

DESCRIPTION

TITLE OF INVENTION: MANAGEMENT SYSTEM, MANAGEMENT METHOD, AND
MANAGEMENT PROGRAM

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TECHNICAL FIELD

[0001] The present disclosure relates to a management system, a management method, and a management program.

10 BACKGROUND ART

[0002] When purchasing a product or receiving the provision of a service, parties involved usually confirm in advance purchase content or service content, and related content, costs, and the like. This confirmation prevents a difference in recognition between the parties and enables smooth transaction.

15 Methods of confirming at this time includes, for example, creating and sharing an estimate sheet, orally describing and sharing contents, or the like.

For example, Patent Literature 1 describes a calculation model for estimating vehicle damage repair illustrated in paragraph 0018. Further, paragraph 0019 of the literature discloses that the calculation model specifies one or more damaged portions from an image, specifies
20 whether the damaged portion can be repaired or replaced, and calculates a repair cost estimate for vehicle damage.

As a result, Patent Literature 1 discloses a content that enables quick processing of insurance payment relating to the vehicle damage.

25 CITATION LIST

PATENT LITERATURE

[0003] Patent Literature 1: JP2022-091875A

SUMMARY OF INVENTION

30 TECHNICAL PROBLEM

[0004] These confirmations are generally performed when a purchaser of a product or a service receiver approves an estimate or the like provided by a seller (service provider side). In particular, when the provision of a service is received, a service provider side may create an

estimate or the like after confirming predetermined items, and a service receiver may approve the estimate.

That is, in many cases, a receiver who receives the provision of the service trusts and accepts the information confirmed by the service provider. Of course, it is desirable for the receiver to confirm the credibility of the confirmation items on the service provider side, but in a case of receiving a highly specialized service, it is difficult to particularly confirm the content of the estimate in detail and request detailed indication or change.

[0005] Also in Patent Literature 1, by performing processing of specifying the damaged portion, and then performing processing of specifying whether the damaged portion can be repaired or is suitable for replacement, the estimate is calculated. That is, since the "performing processing of specifying the damaged portion, and then performing processing of specifying whether the damaged portion can be repaired or is suitable for replacement" described in Patent Literature 1 is a confirmation item by the service provider, the receiver who receives the provision of the service needs to trust it and determine whether to receive the provision of the service.

In this way, it is common that the confirmation item confirmed on the service provider side is trusted, and the content of the estimate created based on the confirmation item is accepted by the service receiver.

[0006] Therefore, an object of the present disclosure is to provide a management system, a management method, and a management program capable of objectively confirming information on a provided service.

SOLUTION TO PROBLEM

[0007] A management system according to an aspect of the present disclosure includes: a control device that includes a first vehicle information acquisition unit configured to acquire vehicle information on a vehicle, with an instruction issued by another worker different from a user of the vehicle as a trigger, a work specification unit configured to specify work to be performed on the vehicle indicated by the vehicle information based on the vehicle information acquired by the vehicle information acquisition unit, a first creation unit configured to create first work content information related to the work using work information for the work specified by the work specification unit, and a first work content information storage unit configured to store the first work content information created by the first creation unit; and an instruction device that includes a user information acquisition unit configured to acquire user information

on the user, a second vehicle information acquisition unit configured to acquire vehicle information on the vehicle, with an instruction issued by the user as a trigger, a work type designation unit configured to designate a work type of the work to be performed the vehicle, a type standard work output unit configured to output, for the work type designated by the work type designation unit, standard work in which the work for the work type is specified, a second creation unit configured to create second work content information using the work specified from the standard work for the work type output by the type standard work output unit and the vehicle information acquired by the second vehicle information acquisition unit, and a second work content information storage unit configured to store the second work content information created by the second creation unit, in which at least one of the control device and the instruction device includes a comparison result output unit that outputs a comparison result obtained by comparing the first work content information created by the first creation unit with the second work content information created by the second creation unit.

[0008] A management method according to another aspect of the present disclosure includes:

by a first computer that is a control device, acquiring vehicle information on a vehicle, with an instruction issued by another worker different from a user of the vehicle as a trigger; specifying work to be performed on the vehicle indicated by the vehicle information based on the acquired vehicle information; creating first work content information related to the work using work information for the specified work; and storing the created first work content information; and by a second computer that is an instruction device, acquiring user information on the user; acquiring vehicle information on the vehicle, with an instruction issued by the user as a trigger; designating a work type of the work to be performed the vehicle; outputting, for the designated work type, standard work in which the work for the work type is specified; creating second work content information using the work specified from the standard work for the output work type and the acquired vehicle information; and storing the created second work content information, in which at least one of the first computer and the second computer outputs a comparison result obtained by comparing the created first work content information with the created second work content information.

[0009] A management program according to another aspect of the present disclosure causes

a first computer as a control device to execute: processing of acquiring vehicle information on a vehicle, with an instruction issued by another worker different from a user of the vehicle as a trigger; processing of specifying work to be performed on the vehicle indicated by the vehicle information based on the acquired vehicle information; processing of creating first work content

information related to the work using work information for the specified work; and processing of storing the created first work content information; and causes a second computer as an instruction device to execute: processing of acquiring user information on the user; processing of acquiring vehicle information on the vehicle, with an instruction issued by the user as a trigger; processing of designating a work type of the work to be performed the vehicle; processing of outputting, for the designated work type, standard work in which the work for the work type is specified; processing of creating second work content information using the work specified from the standard work for the output work type and the acquired vehicle information; and processing of storing the created second work content information, in which at least one of the first computer and the second computer is caused to output a comparison result obtained by comparing the created first work content information with the created second work content information.

[0010] A management system according to an aspect of the present disclosure further includes: a control device that includes a first vehicle information acquisition unit configured to acquire vehicle information on a vehicle, a work specification unit configured to specify work to be performed on the vehicle indicated by the vehicle information based on the vehicle information acquired by the first vehicle information acquisition unit, a first creation unit configured to create first work content information related to the work using work information for the work specified by the work specification unit, a first work content information storage unit configured to store the first work content information created by the first creation unit in association with the vehicle, and a work record information save unit configured to save work record information including work content of the work performed on the vehicle and work result information; an instruction device that includes a user information acquisition unit configured to acquire user information on the user, a second vehicle information acquisition unit configured to acquire vehicle information on the vehicle, with an instruction issued by the user as a trigger, a work type designation unit configured to designate a work type of the work to be performed the vehicle, a type standard work output unit configured to output, for the work type designated by the work type designation unit, standard work in which the work for the work type is specified, a second creation unit configured to create second work content information using the work specified from the standard work for the work type output by the type standard work output unit and the vehicle information acquired by the second vehicle information acquisition unit, and a second work content information storage unit configured to store the second work content information created by the second creation unit; and a management device connectable

to the control device and the instruction device, in which the work record information save unit saves the first work content information or the second work content information, which is a source of the work content of the work performed on the vehicle, and the work record information in association with each other, and the instruction device or the management device further includes a verification unit configured to verify whether the work record information related to the work performed on the vehicle is based on the first work content information or the second work content information saved in association with the work record information, and a verification result output unit configured to output verification result information verified by the verification unit.

In the management system according to an aspect of the present disclosure, the management device further includes: an appropriateness determination information storage unit configured to store appropriateness determination information used for appropriateness determination of the work based on the work information used for the creation of the first work content information, in which the verification unit verifies whether the work record information matches the appropriateness determination information, and outputs that the work is based on the first work content information or the second work content information if the work record information matches the appropriateness determination information, and outputs that the work is not based on the first work content information or the second work content information if the work record information does not match the appropriateness determination information.

A management method according to an aspect of the present disclosure includes: by a first computer, acquiring vehicle information on a vehicle; specifying work to be performed on the vehicle indicated by the vehicle information based on the acquired vehicle information; creating first work content information related to the work using work information for the specified work; storing the created first work content information in association with the vehicle; and saving work record information including the work content of the work performed on the vehicle and work result information; and by a second computer, acquiring user information on the user; acquiring vehicle information on the vehicle, with an instruction issued by the user as a trigger; designating a work type of the work to be performed the vehicle; outputting, for the designated work type, standard work in which the work for the work type is specified; creating second work content information using the work specified from the standard work for the output work type and the acquired vehicle information; and storing the created second work content information, in which the first computer saves the first work content information or the second work content information, which is a source of the work content of

the work performed on the vehicle, and the work record information in association with each other, the first computer or a computer connectable to the first computer and the second computer verifies whether the work record information related to the work performed on the vehicle is based on the first work content information or the second work content information saved in association with the work record information, and outputs verified verification result information.

A management program according to an aspect of the present disclosure causes a first computer to execute: processing of acquiring vehicle information on a vehicle; processing of specifying work to be performed on the vehicle indicated by the vehicle information based on the acquired vehicle information; processing of creating first work content information related to the work using work information for the specified work; processing of storing the created first work content information in association with the vehicle; and processing of saving work record information including the work content of the work performed on the vehicle and work result information; and causes a second computer to execute: processing of acquiring user information on the user; processing of acquiring vehicle information on the vehicle, with an instruction issued by the user as a trigger; processing of designating a work type of the work to be performed the vehicle; processing of outputting, for the designated work type, standard work in which the work for the work type is specified; processing of creating second work content information using the work specified from the standard work for the output work type and the acquired vehicle information; and processing of storing the created second work content information, in which the first computer is caused to save the first work content information or the second work content information, which is a source of the work content of the work performed on the vehicle, and the work record information in association with each other, the first computer or a computer connectable to the first computer and the second computer is caused to execute processing of verifying whether the work record information related to the work performed on the vehicle is based on the first work content information or the second work content information saved in association with the work record information, and processing of outputting verified verification result information.

ADVANTAGEOUS EFFECTS OF INVENTION

[0011] According to the present disclosure, it is possible to objectively confirm information on a provided service.

BRIEF DESCRIPTION OF DRAWINGS

[0012] [FIG. 1] FIG. 1 is a system configuration diagram of a management system according to an embodiment of the present disclosure.

5 [FIG. 2] FIG. 2 is a block diagram showing a detailed configuration of a control device, an instruction device, and a management device constituting the management system according to the embodiment of the present disclosure.

[FIG. 3] FIG. 3 is an example of a hardware configuration in a case where each of the control device, the instruction device, and the management device constituting the management system according to the embodiment of the present disclosure is implemented by a computer.

10 [FIG. 4] FIG. 4 is a sequence diagram illustrating a processing transition performed in the management system according to the embodiment of the present disclosure.

[FIG. 5] FIG. 5 is a sequence diagram illustrating the processing transition performed in the management system according to the embodiment of the present disclosure.

15 [FIG. 6] FIG. 6 is a sequence diagram illustrating the processing transition performed in the management system according to the embodiment of the present disclosure.

[FIG. 7] FIG. 7 is a sequence diagram illustrating the processing transition performed in the management system according to the embodiment of the present disclosure.

[FIG. 8] FIG. 8 is a sequence diagram illustrating the processing transition performed in the management system according to the embodiment of the present disclosure.

20 [FIG. 9] FIG. 9 is a diagram illustrating examples of screens displayed on the instruction device constituting the management system according to the embodiment of the present disclosure.

25 [FIG. 10] FIG. 10 is a diagram illustrating examples of screens displayed on the instruction device constituting the management system according to the embodiment of the present disclosure.

[FIG. 11] FIG. 11 is a diagram illustrating examples of screens displayed on the instruction device constituting the management system according to the embodiment of the present disclosure.

30 [FIG. 12] FIG. 12 is a diagram illustrating examples of screens displayed on the instruction device constituting the management system according to the embodiment of the present disclosure.

[FIG. 13] FIG. 13 is a diagram illustrating examples of screens displayed on the instruction device constituting the management system according to the embodiment of the

present disclosure.

[FIG. 14] FIG. 14 is a diagram illustrating an example of a diagnostic machine and a diagnostic result displayed on a display unit of the diagnostic machine.

5 [FIG. 15] FIG. 15 is a diagram illustrating examples of a user information table and a vehicle information table used in the management system according to the embodiment of the present disclosure.

[FIG. 16] FIG. 16 is a diagram illustrating examples of a vehicle image information table, a work history information table, and a workplace list information table used in the management system according to the embodiment of the present disclosure.

10 [FIG. 17] FIG. 17 is a diagram illustrating examples of an estimate information table and a unit price information table used in the management system according to the embodiment of the present disclosure.

[FIG. 18] FIG. 18 is a flowchart illustrating a flow of processing performed in the management system according to the embodiment of the present disclosure.

15 [FIG. 19] FIG. 19 is a flowchart illustrating a flow of the processing performed in the management system according to the embodiment of the present disclosure.

[FIG. 20] FIG. 20 is a flowchart illustrating a flow of the processing performed in the management system according to the embodiment of the present disclosure.

20 [FIG. 21] FIG. 21 is a flowchart illustrating a flow of the processing performed in the management system according to the embodiment of the present disclosure.

[FIG. 22] FIG. 22 is a flowchart illustrating a flow of the processing performed in the management system according to the embodiment of the present disclosure.

[FIG. 23] FIG. 23 is a flowchart illustrating a flow of the processing performed in the management system according to the embodiment of the present disclosure.

25 [FIG. 24] FIG. 24 is a flowchart illustrating a flow of the processing performed in the management system according to the embodiment of the present disclosure.

[FIG. 25] FIG. 25 is a flowchart illustrating a flow of the processing performed in the management system according to the embodiment of the present disclosure.

30 [FIG. 26] FIG. 26 is a flowchart illustrating a flow of the processing performed in the management system according to the embodiment of the present disclosure.

DESCRIPTION OF EMBODIMENTS

[0013] An embodiment of the present disclosure will be described with reference to the

drawings. In the following embodiment, mutual techniques can be applied between embodiments including modifications. The following embodiment is not intended to limit the contents of the present disclosure, and modifications can be made without departing from the scope of the claims.

5 [0014] FIG. 1 is a system configuration diagram of a management system according to an embodiment of the present disclosure.

[0015] A management system 1 illustrated in FIG. 1 includes a control device 100, an instruction device 200, a management device 300, and an external device 400. In FIG. 1, only one of each of these devices is illustrated, but for convenience of description, it is only
10 illustrated, and it is naturally possible to adopt a configuration in which a plurality of each device is provided. It should be noted that the management system may not be present independently or may be a part of another system. That is, it may be implemented as a part of functions in another system.

[0016] FIG. 2 is a block diagram illustrating a detailed configuration of the control device
15 100, the instruction device 200, and the management device 300 constituting the management system 1 according to the embodiment of the present disclosure.

The control device 100 includes a transmission and reception unit 101, an information processing unit 102, an acquisition unit 103, a storage unit 104, a diagnostic unit 105, a work information specification unit 106, an estimate creation unit 107, an estimate comparison unit
20 108, a workplace determination unit 109, an authentication information determination unit 110, a work instruction information creation unit 111, and an output processing unit 112.

Further, the instruction device 200 includes a transmission and reception unit 201, an information processing unit 202, a setting registration unit 203, an acquisition unit 204, a storage unit 205, an operation unit 206, a display unit 207, a type designation unit 208, a work
25 output unit 209, an information update unit 210, an estimate creation unit 211, a diagnostic unit 212, a work determination unit 213, an estimate comparison unit 214, a workplace extraction unit 215, and a workplace setting unit 216.

The management device 300 includes a transmission and reception unit 301, a verification unit 302, an output unit 303, a comparison processing unit 304, an output processing unit 305, a storage unit 306, an authentication information setting unit 307, and an
30 information registration unit 308.

The following description will be made with reference to FIGS. 1 and 2.

[0017] <Control Device 100>

The control device 100 is implemented by a computer having a configuration as illustrated in FIG. 3, is a device provided in a providing source that provides a predetermined service, and is also referred to as a "providing source device". The control device 100 is a device associated with a workplace that performs work related to a predetermined service, is often provided in the workplace, and is also referred to as a "workplace device". That is, an expression method differs depending on the type of service to be provided.

[0018] The type of the predetermined service is not limited as long as a relationship between a service provider and a service recipient (receiver) is directly or indirectly established, such as a maintenance service for inspection or repair of a moving body such as a vehicle or a small aircraft, an insurance service for vehicle insurance or person insurance, a facility service for using a specific facility or residence, a care service, a communication service, a data holding service, a law guide service, a food and drink provision service, a distribution service, or an article holding service.

[0019] In addition to providing the predetermined service itself, the control device 100 can also provide the predetermined service according to information received from a service providing device 120 through communication with the connected service providing device 120.

Hereinafter, the maintenance service of the moving body will be described as an example of the predetermined service. The moving body at this time indicates an object to which a service is provided and is also referred to as a "service providing target", and a vehicle, which is an example thereof, will be described below as an example.

[0020] When a user (also referred to as a user, an owner, or an owner) of a vehicle, which is an example of the service providing target, brings the vehicle to a workplace such as a maintenance factory, which is a service providing source, to receive a maintenance service, the control device 100 performs reception processing of receiving the maintenance service, and performs diagnostic processing of the vehicle at the service providing device 120 (diagnostic unit 105).

[0021] In the reception processing, with an instruction from a provider (worker) who provides a service as a trigger, acquisition processing (first user information acquisition processing) of acquiring user information for specifying a user is performed, and acquisition processing (first vehicle information acquisition processing) of acquiring vehicle information of a vehicle, which is the service providing target, from the storage unit 104 or the management device 300 is performed (acquisition unit 103).

The user information is information on the user, and includes information configured

in a table as illustrated in (a) of FIG. 15. Examples thereof include user identification information (user ID) for identifying the user, a user name, and an address. The vehicle information is information on the vehicle, and includes information configured in a table as illustrated in (b) of FIG. 15. The vehicle information is implemented by (includes) vehicle specification information for uniquely specifying the vehicle and vehicle state information indicating the state of the vehicle. The former vehicle specification information includes vehicle identification information (vehicle ID) for identifying the vehicle, a model, a vehicle specification, facility, and the like. Examples of the latter vehicle state information include a model year, a travel distance, a registration year, a user ID, a vehicle image, a maintenance history, presence or absence of a vehicle inspection, and information acquired from various sensors (for example, information acquired from an atmospheric pressure sensor, an intake pressure sensor, a throttle opening sensor, an oxygen sensor, an air-fuel ratio sensor).

[0022] The user information and the vehicle information can be acquired from the management device 300 or can be acquired based on information indicated by the user.

The diagnostic processing is also referred to as "first diagnostic processing" or "service providing side diagnostic processing", and includes processing of acquiring vehicle information on the vehicle from the vehicle and confirming whether an item value is a normal value, a specific value, or the like for each designated diagnostic item among items of the vehicle information, and processing of confirming a state by a worker who performs work related to diagnosis. In the diagnostic processing, in addition to the acquisition of the vehicle information on the vehicle from the vehicle, it is also possible to acquire the vehicle information registered in advance in a DB 320 to be described later by making a request to the management device 300, and the diagnostic processing is performed using the vehicle information acquired by at least one of the vehicle information acquisition processing (diagnostic unit 105).

[0023] The control device 100 that has received a diagnostic result (diagnostic result information) of the diagnostic processing from the service providing device 120 performs work specification processing of specifying work to be performed on the vehicle based on the diagnostic result and the vehicle information (work information specification unit 106). The work specified by the work specification processing also includes preventive or preliminary work based on the diagnostic result and the vehicle information.

The work at this time is a service content of a maintenance service performed on a vehicle, which is an example of the service providing target, and involves maintaining, improving, and normalizing a state of the vehicle, ensuring that the benefit (service) provided

by the vehicle can be received as usual. In the case of the vehicle, an example of the benefit is movement of a place.

[0024] When the work is specified by the work specification processing, the control device 100 selects work information for the work. The work information is information such as parts, tools, facility, work difficulty, and work time required to perform the work, and is information used to create information (work content information) that indicates work content required to perform the work and is presented to the user.

[0025] As described above, in the control device 100, when the diagnostic processing is performed and the work and the work information for the diagnostic processing are specified and selected, subsequently, the work content information to be presented to the user for performing the maintenance service on the vehicle is created (estimate creation unit 107). The work content information includes a work item indicating a specific type of work to be performed on the vehicle, work man-hours required for the work, required parts and quantities, and a work wage (work cost) related to the work per unit time.

In particular, for the work man-hours and the work wage, the control device 100 acquires unit price information such as a basic work fee and basic work man-hours for the work information from the management device 300 and includes the unit price information in the work content information. The work basic fee is predetermined and is a basic fee (Leva rate) for the corresponding work, and the basic work man-hours are predetermined and are man-hours of standard work for performing the corresponding work.

[0026] The work content information is also generally referred to as estimate information (also simply referred to as "estimate") or a pre-work confirmation, and is information that allows the user to confirm the content and cost of the maintenance service performed on the vehicle, and includes the user information and the vehicle information. By presenting this estimate to the user before the maintenance service, a difference in recognition between the providing source of the maintenance service and the user can be prevented.

The work content information created using the control device 100 is also referred to as "first work content information", and is hereinafter simply referred to as "work content information A" or an "estimate A".

The estimate A is created in the control device 100 that provides the maintenance service, and the user trusts and approves the estimate A to a certain extent. More specifically, since the control device 100 merely creates the estimate A using the work information for the work specified on a workplace side, the estimate A is created depending on the specified work

and the work information.

[0027] Then, the control device 100 stores, in a storage device (not illustrated), the estimate A in association with a creation date, the user information, and the vehicle information. In addition, the control device 100 stores the estimate A associated with the creation date, the user information, and the vehicle information in the storage unit 104, and transmits the estimate A to the management device 300 together with control device identification information for identifying the created control device 100, and the management device 300 holds and stores the estimate A in the DB 320 as the estimate information.

The estimate A may be transmitted to the instruction device 200 used by the requesting user.

In this way, the control device 100 creates the estimate A and receives a work request based on the estimate A.

[0028] The control device 100 can also receive, from the instruction device 200, a provision request of the maintenance service for a vehicle for which the estimate A has not been created.

In this case, first, workplace determination processing of determining whether a destination (request destination) set in the second work content information (estimate B or estimate C) (details will be described later) received as the provision request is an own workplace is performed.

In addition to the workplace determination processing, it is also possible to perform authentication confirmation processing for confirming whether the second work content information is authenticated, specifically, whether the second work content information is assigned (set) to authentication information.

[0029] In the workplace determination processing, the control device 100 transmits an error to the transmission source when the destination is not the own workplace, and performs execution confirmation processing of confirming whether work content of the received second work content information (estimate B or estimate C) can be executed when the destination is the own workplace (information processing unit 102). Further, by the authentication confirmation processing of determining whether the second work content information is authenticated, the error may be transmitted to the transmission source when the second work content information is not authenticated, and the execution confirmation processing may be performed when the second work content information is authenticated.

In the execution confirmation processing, it is confirmed that this is not a state of being unable to be dealt with due to a temporary failure of the facility, shortage of workers, or

the like.

Based on the result of the execution confirmation processing, when the execution confirmation can be made, the control device 100 performs work instruction information creation processing of creating work instruction information related to the work in order to execute the work of the work content of the second work content information based on the second work content information (estimate B or estimate C) (work instruction information creation unit 111).

[0030] The work instruction information varies for each workplace and is an instruction sheet (instruction sheet data) to be given to the worker who performs the work. For example, it is a document (document data) in which information on work such as a worker, a work facility, a work date and time, and a work order is instructed.

[0031] The workplace information extracted by this workplace extraction processing and the workplace information in which the priority is set are stored in the storage unit.

[0032] In the authentication confirmation processing, the control device 100 requests the management device 300 about whether authentication information is correct, and the management device 300 performs confirmation processing of the authentication information. Details of this confirmation processing are illustrated in S2314 to S2316 of FIG. 23 (authentication information determination unit 110).

In addition, the management device 300 may inquire of an authentication authority, which is the external device 400, whether the authentication information is correct, and the management device 300 may authenticate and confirm the second work content information to which the authentication information is assigned (set) by responding to a response from the external device 400 to the inquiry that the authentication information is correct (information processing unit 102).

[0033] In addition to the above, the control device 100 may confirm whether the authentication information is set in the first work content information created in the own workplace at which the control device 100 is provided, and receive a request for the maintenance service for the first work content information in which the authentication information is set (authentication information determination unit 110).

That is, when the control device 100 transmits the first work content information to the instruction device 200, it is determined whether the request is based on the first work content information using the authentication information. In this case, the control device 100 makes a request to the management device 300 to confirm whether the authentication information set in

the first work content information is correct, and makes a determination based on the response.

When the response indicates that the authentication information is correct, the control device 100 receives the request for the maintenance service and performs the work instruction information creation processing of creating the work instruction information based on the first work content information in which the authentication information is set.

[0034] When the work is performed based on the work instruction created by the work instruction information creation processing described above, the control device 100 stores history information of the performed work in the management device 300 in addition to the storage unit 104. An example of the history information of the work is illustrated in a work history information table of (d) of FIG. 16.

When the work is completed, the control device 100 creates work record information as one piece of work history information and stores the work record information in association with an estimate (an estimate (the first work content information or the second work content information) that is a source of the work content of the work performed on the vehicle).

The work record information is also referred to as a "work record book", a "confirmation", a "service implementation certificate", or a "delivery note", and records the work actually performed, such as whether the work is actually performed for the work (maintenance such as inspection or repair) designated in the estimate, what work is performed as the work, who and when the work is performed. The work record book is included in the work history information, and in a broad sense, includes contents of different formats. The work record book is provided for the user of the vehicle or output (transmitted) to the instruction device 200 used by the user as the work ends (output processing unit 112).

As a result, the work record book can be held by each of the user and the workplace. With this document, it is possible to grasp a specifically performed work content.

[0035] When the work is completed, the control device 100 transmits the work record book to the management device 300 and stores the work record book in association with the user information and the vehicle information in the DB 320 of the management device 300. In response to a request from the instruction device 200 or the management device 300, the control device 100 outputs (transmits) the work record book (output processing unit 112).

[0036] <Instruction Device 200>

The instruction device 200 is implemented by a computer having a configuration as illustrated in FIG. 3, is a device operated by a user (user of the vehicle) who uses a vehicle maintenance service, is also referred to as a user terminal, and is an electronic device hosted by

the user. The instruction device 200 can also be implemented as one function of the electronic device hosted by the user, and in this case, is implemented as an application or software installed in the electronic device.

[0037] The instruction device 200 is a device that performs an instruction, contact, and communication for receiving the predetermined service provided by the control device 100, and can switch and use not only a single service provided by the control device 100 but also any predetermined service provided by the control device 100.

For example, the maintenance service and the insurance service can be switched and used.

[0038] An imaging device 220 and a diagnostic machine 230 can be connected to the instruction device 200. The imaging device 220 is a device capable of imaging the service providing target as an imaging target and recording a captured image, and the diagnostic machine 230 is a device capable of performing diagnostic processing on the service providing target as a diagnostic target and recording the diagnostic result as the diagnostic result information. An example is illustrated in FIG. 14. Of course, the instruction device 200 may be equipped with the functions of the imaging device 220 and the diagnostic machine 230.

[0039] When receiving an instruction operation issued by the user using the operation unit 206, with this as a trigger, the instruction device 200 performs user information acquisition processing (second user information acquisition processing) of acquiring the user information on the user from the management device 300 and vehicle information acquisition processing (second vehicle information acquisition processing) of acquiring the vehicle information on the vehicle to be subjected to the maintenance service (acquisition unit 204).

[0040] As a method of acquiring the vehicle information, a vehicle information reading device may be connected to the vehicle, and the vehicle information may be acquired from the vehicle information reading device. The vehicle information reading device is a device that is connected to an information transmission and reception connector provided in the vehicle or wirelessly connected to the vehicle to read vehicle information. The diagnostic machine 230 to be described later can also be used as the vehicle information reading device.

[0041] Subsequently, the instruction device 200 performs processing of designating a service type to be provided in the maintenance service, which is the predetermined service. The service type is also referred to as a "work type". That is, processing of designating the work type of the work for the vehicle that receives the maintenance service is performed. This processing is processing designated based on the type selected by the user, and in addition, it is also possible

to designate a recommended work type by learning information of a use status (use history) of the same service (maintenance service) of the user in the past as learning source information (type designation unit 208).

[0042] The work type is type information for specifying a specific service performed in the maintenance service, and specifically indicates specific items of the maintenance such as (1) inspection maintenance, (2) repair maintenance, and (3) specific item confirmation (also referred to as "specific maintenance").

Further, there are (1) types such as "a 6-month inspection, a 12-month inspection, a legal vehicle inspection (also simply referred to as a "vehicle inspection"), a pre-travel inspection, a long-distance pre-travel inspection, a post-travel inspection, and a long-distance post-travel inspection" that indicate inspection and maintenance in more detail, (2) types such as "sheet metal repair and paint repair" that indicate repair and maintenance in more detail, and (3) types such as "disassembly maintenance and electronic control device maintenance" that indicate specific item confirmation in more detail.

[0043] As an example, when designating the work type, the instruction device 200 can designate "the 12-month inspection" as a learning result if time point after 12 months from the previous inspection date is set as the use status (use history) of the vehicle, and can designate "the sheet metal repair" as the learning result when the instruction device 200 receives an image of the vehicle and analyzes the image to detect damage.

[0044] Subsequently, for the designated work type, the instruction device 200 extracts the standard work specified as the work for the work type (maintenance in the above example). Then, the instruction device 200 performs output processing of the standard work (work output unit 209). The extracted standard work is standard work (standard work) specified in advance as work to be performed in the designated work type, and can also be referred to as "standard work specified based on the designated work type".

That is, when the work type is designated, the standard work to be performed as the work type is specified, and work that differs from this standard work indicates that it is work that has no direct relationship with the work in the work type (work different from the standard work).

For example, when "the 12-month inspection" is designated as the work type, various types of work such as steering confirmation work and battery confirmation work are extracted as standard (designated in advance) standard work performed in the maintenance which is work for the work type "12-month inspection". The information on the standard work can acquire

and store information stored in the instruction device 200 in advance in association with the work type, or information stored in the management device 300 in advance in association with the work type.

The output processing of the standard work includes communication output to an external device, display output to the display unit 207 of the instruction device 200, and the like.

[0045] When the information on the standard work is output in this way, the instruction device 200 creates the work content information for performing the maintenance service on the vehicle based on (using) the work specified by the standard work for the output work type and the acquired vehicle information (estimate creation unit 211). That is, the work content information creation processing of creating the work content information for performing the work specified by the standard work on the vehicle indicated by the vehicle information is performed.

As described above, the vehicle information includes the vehicle state information indicating the state of the vehicle.

In the work content information creation processing, the work content information may be created based on the vehicle state information by specifying the work related to the maintenance service performed based on the vehicle state information of another vehicle (vehicle information). That is, the vehicle state information of the other vehicle may be learned as the learning source information, and the work content of the maintenance service performed on the vehicle that is the service providing target may be created.

[0046] Further, in the work content information creation processing, one or more diagnostic results stored in the storage unit 205 to be described later are learned as the learning source information, and work content information appropriate for the vehicle indicated by the vehicle information and the user of the user information is created (estimate creation unit 211). This makes it possible to create optimum work content information according to the work content performed on the related vehicle and the work content performed by the user in the past.

Further, in the work content information creation processing, it is also possible to perform processing of specifying the vehicle information of the vehicle that has performed the work specified by the standard work for the work type, and to create the work content information using the work history information of the vehicle performed on the vehicle indicated by the specified vehicle information.

The work history information at this time is managed in association with the vehicle in the DB 320 connected to the management device 300, and the instruction device 200 acquires

the work history information from the management device 300 and creates the work history information.

[0047] The work content information includes a work item indicating a specific type of work to be performed on the vehicle, the work man-hours required for the work, required parts and quantities, and a work wage (work cost) related to the work per unit time.

In particular, for the work man-hours and the work wage, the instruction device 200 acquires unit price information such as a basic work fee and basic work man-hours for the work information from the management device 300 and includes the unit price information in the work content information. The work basic fee is predetermined and is a basic fee (Leva rate) for the corresponding work, and the basic work man-hours are predetermined and are time for the standard work for performing the corresponding work.

[0048] The work content information is also generally referred to as estimate information (also simply referred to as "estimate") or a pre-work confirmation, and is information that allows the user to confirm the content and cost of the maintenance service performed on the vehicle, and includes the user information and the vehicle information. The work content information created using the instruction device 200 is also referred to as "second work content information", and is hereinafter simply referred to as "work content information B" or "estimate B".

The estimate B is created in the instruction device 200 based on the standard work specified based on the designated work type and the vehicle information.

[0049] The estimate B is created based on at least the standard work specified based on the designated work type and the vehicle information, and is therefore based on objective information (actual information). Further, it is also possible to create the estimate B by learning the history information of the work based on the vehicle state information (vehicle information) of the other vehicle that has performed the specified standard work as the learning source information.

The estimate B created using the history information is an estimate with higher reliability (credibility) objectively. In addition, when the estimate B is created, processing of detecting the presence or absence of damage and the state (level) of the damage by analyzing the image of the vehicle is performed, and based on the detected content, the work content for recovering (repairing) the damage can be included, and the estimate has higher reliability (credibility).

[0050] Then, the instruction device 200 stores the estimate B in the storage unit 205 in

association with the creation date, the user information, and the vehicle information. In addition, the instruction device 200 outputs (transmits) the estimate B associated with the creation date, the user information, and the vehicle information to the management device 300 together with the instruction device identification information for identifying the created instruction device 200 (transmission and reception unit 201), and the management device 300 holds and stores the estimate B in the DB 320 as the estimate information.

The instruction device 200 stores the estimate A received from the control device 100 in the storage device. Of course, the estimate B and the estimate C created under the same or similar conditions can also be stored in association with the estimate A.

[0051] In the instruction device 200, when the standard work is extracted, not only the work content information based on the standard work itself can be created but also the work content information can be created by adding a predetermined additional work to the standard work or replacing the standard work with another work.

Based on the standard work, the work desired by the user can be added and replaced, and the work content information on the maintenance service desired by the user can be created. In this specific example, any plan (also referred to as a "group") illustrated in (a) and (c) of FIG. 10 is selected.

[0052] This plan is a work list in which work to be performed is summarized for each designated type, and allows the work desired by the user to be designated collectively rather than one by one. This plan is recommended using history information of the service content provided to the user in the past or the service content performed on the same or the same type of vehicle as the vehicle serving as the service providing target. Of course, a plan other than the recommended plan can be selected.

[0053] Further, the instruction device 200 performs estimate comparison processing (also referred to as "verification processing" or "estimate verification processing") of comparing the estimate B with the estimate A created in the control device 100 (estimate comparison unit 214). Then, comparison result output processing of outputting the compared comparison result information is performed. In this output processing, it is possible to output (transmit) the comparison result information to an external device including the management device 300 in addition to outputting the comparison result information to a display device (display unit) of the instruction device 200.

[0054] The comparison processing is processing of verifying whether the first work content information (estimate A) is based on the second work content information (estimate B or

estimate C) corresponding to the first work content information by comparing each item of the estimate with an item associated in advance. Another expression can also be expressed as the verification processing for verifying whether the first work content information is included in the second work content information, and can also be expressed as the verification processing for verifying whether the first work content information is appropriate based on the second work content information.

[0055] More specifically, when values (work result information) of the items included in the estimate A are values (values are the same or within a certain error range) corresponding to values (quantity or the like) of the items included in the estimate B or the estimate C by comparing the values of the items or setting values, a verification result that the estimate A is based on the estimate B or the estimate C stored in association with the estimate A is obtained. On the other hand, when the values of the items included in the estimate A are not values (quantity or the like) corresponding to the values of the items included in the estimate B or the estimate C (the values are not the same or within a certain error range), a verification result that the estimate A is not based on the estimate B or the estimate C stored in association with the estimate A is obtained.

More specifically, the instruction device 200 acquires, from the management device 300, appropriateness determination information used for determining (appropriateness determination) whether appropriate work has been performed by comparing the items, and verifies whether the comparison result between the items matches the appropriateness determination information. That is, processing of verifying whether the estimate A and the estimate B or the estimate C saved in association with the estimate A match the appropriateness determination information is performed.

[0056] When the comparison result matches the appropriateness determination information, the estimate A is regarded as a verification result indicating that the estimate is appropriate, whereas when the comparison result does not match the appropriateness determination information, the estimate A is regarded as a verification result indicating that the estimate is not appropriate because the estimate A is not an appropriate estimate and has a high possibility that problems are present in unnecessary items, quantities, amounts, and the like.

[0057] As described above, the diagnostic machine 230 as illustrated in FIG. 14 can be connected to the instruction device 200, and the diagnostic machine 230 reads the vehicle information by connecting to the vehicle and performs the diagnostic processing of the vehicle state information included in the vehicle information (diagnostic unit 212).

[0058] The diagnostic processing is also referred to as "second diagnostic processing", "service provided side diagnostic processing", or "service demand side diagnostic processing", uses the vehicle state information as described above as a diagnostic item, and is processing that determines whether the diagnostic item satisfies a predetermined threshold, processing of determining whether a predetermined operation is performed, and processing of determining whether disconnection occurs in an electric circuit or the like.

In this diagnostic processing, diagnostic items such as catalyst deterioration, engine misfire, failure of an exhaust gas recirculation system, and failure of an evaporative emission control system can also be diagnosed by performing the above three determinations.

Then, the diagnostic machine 230 outputs the diagnostic result of the diagnostic processing to the instruction device 200. This diagnostic result includes that each diagnostic item is normal and that it cannot be determined that no failure has occurred.

[0059] Then, the instruction device 200 performs information update processing of updating the content of the estimate B based on the diagnostic result in the diagnostic machine 230 (information update unit 210).

In the information update processing, processing of referring to the diagnostic result and specifying the work content of the work to be performed on the vehicle state information including the diagnostic item for which it cannot be determined that no failure has occurred is performed (work determination unit 213). Then, in the information update processing, subsequently, it is determined whether the work content specified by the specification processing is included in the estimate B, and when the work content is not included, the estimate B is updated using the work content. More specifically, information update for adding the work content is performed on the estimate B to create new other work content information (hereinafter, referred to as an "estimate C").

When the work content specified by the specification processing is included in the estimate B, a new estimate C having the same content as the estimate B is created.

That is, when the diagnostic processing is performed, the instruction device 200 creates the estimate C as new work content information reflecting the diagnostic result based on the estimate B. Accordingly, it can be said that the work content information before the content of the diagnostic processing is reflected is the estimate B, and the work content information after the content of the diagnostic processing is reflected is the estimate C.

[0060] It is also possible to perform diagnostic processing in the instruction device 200 similar to the diagnostic processing performed in the diagnostic machine 230. That is, the

instruction device 200 performs the diagnostic processing (diagnostic unit 212).

Then, the instruction device 200 updates the estimate B using the diagnostic result to create the new estimate C. In the information update at this time, in the diagnostic result of the diagnostic processing, the estimate B is updated using the work related to the vehicle state information for which it cannot be determined that no failure has occurred.

[0061] Then, the instruction device 200 stores the diagnostic result in the storage unit 205 in association with the estimate B before the information update and the estimate C after the information update, and also saves the diagnostic result in the management device 300. Of course, the estimate B before the information update may be overwritten with the estimate C and saved after the information update.

[0062] Next, in order to receive the provision of the maintenance service based on the work content information of the estimate B or the estimate C, the instruction device 200 performs workplace extraction processing of extracting one or more pieces of workplace information regarding the workplace that performs the work of the work content of the estimate B or the estimate C based on the instruction issued by the user (workplace extraction unit 215).

The workplace list information related to the workplace performed by the workplace extraction processing can be, for example, stored in advance in the storage unit 205 or can be acquired from the management device 300.

Then, the one or more pieces of workplace information for performing the work of the work content included in the estimate B or the estimate C are extracted from the workplace list information. The workplace list information is information in which the workplace can be selected based on the work content, the user information, and the vehicle information, and an example thereof is illustrated in (e) of FIG. 16.

[0063] The extraction processing of the workplace information is processing of extracting the one or more pieces of workplace information based on at least one of the work content, the user information, and the vehicle information, where the second work content information, which is either the estimate B or the estimate C, includes the user information and the vehicle information in addition to the work content.

As illustrated in a user information table illustrated in (a) of FIG. 15, the user information includes information on an address (region), and as illustrated in a vehicle information table illustrated in (b) of FIG. 15, the vehicle information is associated with vehicle specification information for uniquely specifying the vehicle such as a vehicle ID or a model type, vehicle state information indicating a state of the vehicle such as a model year or a travel

distance, and a history of work performed in the past on the vehicle, and thus in the workplace extraction processing, processing of extracting one or more pieces of optimal workplace information is performed by learning these pieces of information as the learning source information.

5 [0064] More specifically, in the workplace extraction processing, a workplace is extracted based on the number of workers who perform the work and the work facility information used for the work of the work content with respect to an extraction condition such as the work content included in the work content information, a workplace near the address (region) is extracted with respect to the extraction condition such as the address (region) of the user information, and
10 a workplace is extracted based on the work facility information, the workers, and the like capable of performing the work on the vehicle with respect to the extraction condition such as the model or the vehicle type ID of the vehicle information. In the workplace extraction processing, the one or more pieces of workplace information are extracted based on at least one of the extraction conditions.

15 [0065] When the workplace is extracted by the workplace extraction processing, the instruction device 200 performs priority setting processing of setting a priority to the extracted workplaces based on past work history of the user who uses the maintenance service (the user who requests the work).

The priority setting processing is processing of setting the priority to the workplaces
20 according to an extraction condition or a combination of the extraction conditions. For example, when the extraction condition is the work content included in the work content information, a higher priority is set in descending order of an executable ratio of the work content. When the extraction condition is the address (region) of the user information, a higher priority is set in order of closeness to the address (region). Further, when the extraction condition is the model
25 or the vehicle type ID of the vehicle, a higher priority is set in descending order of the workable ratio at which the work can be performed on the vehicle of the model or the vehicle type ID.

Further, when these extraction conditions are combined, an AND operation is performed to set the priority.

[0066] The instruction device 200 designates a workplace that permits the vehicle to perform
30 work in the maintenance service based on the workplace list information in which the priority is set. For example, a workplace to which the highest priority is set is designated, and an operation by the user is received and designated.

Then, processing of setting workplace specifying information capable of specifying

the designated workplace to the estimate (second work content information) for making the work request in the workplace is performed (setting registration unit 203). That is, the estimate (second work content information) and the designated workplace are associated with each other, and the second work content information is stored.

5 Of course, it is also possible to set the plurality of pieces of workplace specifying information.

[0067] The workplace specifying information includes information designated in the workplace list information table as illustrated in (e) of FIG. 16, and is information capable of uniquely specifying a workplace.

10 [0068] The workplace information extracted by this workplace extraction processing and the workplace information in which the priority is set are stored in the storage unit 205. Further, in the instruction device 200, in addition to the estimate B or the estimate C after the information update stored in the storage unit 205 or the management device 300 in association with the creation date, the user information, and the vehicle information, and the work type and the
15 standard work used for creating the estimate, the workplace information are stored in association. That is, the vehicle that performed the work related to the standard work can be specified, and the history information (work history information) of the work for the vehicle can be specified and learned.

 Then, the instruction device 200 transmits the second work content information
20 (estimate B or estimate C) to the management device 300 at a predetermined timing to make an authentication request. When the instruction device 200 receives, from the management device 300, authentication information that has been granted (set) in response to this authentication request, the instruction device 200 stores the authentication information in the storage unit 205.

[0069] Subsequently, in the instruction device 200, when the designation operation of the
25 workplace by the user is received by the operation unit 206 or the like, or when a single workplace is extracted, the second workplace information (estimate B or estimate C) is transmitted to the control device 100 for the workplace as a request for the maintenance service (information processing unit 202).

 In the control device 100 that has received this, the above-described workplace
30 determination processing and the creation processing of the work instruction information based on the work content are performed, and the work related to the maintenance service is performed.

[0070] As a result, in the instruction device 200, it is possible to designate an optimum

workplace based on the created work content information without designating a workplace (maintenance factory or the like) for receiving the maintenance service in advance.

[0071] In the above example, the workplace is extracted by the workplace extraction processing, and the maintenance service is received by any of the workplaces, but the present disclosure is not limited thereto, created work content information may be published externally (on a public website), and one or more workplaces that wish to provide the maintenance service for the published work content information may designate the workplace by lottery or auction by making a request to execute the maintenance service.

The detailed flow of this processing is illustrated in the flowchart of FIG. 26.

[0072] Further, in the instruction device 200, when the work record information related to the performed work is input or acquired by the operation of the user, the work record information is decomposed for each item and the value set for each item is analyzed (information processing unit 202).

Further, the instruction device 200 acquires the estimate (first work content information and second work content information) stored in the control device 100 and saved in association with the work record book (acquisition unit 204).

The instruction device 200 verifies whether the work record book is based on the estimate (the first work content information and the second work content information) stored in association with the work record book by comparing each item of the estimate with the item of the work record information associated in advance (estimate comparison unit 214).

[0073] More specifically, when the values (work result information) of the items of the work record book are in accordance with the values (quantity or the like) of the items of the estimate by comparing the values of the items or the set values, it is verified that the work record book is based on the estimate (first work content information, second work content information) stored in association with the work record book, and when the values of the items of the work record book are not in accordance with the values (quantity or the like) of the items of the estimate, it is verified that the work record book is not based on the estimate (first work content information, second work content information) stored in association with the work record book.

Specifically, the instruction device 200 acquires, from the management device 300, the appropriateness determination information used for determining (appropriateness determination) whether appropriate work has been performed by comparing the items, and verifies whether the comparison result between the items matches the appropriateness determination information. That is, processing of verifying whether the work record book and

the estimate (the first work content information or the second work content information) saved in association with the work record book match the appropriateness determination information is performed.

[0074] In the former case, it is indicated that the work based on the estimate has been performed, and that it is confirmed afterward that the work is appropriate. On the other hand, in the latter case, it is indicated that there is a high possibility that the work based on the estimate has not been performed, and that it is confirmed afterward that unintended work or unauthorized work is performed.

[0075] Then, the instruction device 200 performs output processing of the verification result.

This output processing includes displaying on the instruction device 200 and transmitting to the management device 300. In this output processing, information indicating that the work based on the estimate has been performed is output when the appropriateness determination information matches by the comparison between the items, and information indicating that the work based on the estimate has not been performed is output when the appropriateness determination information does not match by the comparison between the items.

[0076] From the above, the second work content information (estimate B or estimate C) created in the instruction device 200 is information used to determine whether the first work content information created in the control device 100 is valid or invalid (including not valid), and is also used as information indicating the work content to be requested from the workplace in order to receive the maintenance service.

[0077] <Management Device 300>

The management device 300 is implemented by a computer having a configuration as illustrated in FIG. 3, is connectable to the control device 100 provided in the providing source that provides the predetermined service and the instruction device 200 that performs instructions, contact, and communication for receiving the predetermined service, and is a device that manages necessary information in the control device 100 and the instruction device 200 and provides the information. As an example, the management device 300 is implemented by a server or a cloud device.

[0078] The DB 320 that stores and manages various types of information is connected to the management device 300.

The DB 320 stores user information, vehicle information, work history information of work related to various services, estimate item information indicating items constituting the work content information, unit price information including a basic work fee, basic work man-

hours, and appropriateness determination information, workplace information indicating a providing source that provides a maintenance service, the work content information (estimate information) created in the control device 100 or the instruction device 200, format information of the work instruction information created based on the work content information in the workplace for each workplace, the created work instruction information, the work record information (work maintenance book) indicating a record of work performed in the workplace based on the work instruction information, verification result information indicating a result of verifying whether work based on the work content information has been performed based on the work content information and the work record information, standard work information designating the standard work specified for a work type, and the like.

[0079] The management device 300 receives the work content information (first work content information) from the control device 100. The management device 300 receives the work content information (second work content information) from the instruction device 200. The work content information includes user information and vehicle information in addition to the work content, and work content information to be compared is specified based on the user information and the vehicle information.

For example, if the user ID of the user information and the vehicle ID of the vehicle information included in the first work content information are the same as the user ID of the user information and the vehicle ID of the vehicle information included in the second work content information, and the creation date of the first work content information and the creation date of the second work content information are within a certain period, they are mutually specified as comparison targets.

[0080] In addition, the first work content information and the second work content information may be received from the instruction device 200. That is, the control device 100 transmits the first work content information created by the control device 100 to the instruction device 200, and the instruction device 200 that has received the first work content information transmits the first work content information and the second work content information created by the instruction device 200 to the management device 300.

[0081] Subsequently, the management device 300 performs comparison processing of comparing the first work content information with the second work content information. Then, as a comparison result in the comparison processing, it is verified whether the first work content information is included in the second work content information, and when the first work content information is included, the first work content information (estimate A) is a verification result

indicating that the first work content information is an appropriate estimate, and on the other hand, when the comparison result is not included, the first work content information (estimate A) is a verification result indicating that the first work content information is not an appropriate estimate and there is a high possibility that there is a problem in an unnecessary item, quantity, amount, or the like.

Then, output processing of the verification result (comparison result) of the comparison processing is performed. The management device 300 outputs (transmits) information indicating the comparison result (comparison result information) to the control device 100 and the instruction device 200, and outputs (transmits) information only to the instruction device 200 that has received the first work content information and the second work content information.

[0082] As the comparison processing at this time, processing of extracting items of work contents constituting the first work content information and the second work content information and unit price information (basic work fee, basic work man-hours, and the like) for the items of the work contents, and comparing the items, the unit price information, the total amount for each item, and the sum of the work content information is performed.

Details of the comparison processing will be described later with reference to FIG. 24.

[0083] By this comparison processing, determination processing of determining whether the first work content information is included in the second work content information is performed, and when it is determined that the first work content information is included, a comparison result indicating that the first work content information is valid is output. When it is determined that the first work content information is not included, a comparison result indicating that the first work content information is invalid or not valid is output.

That is, verification, authentication, and evaluation of the first work content information are performed based on the second work content information.

[0084] Then, the management device 300 performs processing of recording the first work content information and the second work content information in association with each other. The comparison result may be stored in association with these.

[0085] Further, the management device 300 creates, for the first work content information for which the comparison result determined to be valid has been output, a hash value of the first work content information, and sets the hash value as authentication information including the hash value. In addition, it is also possible to acquire time information at the time of hash value

creation, create a timestamp including the hash value and the time information, and set the timestamp as the authentication information.

The hash value is a fixed value determined according to the second work content information, and when the second work content information is changed, the fixed value is also changed.

[0086] In this way, by comparing the first work content information created by the control device 100 with the second work content information created by the instruction device 200 based on different information, it is possible to confirm the validity and reliability of the information of the first work content. That is, it is possible to objectively evaluate the estimate A created by using the work information for the work specified on the workplace side, and it is possible to support the user in determining its appropriateness.

[0087] When receiving the authentication request including the second work content information (estimate B or estimate C) from the instruction device 200, the management device 300 creates a hash value of the received second work content information and sets it as authentication information for designating the hash value and the instruction device 200 of the request source. As a result, the authentication information indicating that it is created by the instruction device 200 that made the request is set. In addition, it is also possible to acquire time information at the time of hash value creation, create a timestamp including the hash value and the time information, and set the timestamp as the authentication information.

In addition, the management device 300 may issue an authentication request to the authentication authority, which is the external device 400, and the external device 400 may perform authentication information setting processing as described above and respond with the information.

[0088] Then, the management device 300 transmits the second work content information in which the authentication information is set to the instruction device 200, which is an authentication request source. Further, the management device 300 stores the second work content information in which the authentication information is set in the storage device in association with the instruction device 200, which is the authentication request source.

[0089] FIG. 3 illustrates an example of a hardware configuration in a case where each of the control device 100, the instruction device 200, and the management device 300 is implemented by a computer. Of course, the function of each device can also be implemented by a plurality of devices.

[0090] As illustrated in FIG. 3, each of computers 100, 200, and 300 includes a processor

901, a storage device 902, an I/F 903, and a display device 904.

[0091] The processor 901 controls processing in the computers 100, 200, and 300 by executing a program stored in the storage device 902. For example, each functional unit and processing unit included in the control device, the instruction device, and the management device are implemented by the processor 901 executing the program stored in the storage device 902. The program is executed by the computers 100, 200, and 300.

[0092] The storage device 902 is a volatile or non-volatile storage medium such as a RAM, a ROM, a hard disk drive (HDD), or a flash memory that temporarily stores a source code of the program executed by the processor 901 and data required when the program is executed.

The storage device 902 is also a database that stores basic software (OS), various programs for implementing the above-described configurations, setting information, tables, and the like.

The processor 901 implements various functions by reading and executing these programs, setting information, table information, and the like.

[0093] The I/F 903 is an input and output interface for receiving an input from the user, such as a keyboard, a mouse, a touch panel, various sensors, and a wearable device, is an interface for inputting and outputting data from an external device of the computers 100, 200, and 300, and is a communication interface for performing data communication with the external device of the computers 100, 200, and 300 via a communication network in a wired or wireless manner.

[0094] The display device 904 is a device that displays various types of information. As a specific example, a liquid crystal display, an organic Electroluminescence (EL) display, or the like may be used as the wearable device. A touch panel or a touch operation input device having both the input and output interface and the display device 904 may be used.

[0095] FIGS. 4, 5, 6, 7, and 8 are sequence diagrams illustrating processing transition performed in the management system according to the embodiment of the present disclosure. A processing sequence by the control device 100, the instruction device 200, and the management device 300 constituting the management system is illustrated.

FIGS. 9, 10, 11, 12, and 13 are diagrams illustrating examples of screens displayed on the instruction device constituting the management system according to the embodiment of the present disclosure.

Hereinafter, description will be made with reference to FIGS. 4 to 13.

[0096] The sequence diagram illustrated in FIG. 4 includes designating a workplace as a destination of use where a user uses a predetermined service, processing performed in the

control device 100 corresponding to the workplace, and processing of confirming a result of the processing performed in the control device 100 in the instruction device 200 used by the user, and is a processing transition in which work is performed at the workplace provided with the control device 100 based on the processing performed in the control device 100.

5 [0097] In the control device 100 associated with the workplace where work is performed, login processing is performed by a user operation (S401). When the login processing is performed, the management device 300 specifies and transmits the user information and the vehicle information (S403 and S404) in conjunction with login processing (S402) in the management device 300 through communication with the management device 300, and the
10 control device 100 receives and specifies them (S405). The control device 100 performs vehicle diagnostic processing and processing of confirming the state of the vehicle by using the service providing device 120 or the like (S406).

[0098] At this time, the control device 100 specifies the necessary work based on the vehicle state information, which is the result of vehicle diagnostic processing and vehicle state
15 confirmation processing and the service content desired by the user (specifically, an inspection content or a repair content of the maintenance service), and creates and saves the first work content information (estimate A) related to the specified work (S407).

In the creation processing of the estimate A, the control device 100 and the management device 300 operate in conjunction with each other, the management device 300
20 provides information necessary for creating the estimate A (list information of work for the state information of the vehicle, unit price information of the work, and the like), and saving processing of saving the estimate A is performed in the control device 100 and the management device 300.

[0099] At this time, the created estimate A is provided from the workplace to the user. As the
25 providing method, there is a method via a storage medium in addition to via an electronic communication medium such as various social network services or mails, and the like, and the method is not limited.

[0100] Login processing (S408) is also performed in the instruction device 200 operated by the user, receives and specifies the user information and the vehicle information from the
30 management device 300 (S409), and designates the type of the service content desired by the user in the service (S410). The instruction device 200 selects a service plan for the type of service content desired by the user (S411).

Specifically, when the user ID and the password are input on a login screen illustrated

in (a) of FIG. 9, the user ID and the password are transmitted from the instruction device 200 to the management device 300 to authenticate the user. Subsequently, when a "create estimate" button is operated on the processing selection screen illustrated in (b) of FIG. 9, an instruction screen illustrated in (c) of FIG. 9 is displayed.

5 [0101] In the instruction screen illustrated in (c) of FIG. 9, the user information of the authenticated user and the vehicle information associated with the user information are displayed, and the work type can be selected. When "repair" is selected as the work type and an "OK" button is operated, a repair content selection screen as illustrated in (d) of FIG. 9 is displayed, and when "inspection" is selected as the work type and the "OK" button is operated,
10 an inspection type content selection screen as illustrated in (e) of FIG. 9 is displayed.

The repair content selection screen illustrated in (d) of FIG. 9 illustrates an example in which a repair type of the repair to be performed can be designated as the content of repair, and the repair type of "sheet metal" is selected. When a "next" button is operated on the screen illustrated in (d) of FIG. 9, a screen for selecting a plan in the repair type of the sheet metal as
15 illustrated in (a) of FIG. 10 is displayed.

In an inspection type selection screen illustrated in (e) of FIG. 9, the type of inspection to be performed can be designated as the content of the inspection, and "vehicle inspection" and "3 years" are selected. When a "next" button is operated on the screen illustrated in (e) of FIG. 9, a screen for selecting a plan in the repair type of the inspection as illustrated in (c) of FIG.
20 10 and displayed.

[0102] Then, the instruction device 200 creates the work content information (estimate B) of the work related to the service desired by the user for the vehicle using the information on the type and the plan in addition to the user information and the vehicle information (S412).

Also in the creation processing of the estimate B, the instruction device 200 and the
25 management device 300 operate in conjunction with each other, the management device 300 provides information necessary for creating the estimate B (list information of work for the state information of the vehicle, unit price information of the work, and the like), and saving processing of saving the estimate B is performed in the instruction device 200 and the management device 300.

30 [0103] More specifically, in a case where the content of repair is designated, when any plan is selected from the plurality of plans displayed on the plan selection screen illustrated in (a) of FIG. 10 and is operated, the selected content is displayed as illustrated in (b) of FIG. 10, and the image of the vehicle for which the repair work is requested can be registered (input) on a

confirmation screen illustrated in (b) of FIG. 10.

Further, on the confirmation screen illustrated in (b) of FIG. 10, it is also possible to perform damage diagnostic processing of diagnosing the vehicle from the registered image, specifying a damaged portion of the vehicle, and measuring the degree of damage by comparing the specified portion with an image in a normal state.

When a "create" button illustrated in (b) of FIG. 10 is operated, creation processing of creating the second work content information (estimate B) is performed based on the user information, the vehicle information, the work type, a work plan for the work type, an image of the vehicle, and a simple diagnostic result.

[0104] Further, in a case where the content of inspection is designated, when any plan is selected from the plurality of plans displayed on the plan selection screen illustrated in (c) of FIG. 10 and is operated, the selected content is displayed as illustrated in (d) of FIG. 10, and the image of the vehicle for which the repair work is requested can be registered (input) on the confirmation screen illustrated in (d) of FIG. 10.

Further, on the confirmation screen illustrated in (d) of FIG. 10, it is also possible to perform damage diagnostic processing of diagnosing the vehicle from the registered image, specifying a damaged portion of the vehicle, and measuring the degree of damage by comparing the specified portion with the image in the normal state.

Then, when a "create" button illustrated in (d) of FIG. 10 is operated, creation processing of creating the second work content information (estimate B) is performed based on the user information, the vehicle information, the work type, a work plan for the work type, an image of the vehicle, and a simple diagnostic result.

[0105] When the second work content information (estimate B) is created by the above operation, an estimate result screen as illustrated in (a) of FIG. 11 is displayed. (a) of FIG. 11 is a screen displayed when the "create" button is operated on the confirmation screen of the inspection work illustrated in (d) of FIG. 10. Note that a similar screen as in (a) of FIG. 11 is also displayed on the screen for confirming the sheet metal work as illustrated in (b) of FIG. 10, and a description thereof will be omitted.

On the estimate result screen illustrated in (a) of FIG. 11, estimate content is displayed in addition to the user information, the vehicle information, the selected vehicle type, and the selected plan. On the screen illustrated in (a) of FIG. 11, a two-dimensional code including these contents is also created and displayed.

When a "save estimate" button is pressed on the screen as illustrated in (a) of FIG.

11, the second work content information (estimate B) including the above information is saved.

[0106] Subsequently, when the diagnostic result is acquired by performing the diagnostic processing in the instruction device 200, or the diagnostic result of the diagnostic processing performed by an external diagnostic machine is acquired (S413), the instruction device 200 performs processing of specifying the work based on the diagnostic result in conjunction with the instruction device 200 and the control device 100, and performs processing of updating the estimate B based on the work content of the work and creating the estimate C as new work content information. Further, processing of saving the estimate C in the instruction device 200 and the management device 300 is performed (S414).

When the estimate C is created, since the estimate B is updated, the estimate B is overwritten with the estimate C and saved. Note that the above diagnostic processing is an any processing, and the estimate B is saved when the diagnostic processing is not performed, and the estimate C is saved instead of the estimate B when the diagnostic processing is performed.

[0107] Therefore, the estimate A created by the control device 100 is saved in the control device 100, the estimate B or the estimate C created by the instruction device 200 is saved in the instruction device 200, and the estimate A and the estimate B or the estimate C created by the control device 100 and the instruction device 200 are saved in the management device 300.

[0108] More specifically, when a "perform diagnostic processing" button is operated on an estimate display screen illustrated in (a) of FIG. 11, if the diagnostic machine is connected to the instruction device 200, a result of the diagnostic processing performed by the diagnostic machine is acquired. If the diagnostic machine is not connected to the instruction device 200, the result of the diagnostic processing performed by the instruction device 200 is acquired.

The result of the diagnostic processing is displayed on the diagnostic result display screen of (b) of FIG. 11.

[0109] In the diagnostic result display screen illustrated in (b) of FIG. 11, as an example of the result of performing the diagnostic processing of the vehicle, a failure of "purge failure" in an "evaporative emission control system diagnosis" and a failure of "not good" in the diagnostic of a "vehicle speed sensor" are displayed.

When a "reflect" button is operated on the diagnostic result display screen illustrated in (b) of FIG. 11, the instruction device 200 performs processing of determining whether the second work content information (estimate B) created by the above processing includes performing work based on the diagnostic results, performs the information update processing of including the work in the estimate B when the work is not included in the estimate B as a

result of the determination processing, and creates and saves the new estimate C for the estimate B. Further, as a result of the determination processing, when the work is included in the estimate B, the new estimate C having the same content as the estimate B is created and saved.

In any determination result, when the diagnostic processing is performed, the new estimate C is created instead of the estimate B.

[0110] An estimate display screen illustrated in (c) of FIG. 11 is a screen illustrating the content of the estimate C in the former case (when the work is not included in the estimate B). That is, in addition to the content of the estimate B, the estimate C reflecting the work of the diagnostic result by the diagnostic processing is displayed.

When a "save" button on the estimate display screen illustrated in (c) of FIG. 11 is operated, the instruction device 200 saves the user information, the vehicle information, the work type, the work plan, and the estimate content in association with each other.

[0111] As described above, in a state where the estimate A created by the control device 100 and the estimate B or the estimate C created by the instruction device 200 are saved, when an estimate confirmation instruction is performed using the instruction device 200, the instruction device 200 reads the estimate A from the control device 100 or the management device 300 (S415).

When a "confirm estimate" button is operated on the processing selection screen as illustrated in (b) of FIG. 9, a screen as illustrated in (a) of FIG. 12 is displayed. The screen illustrated in (a) of FIG. 12 is a screen on which the estimate B or the estimate C created immediately before by the instruction device 200 is displayed, and the estimate A to be compared can be designated.

As the designation method, a method of reading a two-dimensional code including the content of the estimate A attached to the estimate A and a method of uploading data of the estimate A are illustrated.

[0112] In the instruction device 200, when the estimate A and the estimate C (here, the estimate C is used as an example) to be compared are designated, comparison processing between the estimate A and the estimate C is performed (S416). Then, the instruction device 200 outputs the comparison result of the comparison processing (S417) and saves the comparison result (S418).

Specifically, when a "compare" button is operated on the screen illustrated in (a) of FIG. 12, the comparison processing is performed, and a screen illustrating a comparison result as illustrated in (b) of FIG. 12 is displayed as the comparison result.

In (b) of FIG. 12, in addition to information for identifying each compared estimate and, as the comparison result, a matching ratio for each item constituting the estimate, a matching ratio of the quantity set for each item, a matching ratio of the unit price set for each item, and a matching ratio of the amount of each item are displayed, an overall result in consideration of all of these is ranked, and a comment indicating the comparison result is displayed.

[0113] Based on these, the user can confirm whether the estimate A created by the workplace is credible or valid based on the objective estimate C based on the vehicle information and the history information based on the vehicle information.

That is, even a user who has no or few expert knowledge about a predetermined service can objectively evaluate the estimate A created by the workplace, and can make the work request after a consent. Conversely, even with specialized work, the workplace can prove that its estimate is objectively guaranteed.

[0114] When the estimate comparison processing is performed in this way, the instruction device 200 receives an operation by the user (S419) and requests (instructs) the control device 100 to perform work based on the estimate A via the management device 300. At this time, the management device 300 saves a requester, the request destination, and the content of the requested estimate A in association with each other (S420).

Specifically, when the user operates a "work request" button on the processing selection screen illustrated in (b) of FIG. 9, a request destination selection screen as illustrated in (a) of FIG. 13 is displayed, in this request destination selection screen, the content of the requested estimate A is illustrated, and only the workplace in which the estimate A is created as the request destination is displayed.

[0115] The control device 100 confirms whether the estimate A that received the request is created by the own control device 100 (S421), when the requested estimate A is created by the own control device 100, creates work instruction information to be used for work at the workplace based on the requested estimate A (S422), and performs work based on the work instruction information (S423). Further, when the work is completed, the control device 100 creates and saves a work record book in which the content of the work is recorded.

[0116] The sequence diagram illustrated in FIG. 5 includes designating a workplace as a destination of use where the user uses a predetermined service, processing performed in the control device 100 corresponding to the workplace, and processing in which the management device 300 confirms the result of the processing performed by the control device 100 based on

an instruction from the instruction device 200 used by the user, and is a processing transition in which work is performed at the workplace provided with the control device 100 based on a result of the processing performed in the control device 100.

[0117] Since the processing illustrated in S401 to S414 in FIG. 5 is the same as that illustrated in S401 to S414 in FIG. 4, and thus description thereof will be omitted. That is, by the processing, the management device 300 is in a state where the estimate A and the estimate B or the estimate C are saved.

[0118] In this state, when the user uses the instruction device 200 to perform processing of designating the estimate A and the estimate B or the estimate C corresponding thereto, the management device 300 performs comparison processing between the estimate A and the estimate C (here, as an example, the estimate C) (S501). Then, the management device 300 outputs the comparison result of the comparison processing to the instruction device 200 (S502), and saves the comparison result (S503).

[0119] At this time, the instruction device 200 performs processing of outputting the comparison result received from the management device 300 (S504). For example, display output is performed on a display device (display unit) of the instruction device 200.

[0120] In a case where, as the comparison result of the comparison processing, the first work content information (estimate A) is included in the second work content information (estimate B or estimate C), that is, in a case where the verification result indicates that the estimate A is an appropriate estimate, the management device 300 sets the created authentication information in the estimate A (S505), and saves the estimate A in which the authentication information is set in association with the estimate B or the estimate C (S506).

Further, the management device 300 transmits the estimate A in which the authentication information is set to the instruction device 200, and the instruction device 200 saves the estimate A in association with the estimate B or the estimate C (S507).

Note that the processing of setting the authentication information indicated in S505 is any processing and does not necessarily need to be performed, and in this case, the management device 300 may only transmit the comparison result to the instruction device 200. Accordingly, the instruction device 200 that received the comparison result saves the result for the requested estimate C.

[0121] Subsequently, in the instruction device 200, when a request operation by the user is received (when the operation of the "work request" button is received on the processing selection screen illustrated in (b) of FIG. 9), the estimate A in which the authentication

information is set is transmitted to the control device 100 corresponding to the workplace that requests the work via the management device 300, and the work request is made (S508).

At this time, the management device 300 saves the requester, the request destination, a request date, and the estimate A in which the authentication information is set in association with each other as information related to the request.

[0122] Further, the control device 100 confirms whether the estimate A that received the request is created by the own control device 100 (S509), when the requested estimate A is created by the own control device 100, creates work instruction information to be used for work at the workplace based on the requested estimate A (S510), and performs work based on the work instruction information (S511). Further, when the work is completed, the control device 100 creates and saves a work record book in which the content of the work is recorded.

[0123] The sequence diagram illustrated in FIG. 6 includes designating a workplace as a destination of use where the user uses a predetermined service, processing performed in the control device 100 corresponding to the workplace, and processing in which the management device 300 confirms the result of the processing performed by the control device 100 based on an instruction from the instruction device 200 used by the user, and is a processing transition in which work is performed at the workplace provided with the control device 100 based on a result of the processing performed in the instruction device 200.

[0124] Since the processing illustrated in S401 to S414 in FIG. 6 is the same as that illustrated in S401 to S414 in FIG. 4, description thereof will be omitted, and since the processing illustrated in S501 to S504 is the same as that illustrated in S501 to S504 in FIG. 5, description thereof will be omitted. That is, by the processing, in the management device 300, the estimate A and the estimate B or the estimate C are saved, and the comparison processing between the estimate A and the estimate C is performed and saved.

[0125] In this state, when the estimate A is included in the estimate C, the management device 300 sets the created authentication information in the estimate C (S601), and saves the estimate C in which the authentication information is set and the estimate A in association with each other (S603). Then, the management device 300 transmits the estimate C to the instruction device 200.

Accordingly, the instruction device 200 saves the estimate C in which the authentication information is set (S602).

[0126] Subsequently, in the instruction device 200, when the request operation by the user is received (when the operation of the "work request" button is received on the processing

selection screen illustrated in (b) of FIG. 9), the estimate C in which the authentication information is set is transmitted to the control device 100 corresponding to the workplace that requests the work via the management device 300, and the work request is made (S604).

At this time, the management device 300 converts the estimate C in which the authentication information is set to a format designated by the control device 100, which is the request destination of the work, and transmits the estimate C to the control device 100 corresponding to the workplace of the request destination (S605).

[0127] The control device 100 receives the work request and determines the type of the estimate receiving the work request. Then, when it is determined that the estimate type is a work request based on the estimate C but not based on the estimate A created in the own control device, it is confirmed whether the authentication information is set in the estimate C.

When the authentication information is set in the estimate C, the control device 100 inquires of the management device 300 whether the authentication information is correct, and makes a determination based on the result of determination processing (S607) performed in the management device 300 (S606).

[0128] When it is determined that the authentication information is correct, the control device 100 creates work instruction information to be used for work at the workplace based on the requested estimate C (S608), and performs work based on the work instruction information in and (S609). Further, when the work is completed, the control device 100 creates and saves a work record book in which the content of the work is recorded.

[0129] The sequence diagram illustrated in FIG. 7 is a processing transition for verifying whether the work record book (work record information) for recording the work content of the work performed at the workplace is based on work content information (estimate) related to the work performed when recording the work record book.

[0130] Since the processing illustrated in S402 to S414 (excluding S405, S406, and S407) in FIG. 7 is the same as that illustrated in S402 to S414 (excluding S405, S406, and S407) in FIG. 4, description thereof will be omitted. That is, by the processing, the estimate B or the estimate C is saved in the management device 300.

[0131] In this state, when the user operates the "work request" button on the processing selection screen illustrated in (b) of FIG. 9, the instruction device 200 acquires candidate information of the workplace to be the request destination from the management device 300 (S701). From the candidate information, the workplace information for requesting the work based on the estimate B or the estimate C for the vehicle based on the user information and the

vehicle information is searched for and displayed (S702).

Further, the instruction device 200 transmits the estimate C and the information on the workplace of the request destination to the management device 300 when receiving the operation by the user and making a request to the control device 100 corresponding to the workplace that makes the work request (S703). Further, the instruction device 200 saves the estimate C associated with the workplace information of the request destination (S704).

[0132] In processing (S702) of searching for the workplace information for requesting the work, the history information of the work stored in the management device 300 is learned as the learning source information, and the workplace information capable of performing the work included in the estimate is extracted.

[0133] The instruction device 200 displays the candidate destinations that makes the received work request on the screen ((b) of FIG. 13), and makes the work request to the request destination designated by the operation of the user.

At this time, the management device 300 saves the requester, the request destination, and the content of the requested estimate C in association with each other, and specifies the workplace as the request destination and the content of the estimate C (S705). Then, the estimate C is converted into a format corresponding to the workplace of the specified request destination (S706).

[0134] Specifically, when the user operates the "work request" button on the processing selection screen illustrated in (b) of FIG. 9, a request destination selection screen as illustrated in (b) of FIG. 13 is displayed, and in this request destination selection screen, the content of the requested estimate C is illustrated, and three candidate workplaces as the request destination are displayed.

[0135] The management device 300 performs request confirmation processing with the control device 100 corresponding to the workplace of the request destination (S707).

In the request confirmation processing, the estimate C converted into the format of the work request destination is transmitted to the control device 100, it is confirmed whether the work based on the estimate C is possible at the workplace corresponding to the control device 100, and the result is returned to the management device 300.

At this time, in a case where work is possible, the control device 100 creates work instruction information to be used for work in the workplace based on the requested estimate C (S708), and performs work based on the work instruction information (S709). Further, when the work is completed, the control device 100 creates and saves a work record book in which

the content of the work is recorded.

On the other hand, when the work is not possible, the control device 100 returns that effect to the management device 300, and the management device 300 returns that effect to the instruction device 200. At this time, the instruction device 200 selects another request destination again and makes a work request.

[0136] Instead of the processing of S701 and S702 described above, an auction of the estimate may be performed, and the request may be made to a successful request destination by the auction. A detailed flow in this case is illustrated in a flowchart of FIG. 26 and will be described later.

[0137] The sequence diagram illustrated in FIG. 8 illustrates a processing transition performed after the processing (S423, S511, S609, and S709) related to the work performed in the control device 100 of each sequence diagram illustrated in FIGS. 4 to 7.

[0138] When the processing related to the work is performed in the control device 100, the control device 100 creates the work record information related to the work, and saves the work record information in association with the estimate (first work content information or second work content information) as a work base (S801).

As a result, in the control device 100, the work record information for recording the content of the work actually performed in the corresponding workplace and the estimate as the work are associated with each other, in other words, the estimate is instruction information for instructing what kind of work needs to be performed in the estimate, and the work record information is record information recording what kind of work has been actually performed.

[0139] Subsequently, the control device 100 transmits the work record information and the estimate to the management device 300, and the management device 300 performs verification processing of verifying whether the work record information for the vehicle performing the work is based on the estimate (S803).

Then, the verification result of the verification processing is output to at least one of the control device 100 and the instruction device 200 (S804). In response to this, the control device 100 and the instruction device 200 output the verification results (S805 and S806).

[0140] Detailed processing of the verification processing (S803) and the output processing (S804) performed in the management device 300 is as follows.

In a state where the work record information and the estimate are saved in association with each other, the management device 300 verifies whether the work record information matches the appropriateness determination information based on the work content information.

The appropriateness determination information is information set for each vehicle type, and is information in which a value or a range for determining appropriateness is set for each item of the work record information.

In a case of matching the appropriateness determination information, it is output that the work based on the estimate (first work content information or second work content information) is performed, and in a case of not matching the appropriateness determination information, it is output that the work based on the estimate (first work content information or second work content information) is not performed.

For example, it is processing of verifying whether a value within an appropriate range of an error (for example, 100 mL plus or minus) from the item (oil amount) with a value (for example, oil amount of 5,000 mL) designated in the item of the work content information as a center is recorded as the work record information. In this case, when the oil amount subjected to oil replacement as the work is in the range of 4,900 mL to 5,100 mL, it is determined that the work is appropriate (it is output that the work based on the estimate has been performed), and when the oil amount subjected to oil replacement is out of the range, it is not determined that the work is appropriate (it is output that the work based on the estimate (first work content information or second work content information) has not been performed).

[0141] FIG. 15 is a diagram illustrating examples of a user information table and a vehicle information table used in the management system according to the embodiment of the present disclosure.

(a) of FIG. 15 illustrates a user information table, the user information table includes items of a user ID, a user name, an address (region), family information, and a user rank, and these items are stored in association with each other.

[0142] The user ID is information for identifying the user, and the user rank is ranking information set according to the number of times the user has used the service or the like, and in general, a higher rank is set as the user uses more services. The ranking information is used to calculate the order of work at the workplace and costs related to the estimate, and the higher the rank, the more priority the work will be given, and the greater a discount will be received.

[0143] (b) of FIG. 15 illustrates a vehicle information table, the vehicle information table includes items of a vehicle ID, a model, a vehicle type ID, a model year, a travel distance, a manufacturer, a registration year, a vehicle image ID, a user ID, and a work history ID, and indicates that these items are stored in association with each other.

[0144] The vehicle image ID is information for identifying a file of an image related to the

vehicle identified by the vehicle ID, the user ID is information for identifying a user (owner) of the vehicle identified by the vehicle ID, and the work history ID indicates history information of work performed on the vehicle identified by the vehicle ID.

[0145] FIG. 16 illustrates diagrams of an example of a vehicle image information table, a work history information table, and a workplace list information table used in the management system according to the embodiment of the present disclosure.

(c) of FIG. 16 illustrates a vehicle image information table, and this user information table includes items of a vehicle image ID, a name, an image-capturing date and time, a photographer, an image-capturing location, and a holding location, and these items are stored in association with each other.

[0146] The vehicle image ID is information for identifying an image of a file obtained by imaging the vehicle, and a file name corresponding thereto is indicated as the name. The holding location indicates access information (URL) with which the image can be accessed.

[0147] (d) of FIG. 16 illustrates a work history information table, the work history information table includes items of a work history ID, a work content, a worker, a work date, an estimate ID, a vehicle ID, a work status, a recommended date of next work, and a next recommended work content, and these items are stored in association with each other.

[0148] The work history ID is information for identifying the work history, in which the worker who performed the work identified by the work ID and the work date are associated with each other, and the identification information of the estimate serving as a base of performing the work is indicated in the estimate ID. The identification information of the vehicle that is a target of the work is indicated in the vehicle ID, and the work status is indicated in the work status. Further, the recommended date of next work is a date recommended to perform the work next time, which is calculated based on information on the work date, and the next recommended work content indicates the content of the work recommended to be performed on a next recommended date.

[0149] (e) of FIG. 16 illustrates a workplace list information table, the workplace list table includes items of a workplace ID, a name, an address (region), worker information, work facility information, and a reservation information ID, and these items are stored in association with each other.

[0150] The workplace ID is information for identifying a workplace, and the location of the workplace is indicated in the address (region). A worker who performs the work at the workplace is indicated in the worker information, and the work facility (lift-up device, tire

replacement device, and the like) provided at the workplace are indicated in the work facility information.

The workplace ID is associated with a reservation information ID of the workplace, and the reservation information ID is identification information for linking reservation information with other reservation systems.

[0151] FIG. 17 is a diagram illustrating examples of an estimate information table and a unit price information table used in the management system according to the embodiment of the present disclosure.

In (f) of FIG. 17, the estimate information table is illustrated, and this estimate information table includes items of the estimate ID, a creator, the creation date, the vehicle ID, the estimate content, and a user desired condition and designation item, and indicates that these items are stored in association with each other.

[0152] The estimate ID is information for identifying an estimate, indicates a vehicle serving as a target of the estimate in the vehicle ID, and indicates a specific content of the estimate in the estimate content. Further, in creating an estimate, a desired condition designated by the user is illustrated in the user desired condition and designation item.

[0153] (g) of FIG. 17 illustrates a unit price information table, the unit price information table includes items of the vehicle type ID, a work content ID, the work content, a basic work fee, a special work fee, basic work man-hours, related work, and appropriateness determination information, and indicates that these items are stored in association with each other.

[0154] The work content ID, the work content, the basic work fee, the special work fee, the basic work man-hour, the related work, and the appropriateness determination information are associated with each other for each vehicle type ID, and the appropriateness determination information is used to verify whether the work record book is based on the estimate based on the basic work fee, the special work fee, and the basic work man-hours, which are the unit price information.

[0155] FIGS. 18 to 26 are flowcharts each illustrating a flow of processing performed in the management system 1 according to the embodiment of the present disclosure.

[0156] FIG. 18 is estimate creation processing performed in the control device 100, in which user information serving as an estimate creation target and vehicle information are input, and user information and vehicle information for a user ID and a vehicle ID (including a model and a vehicle identification number) are acquired after the login processing (S1801) to the control device 100 (S1802).

As a result, the vehicle serving as a target of the predetermined service and the user of the vehicle are specified.

[0157] Subsequently, the control device 100 acquires the vehicle state information as the diagnostic result by processing of diagnosing a vehicle state of the vehicle (S1803). The vehicle state information acquires, in addition to information acquired from a diagnostic device (diagnostic machine) that diagnoses a vehicle at the workplace corresponding to the control device 100, a measurement value measured by the worker who performs the work.

[0158] The control device 100 specifies the work required for the vehicle based on at least one piece of information such as the vehicle state information, the work history for the vehicle, and the request content (request item) of the user (S1804), and creates the first work content information (estimate A) related to the work using the work information indicating the work content for the specified work (S1805).

As the work history information for the vehicle at this time, the work history information for the vehicle stored in the management device 300 may be used, or the work record information (work record book) recorded in the past may be used.

[0159] Then, the control device 100 saves the first work content information in the control device 100 and the management device 300 in association with the vehicle information and the user information (S1806).

[0160] FIG. 19 is work processing based on the host company or other company estimates performed in the control device 100, and the processing is started by receiving a work request for work based on the estimate or other information (verification result information or the like). It is determined whether the estimate included in the work request is an estimate created at another workplace (another workplace) different from the workplace (own workplace) corresponding to the control device 100 (S1901).

[0161] Processing when the work request based on the estimate created at the other workplace is made will be described below.

In a case of the work request based on the estimate created at the other workplace (YES in S1901), the control device 100 subsequently determines whether workplace information for performing work set in the estimate is the own workplace (S1902). That is, this is processing when the work request is based on the estimate B or the estimate C. Hereinafter, the work request based on the estimate C (estimate reflecting diagnostic result of diagnostic processing) will be described as an example.

If the workplace information for performing the work is not the own workplace (NO

in S1902), since it is considered that a transmission destination is wrong, an error notification is provided to the transmission source, and the processing proceeds to estimate verification processing based on the work record information in S1915.

[0162] If the workplace information for performing the work is the own workplace (YES in S1902), the control device 100 subsequently determines whether the estimate receiving the work request is an authenticated estimate in which the authentication information is set (S1903). If the estimate is an authenticated estimate (YES in S1903), the control device 100 performs confirmation processing of confirming whether the authentication information is correct through mutual communication with the management device 300 (S1904).

If it cannot be confirmed by the confirmation processing that the authentication information is correct, an error indicating that the work of the work content receiving the work request cannot be performed is returned to the transmission source, and the processing ends.

[0163] If it can be confirmed by the confirmation processing that the authentication information is correct, or if the estimate is not an authenticated estimate, the control device 100 subsequently confirms the work content included in the estimate content and determines whether to accept the work (to undertake the work) based on the work content (S1905).

If it is determined that the work is not accepted (NO in S1905), the control device 100 proceeds to the estimate verification processing based on the work record information in S1915. Further, if it is determined that the work is accepted (YES in S1905), the control device 100 creates (S1906) and saves (S1907) work instruction information based on the estimate C receiving the work request.

[0164] Subsequently, the control device 100 performs work management of the work based on the created work instruction information (S1908). The work management is a management method for work that differs for each work environment of the workplace corresponding to the control device 100, and sets work environment and procedures required for the work, such as work process, a worker, a work location, and a tool required for the work for performing the work.

When the work is performed based on the estimate C, the control device 100 saves the work record information of the work and the estimate C in association with each other (S1909).

[0165] Next, processing when the work request based on the estimate created at the own workplace is made will be described below.

In determination processing (S1910) of whether the work request is based on the

estimate created by the own workplace, if it is not determined that the work request is the estimate created by the own workplace (NO in S1910), since there are cases such as the workplace that creates the estimate is unknown, the control device 100 provides an error notification to the transmission source, and proceeds to the verification processing of the estimate based on the work record information in S1915.

[0166] If it is not determined that the work request is the estimate created by the own workplace (YES in S1910), the control device 100 creates (S1911) and saves (S1912) the work instruction information based on the estimate C receiving the work request.

Subsequently, the control device 100 performs work management of the work based on the created work instruction information (S1913). When the work is performed based on the estimate C, the control device 100 saves the work record information of the work and the estimate C in association with each other (S1914).

In the case of the estimate created at the own workplace, it is not always necessary to perform the processing of determining the presence or absence of authentication as illustrated in S1903 or the possibility of acceptance as illustrated in S1905, and of course, the processing may be performed.

[0167] Subsequently, the control device 100 determines whether the verification result information of the estimate is received based on the work record information from the management device 300 (S1915). The information on the verification result of the estimate based on the work record information is information received after the management device 300 performs the processing as illustrated in FIG. 23.

If the verification result of the estimate is received from the management device 300 based on the work record information (YES in S1915), the control device 100 saves and outputs (displays) the verification result information (S1916), and if the verification result of the estimate is not received from the management device 300 based on the work record information (NO in S1916), the processing ends.

[0168] FIG. 20 is estimate creation processing performed in the instruction device 200, in which user information as the estimate creation target and vehicle information are input, and user information and vehicle information for a user ID and a vehicle ID (including a model and a vehicle identification number) are acquired after login processing (S2001) to the instruction device 200 (S2002).

As a result, the vehicle serving as a target of the predetermined service and the user of the vehicle are specified.

[0169] Subsequently, the instruction device 200 receives the work type (S2003) and specifies the standard work in which the work for the work type is specified for the work type (S2004). Further, the instruction device 200 displays a work plan selectable by the user based on the standard work for each work type (S2005).

5 [0170] Then, the instruction device 200 creates the estimate B using the work in the selected work plan and the vehicle information (S2006), and saves the estimate B in association with the user information and the vehicle information (S2007).

[0171] FIG. 21 is the diagnostic processing performed in the instruction device 200, and there are a method of acquiring the diagnostic result by the diagnostic processing performed by
10 the instruction device 200 and a method of receiving the diagnostic processing performed by the diagnostic machine by the instruction device 200.

[0172] The instruction device 200 determines whether a diagnostic request (diagnostic operation) is received (S2101).

The instruction device 200 waits until the diagnostic request is made (NO in S2101),
15 and if the diagnostic request is received (YES in S2101), the instruction device 200 subsequently determines whether the diagnostic request is a request from the diagnostic machine (S2102).

[0173] If the diagnostic request is a request from the diagnostic machine (YES in S2102), the instruction device 200 performs connection confirmation with the diagnostic machine,
20 (S2103), and issues a diagnostic instruction to the diagnostic machine (S2104). Accordingly, the instruction device 200 determines whether the diagnostic result is received from the diagnostic machine (S2105), and waits until the diagnostic result is received (NO in S2105).

If the diagnostic machine is received from the diagnostic machine (YES in S2105), the instruction device 200 saves the information on the received diagnostic result (diagnostic
25 result information) in association with the user information and the vehicle information (S2108).

[0174] If the diagnostic request is not a diagnostic request from the diagnostic machine (NO in S2102), it is determined as a diagnostic request from the instruction device 200, the instruction device 200 is connected to the vehicle, communication confirmation is performed
(S2106), and the diagnostic processing are performed (S2107).

30 Then, a result of the diagnostic processing (diagnostic result information) is saved in association with the user information and the vehicle information (S2108). Of course, the result may be saved in the management device 300 as the diagnostic result information for the vehicle.

[0175] As described above, the diagnostic processing is processing of acquiring a measured

value and appropriateness as the diagnostic result for the diagnostic item designated in advance, and is also processing of acquiring a measured value and appropriateness for the diagnostic item designated by the worker.

[0176] FIG. 22 illustrates estimate creation, estimate comparison, and work request processing performed in the instruction device 200.

The processing illustrated in S2201 to S2208 is the estimate creation processing, the processing illustrated in S2209 to S2211 is the estimate comparison processing, and the processing illustrated in S2212 to S2216 is the work request processing.

[0177] In the instruction device 200, in the flowchart as illustrated in FIG. 20, the processing is started when an instruction operation of the estimate creation is performed after the estimate B is created. First, the diagnostic processing as illustrated in FIG. 21 is performed, and it is determined whether the diagnostic result information for the vehicle that is a work target is saved in the instruction device 200 or the management device 300 (S2201).

[0178] If it is determined that the diagnostic result information is saved (YES in S2202), the instruction device 200 extracts "vehicle configuration information from which it cannot be determined that no failure has occurred" of the vehicle from the diagnostic result information (S2202). By this processing, it is determined whether the vehicle configuration information can be extracted (S2203), and if the vehicle configuration information cannot be extracted (NO in S2203), since it is not necessary to reflect a diagnostic processing result in the estimate B, the instruction device 200 creates and saves the estimate C having the same content as the estimate B (S2204).

[0179] If the vehicle configuration information can be extracted (YES in S2203), the instruction device 200 saves the diagnostic result information including the vehicle information and the "vehicle configuration information from which it cannot be determined that no failure has occurred" (S2205).

Subsequently, the instruction device 200 determines whether work (work to be performed) required for the vehicle configuration information is included in the estimate B (S2206). If the vehicle configuration information is included (YES in S2206), since an estimate procedure in the addition of the required work to the vehicle configuration information is unnecessary, the estimate C having the same content as the estimate B is created and saved (S2204).

[0180] Further, when the work (work to be performed) required for the vehicle configuration information is not included in the estimate B (NO in S2206), the instruction device 200 specifies

the work (work to be performed) required for the vehicle configuration information, and creates and saves a new estimate C to which the work content for the work is added based on the estimate B (S2207).

[0181] In this way, when the estimate C, which is the second work content information, based on the content of the diagnostic result information is created based on the diagnostic result information, the identification information of the estimate B and the created estimate C are transmitted to the management device 300 (S2208). Accordingly, the management device 300 specifies the estimate B being managed based on the identification information of the received estimate B, updates the estimate B with the received estimate C, and saves the estimate B.

[0182] Subsequently, the instruction device 200 determines whether the confirmation request of the estimate A, which is the first work content information, created by the control device 100 is received (S2209). Upon receiving the confirmation request, the instruction device 200 performs comparison processing (verification processing) between the estimate A receiving the confirmation request and the estimate B or the estimate C created and saved by the instruction device 200 (S2210).

The estimate B or the estimate C at this time is the latest estimate saved in the instruction device 200. That is, even if a creation condition of the estimate A and a creation condition of the estimate B or the estimate C are different, it is possible to perform the comparison processing even if they are the same.

Of course, the estimates may be compared with each other by designating the estimate B or the estimate C to be compared with the estimate A using the identification information, or the estimate B or the estimate C to be compared with the estimate A may be searched for based on the estimate creation condition and compared with the searched estimate B or estimate C.

[0183] Then, the instruction device 200 outputs and saves the result of the comparison processing (S2211).

[0184] Subsequently, the instruction device 200 determines whether the designation request of the workplace is made by the operation of the user (S2212). Examples of the operation at this time include an operation of designating a workplace on a screen displayed on the instruction device 200 as illustrated in (b) of FIG. 13.

[0185] If the designation operation of the workplace is performed (YES in S2212), the instruction device 200 extracts a workplace as a candidate for requesting the work based on the estimate C from the workplace list based on at least one piece of information of the user information and the vehicle information (S2213). Further, the instruction device 200 sets the

priority based on the past work history included in the user information to the extracted candidate workplace (S2214), and outputs a candidate for the candidate workplace to which the priority is set (S2215). Further, a confirmation request of the work is made in the workplace designated by the user, and the work request is made to the work based on the estimate C since the confirmation response from the workplace means that the work has been accepted (S2216).

[0186] FIG. 23 is management processing performed in the management device 300, in which when a login request is made from the control device 100 or the instruction device 200 (S2301), authentication processing is performed based on the login ID and the password received as the login request, and information based on the login ID is transmitted (S2302).

When the authentication processing from the control device 100 is performed, information associated with the control device 100 is transmitted, and when the authentication processing from the instruction device 200 is performed, user information and vehicle information are transmitted.

In a state where the authentication processing is performed, when the request is received in the determination processing (S2303) of whether the estimate creation request (estimate request) is received from the instruction device 200 and the control device 100 (YES in S2303), information necessary for the estimate creation according to the request source and setting information are transmitted to the request source (S2304).

In the case of a request from the control device 100, the management device 300 transmits vehicle information on a vehicle that performs an estimate, user information on a user of the vehicle, estimate item information, unit price information, and the like.

If the request is from the instruction device 200, the management device 300 transmits information such as standard work information for the work type in addition to the same information as that of the control device 100.

[0187] Subsequently, the management device 300 determines whether there is an estimate comparison request (S2305), and if there is no estimate comparison request (NO in S2305), the processing proceeds to S2313. If the estimate comparison request is received from the instruction device 200 (YES in S2305), the management device 300 performs estimate comparison processing (S2306). A detailed flow of the comparison processing will be described later with reference to FIG. 24.

[0188] Each of the estimates compared in response to the result of the comparison processing and the comparison result information are saved (S2307).

Subsequently, it is determined, from the comparison result information, whether the

estimate A is content included in the estimate C and is set to be valid indicating an appropriate estimate A (S2308). If it is not set to be valid (NO in S2308), the authentication information is not set in the estimate A since setting processing of the authentication information to be described later is not performed. Of course, information indicating that the authentication information is not set may be set in the estimate A.

[0189] If the estimate A is valid (YES in S2308), the management device 300 calculates a hash value of the estimate A (S2309), acquires current time information (S2310), and sets (assigns) a timestamp including the hash value and the current time information as the authentication information in the estimate A (S2311). Then, the estimate A in which the authentication information is set is saved (S2312).

The authentication information may further include an authentication expiration date.

[0190] Subsequently, the management device 300 determines whether an authentication request of the estimate A is received from the instruction device 200 (S2313).

If the authentication request is not received (NO in S2313), the processing ends.

[0191] If the authentication request is received (YES in S2313), the management device 300 calculates the hash value of the estimate A receiving the authentication request (S2314), compares the hash value with a hash value included in the authentication information set in the estimate A (S2315), and saves a authentication possibility based on the comparison result and the hash value itself in association with the estimate A (S2316).

[0192] FIG. 24 illustrates the estimate comparison processing (verification processing) performed in the instruction device 200 or the management device 300.

This comparison processing (verification processing) is processing performed by both the instruction device 200 and the management device 300, but the management device 300 will be described below as an example.

The comparison processing (verification processing) is processing of determining whether the first work content information (estimate A) created in the control device 100 is appropriate as compared with (verified based on) the second work content information (estimate B or estimate C) created in the instruction device 200, and specifying information that is determined to be inappropriate if not appropriate.

[0193] In a state where the management device 300 receives the first work content information (estimate A) from the control device 100, receives the second work content information (estimate B or estimate C (hereinafter, estimate C)) from the instruction device 200, and saves each estimate, first, estimate items (hereinafter, referred to as "items") constituting

each estimate (estimate A and estimate C) (S2401) are extracted.

Then, the management device 300 performs processing of associating the extracted items of the estimate A and the extracted items of the estimate C for each item (S2402), and stores items that can be associated and items that cannot be unassociated separately (S2403).

5 The association processing of the items is processing of associating items having the same or similar item names with each other and associating items designated in advance with each other.

[0194] Then, the management device 300 performs analysis processing of the items that cannot be associated (S2404). The detailed flow of this analysis processing (first analysis processing) is illustrated in the flowchart of FIG. 25 and will be described below. That is, the
10 analysis processing in S2404 is a verification result of the estimate A based on the items that cannot be associated.

[0195] On the other hand, processing illustrated in the following S2405 to S2418 is analysis processing (second analysis processing) of the items that can be associated, and this analysis
15 processing is a verification result of the estimate A based on the items that can be associated.

First, the management device 300 extracts, for each item that can be associated, a basic work fee that is unit price information of the item (S2405), and extracts work man-hours that are man-hours required to perform work of the item (S2406).

[0196] Subsequently, the management device 300 calculates the total amount for each item
20 using the basic work fee and the work man-hours of each item (S2407), and reads allowable range information for the extracted item (basic work fee and work man-hours) and the calculated value (total amount) from the storage device (S2408).

[0197] Then, the management device 300 compares the extracted item (basic work fee and work man-hours) and the calculated value (total amount) with the allowable range information
25 for each of them (S2409), and determines whether the value of each item exceeds the value (threshold) of the allowable range information (S2410).

The allowable range information includes information indicating a range of a certain width determined to be appropriate or a threshold, and can be determined to be appropriate if an item (basic work fee, work man-hours, total amount) is included in the allowable range
30 information, and is not determined to be appropriate if an item (basic work fee, work man-hours, total amount) is not included in the allowable range information.

[0198] If the value of each item does not exceed the value (threshold) of the allowable range information (NO in S2410), the management device 300 sets that the estimate A serving as a

verification target is included in the allowable range information of the estimate C (S2411), and stores the estimate A, the estimate C, and the comparison result in association with each other (S2412).

[0199] If the value of each item exceeds the value (threshold) of the allowable range information (YES in S2410), the management device 300 compares the sum obtained by adding up the total amounts of all the items (S2413), and determines whether the sum exceeds the value (threshold) of the allowable range information (S2414).

If the sum does not exceed the value (threshold) of the allowable range information (NO in S2414), the management device 300 sets that the estimate A serving as a verification target is included in the allowable range information of the estimate C (S2411), and stores the estimate A, the estimate C, and the comparison result in association with each other (S2412).

[0200] On the other hand, in a case where the sum exceeds the value (threshold) of the allowable range information (YES in S2414), the management device 300 sets that the estimate A is out of the range not included in the allowable range information of the estimate C (S2415), and specifies an item exceeding the allowable range value of the allowable range information and an excess amount exceeding the allowable range value in the item (S2416).

Further, the management device 300 saves the estimate A, the estimate C, the comparison result, the item exceeding the allowable range value, and the exceeded amount in association with each other (S2417).

[0201] Then, in the management device 300, since the amount of the item that can be associated exceeds the allowable range information, this needs to be presented to the user as a problem, and thus the estimate A is set to "confirmation required" indicating that the estimate A is not valid and the confirmation level thereof is set (in the example illustrated in FIG. 24, "level 5" that is a confirmation level higher than S2502 in the same diagram described later and lower than S2506 in FIG. 25 is set) (S2418).

[0202] According to the processing as described above, in the management device 300, in the estimate items constituting the estimate in the comparison processing (verification processing) between the estimates, it is determined whether the estimate is valid or not valid (invalid) for each of the items that cannot be associated with the item that can be associated, and then it is set whether the estimate is valid or not valid as a comparison result based on these. Note that the estimate is set to not valid by setting "confirmation required".

[0203] More specifically, the determination is made as follows.

1. When it is determined that the estimate A is valid in the analysis processing (first

analysis processing) of the item that cannot be associated and it is determined that the item information does not exceed the allowable range information and the sum does not exceed the allowable value range in the analysis processing (second analysis processing) of the item that can be associated, it is determined that the estimate A is valid as it is.

5 2. When it is determined that the estimate A is valid in the analysis processing (first analysis processing) of the item that cannot be associated, and it is determined that either the item information exceeds the allowable range information or the sum exceeds the allowable value range in the analysis processing (second analysis processing) of the item that can be associated, "confirmation required" is set, and it is determined that the estimate A is not valid.

10 3. When it is not determined that the estimate A is valid in the analysis processing (first analysis processing) of the item that cannot be associated, "confirmation required" is set regardless of the results of the first analysis processing and the second analysis processing, and it is determined that the estimate A is not valid.

[0204] Then, the management device 300 outputs the determination result to at least one of
15 the control device 100 and the instruction device 200 (S2419).

[0205] FIG. 25 illustrates details of the analysis processing illustrated in FIG. 24.

This is processing when there is an item that cannot be associated by the association processing of the estimate items in the first work content information and the second work content information.

20 The management device 300 determines whether the item that cannot be associated is an item designated based on the standard work and is an item included in the estimate C but not included in the estimate A (S2501).

In a case where the item is included in the estimate C but is not included in the estimate A (YES in S2501), since the item is an item in the standard work, the management
25 device 300 can determine that the setting of the simple item is omitted or the item is intentionally deleted, and sets the setting of "confirmation required" indicating that the estimate A is not valid as a small problem that cannot be associated, and a confirmation level thereof (in the example illustrated in FIG. 25, a confirmation level "level 2" smaller than that in S2506 to be described later is set) (S2502).

30 [0206] On the other hand, if the item is included in the estimate C but is not included in the estimate A (NO in S2501), the management device 300 subsequently determines whether another item that is included in the estimate C and different from the item designated based on the standard work is included in the estimate A (S2503).

If the other item is not included in the estimate A (NO in S2503), as a result of verification based on the estimate C, the management device 300 determines that the estimate A is not an estimate in which a problem particularly occurs, and sets the estimate A to be valid (S2505).

On the other hand, if "the other item" is included in the estimate A (YES in S2503), the management device 300 can determine whether an unnecessary item is added or an item desired by the user is added since the estimate A includes an item other than the item designated based on the standard work.

[0207] In this case, the management device 300 subsequently determines whether "the other item" is an item designated as additional work by the user (S2504). In this determination, in addition to performing a display, to the user, for confirming whether the item is designated as the additional work, a type of the user additional item may be set in the creation processing of the estimate A, and it may be determined whether this type is set.

If it is determined that "the other item" is an item designated as the additional work by the user (YES in S2504), the management device 300 sets the estimate A to be valid since "the other item" is an item related to work intended by the user (S2505).

[0208] On the other hand, if it is not determined that "the other item" is an item designated as the additional work by the user (NO in S2504), since "the other item" is an item different from the item designated based on the standard work and is not an item of the work intended by the user, as a result of verification based on estimate C, the management device 300 determines that the estimate A is an estimate in which a problem occurs for some reason, and it is determined that (verifies) the inability to match the items with each other is due to the occurrence of some kind of problem.

Since this needs to be presented to the user as a problem, the estimate A is set to "confirmation required" indicating that it is not valid, and the confirmation level thereof is set (in the example illustrated in FIG. 25, the confirmation level "level 10" higher than that in S2502 to be described later is set) (S2506).

[0209] By the analysis processing as described above, the instruction device 200 or the management device 300 can set the result of analyzing the estimate A (first work content information) based on the estimate C (second work content information).

[0210] FIG. 26 is auction processing performed in the management device 300.

The auction processing is processing of receiving bidding processing from a candidate who undertakes the work based on the estimate, and selecting a person who

designates the most advantageous bid condition from work receivers who performed the bidding processing.

[0211] The management device 300 opens an online auction venue and receives registration of an estimate registrant who registers an estimate and a work receiver who receives work based on the estimate (S2601). One or more auction venues can be provided and are identified by site IDs.

In a state where the registration of the estimate registrant and the work receiver is received, it is determined whether estimate registration processing by the estimate registrant is performed (S2602), and if the estimate registration processing is performed (YES in S2602), the management device 300 confirms the format of the registered estimate and confirms the condition (work condition) designated for performing the work based on the estimate (S2603).

That is, the estimate registrant can set the work condition for requesting the work based on the estimate. The work condition at this time includes a general condition and a special condition, the special condition is a condition for immediately determining a single work request destination, and the general condition is a condition other than the special condition.

[0212] When the estimate format and the work condition are confirmed and correct information is set, the estimate in which the work condition is set is disclosed in the auction venue (S2604). At this time, it is possible to disclose not only the entire estimate but also a part of the estimate. Examples of information that is not disclosed include personal information of the estimate registrant.

[0213] In this way, in a state where the estimate is disclosed in the auction venue, it is determined whether there is a bid satisfying the special condition within a period in which a bid is available (S2605), and if there is a bid (YES in S2605), the work receiver who has performed the bidding processing under the special condition is determined as the work assignee, (S2612), and the workplace information of the work assignee and the estimate are saved in association with each other (S2613).

Further, until there is a bid satisfying the special condition within the bid available period (NO in S2605), it is subsequently determined whether the bid available period is exceeded (S2606), and the bid is received until the bid available period is exceeded (NO in S2606).

[0214] If the bid available period is exceeded (YES in S2606), the management device 300 determines whether the bidding processing is being performed (S2607). If there is no bid at this time (NO in S2607), the management device 300 saves a bid history and ends the processing.

That is, it is indicated that the work assignee who accepts the work based on the estimate does not appear in the auction processing. In this case, the auction can be performed again in another auction venue.

[0215] On the other hand, if the bid available period is exceeded (YES in S2606), if the management device 300 is performing the bidding processing (YES in S2607), the management device 300 subsequently determines whether the number of times of the bidding processing is plural (S2609).

If there are a plurality of bids (YES in S2609), the management device 300 sets a priority for each bid based on the bid condition (S2610). In the priority setting processing at this time, the priority is set in consideration of a plurality of conditions such as an order in which a delivery date designated as the bid condition is shorter, an order in which the amount of the estimate is lower, and an order in which the bidding is faster.

At this time, the priority may be set based on a condition (general condition) set by the estimate registrant.

[0216] Then, the work receiver (bidder) who has performed the bidding processing is notified of the priority (S2611). Of course, it is also possible to provides a notification in descending order of the priority. If there is only one bid rather than multiple bids (NO in S2609), the bidder is notified of the priority (first place) (S2611).

When the bidder receives (permits) the notification, the work assignee is determined (S2612).

As described above, when the work assignee is determined, the management device 300 saves the information of the work assignee (the requested workplace information) and the estimate in association with each other (S2613).

[0217] Examples of the above learning include a method in which a pattern of data is input to a computer based on data referred to as teacher data in which information and correct determination are set, and the computer finds a new feature or relevance based on the pattern, and a method in which the computer finds commonality of input data and feature data.

Further, learning is an example of a method referred to as deep learning in which a computer constructs a neural network to analyze, extract, and output local or characteristic data.

Of course, this learning includes pre-processing including processing of complementing insufficient data, processing of excluding unnecessary data, processing of unifying data formats, and the like, and also includes post-processing of storing a learning result so as to be used for other learning.

[0218] The terms "unit", "means", "device", and "system" used in the above-described embodiments and the claims do not simply mean a physical means, and also include a case where functions of these are implemented by software or a software service.

The functions of a single "unit", "means", "device", or "system" may be implemented not only by a single physical means, software, software module, or device but also by a plurality of physical means, software, software modules, devices, or a combination thereof.

[0219] The terms used in the above-described embodiments and claims should be interpreted as non-limiting terms. For example, the term "include" should be interpreted as "including the stated element but not limited thereto". The term "contain" should be interpreted as "containing the stated element but not limited thereto". The term "include" should be interpreted as "including the stated element but not limited thereto". The term "has" should be interpreted as "having the stated element but not limited thereto". The term "include" should be interpreted as "including the stated element but not limited thereto".

[0220] The present application is based on a Japanese Patent Application No. 2023-176486 filed on October 12, 2023, the contents of which are incorporated herein by reference.

REFERENCE SIGNS LIST

[0221] 100 control device
120 service providing device
200 instruction device
220 imaging device
230 diagnostic machine
300 management device
320 DB
400 external device

CLAIMS

[Claim 1]

A management system comprising:

5 a control device including:

a first vehicle information acquisition unit configured to acquire vehicle information on a vehicle, with an instruction issued by another worker different from a user of the vehicle as a trigger;

10 a work specification unit configured to specify work to be performed on the vehicle indicated by the vehicle information based on the vehicle information acquired by the vehicle information acquisition unit;

a first creation unit configured to create first work content information related to the work using work information for the work specified by the work specification unit; and

15 a first work content information storage unit configured to store the first work content information created by the first creation unit; and

an instruction device including:

a user information acquisition unit configured to acquire user information on the user;

20 a second vehicle information acquisition unit configured to acquire vehicle information on the vehicle, with an instruction issued from the user as a trigger;

a work type designation unit configured to designate a work type of the work to be performed the vehicle;

25 a type standard work output unit configured to output, for the work type designated by the work type designation unit, standard work in which the work for the work type is specified;

30 a second creation unit configured to create second work content information using the work specified from the standard work for the work type output by the type standard work output unit and the vehicle information acquired by the second vehicle information acquisition unit; and

a second work content information storage unit configured to store the second work content information created by the second creation unit, wherein

at least one of the control device and the instruction device includes a comparison

result output unit that outputs a comparison result obtained by comparing the first work content information created by the first creation unit with the second work content information created by the second creation unit.

5 [Claim 2]

The management system according to claim 1, further comprising:

a management device connectable to the control device and the instruction device,

wherein

the management device:

10 configured to receive the first work content information from the control device;

 configured to receive the second work content information from the instruction device;

15 including a comparison processing unit configured to compare the first work content information with the second work content information; and

 configured to transmit a comparison result obtained by the comparison processing unit to at least one of the control device and the instruction device.

[Claim 3]

20 The management system according to claim 2, wherein

 the management device manages a basic work fee per unit time of the work for each work, and

 the comparison processing unit compares the basic work fee in the work included in the second work content information with the basic work fee in the work included in the first
25 work content information.

[Claim 4]

The management system according to claim 1, further comprising:

a vehicle information reading device configured to read vehicle information stored in

30 the vehicle, wherein

 the second vehicle information acquisition unit acquires the vehicle information read by the vehicle information reading device, and

 the second creation unit creates the second work content information using the work

specified from the standard work for the work type output by the type standard work output unit and the vehicle information acquired by the second vehicle information acquisition unit.

[Claim 5]

5 The management system according to claim 1, wherein
 the second creation unit specifies vehicle information performed on work specified
 by the standard work, and creates the second work content information using work history
 information of the vehicle performed on the vehicle indicated by the vehicle information.

10 [Claim 6]

 A management method comprising:
 by a first computer that is a control device,
 acquiring vehicle information on a vehicle, with an instruction issued by another
 worker different from a user of the vehicle as a trigger;
 15 specifying work to be performed on the vehicle indicated by the vehicle information
 based on the acquired vehicle information;
 creating first work content information related to the work using work information
 for the specified work; and
 storing the created first work content information; and
 20 by a second computer that is an instruction device,
 acquiring user information on the user;
 acquiring vehicle information on the vehicle, with an instruction issued by the user
 as a trigger;
 designating a work type of the work to be performed the vehicle;
 25 outputting, for the designated work type, standard work in which the work for the
 work type is specified;
 creating second work content information using the work specified from the standard
 work for the output work type and the acquired vehicle information; and
 storing the created second work content information, wherein
 30 at least one of the first computer and the second computer outputs a comparison result
 obtained by comparing the created first work content information with the created second work
 content information.

[Claim 7]

A management program causing
a first computer as a control device to execute
processing of acquiring vehicle information on a vehicle, with an instruction issued
5 by another worker different from a user of the vehicle as a trigger;
processing of specifying work to be performed on the vehicle indicated by the vehicle
information based on the acquired vehicle information;
processing of creating first work content information related to the work using work
information for the specified work; and
10 processing of storing the created first work content information; and
causing a second computer as an instruction device to execute
processing of acquiring user information on the user;
processing of acquiring vehicle information on the vehicle, with an instruction issued
by the user as a trigger;
15 processing of designating a work type of the work to be performed the vehicle;
processing of outputting, for the designated work type, standard work in which the
work for the work type is specified;
processing of creating second work content information using the work specified
from the standard work for the output work type and the acquired vehicle information; and
20 processing of storing the created second work content information, wherein
at least one of the first computer and the second computer is caused to output a
comparison result obtained by comparing the created first work content information with the
created second work content information.