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(54) **INFORMATION PROCESSING APPARATUS, INFORMATION PROCESSING METHOD AND SYSTEM**

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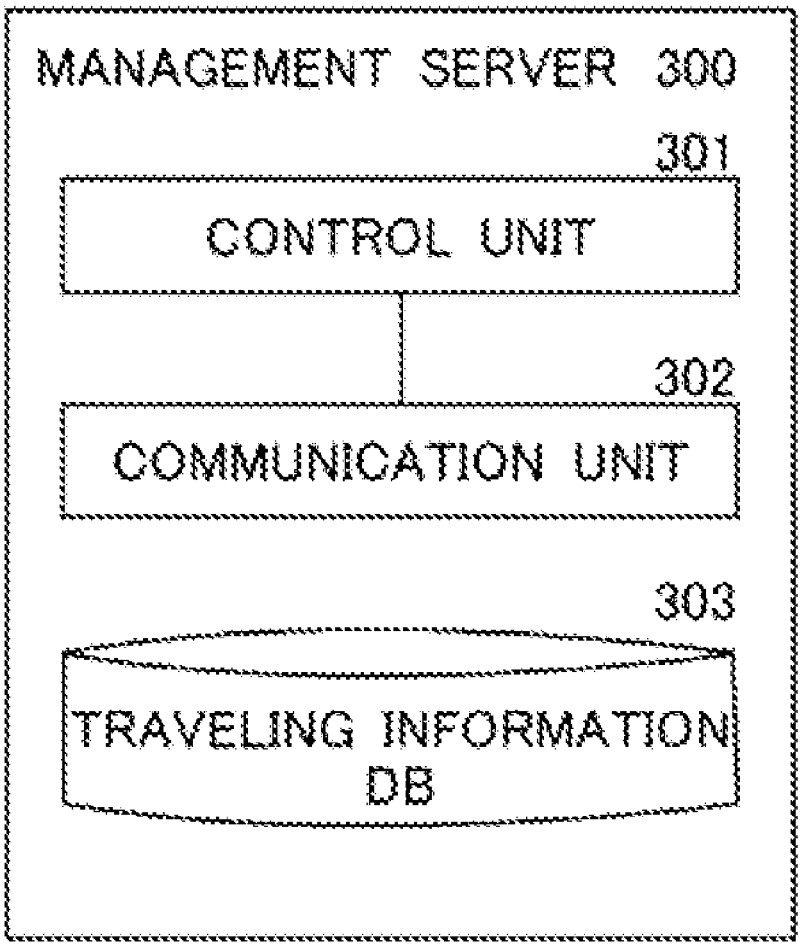
(57) **ABSTRACT**

The present disclosure makes it possible to, when a user misses his way while moving by a vehicle, guide the user to a destination. An information processing apparatus according to the present disclosure manages a communication line for a telephone conversation between a user who is driving a vehicle and an operator who makes a telephone conversation with the user. When a current location of the vehicle is within a predetermined range from a destination of the user, the information processing apparatus executes a predetermined determination process for determining whether predetermined condition by which the user can be judged to miss his way is met. If judging that the predetermined condition is met in the predetermined determination process, the information processing apparatus notifies the operator to perform route guidance by a telephone conversation for the user.



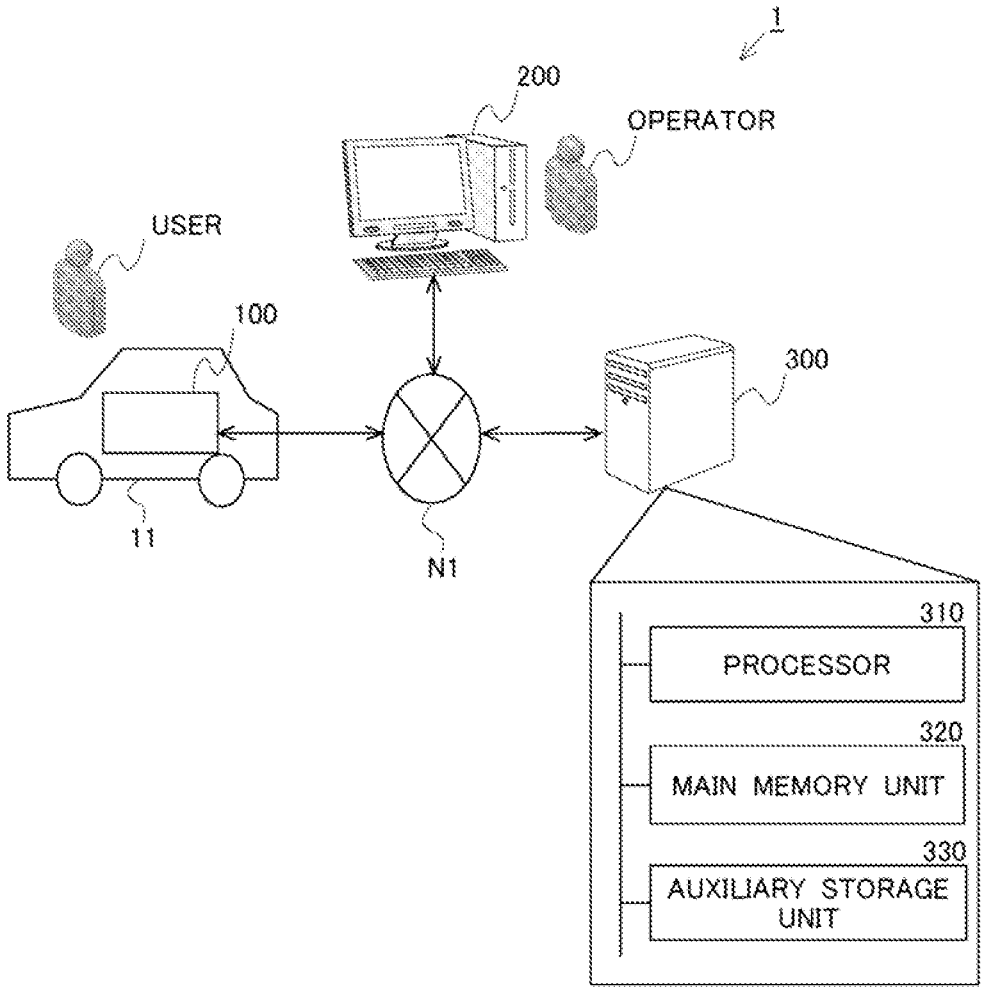

1
200
OPERATOR
USER
100
300
11
N1
310
PROCESSOR
320
MAIN MEMORY UNIT
330
AUXILIARY STORAGE UNIT

FIG. 1

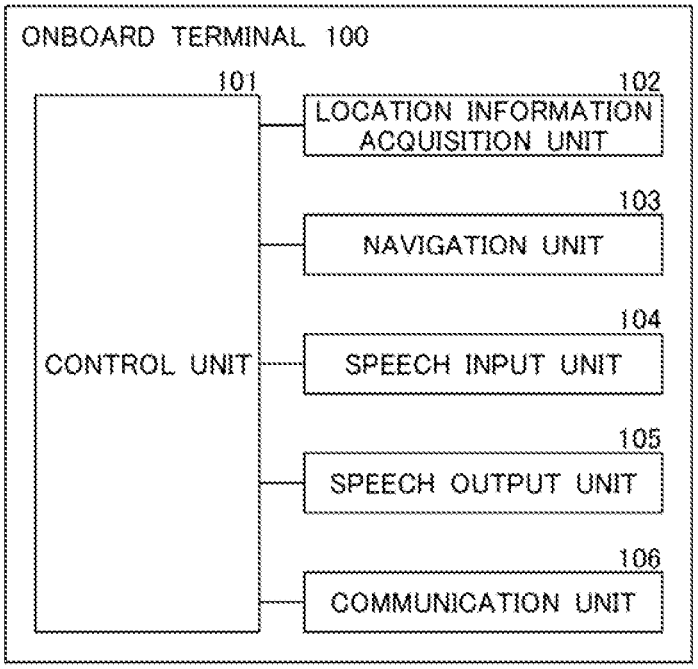

ONBOARD TERMINAL 100
101
CONTROL UNIT
102
LOCATION INFORMATION ACQUISITION UNIT
103
NAVIGATION UNIT
104
SPEECH INPUT UNIT
105
SPEECH OUTPUT UNIT
106
COMMUNICATION UNIT

FIG. 2

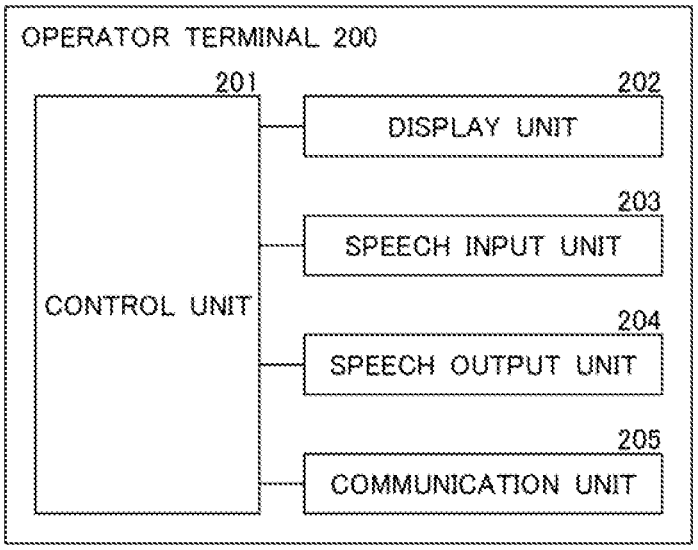

OPERATOR TERMINAL 200
201
CONTROL UNIT
202
DISPLAY UNIT
203
SPEECH INPUT UNIT
204
SPEECH OUTPUT UNIT
205
COMMUNICATION UNIT

FIG. 3

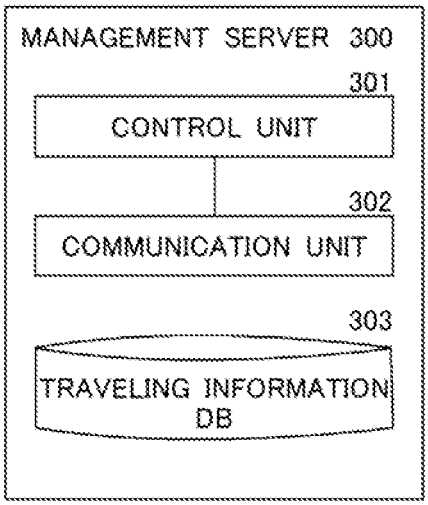

MANAGEMENT SERVER 300
301
CONTROL UNIT
302
COMMUNICATION UNIT
303
TRAVELING INFORMATION DB

FIG. 4

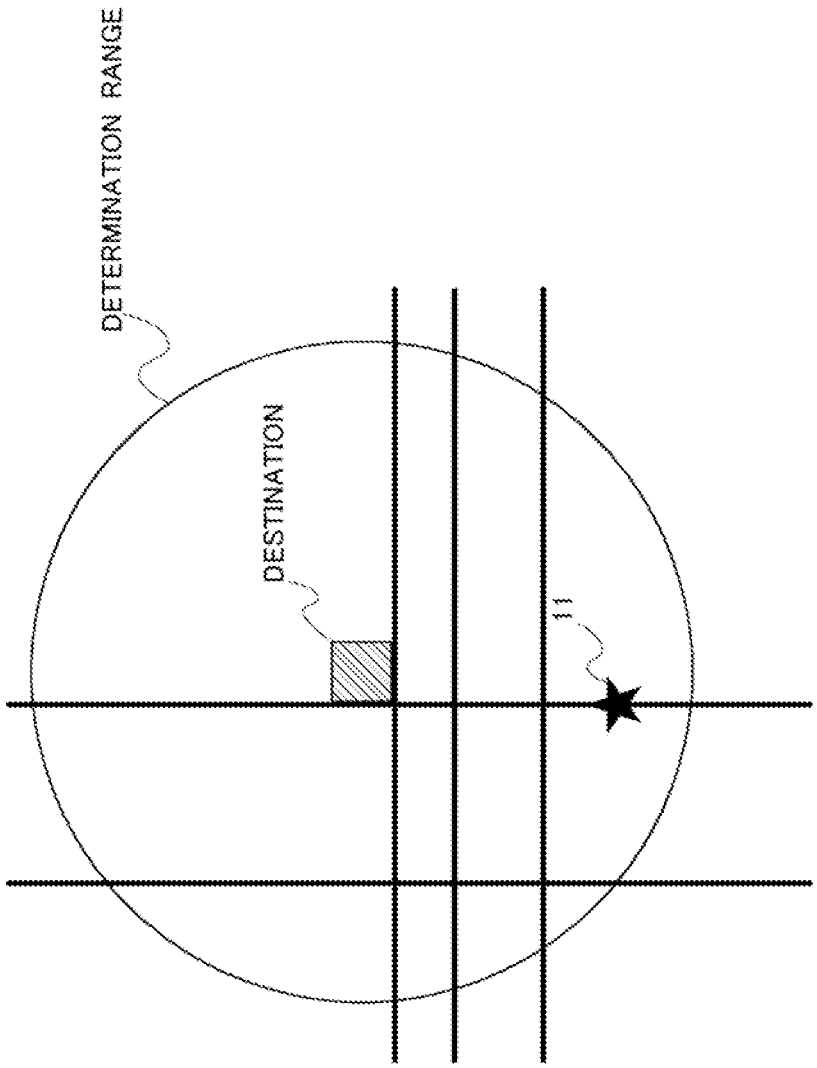


FIG. 5

TRAVELING INFORMATION

DESTINATION	TRAVELING HISTORY	SCHEDULED ARRIVAL TIME	NUMBER OF ROUTE CHANGES
(X,Y)	...	HH:MM	...

FIG. 6

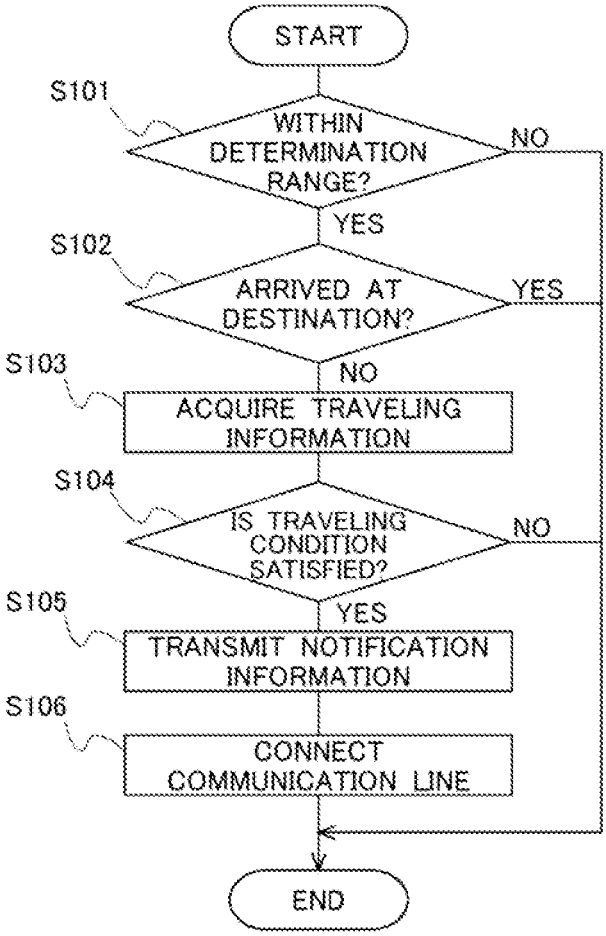

START
S101
WITHIN DETERMINATION RANGE?
NO
YES
S102
ARRIVED AT DESTINATION?
YES
NO
S103
ACQUIRE TRAVELING INFORMATION
S104
IS TRAVELING CONDITION SATISFIED?
NO
YES
S105
TRANSMIT NOTIFICATION INFORMATION
S106
CONNECT COMMUNICATION LINE
END

FIG. 7

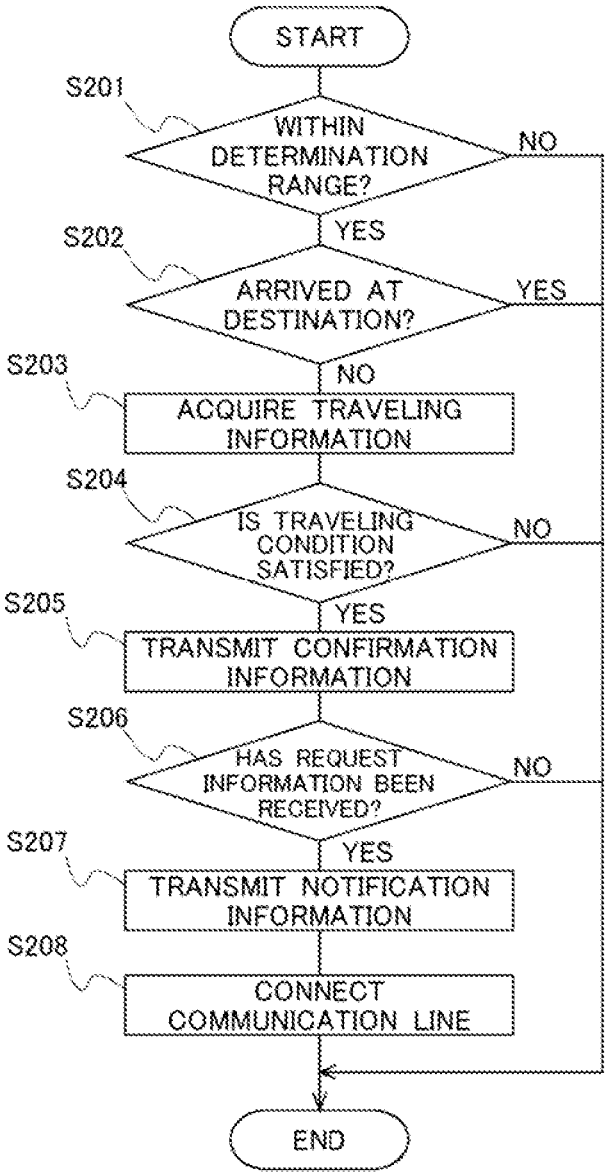

START
S201
WITHIN DETERMINATION RANGE?
NO
YES
S202
ARRIVED AT DESTINATION?
YES
NO
S203
ACQUIRE TRAVELING INFORMATION
S204
IS TRAVELING CONDITION SATISFIED?
NO
YES
S205
TRANSMIT CONFIRMATION INFORMATION
S206
HAS REQUEST INFORMATION BEEN RECEIVED?
NO
YES
S207
TRANSMIT NOTIFICATION INFORMATION
S208
CONNECT COMMUNICATION LINE
END

FIG. 8

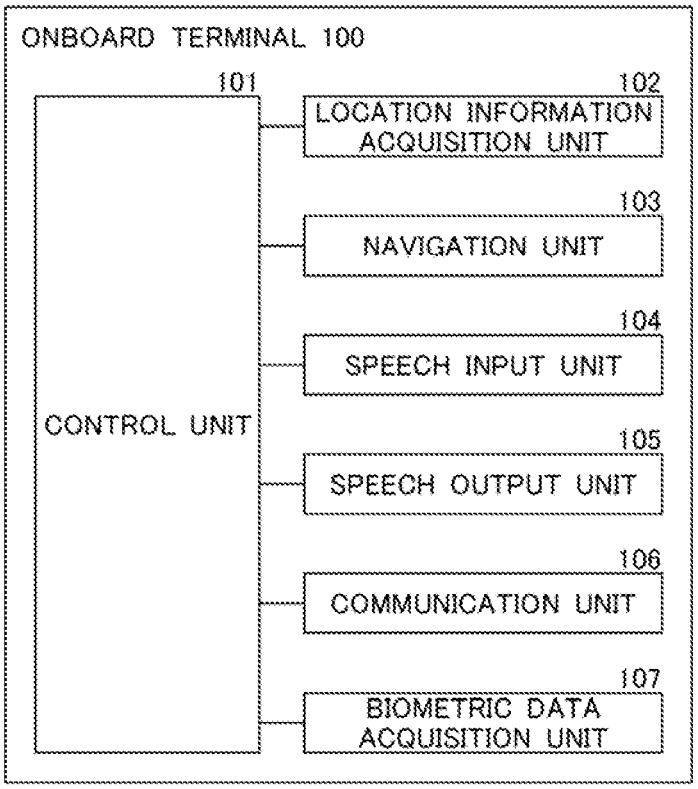

ONBOARD TERMINAL 100
101
CONTROL UNIT
102
LOCATION INFORMATION ACQUISITION UNIT
103
NAVIGATION UNIT
104
SPEECH INPUT UNIT
105
SPEECH OUTPUT UNIT
106
COMMUNICATION UNIT
107
BIOMETRIC DATA ACQUISITION UNIT

FIG. 9

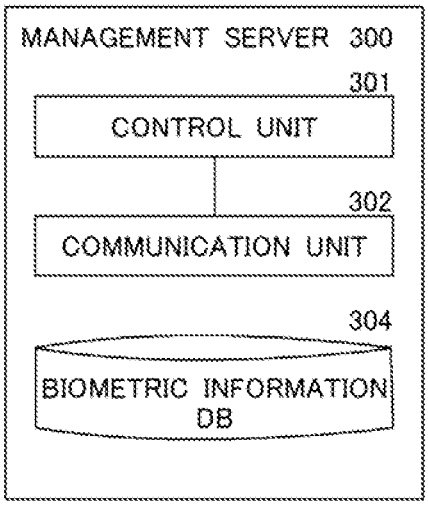

MANAGEMENT SERVER 300
301
CONTROL UNIT
302
COMMUNICATION UNIT
304
BIOMETRIC INFORMATION DB

FIG. 10

BIOMETRIC INFORMATION

LINE-OF-SIGHT DIRECTION	HEART RATE	BLOOD PRESSURE	SWEAT RATE
...	...	...	...

FIG. 11

INFORMATION PROCESSING APPARATUS, INFORMATION PROCESSING METHOD AND SYSTEM

CROSS REFERENCE TO THE RELATED APPLICATION

[0001] This application claims the benefit of Japanese Patent Application No. 2019-211780, filed on Nov. 22, 2019, which is hereby incorporated by reference herein in its entirety.

BACKGROUND

Technical Field

[0002] The present disclosure relates to an information processing apparatus, an information processing method and a system.

Description of the Related Art

[0003] In Patent document 1, a service is described in which, when a user communicates setting of a destination to an operator, using a mobile phone, information required to operate an onboard apparatus is provided via the operator. For example, a service is described in which, when the user communicates his request to the operator, the operator explains a method for setting the destination by a voice conversation, or the operator instructs an information center to transmit data for setting the destination to the onboard apparatus.

CITATION LIST

Patent Document

[0004] Patent document 1: Japanese Patent Laid-Open No. 2015-95736

SUMMARY

[0005] An object of the present disclosure is to provide a technique capable of, when a user misses his way while moving by a vehicle, guiding the user to a destination.

[0006] An information processing apparatus according to the present disclosure is an information processing apparatus managing a communication line for a telephone conversation between a user who is driving a vehicle and an operator who makes a telephone conversation with the user, the information processing apparatus: executing a predetermined determination process for determining whether predetermined condition by which the user can be judged to miss his way is met when a current location of the vehicle is within a predetermined range from a destination of the user; and notifying the operator to perform route guidance by a telephone conversation for the user if judging that the predetermined condition is met in the predetermined determination process.

[0007] According to the present disclosure, it becomes possible to, when a user who is moving by a vehicle misses his way, guide the user to a destination.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a diagram illustrating a schematic configuration of a telephone conversation management system according to embodiments;

[0009] FIG. **2** is a block diagram schematically illustrating an example of a functional configuration of an onboard terminal in a first embodiment;

[0010] FIG. **3** is a block diagram schematically illustrating an example of a functional configuration of an operator terminal;

[0011] FIG. **4** is a block diagram schematically illustrating an example of a functional configuration of a management server in the first embodiment;

[0012] FIG. **5** is a diagram illustrating a current location of a vehicle, a destination and a determination range;

[0013] FIG. **6** is a diagram illustrating an example of a table configuration of a travel information stored in a travel information database;

[0014] FIG. **7** is a flowchart illustrating a flow of a notification process in the first embodiment;

[0015] FIG. **8** is a flowchart illustrating a flow of a notification process in a second embodiment;

[0016] FIG. **9** is a block diagram schematically illustrating an example of a functional configuration of an onboard terminal in a modification;

[0017] FIG. **10** is a block diagram schematically illustrating an example of a functional configuration of a management server in the modification; and

[0018] FIG. **11** is a diagram illustrating an example of a table configuration of a biometric information stored in a biometric information database.

DESCRIPTION OF THE EMBODIMENTS

[0019] An information processing apparatus according to the present disclosure is an information processing apparatus that manages a communication line for a telephone conversation between a user who is driving a vehicle and an operator who makes a telephone conversation with the user. By making a telephone conversation with the operator while driving the vehicle, the user can obtain various information from the operator. Further, the operator provides the user with various information in response to a request from the user obtained by the telephone conversation.

[0020] The information processing apparatus acquires a destination of the user and a current location of the vehicle. Then, when the current location of the vehicle is within a predetermined range from the destination, a controller executes a predetermined determination process for determining whether a predetermined condition by which the user can be judged to miss his way is met or not. Here, the predetermined condition may be, for example, a condition about a traveling situation of the vehicle. Further, the predetermined condition may be a condition about biometric information about the user.

[0021] Then, when judging that the predetermined condition is met in the predetermined determination process, the controller notifies the operator to perform route guidance by a telephone conversation for the user. Thereby, it is possible to prompt the operator to perform the route guidance for the user who misses his way. As a result, it becomes possible to guide the user to the destination by the operator's telephone conversation.

[0022] The predetermined determination process is executed when the current location of the vehicle is within a predetermined range from the destination. The predetermined range refers to a geographical range that includes the destination. In this case, the controller does not execute the predetermined determination process when the current loca-

tion of the vehicle is outside the predetermined range from the destination. In other words, when the current location of the vehicle is outside the predetermined range from the destination, the operator is not notified to perform route guidance by a telephone conversation for the user, by the controller. Thereby, it is possible to prevent an unnecessary telephone conversation for route guidance being performed for the user by the operator.

[0023] As described above, by the information processing apparatus according to the present disclosure, it becomes possible to, when a user who is moving by a vehicle misses his way, guide the user to a destination.

[0024] Specific embodiments of the present disclosure will be described below based on drawings. As for dimensions, materials, shapes and relative arrangement and the like of component parts described in the present embodiments, a technical scope of the present disclosure is not intended to be limited thereto unless otherwise stated.

First Embodiment

(Outline of System)

[0025] A telephone conversation management system **1** in the present embodiment will be described based on FIG. **1**. FIG. **1** is a diagram illustrating a schematic configuration of the telephone conversation management system **1** according to the present embodiment. The telephone conversation management system **1** is configured, including an onboard terminal **100**, an operator terminal **200** and a management server **300**. The onboard terminal **100** is a terminal mounted on a vehicle **11**. Here, the vehicle **11** is a vehicle that a user drives. The operator terminal **200** is a terminal that an operator uses. The management server **300** is a server that manages a communication line for a telephone conversation between the user and an operator. The onboard terminal **100**, the operator terminal **200** and the management server **300** are mutually connected via a network N**1**. Here, for the network N**1**, for example, a WAN (Wide Area Network), which is a global public communication network such as the Internet, or a telephone communication network such as mobile phones and the like may be adopted.

[0026] The onboard terminal **100** is a terminal that enables a telephone conversation between the user and the operator by connecting to the operator terminal **200** via the network N**1**. Note that the onboard terminal **100** is not limited to a terminal that is integrally mounted on the vehicle **11**. For example, a mobile information terminal that the user possesses may function as the onboard terminal **100**. The operator terminal **200** is a terminal that enables a telephone conversation between the user and the operator by connecting to the onboard terminal **100** via the network N**1**.

[0027] The user and the operator can mutually perform a telephone conversation using the onboard terminal **100** and the operator terminal **200**, respectively. The operator makes a response corresponding to content of an inquiry from the user through the telephone conversation with the user. For example, the operator can recommend a restaurant or a facility corresponding to the user's request by the telephone conversation. The operator may directly set the restaurant or the facility recommended to the user for a car navigation system (a navigation unit **103** described later) mounted on the onboard terminal **100** as the destination of the vehicle **11** via the network N**1**. At this time, a case may happen where the user misses his way while he is going to the user's destination (which may be hereinafter referred to simply as "destination") by the vehicle **11**. Therefore, the management server **300** performs a predetermined determination process for determining whether the user misses his way or not. Then, if the user misses his way, the management server **300** notifies the operator to perform route guidance for the user by a telephone conversation. The predetermined determination process will be described later.

[0028] The management server **300** is configured, including a general computer. The computer constituting the management server **300** is provided with a processor **310** such as a CPU and a DSP, a main memory unit **320** such as a read-only memory (ROM) and a random access memory (RAM), an auxiliary storage unit **330** such as an EPROM, a hard disk drive (HDD) and a removal medium. Here, the removable medium is, for example, a flash memory such as a USB memory and an SD card, or a disk recording medium such as a CD-ROM, a DVD disk and a Blu-ray disk.

[0029] In the management server **300**, an operating system (OS), various kinds of programs, various kinds of information tables and the like are stored in the auxiliary storage unit **330**. In the management server **300**, by the processor **310** loading a program stored in the auxiliary storage unit **330** to the main memory unit **320** and executing the program, various kinds of functions as described later can be realized. However, a part or all of the functions in the management server **300** may be realized by a hardware circuit such as an ASIC and an FPGA. Note that the management server **300** does not necessarily have to be realized by a single physical configuration but may be configured with a plurality of mutually cooperating computers.

[0030] (System Configuration)

[0031] Next, a functional configuration of each of the onboard terminal **100**, the operator terminal **200** and the management server **300** included in the telephone conversation management system **1** according to the present embodiment will be described based on FIGS. **2** to **4**.

[0032] (Onboard Terminal)

[0033] FIG. **2** is a block diagram schematically illustrating an example of the functional configuration of the onboard terminal **100**. As illustrated in FIG. **2**, the onboard terminal **100** is configured, including a control unit **101**, a location information acquisition unit **102**, the navigation unit **103**, a speech input unit **104**, a speech output unit **105** and a communication unit **106**. The control unit **101** has a function of performing arithmetic processing for controlling the onboard terminal **100**. The control unit **101** is configured, for example, with a microcomputer.

[0034] The location information acquisition unit **102** is a device that acquires a current location of the vehicle **11**. Specifically, the location information acquisition unit **102** is configured, including a GPS receiver and the like. The control unit **101** transmits current location information indicating the current location of the vehicle **11**, which has been acquired by the location information acquisition unit **102**, to the management server **300** via the communication unit **106**.

[0035] Specifically, the navigation unit **103** is configured, including a car navigation system. The operator can set a destination of the user for the navigation unit **103** by communicating with the navigation unit **103** via the network N**1** using the operator terminal **200**. Note that the user himself can set the destination for the navigation unit **103**. Based on the set destination, the navigation unit **103** generates a scheduled traveling route which is a traveling route

of the vehicle **11** from the current location of the vehicle **11** to the destination. Furthermore, the navigation unit **103** generates route information which is information indicating the scheduled traveling route. The generated route information is displayed on a display unit that the navigation unit **103** has. Based on the route information displayed on the display unit that the navigation unit **103** has, the user can cause the vehicle **11** to travel and go to the destination. Further, the navigation unit **103** estimates scheduled arrival time of arriving at the destination in the case of the vehicle **11** traveling on the scheduled traveling route. Then, the navigation unit **103** generates scheduled time information which is information indicating the scheduled arrival time. Further, if the vehicle **11** travels on a road other than the scheduled traveling route, the navigation unit **103** regenerates a scheduled traveling route. Here, generation of the scheduled traveling route and estimation of the scheduled arrival time may be performed not by the navigation unit **103** but by a server apparatus different from the onboard terminal **100**. Further, the control unit **101** transmits information indicating the destination that the operator (or the user) has set by the navigation unit **103**, to the management server **300** via the communication unit **106** as destination information. Further, the control unit **101** transmits the route information and the scheduled time information that the navigation unit **103** has generated, to the management server **300** via the communication unit **106**.

[0036] The speech input unit **104** is a device that converts a speech uttered by the user to speech data. Specifically, the speech input unit **104** is configured, including a microphone and the like. The control unit **101** transmits the speech data converted by the speech input unit **104** to the operator terminal **200** via the communication unit **106**.

[0037] The speech output unit **105** is a device that converts the speech data to a speech. The speech output unit **105** converts the speech data that the control unit **101** has received from the operator terminal **200** or the management server **300** via the communication unit **106**, to a speech. Further, the speech output unit **105** also performs output of the converted speech. Specifically, the speech output unit **105** is configured, including speakers, a headphone or earphones.

[0038] The communication unit **106** is a communication device for connecting the onboard terminal **100** to the network N**1**. The communication unit **106** is configured, for example, including a LAN (Local Area Network) interface board or a wireless communication circuit for wireless communication.

[0039] (Operator Terminal)

[0040] FIG. **3** is a block diagram schematically illustrating an example of the functional configuration of the operator terminal **200**. As illustrated in FIG. **3**, the operator terminal **200** is configured, including a control unit **201**, a display unit **202**, a speech input unit **203**, a speech output unit **204** and a communication unit **205**. The control unit **201** has a function of performing arithmetic processing for controlling the operator terminal **200**. The control unit **201** is configured, for example, with a microcomputer.

[0041] The display unit **202** is configured, for example, with a liquid crystal display or an organic electroluminescent display. As described later, the operator terminal **200** receives notification information that notifies the operator to perform route guidance for the user by a telephone conversation, from the management server **300**. When receiving this notification information, the control unit **201** displays the notification information on the display unit **202**.

[0042] The speech input unit **203** is a device that converts a speech uttered by the operator to speech data. The control unit **201** transmits the speech data converted by the speech input unit **203** to the onboard terminal **100** via the communication unit **205**. The speech output unit **204** converts speech data that the control unit **201** has received from the onboard terminal **100** via the communication unit **205**, to a speech. Further, the speech output unit **204** also performs output of the converted speech.

[0043] The communication unit **205** is a communication device for connecting the operator terminal **200** to the network N**1**. A configuration of the communication unit **205** may be similar to the configuration of the communication unit **106** in the onboard terminal **100**. The control unit **201** receives the notification information from the management server **300** via the communication unit **205** through the network N**1**.

[0044] By transmission and receiving of speech data obtained by converting a speech uttered by the user and speech data obtained by converting a speech uttered by the operator being performed between the onboard terminal **100** and the operator terminal **200** as described above, a telephone conversation between the user and the operator is enabled. Then, when the telephone conversation with the operator is enabled, it becomes possible for the user to communicate his request to the operator by the telephone conversation. Furthermore, the operator can select a place corresponding to the request communicated from the user and set the selected place for the navigation unit **103** of the onboard terminal **100** as a destination of the user.

[0045] (Management Server)

[0046] FIG. **4** is a block diagram schematically illustrating an example of the functional configuration of the management server **300**. As illustrated in FIG. **4**, the management server **300** is configured, including a control unit **301**, a communication unit **302** and a traveling information database (a traveling information DB) **303**.

[0047] The communication unit **302** is a communication device for connecting the management server **300** to the network N**1**. A configuration of the communication unit **302** may be similar to the configuration of the communication unit **106** in the onboard terminal **100**. The control unit **301** receives the destination information, the current location information, the route information and the scheduled time information from the onboard terminal **100** via the communication unit **302**. Further, the control unit **301** transmits the notification information generated by the control unit **301** to the operator terminal **200** via the communication unit **302**.

[0048] The control unit **301** has a function of performing arithmetic processing for controlling the management server **300**. The control unit **301** is configured, for example, with a microcomputer. The control unit **301** sets a predetermined range (which may be hereinafter referred to as "determination range") with the destination as a reference, based on the destination information received via the communication unit **302**. Note that a reason why the control unit **301** sets the determination range will be described later. FIG. **5** is a diagram illustrating the current location of the vehicle **11**, the destination and the determination range. A star illustrated in FIG. **5** indicates the current location of the vehicle **11**. Lines illustrated in FIG. **5** indicate roads where the vehicle **11** can travel. As illustrated in FIG. **5**, the determination

range is set as a predetermined range with a destination as a reference. Note that, though the determination range illustrated in FIG. **5** has a circular shape, the determination range is not limited to a circular shape. The determination range may be a particular area that includes the destination, or a city, a town, a village or the like.

[0049] The control unit **301** continuously receives the current location information via the communication unit **302**. Then, when the current location of the vehicle **11** is within the determination range, the control unit **301** generates traveling history information, which is information about transition of the current location of the vehicle **11**, based on the continuously received current location information. Further, the control unit **301** receives the scheduled time information indicating scheduled arrival time estimated when the vehicle **11** enters the determination range, from the onboard terminal **100**. Further, after the vehicle **11** enters the determination range, the control unit **301** continuously receives the route information from the onboard terminal **100** via the communication unit **302**.

[0050] The control unit **301** stores the destination information, the traveling history information and the scheduled time information into the traveling information DB **303** as traveling information. Further, if the scheduled traveling route of the vehicle **11** included in the route information received from the onboard terminal **100** is changed by regeneration, the control unit **301** counts the number of changes and stores the number of changes into the traveling information DB **303** as traveling information. FIG. **6** is a diagram illustrating an example of a table configuration of a travel information stored in the traveling information DB **303**. As illustrated in FIG. **6**, the travel information table has a destination field, a traveling history field, a scheduled arrival time field and a number-of-route-changes field. In the destination field, the destination obtained from the destination information is inputted. In the traveling history field, the traveling history information is inputted. In the scheduled arrival time field, the scheduled time information is inputted. In the number-of-route-changes field, the number of times the scheduled traveling route of the vehicle **11** has been changed is inputted. In the destination field, the destination set by the operator (or the user) is inputted. In the scheduled arrival time field, scheduled arrival time estimated when the vehicle **11** enters the determination range is inputted. Therefore, the information inputted in these fields is not updated. On the other hand, a traveling history of the vehicle **11** changes as time passes. Therefore, the traveling history information inputted in the traveling history field is updated as time passes. Further, each time a scheduled traveling route is regenerated by the navigation unit **103** of the onboard terminal **100**, the number of changes in the scheduled traveling route inputted in the number-of-route-changes field is also updated.

[0051] Note that, in the present embodiment, the onboard terminal **100** and the operator terminal **200** mutually transmit and receive speech data via the network N**1**. The onboard terminal **100** and the operator terminal **200** also transmit and receive various kinds of information to and from the management server **300** via the network N**1**. However, a communication network used to transmit and receive speech data between the onboard terminal **100** and the operator terminal **200** and a communication network used to transmit and receive various kinds of information between the onboard terminal **100** and the management server **300** and between the operator terminal **200** and the management server **300** may be different communication networks. For example, a WAN and a telephone communication network may be adopted as the communication network used to transmit and receive various kinds of information and the communication network used to transmit and receive speech data, respectively.

[0052] (Predetermined Determination Process)

[0053] In the management server **300**, the control unit **301** determines whether a traveling situation of the vehicle **11** satisfies a predetermined traveling condition or not as the predetermined determination process for determining whether the user misses his way or not. The determination about whether the traveling situation of the vehicle **11** satisfies a predetermined traveling condition or not is performed based on the traveling information stored in the traveling information DB **303**. The predetermined traveling condition is a condition by which the user can be judged to miss his way. The "predetermined traveling condition" at this time will be specifically described below.

[0054] For example, when the user misses his way, he may stop the vehicle **11** once and see a map to confirm a correct route or may operate the car navigation system. In such a case, the vehicle **11** stops at a location different from a destination for a while. At this time, the control unit **301** can grasp a time during which the vehicle **11** stops at the location different from the destination by the traveling history information included in the traveling information. Therefore, the predetermined traveling condition may be that the vehicle **11** stops at a location different from a destination for a predetermined time or more.

[0055] Further, when the user misses his way, he may turn the vehicle **11** to change a direction. At this time, the control unit **301** can determine whether the vehicle **11** has turned or not by the traveling history information included in the traveling information. Therefore, the predetermined traveling condition may be that the vehicle **11** turns.

[0056] Further, when the user misses his way, he may cause the vehicle **11** to enter a one-way road from an opposite direction. The control unit **301** can determine whether the vehicle **11** has entered the one-way road from the opposite direction or not by the traveling history information included in the traveling information. Therefore, the predetermined traveling condition may be that the vehicle **11** enters a one-way road from an opposite direction.

[0057] Further, when the user misses his way, the vehicle **11** may travel away from the destination. The control unit **301** can calculate transition of a distance between a current location of the vehicle **11** and the destination by the destination information and the traveling history information that are included in the traveling information. At this time, the distance between the current location of the vehicle **11** and the destination may be a distance of the shortest route from the current location of the vehicle **11** to the destination. Then, the control unit **301** can determine whether the vehicle **11** travels away from the destination or not based on transition of the distance between the current location of the vehicle **11** and the destination. Therefore, the predetermined traveling condition may be that the vehicle **11** travels away from a destination.

[0058] Further, when the user misses his way, the vehicle **11** may travel on a road or an intersection where the vehicle **11** has traveled once, again. The control unit **301** can determine whether the vehicle **11** travels on the road or the

intersection where the vehicle **11** has traveled once, again or not based on the traveling history information included in the traveling information. Therefore, the predetermined traveling condition may be that the vehicle **11** travels on a road or an intersection where the vehicle **11** has traveled once, again.

[0059] Further, when the user misses his way, the vehicle **11** may not arrive at the destination even if the scheduled arrival time at which the vehicle **11** is to arrive the destination of the vehicle **11** has passed, the scheduled arrival time having been estimated when the vehicle **11** enters the determination range. Therefore, the predetermined traveling condition may be that the vehicle **11** has not arrived at a destination even if a predetermined time passes after a scheduled arrival time at which the vehicle **11** is to arrive at the destination, the scheduled arrival time having been estimated when the vehicle **11** enters the determination range.

[0060] Further, when the user misses his way, the vehicle **11** may travel on a route deviated from a scheduled traveling route generated when the vehicle **11** enters the determination range. Then, regeneration of the scheduled traveling route may be repeatedly performed by the navigation unit **103** in the onboard terminal **100**. When regeneration of the scheduled traveling route is repeatedly performed, the number of changes in the scheduled traveling route inputted in the number-of-route-changes field of the traveling information DB **303** increases. Therefore, the predetermined traveling condition may be that route information is changed a predetermined number of times or more.

[0061] If the traveling situation of the vehicle **11** satisfies at least any one of the seven predetermined traveling conditions described above, it can be judged that the user misses his way. Therefore, in the present embodiment, when the vehicle **11** exists in the determination range, it is judged whether the traveling situation of the vehicle **11** satisfies at least any one of the seven predetermined traveling conditions described above or not. Note that the seven predetermined traveling conditions described above are examples of the traveling condition for determining whether the user misses his way or not. As the predetermined traveling condition for determining whether the user misses his way or not, other known conditions can be adopted.

[0062] (Notification to Operator)

[0063] In the present embodiment, if it is judged that the traveling situation of the vehicle **11** existing in the determination range satisfies a predetermined traveling condition in the predetermined judgment process, the management server **300** notifies the operator to perform route guidance for the user by a telephone conversation.

[0064] (Flow of Notification Process)

[0065] Here, a notification process executed by the control unit **301** in the management server **300** will be described based on FIG. **7**. FIG. **7** is a flowchart illustrating a flow of the notification process in the present embodiment. Note that the process illustrated in FIG. **7** is cyclically executed at predetermined intervals. In the notification process, first, it is determined at S**101** whether the current location of the vehicle **11** is within the determination range or not based on the current location information about the vehicle **11**. If a negative judgment is made at S**101**, the notification process is ended once. In this case, transmission of the notification information from the management server **300** to the operator terminal **200** is not performed. Therefore, a notification prompting the operator to perform route guidance for the user by a telephone conversation is not given. On the other hand, if a positive judgment is made at S**101**, a process of S**102** is executed.

[0066] At S**102**, it is judged whether the vehicle **11** has arrived at the destination or not based on the current location information about the vehicle **11**. If a positive judgment is made at S**102**, the notification process is ended once. On the other hand, if a negative judgment is made at S**102**, a process of S**103** is executed. At S**103**, the traveling information stored in the traveling information DB **303** is acquired. Here, the acquired traveling information includes the traveling history of the vehicle **11** and the number of changes in the scheduled traveling route of the vehicle **11** during a period from when the vehicle **11** entered the determination range until the current time. Next, at S**104**, it is determined whether the traveling situation of the vehicle **11** satisfies a predetermined traveling condition or not (that is, the predetermined determination process is executed) based on the traveling information acquired at S**103**. If a negative judgment is made at S**104**, it can be judged that the user does not miss his way at present. In this case, the notification process is ended once. On the other hand, if a positive judgment is made at S**104**, it can be judged that the user misses his way. Therefore, a process of S**105** is executed next.

[0067] At S**105**, the notification information for prompting the operator to perform route guidance for the user by a telephone conversation is transmitted to the operator terminal **200**. In the operator terminal **200**, when the notification information is received from the management server **300**, the notification information is displayed on the display unit **202**. Thereby, the operator can grasp that the user who is moving by the vehicle **11** misses his way. Next, at S**106**, a communication line for a telephone conversation between the user and the operator is connected between the onboard terminal **100** and the operator terminal **200**. After that, the notification process is ended.

[0068] When judging that the traveling situation of the vehicle **11** satisfies a predetermined traveling condition in the predetermined determination process, the management server **300** in the present embodiment transmits the notification information to the operator terminal **200**. Then, by the notification information being displayed on the display unit **202** of the operator terminal **200**, it is possible to prompt the operator to perform route guidance for the user who misses his way. Thereby, it becomes possible to, when the user who is moving by the vehicle **11** misses his way, guide the user to the destination by the operator's telephone conversation.

[0069] Further, when moving toward the destination by the vehicle **11**, the user may intentionally stop in at a place other than the destination at a location relatively away from the destination or cause the vehicle **11** to travel, deviating from the scheduled traveling route to the destination. In such a case, since the user does not miss his way, he does not need route guiding by the operator. Therefore, in the present embodiment, the predetermined determination process is executed when the vehicle **11** exists within the determination range, in the notification process. In other words, when the vehicle **11** exists outside the determination range, the predetermined determination process is not executed. Therefore, for example, even if the vehicle **11** stops for a predetermined time or more when the user stops in at a place other than the destination, which is located outside the determination range, transmission of the notification information

from the management server **300** to the operator terminal **200** is not performed. Thus, by the notification prompting route guidance for the user by a telephone conversation is not given to the operator when the vehicle **11** exists outside the determination range, it is possible to prevent an unnecessary telephone conversation for route guidance from being performed for the user.

Second Embodiment

[0070] In the first embodiment, if it is judged in the predetermined determination process that the traveling situation of the vehicle **11** existing in the determination range satisfies a predetermined traveling condition, the management server **300** transmits the notification information to the operator terminal **200**. In the present embodiment, before transmitting the notification information to the operator terminal **200**, the management server **300** gives a notification confirming whether or not to request route guidance by the operator to the user.

[0071] Since a functional configuration of each of the onboard terminal **100**, the operator terminal **200** and the management server **300** included in the telephone conversation management system **1** in the present embodiment is similar to the first embodiment, description will be omitted.

[0072] (Confirmation to User)

[0073] In the present embodiment, if judging that the traveling situation of the vehicle **11** existing in the determination range satisfies a predetermined traveling condition, the control unit **301** in the management server **300** transmits confirmation information for confirming whether or not to request route guidance by the operator to the user, to the onboard terminal **100**.

[0074] In the onboard terminal **100**, the confirmation information is displayed on the display unit that the navigation unit **103** has. Thereby, it becomes possible for the user who misses his way to request route guidance by the operator. Specifically, the user who needs route guidance by the operator inputs information indicating that he requests route guidance, to an input unit that the navigation unit **103** has. Then, when the information indicating that the user requests route guidance is inputted by the user, the control unit **101** transmits request information indicating that route guidance has been requested, to the management server **300** via the communication unit **106**. When receiving the request information from the onboard terminal **100**, the management server **300** transmits the notification information to the operator terminal **200**. On the other hand, if the user does not need route guidance by the operator, the information indicating that the user requests route guidance is not inputted to the navigation unit **103** in the onboard terminal **100**. Therefore, the request information is not transmitted from the onboard terminal **100** to the management server **300**. In this case, transmission of the notification information from the management server **300** to the operator terminal **200** is not performed, either.

[0075] Note that the confirmation information does not necessarily have to be displayed the display unit that the navigation unit **103** has. For example, the user may be notified of the content of the confirmation information by speech output from the speech output unit **105**. Further, the information indicating that the user requests route guidance may be inputted to an input device other than the input unit that the navigation unit **103** has. For example, the user may input the information indicating that he requests route guidance by inputting a speech to the speech input unit **104**.

[0076] (Flow of Notification Process)

[0077] A notification process executed by the control unit **301** in the management server **300**, in the present embodiment will be described based on FIG. **8**. FIG. **8** is a flowchart illustrating a flow of the notification process in the present embodiment. Note that the process illustrated in FIG. **8** is cyclically executed at predetermined intervals. Note that, since a process from S**201** to S**204** in the present embodiment is the same as the process from S**101** to S**104** in the first embodiment, description will be omitted. Further, since processes of S**207** and S**208** in the present embodiment are also similar to the processes of S**105** and S**106** in the first embodiment, description will be omitted.

[0078] If a negative judgment is made at S**204**, a process of S**205** is executed. At S**205**, the confirmation information for confirming whether or not to request route guidance by the operator is transmitted to the onboard terminal **100**.

[0079] Next, at S**206**, it is determined whether or not the request information has been received from the onboard terminal **100**. If a negative judgment is made at S**206**, the notification process is ended once. On the other hand, if a positive judgment is made at S**206**, that is, the request information has been received from the onboard terminal **100**, a process of S**207** is executed. In other words, similarly to the first embodiment, the notification information for prompting the operator to perform route guidance for the user by a telephone conversation is transmitted to the operator terminal **200**. After that, the notification process is ended.

[0080] In the present embodiment, if judging that the traveling situation of the vehicle **11** satisfies a predetermined traveling condition, the management server **300** transmits the confirmation information to the onboard terminal **100**. Then, only when receiving the request information from the onboard terminal **100**, the management server **300** transmits the notification information to the operator terminal **200**. Thereby, only when the user needs route guidance by a telephone conversation with the operator, the management server **300** can prompt the operator to perform route guidance for the user who misses his way. Therefore, if the user does not need route guidance by the operator, a telephone conversation from the operator is not performed for the user. Therefore, it is possible to prevent an unnecessary telephone conversation by the operator from being performed for the user.

[0081] (Modification)

[0082] In the first and second embodiments described above, it is determined whether the traveling situation of the vehicle **11** satisfies a predetermined traveling condition or not as the predetermined determination process for determining whether the user misses his way or not. However, a condition by which it can be determined whether the user misses his way or not is not limited to a condition about the traveling situation of the vehicle **11**. In the present modification, the management server **300** determines whether a predetermined condition (which may be hereinafter referred to as "biometric condition") is satisfied or not for biometric information about the user as the predetermined determination process.

[0083] (System Configuration)

[0084] A functional configuration of each of the onboard terminal **100** and the management server **300** included in the

telephone conversation management system **1** according to the present modification will be described based on FIGS. **9** and **10**. Note that, since a functional configuration of the operator terminal **200** included in the telephone conversation management system **1** is similar to the first embodiment, description will be omitted.

[0085] FIG. **9** is a block diagram schematically illustrating an example of the functional configuration of the onboard terminal **100**. The onboard terminal **100** is configured, including the control unit **101**, the location information acquisition unit **102**, the navigation unit **103**, the speech input unit **104**, the speech output unit **105**, the communication unit **106** and a biometric data acquisition unit **107**. In the present modification, since functions of the control unit **101**, the location information acquisition unit **102**, the navigation unit **103**, the speech input unit **104** and the speech output unit **105** are similar to the first embodiment, description will be omitted.

[0086] The biometric data acquisition unit **107** is a device that acquires biometric data of the user. In the present modification, the biometric data acquisition unit **107** acquires a face image, heart rate, blood pressure and sweat rate of the user as the biometric data of the user. At this time, the biometric data acquisition unit **107** may be provided with a camera that photographs the user's face image, a heart rate monitor, a blood pressure gauge and a sweat rate meter. The control unit **101** transmits the biometric data of the user acquired by the biometric data acquisition unit **107** to the management server **300** via the communication unit **106**. Note that the biometric data acquired from the biometric data acquisition unit **107** may be biometric data other than the face image, heart rate, blood pressure and sweat rate of the user.

[0087] FIG. **10** is a block diagram schematically illustrating an example of the functional configuration of the management server **300**. In the present modification, the management server **300** is configured, including the control unit **301**, the communication unit **302** and a biometric information database (a biometric information DB) **304**. The control unit **301** receives the biometric data of the user from the onboard terminal **100** via the communication unit **302**. Further, similarly to the first embodiment, the control unit **301** transmits the notification information to the operator terminal **200** via the communication unit **302**.

[0088] After the vehicle **11** enters the determination range, the control unit **301** continuously receives the biometric data of the user from the onboard terminal **100** via the communication unit **302**. Then, the control unit **301** calculates a line-of-sight direction from the user's face image among the continuously received biometric data. Then, the control unit **301** generates information about transition of the line-of-sight direction of the user. Further, the control unit **301** generates information about transition of the heart rate of the user, transition of the blood pressure and transition of the sweat rate from information about the heart rate, blood pressure and sweat rate of the user among the continuously received biometric data of the user. In other words, the control unit **301** generates information about transition of the biometric data of the user.

[0089] The control unit **301** stores the information about the transition of the biometric data of the user into the biometric information DB **304** as the biometric information. FIG. **11** is a diagram illustrating an example of a table configuration of a biometric information stored in the biometric information DB **304**. The biometric information table has a line-of-sight direction field, a heart rate field, a blood pressure field and a sweat rate field. In the line-of-sight direction field, information about transition of the line-of-sight direction of the user is inputted. In the heart rate field, information about transition of the heart rate of the user is inputted. In the blood pressure field, information about transition of the blood pressure of the user is inputted. In the sweat rate field, information about transition of the sweat rate of the user is inputted.

[0090] (Predetermined Determination Process)

[0091] In the management server **300**, the control unit **301** determines whether a predetermined biometric condition is satisfied or not for the biometric information about the user, as the predetermined determination process for determining whether the user misses his way or not. The determination about whether a predetermined biometric condition is satisfied or not for the biometric information about the user is performed based on the biometric information stored in the biometric information DB **304**. The predetermined biometric condition is a condition by which it can be judged that the user misses his way. The "predetermined biometric condition" at this time will be specifically described below.

[0092] For example, when the user misses his way, he may look around himself to find an intersection, a building, a signboard or the like to be a landmark. In this case, the line-of-sight direction of the user drastically changes. Therefore, the predetermined biometric condition may be that transition of the line-of-sight direction of the user changes more drastically than usual.

[0093] Further, when the user misses his way, he may be in a tense state. The control unit **301** can grasp whether the user is in the tense state from transitions of the heart rate, blood pressure and sweat rate of the user. Therefore, the predetermined biometric condition may be that at least any of the transition of the heart rate of the user, the transition of the blood pressure and the transition of the sweat rate changes more drastically than usual.

[0094] If at least any one of the predetermined biometric conditions described above is satisfied for the biometric information about the user, it can be judged that the user misses his way. Note that the predetermined biometric conditions described above are examples of the biometric condition for determining whether the user misses his way or not. As the predetermined biometric condition for determining whether the user misses his way or not, other known conditions can be adopted.

[0095] (Notification Process)

[0096] In the management server **300** according to the present modification, a notification process is executed, with the process for determining whether a predetermined biometric condition is satisfied or not for the biometric information about the user as described above as the predetermined determination process. In other words, instead of S**103** and S**104** in the flow illustrated in FIG. **7** if the present modification is applied to the first embodiment, and instead of S**203** and S**204** in the flow illustrated in FIG. **8** if the present modification is applied to the second embodiment, the process for acquiring the biometric information about the user from the biometric information DB **304** and the process for determining whether a predetermined biometric condition is satisfied or not for the acquired biometric information about the user are executed.

[0097] Note that the predetermined determination process for determining whether the user misses his way or not may be performed based on both of the traveling information about the vehicle **11** and the biometric information about the user. In this case, it becomes possible to prompt the operator to perform route guidance for the user who misses his way with a higher accuracy.

Other Embodiments

[0098] The embodiments described above are merely examples, and the present disclosure can be appropriately changed within a range not departing from the spirit thereof and implemented. The processes and means described in the present disclosure can be freely combined and implemented unless technical contradiction occurs.

[0099] A process described as being performed by one apparatus may be shared and executed by a plurality of apparatuses. Or otherwise, a process described as being performed by different apparatuses may be executed by one apparatus. In a computer system, by what hardware configuration (server configuration) each function is to be realized is flexibly changeable.

[0100] The present disclosure can be realized by supplying a computer program in which the functions described in the embodiments and modification described above are implemented to a computer, and one or more processors that the computer has reading out and executing the program. Such a computer program may be provided to the computer by a non-transitory computer-readable storage medium connectable to a system bus of the computer or may be provided to the computer via a network. As the non-transitory computer-readable storage medium, for example, a disk of an arbitrary type such as a magnetic disk (a floppy (R) disk, a hard disk drive (HDD) and the like) and an optical disk (a CD-ROM, a DVD disk, A Blu-ray disk and the like), a read-only memory (ROM), a random access memory (RAM), an EPROM, an EEPROM, a magnetic card, a flash memory, an optical card, and a medium of an arbitrary type that is appropriate for storing electronic commands are included.

DESCRIPTION OF THE REFERENCE NUMERALS AND SYMBOLS

[0101] **1**: telephone conversation management system

[0102] **11**: vehicle

[0103] **100**: onboard terminal

[0104] **200**: operator terminal

[0105] **300**: management server

[0106] **301**: control unit

What is claimed is:

1. An information processing apparatus managing a communication line for a telephone conversation between a user who is driving a vehicle and an operator who makes a telephone conversation with the user, the information processing apparatus comprising a controller comprising at least one processor configured to:

execute a predetermined determination process for determining whether a predetermined condition by which the user can be judged to miss his way is met when a current location of the vehicle is within a predetermined range from a destination of the user; and

notify the operator to perform route guidance by a telephone conversation for the user if judging that the predetermined condition is met in the predetermined determination process.

2. The information processing apparatus according to claim **1**, wherein

if judging that the predetermined condition is met in the predetermined determination process, the controller further executes giving a notification confirming whether or not to request the route guidance by the operator, to the user;

if the route guidance by the operator is requested by the user, the controller notifies the operator to perform the route guidance by the telephone conversation for the user; and

if the route guidance by the operator is not requested by the user, the controller does not notify the operator.

3. The information processing apparatus according to claim **1**, wherein the predetermined condition includes a condition about a traveling situation of the vehicle.

4. The information processing apparatus according to claim **3**, wherein

the predetermined condition includes at least any one of:

the vehicle stopping at a position different from the destination for a predetermined time or more;

the vehicle turning;

the vehicle entering a one-way road from an opposite direction;

the vehicle traveling away from the destination;

the vehicle traveling on a road or intersection where the vehicle has traveled once, again;

the vehicle not having arrived at the destination even if a predetermined time passes after a scheduled arrival time at which the vehicle is to arrive at the destination, the scheduled arrival time having been estimated when the vehicle enters a predetermined range from the destination; and

a scheduled traveling route estimated as a traveling route of the vehicle from the current location of the vehicle to the destination being changed a predetermined number of times or more.

5. The information processing apparatus according to claim **1**, wherein the predetermined condition includes a condition about biometric information about the user.

6. The information processing apparatus according to claim **5**, wherein the biometric information includes information about at least any one of a line-of-sight direction of the user, a heart rate of the user, a blood pressure of the user and a sweat rate of the user.

7. The information processing apparatus according to claim **1**, wherein the predetermined condition includes conditions about a traveling situation of the vehicle and biometric information about the user.

8. An information processing method for managing a communication line for a telephone conversation between a user who is driving a vehicle and an operator who makes a telephone conversation with the user, the information processing method comprising the steps of:

executing a predetermined determination process for determining whether a predetermined condition by which the user can be judged to miss his way is met when a current location of the vehicle is within a predetermined range from a destination of the user; and

notifying the operator to perform route guidance by a telephone conversation for the user if judging that the predetermined condition is met in the predetermined determination process.

9. The information processing method according to claim **8**, further comprising a step of, if judging that the predetermined condition is met in the predetermined determination process, giving a notification confirming whether or not to request the route guidance by the operator, to the user; wherein

if the route guidance by the operator is requested by the user, the operator is notified to perform the route guidance by the telephone conversation for the user; and

if the route guidance by the operator is not requested by the user, the operator is not notified.

10. The information processing method according to claim **8**, wherein the predetermined condition includes a condition about a traveling situation of the vehicle.

11. The information processing method according to claim **10**, wherein

the predetermined condition includes at least any one of:

the vehicle stopping at a position different from the destination for a predetermined time or more;

the vehicle turning;

the vehicle entering a one-way road from an opposite direction;

the vehicle traveling away from the destination;

the vehicle traveling on a road or intersection where the vehicle has traveled once, again;

the vehicle not having arrived at the destination even if a predetermined time passes after a scheduled arrival time at which the vehicle is to arrive at the destination, the scheduled arrival time having been estimated when the vehicle enters a predetermined range from the destination; and

a scheduled traveling route estimated as a traveling route of the vehicle from the current location of the vehicle to the destination being changed a predetermined number of times or more.

12. The information processing method according to claim **8**, wherein the predetermined condition includes a condition about biometric information about the user.

13. The information processing method according to claim **12**, wherein the biometric information includes information about at least any one of a line-of-sight direction of the user, a heart rate of the user, a blood pressure of the user and a sweat rate of the user.

14. The information processing method according to claim **8**, wherein the predetermined condition includes conditions about a traveling situation of the vehicle and biometric information about the user.

15. A system comprising:

an information processing apparatus configured to manage a communication line for a telephone conversation between a user who is driving a vehicle and an operator who makes a telephone conversation with the user;

an onboard terminal mounted on the vehicle; and

an operator terminal that the operator uses; wherein

the information processing apparatus executes a predetermined determination process for determining whether a predetermined condition by which the user can be judged to miss his way is met when a current location of the vehicle received from the onboard terminal is within a predetermined range from a destination of the user; and

if judging that the predetermined condition is met in the predetermined determination process, the information processing apparatus transmits notification information for prompting the operator to perform route guidance by a telephone conversation for the user, to the operator terminal.

16. The system according to claim **15**, wherein

if judging that the predetermined condition is met in the predetermined determination process, the information processing apparatus transmits confirmation information for confirming whether or not to request the route guidance by the operator, to the user, to the onboard terminal; and

if receiving request information indicating that the route guidance by the operator is requested, from the onboard terminal, the information processing apparatus transmits the notification information to the operator terminal; and

if not receiving the request information from the onboard terminal, the information processing apparatus does not transmit the notification information to the operator terminal.

17. The system according to claim **15**, wherein

the predetermined condition includes a condition about a traveling situation of the vehicle; and

the information processing apparatus performs determination about whether the traveling situation of the vehicle satisfies the predetermined condition or not based on traveling information about the vehicle received from the onboard terminal in the predetermined determination process.

18. The system according to claim **17**, wherein

the predetermined condition includes at least any one of:

the vehicle stopping at a position different from the destination for a predetermined time or more;

the vehicle turning;

the vehicle entering a one-way road from an opposite direction;

the vehicle traveling away from the destination;

the vehicle traveling on a road or intersection where the vehicle has traveled once, again;

the vehicle not having arrived at the destination even if a predetermined time passes after a scheduled arrival time at which the vehicle is to arrive at the destination, the scheduled arrival time having been estimated when the vehicle enters a predetermined range from the destination; and

a scheduled traveling route estimated as a traveling route of the vehicle from the current location of the vehicle to the destination being changed a predetermined number of times or more.

19. The system according to claim **15**, wherein

the predetermined condition includes a condition about biometric information about the user; and

the information processing apparatus determines whether the biometric information about the user received from the onboard terminal satisfies the predetermined condition or not in the predetermined determination process.

20. The system according to claim **15**, wherein the predetermined condition includes conditions about a traveling situation of the vehicle and biometric information about the user.

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