

DESCRIPTION

Title of the Invention: INFORMATION PROCESSING DEVICE,
INFORMATION PROCESSING METHOD, AND PROGRAM

TECHNICAL FIELD

[0001]

The present invention relates to an information processing device, an information processing method, and a program.

BACKGROUND ART

[0002]

Conventionally, in a used vehicle assessment support system, there is a technique for calculating repair costs and used vehicle purchase prices based on various types of information (for example, see Patent Document 1).

[0003]

Patent Document 1: Japanese Unexamined Patent Application, Publication No.2017-219956

DISCLOSURE OF THE INVENTION

Problems to be Solved by the Invention

[0004]

However, according to the conventional techniques including the technique disclosed in Patent Document 1, only the used vehicle purchase price can be merely calculated in

consideration of repair costs. Normally, used vehicle purchasers merely propose a certain disposal method. In other words, some used vehicle purchasers merely purchase used vehicles on the premise of reselling the used vehicles in Japan after repairing the used vehicles. As a result, for users of used vehicles, there have been no proposals for purchase prices for appropriate disposal methods other than those assumed by the used vehicle purchasers.

[0005]

The present invention has been made in view of such circumstances, and an object of the present invention is to improve convenience in proposing a reuse method for a damaged vehicle to a user who manages the damaged vehicle.

Means for Solving the Problems

[0006]

In order to achieve the above object, an aspect of the present invention is to provide an information processing device that classifies a reuse method of a damaged vehicle managed by a user,

the information processing device including:

a damaged vehicle information acquisition unit that acquires, as damaged vehicle information, information including vehicle information on the damaged vehicle and damage information capable of identifying damage to the damaged vehicle;

a degree-of-damage determination unit that calculates a repair cost of the damaged vehicle based on the damage information and determines a degree of damage based on the repair cost;

a residual value determination unit that calculates a used vehicle market price based on the vehicle information and determines a residual value based on the used vehicle market price and the degree of damage; and

a reuse method classification unit that classifies, based on the degree of damage and the residual value, the reuse method of the damaged vehicle into either a restoration sales method of restoring the damaged vehicle and selling the damaged vehicle as a used vehicle or a recycling method of recycling the damaged vehicle.

[0007]

An information processing method and a program according to an aspect of the present invention are a method and a program corresponding to the information processing device according to an aspect of the present invention.

Effects of the Invention

[0008]

According to the present invention, it is possible to improve convenience in proposing a reuse method for a damaged vehicle to a user who manages the damaged vehicle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009]

FIG. 1 is a schematic diagram illustrating an example of a flow of a present service to which an information processing system including a server according to an embodiment of an information processing device of the present invention is

applied;

FIG. 2 is a graph showing a concept of car-triage that contributes to determine a reuse method of a damaged vehicle in the present service in FIG. 1;

FIG. 3 is a diagram showing an example of a configuration of the information processing system for providing the service shown in FIG. 1;

FIG. 4 is a block diagram showing an example of a hardware configuration of a server in the information processing system shown in FIG. 3;

FIG. 5 is a functional block diagram showing an example of a functional configuration of an information processing system including the server shown in FIG. 4;

FIG. 6 is another flowchart showing an example of classification of the reuse method of the damaged vehicle by the server having the functional configuration shown in FIG. 5;

FIG. 7 is a diagram showing a flow in which the server having the functional configuration shown in FIG. 5 acquires damaged vehicle information;

FIG. 8 is a diagram showing a flow in which the server having the functional configuration shown in FIG. 5 calculates a degree of damage;

FIG. 9 is a diagram showing a flow in which the server having the functional configuration shown in FIG. 5 calculates a residual value; and

FIG. 10 is a diagram showing a flow in which the server having

the functional configuration shown in FIG. 5 calculates a residual value in recycling.

PREFERRED MODE FOR CARRYING OUT THE INVENTION

[0010]

An embodiment of the present invention will be described below with reference to the drawings.

[0011]

FIG. 1 is a schematic diagram illustrating an example of a flow of a service (hereinafter, referred to as a "present service") to which an information processing system including a server according to an embodiment of an information processing device of the present invention is applied.

[0012]

Regarding a vehicle C managed by a user U, the present service is to present a reuse method of the vehicle C and a purchase price of the vehicle C when the reuse method is employed, based on a photograph of the vehicle C taken by the user U. In the present embodiment, when a purchase method premised on restoration (repair) is presented as a reuse method, restoration (repair) costs are also presented. Although details will be described below, the present service is particularly useful for the vehicle C that has been damaged by accidents or natural disasters. Therefore, hereinafter, the vehicle C is referred to as a "damaged vehicle C" assuming that the vehicle C is damaged. In addition, as a feature of the present service, it is possible to determine a reuse

method of the damaged vehicle C based on a concept of car-triage, and to present a better reprocessing method to the user U. The car-triage is to determine a reuse method for the damaged vehicle C that maximizes the economic value according to the degree of damage and the residual value of the damaged vehicle C. Further details of the car-triage will be described below.

[0013]

Hereinafter, in the following description, it is assumed that a provider of the present service (hereinafter, referred to as a "service provider") presents the reuse method and the purchase price to the user U, and sells the damaged vehicle C, which is purchased from the user U, to other business persons through a user terminal 2 with a method according to the reuse method.

[0014]

An outline of the flow of the present service will be described below along steps ST1 to ST6 shown in FIG. 1.

[0015]

Specifically, for example, in step ST1, the user U uses a camera of the user terminal 2 such as a smartphone of the user to take a photograph a damaged vehicle C as a subject. Thus, captured image data (hereinafter, referred to as "photo image information") (of the photograph) including the damaged vehicle C as a subject is transmitted from the user terminal 2, and is provided to a service provider (a server 1 in FIG. 3 which will be described below). In FIG. 1, the damaged vehicle

C is shown a state immediately after being damaged (caused an accident), but a timing at which the user U takes a photograph including the damaged vehicle C as a subject does not have to be immediately after being damaged (caused an accident).

[0016]

In step ST1, the user U uses the user terminal 2 to take a photograph including a vehicle inspection certificate of the damaged vehicle C as a subject. Thus, captured image data (hereinafter, referred to as "vehicle inspection certificate information") including the vehicle inspection certificate as a subject is transmitted from the user terminal, and is provided to a service provider (the server 1 in FIG. 3 which will be described below). Thus, the service provider (the server 1 in FIG. 3 which will be described below) performs series of steps ST2 to ST4 as follows.

[0017]

In other words, in step ST2, a damage location of the damaged vehicle C is identified based on the transmitted photo image information. Specifically, for example, the server 1, which will be described below, employs an image recognition model of AI (Artificial Intelligence). When the transmitted photo image information is input, the image recognition model identifies and outputs the location and degree of damage to the damaged vehicle C included in the photo image information as a subject. Such an image recognition model is generated as a result of predetermined learning processing. In other words, for example, the image recognition model is generated and

updated by learning processing using photo image information of the damaged vehicle C and data indicating the degree of damage to the damaged vehicle C.

[0018]

Next, in step ST3, based on the location and degree of damage to the damaged vehicle C obtained in step ST2, a repair cost of the damaged vehicle C is calculated. Specifically, for example, the server 1 employs a repair estimation system (a degree-of-damage determination unit 52 in FIG. 5 which will be described below). The repair estimation system calculates the repair cost based on the location and degree of damage to the identified damaged vehicle C.

[0019]

Next, in step ST4, a residual value of the damaged vehicle C is calculated in consideration of the repair cost of the damaged vehicle C obtained in step ST3. In other words, the server 1 calculates the residual value of the damaged vehicle C, based on the vehicle inspection certificate information of the vehicle C obtained in step ST1 and the repair cost of the damaged vehicle C calculated in step ST3. Here, the degree of damage is an index representing the degree of damage to the damaged vehicle C. In the present embodiment, the degree of damage employs a ratio between a value obtained by subtracting the cost (that is, the above-described repair cost) required to repair the damaged vehicle C from a value (selling price) when the damaged vehicle C is repaired and the value (selling price) when the damaged vehicle C is repaired.

[0020]

In step ST5, based on the degree of damage and the residual value of the damaged vehicle C calculated in steps ST3 and ST4, a method capable of selling the damaged vehicle C at the highest price is presented to the user U through the user terminal 2. The method capable of selling the damaged vehicle C at the highest price in the present embodiment includes HOW, WHERE, and WHEN as follows. In other words, the user U is presented with HOW (how) of the method capable of selling the damaged vehicle C at the highest price, for example, repair sales, selling as-is, and dismantling sales. Further, the user U is presented with WHERE (where) of the method capable of selling the damaged vehicle C at the highest price, for example, used vehicle AA (Auto Auction) sales, retail sales, and export sales to overseas. Further, the user U is presented with a method of selling the damaged vehicle C based on the timing of value maximization, which is WHEN (when) of the method capable of selling the damaged vehicle C at the highest price. In other words, for example, the residual value of a used vehicle (a market value in a case of selling in a used vehicle market) changes in conjunction with fluctuations in supply and demand. Therefore, for example, the user U is presented with a method of selling the damaged vehicle C based on the residual value of the damaged vehicle C after a predetermined period from the purchase time and a storage cost of the damaged vehicle C (or the damaged vehicle C undergone repair) until the predetermined period.

[0021]

The present service can present a better reprocessing method to the user U by introducing the concept of the car-triage at the time of determination of HOW (how) described above.

[0022]

In step ST6, the user U is presented with the residual value of the damaged vehicle C in the method capable of selling the damaged vehicle C at the highest price presented in step ST5. In other words, the user U can grasp WHEN, WHERE, and HOW of the method capable of selling the damaged vehicle C at the highest price presented as a result of the process of step ST5 and the salvage value of the damaged vehicle C in such a method. In other words, transparency of the purchase price can be secured for the user U. Thus, the user U can grasp the reason for the price of the damaged vehicle C, make a decision to sell the damaged vehicle C with a sense of satisfaction, or determine a reuse method.

[0023]

For example, when the user U is presented with a reuse method premised on restoration (repair) of the damaged vehicle C, a purchase price, and a restoration (repair) cost, the user U may consider of repairing the damaged vehicle C and continuing to drive it rather than having the damaged vehicle C purchased. In such a case, the service provider can receive an order for restoration (repair) of the damaged vehicle C from the user U based on the presented restoration (repair)

cost. In other words, the user U is presented with the restoration (repair) cost on the premise that the service provider takes charge of the restoration (repair). Thus, the transparency of the purchase price is secured.

[0024]

The overall flow of the present service has been described above with reference to FIG. 1. The concept of the car-triage in the present service will be described below with reference to FIG. 2.

[0025]

FIG. 2 is a graph showing the concept of the car-triage that contributes to determine the reuse method of the damaged vehicle in the present service in FIG. 1.

[0026]

Conventionally, triage is a method applied to natural persons, and is used to determine classification of the priority of treatment according to the degree of urgency and severity of injury or disease when a large number of injured or sick persons occur in the event of a disaster.

[0027]

The car-triage of the present service is a method applied to the vehicle C, and can be used to determine a reuse method that maximizes economic values based on the degree of damage and residual value of the vehicle C. In other words, the car-triage of the present service means classifying the reuse method for maximizing economic values according to the degree of damage (correlating with the size of the repair cost) and

residual value of the damaged vehicle C.

[0028]

A vertical axis of the graph shown in FIG. 2 is an axis indicating the degree of damage (that is, correlating with the size of the repair cost), and indicates a situation in which the degree of damage is gradually higher (that is, being damaged and broken) toward an upper side and the degree of damage is gradually lower toward a lower side. A horizontal axis of the graph shown in FIG. 2 is an axis indicating the residual value, and indicates a situation in which the residual value of the damaged vehicle C is gradually lower toward a right side and the residual value of the damaged vehicle C is gradually higher toward a left side.

[0029]

In the graph shown in FIG. 2, four regions R1 to R4 are classified according to the degree of damage and the residual value. The region R1 indicates classification of domestic restoration sales. The domestic restoration sales is a method of selling the vehicle C as a used vehicle at retail or AA on the premise that the vehicle will be restored.

[0030]

The region R2 indicates classification of overseas restoration sales. The overseas restoration sales is a method of selling overseas the vehicle C as a used vehicle on the premise that the vehicle will be restored.

[0031]

The region R3 indicates classification of parts recycling

sales. The parts recycling sales is a method of selling the vehicle C (or one or more parts) on the premise that one or more parts of the vehicle C are sold on a part-by-part basis.

[0032]

The region R4 indicates classification of resource recycling. The resource recycling sales is a method of selling the vehicle C on the premise that materials of the vehicle C are sold based on the value of the materials as resources.

[0033]

A description will be made below with reference to the graph of FIG. 2 with respect to how the reuse method is classified according to the concept of the car-triage. First, as indicated by a line L11 in FIG. 2, based on the degree of damage and residual value of the damaged vehicle C, the reuse method of the damaged vehicle C is classified into one of a restoration sales method of restoring the damaged vehicle C and selling it as a used vehicle and a recycling method of recycling the damaged vehicle. Specifically, when the damaged vehicle C is high in the residual value and is low in the degree of damage, that is, when the degree of damage is low relative to the residual value, the restoration sales method is employed in which the damaged vehicle C is restored and is sold as a used vehicle. This indicates that the damaged vehicle C should be repaired because the repair cost for the damaged vehicle C can be covered by a sale price obtained by selling as a used vehicle. In addition, when the damaged vehicle C is low in the residual value and is high in the

degree of damage, that is, when the degree of damage is high relative to the residual value, the recycling method of recycling the damaged vehicle is employed. This indicates that the damaged vehicle C should not be repaired because the repair cost for the damaged vehicle C cannot be covered by a sale price obtained by selling as a used vehicle. In other words, as a result of the car-triage, the classification is made as to whether the reuse method of restoring the damaged vehicle C should be employed or the reuse method of recycling without repairing the damaged vehicle C should be employed, based on the degree of damage and residual value of the damaged vehicle C.

[0034]

Here, the repair cost in Japan is often higher than the repair cost in foreign countries (especially, foreign countries where there are users who want to purchase the damaged vehicle C made in Japan). In other words, labor costs of persons in charge of repairs in Japan are normally higher than those in foreign countries. Further, the higher level of completion of repairs is normally demanded in Japan. In other words, for example, parts used for repairs in Japan are required to be new or of good quality, which may increase costs. Further, for example, even minor scratches on the body may be required to be repaired. In summary, since labor costs are high and the demand for repairs is high, the demand for the level of completion of repairs is high, and thus the residual value may become low. On the other hand, since the

labor costs of persons in charge of repairs are low and the demand for the level of completion is low in foreign countries, if a repair is sufficient enough to be driven even when there is a history of accidents, the reduction in residual value will be made low. Further, transportation costs of the damaged vehicle C intended for sale in foreign countries are higher than the transportation costs of the damaged vehicle C intended for sale in Japan.

[0035]

For this reason, when the reuse method of the damaged vehicle C is classified into the restoration sales method (indicated below the line L11), the reuse method of the damaged vehicle C is classified into either the domestic restoration sales method or the overseas restoration sales method as shown by a line L12 in FIG. 2. Specifically, in the case where the restoration sales method is employed, when the damaged vehicle C is high in the residual value and is low in the degree of damage, that is, when the degree of damage is low relative to the residual value, the domestic restoration sales method is employed in which the damaged vehicle C is restored and is sold domestically as a used vehicle. Further, in the case where the restoration sales method is employed, when the damaged vehicle C is high in the residual value and is high in the degree of damage, that is, when the degree of damage is high relative to the residual value, the overseas restoration sales method is employed in which the damaged vehicle C is restored and is sold overseas as a used vehicle.

In other words, as a result of the car-triage, when the restoration sales method is employed for the damaged vehicle C, the classification is made as to whether the domestic restoration sales method should be employed or the foreign restoration sales method should be employed, based on the degree of damage and residual value of the damaged vehicle C. In addition, although the description has been made with respect to in-Japan and foreign countries, when the labor cost in a first country is higher than the labor cost in a second country and the value of the vehicle in the first country is high in the second country, a foreign repair sales method from the first country to the second country is preferred.

[0036]

Here, when the damaged vehicle C is not restored, the damaged vehicle C (purchased for the purpose of traveling on roads) is disposed in a form other than an automobile. Specifically, in the disposal, there is a recycling method using the damaged vehicle C as a resource. In other words, for example, each of parts (frame, gear, and wheels, for example) of the damaged vehicle C is recycled as a resource such as iron or aluminum. In the disposal, there is a method of recycling at least some of the parts constituting the damaged vehicle C as parts. In other words, for example, an undamaged meter panel of the damaged vehicle C is recycled as a part. For example, when only a rear of the damaged vehicle C is damaged as a result of a rear-end collision, each part of an engine room of the damaged vehicle C can be disposed more

expensively by recycling compared with a case of recycling each part as a resource such as iron.

[0037]

Therefore, when the reuse method of the damaged vehicle C is classified into the recycling method (indicated above a line L21), the reuse method of the damaged vehicle C is classified into either a resource recycling method and a parts recycling method as shown by a line L13 in FIG. 2. Specifically, in the case where the recycling method is employed, when the damaged vehicle C is low in the residual value and is high in the degree of damage, that is, when the degree of damage is high relative to the residual value, the resource recycling method is employed in which the damaged vehicle C is recycled as a resource. Further, in the case where the recycling method is employed, when the damaged vehicle C is high in the residual value and is low in the degree of damage, that is, when the degree of damage is low relative to the residual value, the parts recycling method is employed in which the at least some of parts constituting the damaged vehicle C are recycled as parts. In other words, as a result of the car-triage, when the recycling method is employed for the damaged vehicle C, the classification is made as to whether the resource recycling method for recycling as resources should be employed or the parts recycling method for recycling at least some of parts as parts should be employed, based on the degree of damage and residual value of the damaged vehicle C.

[0038]

Thus, looking at the straight line L21 in the graph of FIG. 2, the damaged vehicle C with a constant residual value is classified into four different categories depending on the degree of damage. In other words, when the degree of damage is sufficiently low, the damaged vehicle C is reused by the method of region R1, that is, the domestic restoration sales. Therefore, when the degree of damage is a moderate level (for example, about 40% on the straight line L21), the cost of restoring the damaged vehicle C relative to the residual value of the restored damaged vehicle C is larger than that in the above-described example. In this case, it is preferable to restore the damaged vehicle C and sell the restored damaged vehicle C for the overseas market. Furthermore, when the degree of damage is a high level (for example, about 60% on the straight line L21), the cost of restoring the damaged vehicle C relative to the residual value of the restored damaged vehicle C is even larger than that in the above-described example. In this case, it is preferable to give up restoring the damaged vehicle C and sell at least some of the damaged vehicle C as parts, regardless of the overseas or domestic market. Then, when the degree of damage is a higher level (for example, about 80% on the straight line L21), the cost of restoring the damaged vehicle C relative to the residual value of the restored damaged vehicle C is even larger than that in the above-described example. In this case, it is preferable to reuse the damaged vehicle C as a resource,

assuming that the parts of the damaged vehicle C also do not have value.

[0039]

Similarly, looking at a straight line L22 in the graph of FIG. 2, the damaged vehicle C with a constant degree of damage is classified into four different categories depending on the residual value. In other words, as described above, it is found that it is preferable to use the damaged vehicle C for the domestic restoration sales when the residual value is high, and to recycle the damaged vehicle C as a resource when the residual value is low.

[0040]

As described above, the present service can classify any preferred method as the reuse method of the damaged vehicle C by means of the car-triage.

[0041]

FIG. 3 is a diagram showing an example of a configuration of the information processing system for providing the service shown in FIG. 1.

[0042]

The information processing system shown in FIG. 3 is configured in which a server 1, a user terminal 2, and a person-in-charge terminal 3 are connected to each other via a predetermined network NW such as the Internet.

[0043]

The server 1 is an information processing device managed by the service provider. The user terminal 2 is an information

processing terminal operated by the user U. The person-in-charge terminal 3 is an information processing terminal operated by a person in charge of purchasing who communicates with the user U in order to provide a service for purchasing the damaged vehicle C.

[0044]

In addition, exchange of information between the user terminal 2 and the person-in-charge terminal 3 is basically performed via the server 1. Then, the service provider S exchanges information from the server 1 as necessary.

[0045]

FIG. 4 is a block diagram showing an example of a hardware configuration of the server in the information processing system shown in FIG. 3.

[0046]

The server 1 includes a CPU (Central Processing Unit) 11, a ROM (Read Only Memory) 12, a RAM (Random Access Memory) 13, a bus 14, an input/output interface 15, an output unit 16, an input unit 17, a storage unit 18, a communication unit 19, and a drive 20.

[0047]

The CPU 11 executes various types of processing according to programs recorded in the ROM 12 or programs loaded from the storage unit 18 to the RAM 13. The RAM 13 also appropriately stores data necessary for the CPU 11 to execute various types of processing.

[0048]

The CPU 11, the ROM 12, and the RAM 13 are connected to each other via the bus 14. The bus 14 is also connected with the input/output interface 15. The input/output interface 15 is connected with the output unit 16, the input unit 17, the storage unit 18, the communication unit 19, and the drive 20.

[0049]

The output unit 16 is configured by, for example, a display and a speaker, and outputs various information as an image or a sound. The input unit 17 is configured by, for example, a keyboard and a mouse, and inputs various information.

[0050]

The storage unit 18 is configured by, for example, a hard disk and a DRAM (Dynamic Random Access Memory), and stores various data. The communication unit 19 communicates with other devices (the user terminal 2 and the person-in-charge terminal 3 in the example of FIG. 2) via the network NW including the Internet.

[0051]

The drive 20 is appropriately mounted with a removable medium 31 such as a magnetic disk, an optical disk, a magneto-optical disk, or a semiconductor memory. A program read from the removable medium 31 by the drive 20 is installed in the storage unit 18 as necessary. In addition, the removable medium 31 can also store various data stored in the storage unit 18 in the same manner as the storage unit 18.

[0052]

Although not shown, the user terminal 2 and the person-in-charge terminal 3 of the information processing system in FIG. 3 have basically the same hardware configuration as that shown in FIG. 3.

[0053]

FIG. 5 is a functional block diagram showing an example of a functional configuration of an information processing system including the server shown in FIG. 4. The CPU 11 of the server 1 functions as a damage information acquisition unit 51, a degree-of-damage determination unit 52, a residual value determination unit 53, a reuse method determination unit 54, a presentation information generation unit 55, and a presentation control unit 56. The damage information acquisition unit 51 includes a damaged vehicle information acquisition unit 61 and a damage location identification unit 62. The reuse method determination unit 54 includes a reuse method classification unit 71, a WHERE unit 72, and a WHEN unit 73. One region of the storage unit 18 of the server 1 stores a damage identification AI model 81.

[0054]

The damaged vehicle information acquisition unit 61 acquires, as damaged vehicle information, information including the vehicle information and damage information that can identify the damage for the damaged vehicle C. The degree-of-damage determination unit 52 calculates a repair cost of the damaged vehicle C based on the damage information, and determines the degree of damage based on the repair cost. The

residual value determination unit 53 calculates a used vehicle market price based on the vehicle information, and determines a residual value based on the used vehicle market price and the degree of damage. The reuse method classification unit 71 classifies, based on the degree of damage and the residual value, the reuse method of the damaged vehicle C into either the restoration sales method of restoring the damaged vehicle C and selling it as a used vehicle or the recycling method of recycling the damaged vehicle C.

[0055]

Specifically, the degree-of-damage determination unit 52 calculates a domestic repair cost as a repair cost. The residual value determination unit 53 calculates a domestic used vehicle market price as a used vehicle market price. When the reuse method of the damaged vehicle C is classified into the restoration sales method, the reuse method classification unit 71 classifies, based on the domestic repair cost and the domestic used vehicle market price, the reuse method of the damaged vehicle C into either the domestic restoration sales method in which the damaged vehicle C is restored and is sold domestically as a used vehicle or the overseas restoration sales method in which the damaged vehicle C is restored and is sold overseas as a used vehicle. Specifically, for example, when the domestic restoration sales method of the damaged vehicle C does not make a profit, the reuse method classification unit 71 classifies, based on the domestic repair cost and the domestic used vehicle market price, the

reuse method of the damaged vehicle C into the overseas restoration sales method.

[0056]

When the reuse method of the damaged vehicle C is classified into the recycling method, the reuse method classification unit 71 classifies, based on the residual value, the reuse method of the damaged vehicle C into either the resource recycling method in which the damaged vehicle C is recycled as a resource or the parts recycling method in which the at least some of parts constituting the damaged vehicle C are recycled as parts.

[0057]

When the reuse method of the damaged vehicle C is classified into the recycling method, the reuse method classification unit 71 calculates a value for each of parts by using the parts constituting the damaged vehicle C as a unit, and classifies the reuse method into either the resource recycling method or the parts recycling method.

[0058]

FIG. 6 is another flowchart showing an example of classification of the reuse method of the damaged vehicle by the server having the functional configuration shown in FIG. 5.

[0059]

As shown in step ST21, the reuse method of the damaged vehicle C is classified depending on whether the damaged vehicle C can be repaired. Specifically, for example, the

reuse method of the damaged vehicle C is classified depending on the viewpoint corresponding to the classification by the line L11 in FIG. 2 described above. Here, when it is determined in step ST21 to be "Yes", the process proceeds to step ST22. Further, when it is determined in step ST21 to be "No", the process proceeds to step ST24.

[0060]

As shown in step ST22, the reuse method of the damaged vehicle C is classified depending on whether the damaged vehicle C is repaired at our company. Here, when it is determined in step ST22 to be "Yes", the process proceeds to step ST23. Further, when it is determined in step ST22 to be "No", WEB sales are employed in the restoration sales method.

[0061]

As shown in step ST23, the reuse method of the damaged vehicle C is classified depending on whether the damaged vehicle C is sold commercially. Here, when it is determined in step ST23 to be "Yes", AA exhibition is employed in the restoration sales method. Further, when it is determined in step ST23 to be "No", retail sales are employed in the restoration sales method.

[0062]

As described above, the WEB sales, the AA exhibition, and the retail sales are examples of the restoration sales method. In other words, when it is determined in step ST21 that the damaged vehicle can be repaired, the restoration sales method is employed, and the damaged vehicle is sold by any method.

[0063]

As shown in step ST24, the reuse method of the damaged vehicle C is classified depending on whether the parts of the damaged vehicle C are valuable. Here, when it is determined in step ST24 to be "Yes", the parts recycling method R3 is employed in the recycling method. Further, when it is determined in step ST23 to be "No", the resource recycling method R4 is employed in the recycling method.

[0064]

FIG. 7 is a diagram showing a flow in which the server having the functional configuration shown in FIG. 5 acquires damaged vehicle information. First, as a premise, as shown in step ST31, damaged vehicle information is acquired for the damaged vehicle C as follows. In other words, as shown in step ST32, the user U operates the user terminal 2 to capture an image of the damaged vehicle C as a subject. Next, as shown in step ST33, the image information obtained by capturing the damaged vehicle C as a subject in step ST32 is transmitted to the server 1, and the damage location is recognized by the damage location identification unit 62 using an AI model.

[0065]

FIG. 8 is a diagram showing a flow in which the server having the functional configuration shown in FIG. 5 calculates the degree of damage. As shown in step ST41, repair fees are calculated by the server 1 according to the damage location recognized in step ST33 in FIG. 7. As shown in step ST42, parts for replace used in the repair are automatically

searched. Next, as shown in step ST43, the repair cost is calculated based on the repair fees and costs of the parts for replace calculated in steps ST41 and S42.

[0066]

FIG. 9 is a diagram showing a flow in which the server having the functional configuration shown in FIG. 5 calculates a residual value. As a premise, as shown in step ST51, the residual value is calculated as follows based on the vehicle information of the damaged vehicle C acquired in step ST32 in FIG. 7. In other words, as shown in step ST52, a unique algorithm is used to calculate a selling price (that is, residual value) after repair at each location (WHERE). Next, in step ST53, the residual value is presented to the user U or the person in charge of purchase together with the information of the location with the highest residual value among the residual values calculated at each location in step ST52.

[0067]

Specifically, only the residual value may be presented to the user U. Thus, the user U can grasp the residual value of the damaged vehicle C and then decide to sell the damaged vehicle C. Further, for example, not only the residual value but also the reuse method may be presented to the user U. Thus, the user U can grasp the residual value of the damaged vehicle C and what kind of reuse method is premised as the basis of the residual value. As a result, since the transparency of the purchase price to the user U is ensured, the user U can make a decision to sell the damaged vehicle C

with a sense of satisfaction. Further, for example, as described above, when the reuse method is the domestic restoration sales method, the user U may be presented with the reuse method and the restoration (repair) cost together with the residual value. Thus, the user U can grasp not only the residual value of the damaged vehicle C but also the fact that the residual value is based on the premise of restoration at our country and the amount of restoration (repair) cost. At this time, the service provider can receive an order for restoration (repair) of the damaged vehicle C from the user U based on the presented restoration (repair) cost. In this way, the user U is presented with the restoration (repair) cost on the premise that the service provider undertakes the restoration (repair). Thus, the transparency of the purchase price is secured.

[0068]

Further, the person in charge of purchase may be presented with information on the location with the highest residual value and the residual value at other locations. Thus, the person in charge of purchase can verify validity of the information such as the residual value presented to the user U, or use the information for explanation to the user U. Specifically, for example, when the reuse method is the recycling method by the present service, the user U may have an impression that the "damaged vehicle C has a value when the restoration sales method is employed". In this case, the person in charge of purchase, who knows the residual value of

the damaged vehicle C in the restoration sales method, can use the residual value for explanation to the user U. Thus, the transparency of the purchase price is secured.

[0069]

FIG. 10 is a diagram showing a flow in which the server having the functional configuration shown in FIG. 5 calculates the residual value in recycling. As shown in step ST61, the residual value in recycling is calculated as follows based on the information on the damage location recognized in step ST33 in FIG. 7. As shown in step ST62, parts other than the damage location or parts that are valuable even after being damaged are extracted as recyclable parts. As shown in step ST63, the user U or the person in charge of purchase is presented with the residual value of the recyclable parts extracted in step ST62 and the residual value of the damaged vehicle C that has not been recycled as a resource in recycling.

[0070]

In this way, the user U photographs the damaged vehicle C, thereby performing car-triage in the present service. Then, the purchase price of the damaged vehicle C is presented from the user U together with the reuse method that is the result of the car-triage as described above. Thereby, since the person in charge does not need to go to the damaged vehicle C to calculate the purchase price (assessment price) of the damaged vehicle C, the cost can be reduced and used to increase the purchase price (assessment price) of the damaged vehicle C and the profit of the purchaser. Furthermore, since

it contributes to reduction of the time for assessment, even when a large number of damaged vehicles C occur due to a large-scale disaster, assessment can be performed quickly. As a result, the user U, who is a disaster victim, purchases immediately the damaged vehicle C, and thus there is an advantage that the user U can immediately obtain funds when necessary for expenses related to the disaster.

[0071]

Conventionally, the user U applies for an assessment of the damaged vehicle C to a used vehicle dealer, and the used vehicle dealer confirms the damaged vehicle C directly and presents the purchase price (assessment price) of the damaged vehicle C. For the user U, the assessment is a black box, and future handling of the damaged vehicle C (whether the damaged vehicle C is repaired or disposed as a scrap) is not generally known. Therefore, currently, the user U applies for an assessment of the damaged vehicle C to a plurality of used vehicle dealers, compares the assessment prices, and have the vehicle purchased by the used vehicle dealer with the higher price.

[0072]

In the present service, the user U is presented with the purchase price (assessment price) of the damaged vehicle C in consideration of various kinds of reuse methods, for example, the domestic restoration sales method, the overseas restoration sales method, the resource recycling method, and the parts recycling method. Further, the user U can also be

presented with the purchase price (assessment price) of the damaged vehicle C in any one of various kinds of reuse methods. Therefore, the transparency of the purchase price is secured for the user U, and the user U can obtain the sense of satisfaction as a result of the assessment. Furthermore, for example, in the domestic restoration sales method, the user U is also presented with information on what kind of place (WHERE, which is any place of a plurality of AAs) the vehicle is sold. Thus, the transparency of the purchase price is secured for the user U, and the user U can obtain the improved sense of satisfaction as a result of the assessment.

[0073]

In addition, the following effects can be obtained by the present service. In other words, the user U can receive the following merits. The user U may include not only the owner of the damaged vehicle C but also a non-life insurance company that owns or plans to own the damaged vehicle C to apply vehicle insurance, an automobile dealer who uses the present service on behalf of the owner, a used vehicle dealer, or a sheet metal worker. In other words, as described above, the user U can obtain a sense of satisfaction with the purchase price. Specifically, for example, the user U can grasp the residual value (or the purchase price of the damaged vehicle C), and can obtain a sense of satisfaction due to the transparency thereof.

[0074]

In addition, the user U can receive a price offer quickly

and appropriately through the present service. As a result, among the users U, a person who sells an automobile (especially, an automobile dealer who intends to sell a new automobile) can easily buy an automobile (new automobile). The owner of the damaged vehicle C among the users U can decide whether to buy an automobile (new automobile) without spending time for purchase assessment of the damaged vehicle C.

[0075]

In addition, the user U (especially, a non-life insurance company that owns or plans to own the damaged vehicle C to apply vehicle insurance) can improve the degree of compensation for the insurance money paid. In addition, the user U can simultaneously obtain the price for selling and repairing the damaged vehicle C as it is. In addition, the user U (especially, a person who uses the present service as a corporation) can add a price calculation function by linking the present service and API (Application Programming Interface) to a system of the corporation, and can differentiate their own system (DX, digital transformation).

[0076]

The person who purchases the damaged vehicle C using the present service can receive the following merits. The service provider in the above-described embodiment is an example of the person who purchases the damaged vehicle C using the present service. In other words, the person who purchases the damaged vehicle C can maximize the profit and the value of the damaged vehicle. Specifically, for example, the optimum reuse

method is presented, and the damaged vehicle can be distributed at an AA venue where the residual value is highly evaluated in the domestic restoration sales method. Further, the person who purchases the damaged vehicle C can reduce the cost and time required for assessment (improve productivity). Further, the person who purchases the damaged vehicle C can reduce an operating cost and the cost required for assessment described above, and pass the cost on the purchase price. Further, the person who purchases the damaged vehicle C can equalize the assessment ability difference (individual skill) between sales representatives. Further, the person who purchases the damaged vehicle C can have a certain level of sales ability (assessment ability) regardless of whether the person is a new sales representative or has sales experience. As a result, for example, labor and cost for OJT (On the Job Training) can be reduced. Further, the person who purchases the damaged vehicle C can license the system and technology related to the present service to other purchasers, thereby making monetization. In other words, the person who purchases the damaged vehicle C can obtain profits other than the purchase and sale of the damaged vehicle C. Further, the person who purchases the damaged vehicle C can enclose suppliers by licensing the system (whether on a chargeable basis or free of charge). Further, the person who purchases the damaged vehicle C can present a competitive purchase price based on its own pricing and filtering of sales method. Thus, the person who purchases the damaged vehicle C can increase

its market share in the damaged vehicle purchasing industry. Further, the person who purchases the damaged vehicle C can obtain (expand) profits by repair requests in addition to the purchase. Further, the person who purchases the damaged vehicle C can accumulate vehicle and damage data. Thus, know-how can be accumulated and the accuracy of AI algorithm of the present service can be improved.

[0077]

In addition, the present service can contribute to the resolution of the following social problems. In other words, it is possible to quickly cope with situations such as large-scale disasters in which a large number of damaged vehicles occur. In addition, the amount of money can be paid quickly and appropriately to the user U, such as a disaster victim or an accident victim. In other words, such a user U often needs to secure money quickly. The present service makes it possible to cope with the needs of the user U and provide quick and appropriate financial support with money. Moreover, a load on the global environment is reduced. In other words, from the viewpoint of so-called ecology, that is, SDG's, a better circulation of resources can be created. In addition, it can encourage a change of a sense of value of person and world from "accident vehicle or old model or long mileage = valueless" to "accident vehicle or old model or long mileage = valuable" (paradigm shift). In addition, the reuse method of the present service includes the foreign restoration sales method, and it is expected that the number of damaged vehicles

C employing such a reuse method will increase. Thus, this can allow further promotion of motorization, restoration levels, and job creation in foreign countries (especially, in developing countries). Further, the transparency of material values increases, and thus it is possible to promote distribution to appropriate dismantling companies. In other words, there is a case where the dismantling company beats down the price of the damaged vehicle C. However, in the present service, the reuse method including parts recycling sales are considered, and the material value can be calculated based on the purchase price of various dismantling companies. As a result, a request for purchase of the damaged vehicle C is made to an appropriate dismantling company.

[0078]

In addition, the above-described reuse method is also presented to the person in charge of purchase of the damaged vehicle C (sales representative, for example). In other words, although not shown in FIG. 5, the person in charge of purchase of the damaged vehicle C (sales representative, for example) can use the person-in-charge terminal 3 to browse the purchase price (assessment price) of the damaged vehicle C in each reuse method and what kind of residual value is in what kind of place (WHERE). Thus, the person in charge does not need to visit the damaged vehicle C to make an assessment, and can explain the basis of the assessment to the user U.

[0079]

In the above-described embodiment, when the domestic

restoration sales method of the damaged vehicle C does not make a profit, the reuse method classification unit 71 classifies, based on the domestic repair cost and the domestic used vehicle market price, the reuse method of the damaged vehicle C into the overseas restoration sales method, but the present invention is not particularly limited thereto. Specifically, for example, the residual value determination unit 53 can calculate the used vehicle market price for foreign countries when the damaged vehicle is restored and sold overseas as a used vehicle. Specifically, for example, on the premise that the damaged vehicle is restored and sold as a used vehicle overseas, based on the damage information and vehicle information of the damaged vehicle C, the used vehicle market price (for example, an assignment price to a company that exports the damaged vehicle C overseas) of the damaged vehicle C may be calculated. Then, when the reuse method of the damaged vehicle C is classified into the restoration sales method, the reuse method classification unit 71 can classify, based on the domestic repair cost and the overseas repair cost as well as the domestic used vehicle market price and the overseas used vehicle market price, the reuse method of the damaged vehicle C into either the domestic restoration sales method in which the damaged vehicle C is restored and sold domestically as a used vehicle or the overseas restoration sales method in which the damaged vehicle C is restored and sold overseas as a used vehicle.

[0080]

The embodiment of the information processing system according to the present invention has been described above. However, the embodiment according to the present invention may be as follows, for example.

[0081]

In the above-described embodiment, it is assumed that the user U of the damaged vehicle C takes a photograph of the damaged vehicle C as a subject, but the present invention is not particularly limited thereto. In other words, for example, it is sufficient if the image is captured by a person who conducts purchase assessment of the damaged vehicle C. Specifically, for example, the image may be captured by a person in charge of a non-life insurance company who assesses a large number of damaged vehicles C (for example, vehicle insurance or flood insurance) or a person in charge of an automobile dealer.

[0082]

Further, for example, the series of processes described above can be implemented by hardware, or can be implemented by software. In other words, the functional configuration of FIG. 4 is merely an example, and is not particularly limited. In other words, it is sufficient for the information processing device to have a function capable of executing the series of processes described above as a whole, and the functional blocks to be used for implementing such a function is not limited to that in the example of FIG. 4. Further, locations of the functional blocks and a database are not particularly

limited to that in the example of FIG. 4, and may be arbitrary. For example, at least part of the functional blocks and the database required for executing various processes may be transferred to the user terminal 2 or the person-in-charge terminal 3. Conversely, the functional blocks and the database of the user terminal 2 and the person-in-charge terminal 3 may be transferred to the server. One functional block may be configured by hardware alone, software alone, or a combination thereof.

[0083]

For example, in a case where a series of processes is executed by software, a program forming such software is installed on, e.g., a computer from a network or a recording medium. The computer may be a computer incorporated into dedicated hardware. Alternatively, the computer may be a computer capable of executing various functions by installation of various programs, for example, a general-purpose smartphone or a personal computer in addition to the server.

[0084]

A recording medium including these programs may include, for example, not only a removable medium not shown in the figures and distributed separately from an apparatus body for providing the programs to a user, but also a recording medium provided to a user U with the recording medium being incorporated into a device body in advance.

[0085]

In the specification, steps of writing a program recorded on the recording medium includes not only processes that are performed chronologically in that order, but also processes that are not necessarily chronologically processed and that are performed in parallel or individually. In the specification, the terms of the system means an overall device configured by a plurality of devices or a plurality of units.

[0086]

In other words, the information processing device according to the present invention can take various embodiments having the following configurations.

[0087]

In other words, the information processing device (for example, the server 1 shown in FIGS. 2 to 4) according to the present invention classifies a reuse method of a damaged vehicle managed by a user,

the information processing device including:

a damaged vehicle information acquisition unit (for example, the damaged vehicle information acquisition unit 61 in FIG. 5) that acquires, as damaged vehicle information, information including vehicle information on the damaged vehicle and damage information capable of identifying damage to the damaged vehicle;

a degree-of-damage determination unit (for example, the degree-of-damage determination unit 52 in FIG. 5) that calculates a repair cost of the damaged vehicle based on the damage information and determines a degree of damage based on

the repair cost;

a residual value determination unit (for example, the residual value determination unit 53 in FIG. 5) that calculates a used vehicle market price based on the vehicle information and determines a residual value based on the used vehicle market price and the degree of damage; and

a reuse method classification unit (for example, the reuse method classification unit 71 in FIG. 5) that classifies, based on the degree of damage and the residual value, the reuse method of the damaged vehicle into either a restoration sales method of restoring the damaged vehicle and selling the damaged vehicle as a used vehicle or a recycling method of recycling the damaged vehicle. Thus, only by capturing of the damaged vehicle from the user, the reuse method of the damaged vehicle can be classified into an optimal method. In other words, the user can grasp the reuse method of the damaged vehicle and the residual value in the reuse method, and can let go of the damaged vehicle (get bought) after grasping the reuse method of the damaged vehicle. On the purchasing side, as described above, since it is easier for the user to get a sense of satisfaction, the purchase becomes easier and the number of purchases can be increased.

[0088]

Further,

the degree-of-damage determination unit calculates a domestic repair cost as the repair cost,

the residual value determination unit calculates a domestic

used vehicle market price as the used vehicle market price,
and
when the reuse method of the damaged vehicle is classified
into the restoration sales method, the reuse method
classification unit classifies, based on the domestic repair
cost and the domestic used vehicle market price, the reuse
method of the damaged vehicle into either a domestic
restoration sales method in which the damaged vehicle is
restored and sold domestically as a used vehicle or an
overseas restoration sales method in which the damaged vehicle
is restored and sold overseas as a used vehicle.

[0089]

Further, when the reuse method of the damaged vehicle is
classified into the recycling method, the reuse method
classification unit classifies, based on the residual value,
the reuse method of the damaged vehicle into either a resource
recycling method in which the damaged vehicle is recycled as a
resource or a parts recycling method in which at least some of
parts constituting the damaged vehicle are recycled as parts.

[0090]

Further, when the reuse method of the damaged vehicle is
classified into the recycling method, the reuse method
classification unit classifies the reuse method into either
the resource recycling method or the parts recycling method,
using each of the parts constituting the damaged vehicle as a
unit.

EXPLANATION OF REFERENCE NUMERALS

[0091]

1 ... server, 2 ... user terminal, 3 ... person-in-charge terminal, 11 ... CPU, 20 ... drive, 31 ... removable medium, 51 ... damage information acquisition unit, 52 ... degree-of-damage determination unit, 53 ... residual value determination unit, 54 ... reuse method determination unit, 55 ... presentation information generation unit, 56 ... presentation control unit, 61 ... damaged vehicle information acquisition unit, 62 ... damage location identification unit, 71 ... reuse method classification unit, 72 ... WHERE unit, 73 ... WHEN unit, 81 ... AI model

CLAIMS

1. An information processing device that classifies a reuse method of a damaged vehicle managed by a user, the information processing device comprising:

a damaged vehicle information acquisition unit that acquires, as damaged vehicle information, information including vehicle information on the damaged vehicle and damage information capable of identifying damage to the damaged vehicle;

a degree-of-damage determination unit that calculates a repair cost of the damaged vehicle based on the damage information and determines a degree of damage based on the repair cost;

a residual value determination unit that calculates a used vehicle market price based on the vehicle information and determines a residual value based on the used vehicle market price and the degree of damage; and

a reuse method classification unit that classifies, based on the degree of damage and the residual value, the reuse method of the damaged vehicle into either a restoration sales method of restoring the damaged vehicle and selling the damaged vehicle as a used vehicle or a recycling method of recycling the damaged vehicle.

2. The information processing device according to claim 1, wherein the degree-of-damage determination unit calculates a

domestic repair cost as the repair cost,

the residual value determination unit calculates a domestic used vehicle market price as the used vehicle market price, and

when the reuse method of the damaged vehicle is classified into the restoration sales method, the reuse method classification unit classifies, based on the domestic repair cost and the domestic used vehicle market price, the reuse method of the damaged vehicle into either a domestic restoration sales method in which the damaged vehicle is restored and sold domestically as a used vehicle or an overseas restoration sales method in which the damaged vehicle is restored and sold overseas as a used vehicle.

3. The information processing device according to claim 1 or 2, wherein when the reuse method of the damaged vehicle is classified into the recycling method, the reuse method classification unit classifies, based on the residual value, the reuse method of the damaged vehicle into either a resource recycling method in which the damaged vehicle is recycled as a resource or a parts recycling method in which at least some of parts constituting the damaged vehicle are recycled as parts.

4. The information processing device according to claim 3, wherein when the reuse method of the damaged vehicle is classified into the recycling method, the reuse method classification unit classifies the reuse method into either

the resource recycling method or the parts recycling method, using each of the parts constituting the damaged vehicle as a unit.

5. An information processing method executed by an information processing device that classifies a reuse method of a damaged vehicle managed by a user, the information processing method comprising:

- a damaged vehicle information acquisition step of acquiring, as damaged vehicle information, information including vehicle information on the damaged vehicle and damage information capable of identifying damage to the damaged vehicle;

- a degree-of-damage determination step of calculating a repair cost of the damaged vehicle based on the damage information and determining a degree of damage based on the repair cost;

- a residual value determination step of calculating a used vehicle market price based on the vehicle information and determining a residual value based on the used vehicle market price and the degree of damage; and

- a reuse method classification step of classifying, based on the degree of damage and the residual value, the reuse method of the damaged vehicle into either a restoration sales method of restoring the damaged vehicle and selling the damaged vehicle as a used vehicle or a recycling method of recycling the damaged vehicle.

6. A program causing a computer that classifies a reuse method of a damaged vehicle managed by a user to execute control processing including:

- a damaged vehicle information acquisition step of acquiring, as damaged vehicle information, information including vehicle information on the damaged vehicle and damage information capable of identifying damage to the damaged vehicle;

- a degree-of-damage determination step of calculating a repair cost of the damaged vehicle based on the damage information and determining a degree of damage based on the repair cost;

- a residual value determination step of calculating a used vehicle market price based on the vehicle information and determining a residual value based on the used vehicle market price and the degree of damage; and

- a reuse method classification step of classifying, based on the degree of damage and the residual value, the reuse method of the damaged vehicle into either a restoration sales method of restoring the damaged vehicle and selling the damaged vehicle as a used vehicle or a recycling method of recycling the damaged vehicle.