generates a progress management screen on the basis of the progress management information and outputs the progress management screen to the user terminal 3. As a result, the

user terminal 3 can check the schedule of the ship as a target and the state of progress of the procedure.

[0096]

As illustrated in Fig. 8(a), the schedule information includes a ship name, ship identification information (IMO, call sign), and a port entrance and leave schedule. The port entrance and leave schedule includes a port name of arrival and departure port, the contents of port services (docking, anchoring, stevedoring, and the like), and the dates of the port services.

[0097]

As illustrated in Fig. 8(b), the procedural progress information includes the ship name, the ship identification information, and a procedural situation of each piece of procedural information. The procedural situation indicates uncompletion of the procedural information related to each status of the port entrance and leave operation. In addition, as illustrated in Fig. 8(c), the procedural progress information includes procedural situations related to the respective contractors of insurance, loading items, a pilot of docking work, an attendant board, a tag boat, stevedoring handling work, and the like. In the procedural situation related to the arrangement, the name of the related party as the arrangement destination may be further displayed.

[0098]

Hereinafter, in the present embodiment, the following embodiments (1) to (7) may be adopted.

(1) A port services support system including: a registration unit that receives registration of basic information in accordance with an operation type of a port operation and links the basic information to identification information; a storage unit that stores one or a plurality of operation flows corresponding to the operation type; an acquisition unit that acquires the identification information; and a procedure processing unit that executes procedure processing in accordance with a status of the operation flow for a target specified by the identification information.

(2) The port services support system according to (1), in which the procedure processing unit generates a procedural document in accordance with the status of the operation flow on the basis of the basic information, and executes procedure processing of submitting the procedural document.

(3) The port services support system according to (2), in which the storage unit stores a verification check table, and the port services support system includes a verification unit that refers to the verification check table, and verifies a specific item of the procedural

document.

(4) The port services support system according to any one of (1) to (3), in which a status of the operation flow is linked to one or a plurality of pieces of procedural information, and the procedure processing unit updates the status by completing procedure processing of all necessary procedures of the procedural information.

(5) The port services management system according to any one of (1) to (4), including an output unit that generates, in accordance with a status of an operation flow specified by the identification information, a progress management screen of the operation flow.

(6) The port services support system according to any one of (1) to (5), in which the registration unit links basic information of import and export to cargo identification information, the cargo identification information is physically assigned to the cargo as a two-dimensional code or an electronic tag, and the acquisition unit acquires the cargo identification information of the cargo from which the two-dimensional code or the electronic tag is read via a reading device.

(7) The port services support system according to any one of (1) to (6), in which the registration unit links basic information of a port entrance and leave operation to ship identification information, the basic information

including port information, and the acquisition unit acquires the ship identification information by detecting position information of the ship in a predetermined area set in the port information.

[0099]

The embodiment according to (1) makes it possible to support performing an appropriate procedure in accordance with a status corresponding to an operation type.

The embodiment according to (2) makes it possible to automatically generate a procedural document in accordance with the status of the operation flow and efficiently perform procedure.

The embodiment according to (3) makes it possible to verify a specific item of a procedural document using the verification check table, and thus makes it possible to improve the drafting accuracy of the document.

The embodiment according to (4) makes it possible to appropriately update the status of the operation flow in accordance with the procedure processing of the procedural information.

The embodiment according to (5) makes it possible to generate a screen display in accordance with the status, and thus the support progress management of the port services by visualizing the progress.

The embodiment according to (6) makes it possible to

perform an appropriate and efficient procedure in accordance with the actual state of the cargo by reading the identification information physically assigned to the cargo.

The embodiment according to (7) makes it possible to detect approaching of a ship to the port and perform an appropriate and efficient procedure in accordance with an actual state of the ship.

Reference Signs List

[0100]

- 1 Port services support system
- 2 Port services support apparatus
- 21 Registration unit
- 22 Acquisition unit
- 23 Procedure processing unit
- 24 Verification unit
- 25 Output unit
- 3 User terminal
- 4 Ship device
- 5 Storage unit
- 51 Operation flow storage unit
- 52 Verification information storage unit
- 51 Cargo information storage unit
- 52 Ship information storage unit

53 Submission information storage unit

CLAIMS

Claim 1.

A port services support system comprising:

a storage unit that stores one or a plurality of pieces of operation flow information corresponding to each of an import and export operation and a port entrance and leave operation which are port services,

the operation flow information having a plurality of statuses and one or a plurality of pieces of procedural information linked to the statuses;

a registration unit that starts operation flow management by receiving registration of cargo information in accordance with the import and export operation, and linking the cargo information to cargo identification information and operation flow information corresponding to the import and export operation, and

starts operation flow management by receiving registration of port entrance and leave information in accordance with the port entrance and leave operation, and linking the port entrance and leave information to ship information including ship identification information and operation flow information corresponding to the port entrance and leave operation,

the port entrance and leave information including a port entrance and/or leave dates and port information;

a procedure processing unit that links the cargo information to the ship information by executing, for a cargo specified by the cargo identification information, procedure processing of the procedural information linked to a status of reservation operation of a ship that transports the cargo;

an acquisition unit that acquires the cargo identification information that has been assigned to the cargo and read, and the ship identification information of the ship, position information of the ship having been detected in a predetermined area set in the port information, and

coordinates the port entrance and/or leave dates of the port entrance and leave information linked to the ship identification information in accordance with a time stamp acquired together with the ship identification information; and

a calculation unit that acquires the port entrance and/or leave dates of the ship associated with the cargo information, and calculates a work date for the port entrance and/or leave dates and a procedural deadline for the work date.

Claim 2.

The port services support system according to claim 1, wherein the procedure processing unit generates a

procedural document in accordance with a status of the operation flow information on the basis of the cargo information or the port entrance and leave information, and executes procedure processing of submitting the procedural document.

Claim 3.

The port services support system according to claim 2, wherein

the storage unit stores a verification check table including a law check table,

the law check table storing a law corresponding to the procedural information, and a submission deadline in accordance with an item of the procedural information defined by a law is set, and

the port services support system comprises a verification unit that refers to the law check table, verifies a specific item of the procedural information, and outputs the submission deadline.

Claim 4.

The port services support system according to claim 1 or 2, wherein a status of the operation flow information is defined for each stage of operation, one or a plurality of pieces of procedural information is linked to one status, and

the procedure processing unit updates the status to

a status of a next stage by completing procedure processing of all necessary procedures set in the procedural information associated with the one status.

Claim 5.

The port services support system according to claim 1 or 2, comprising an output unit that

generates a progress management screen for the cargo in accordance with a status of operation flow information related to an import and export operation for the cargo specified by the cargo identification information, and

generates a progress management screen for port entrance and leave of the ship in accordance with a status of operation flow information related to a port entrance and leave operation for the ship specified by the ship identification information.

Claim 6.

The port services support system according to claim 1 or 2, wherein

the cargo identification information is physically assigned to the cargo or a related document as a two-dimensional code or an electronic tag, and

the acquisition unit acquires the cargo identification information of the cargo from which the two-dimensional code or the electronic tag has been read via a reading device.

Claim 7.

A port services support method of causing a computer to execute processing of:

storing one or a plurality of pieces of operation flow information corresponding to each of an import and export operation and a port entrance and leave operation which are port services,

the operation flow information having a plurality of statuses and one or a plurality of pieces of procedural information linked to the statuses;

starting operation flow management by receiving registration of cargo information in accordance with the import and export operation, and linking the cargo information to cargo identification information and operation flow information corresponding to the import and export operation, and

starting operation flow management by receiving registration of port entrance and leave information in accordance with the port entrance and leave operation, and linking the port entrance and leave information to ship information including ship identification information and operation flow information corresponding to the port entrance and leave operation,

the port entrance and leave information including a port entrance and/or leave dates and port information;

linking the cargo information to the ship information by executing, for a cargo specified by the cargo identification information, procedure processing of the procedural information linked to a status of reservation operation of a ship that transports the cargo;

acquiring the cargo identification information that has been assigned to the cargo and read, and the ship identification information of the ship, position information of the ship having been detected in a predetermined area set in the port information,

coordinating the port entrance and/or leave dates of the port entrance and leave information linked to the ship identification information in accordance with a time stamp acquired together with the ship identification information;

acquiring the port entrance and/or leave dates of the ship associated with the cargo information, and calculating a work date for the port entrance and/or leave dates and a procedural deadline for the work date.

Claim 8.

A port services support program causing a computer to function as:

a storage unit that stores one or a plurality of pieces of operation flow information corresponding to each of an import and export operation and a port entrance and leave operation which are port services,

the operation flow information having a plurality of statuses and one or a plurality of pieces of procedural information linked to the statuses;

a registration unit that starts operation flow management by receiving registration of cargo information in accordance with the import and export operation, and linking the cargo information to cargo identification information and operation flow information corresponding to the import and export operation, and

starts operation flow management by receiving registration of port entrance and leave information in accordance with the port entrance and leave operation, and linking the port entrance and leave information to ship information including ship identification information and operation flow information corresponding to the port entrance and leave operation,

the port entrance and leave information including a port entrance and/or leave dates and port information;

a procedure processing unit that links the cargo information to the ship information by executing, for a cargo specified by the cargo identification information, procedure processing of the procedural information linked to a status of reservation operation of a ship that transports the cargo;

an acquisition unit that acquires the cargo

identification information that has been assigned to the cargo and read, and the ship identification information of the ship, position information of the ship having been detected in a predetermined area set in the port information, and

coordinates the port entrance and/or leave dates of the port entrance and leave information linked to the ship identification information in accordance with a time stamp acquired together with the ship identification information; and

a calculation unit that acquires the port entrance and/or leave dates of the ship associated with the cargo information, and calculates a work date for the port entrance and/or leave dates and a procedural deadline for the work date.