

SPECIFICATION

Title of the invention

SYSTEM AND METHOD FOR PROVIDING GUIDE INFORMATION

5 Field of the invention

The present invention relates to a system for guiding a route, more specifically, a system for providing guide information to a mobile terminal.

Background of the invention

10 Since there are many shops located in a large shopping mall, signs for guiding each shop are posted on the entrances or escalators. Recently, kiosks are located to guide customers to find the shops where he/she wants to visit.

But, since the customer has to find the shop which has been provided by the kiosk after being guided once, the customer may forget information on the way to the
15 shop due to window-shopping and other activities, and as a result, the customer should visit the kiosk again or ask help to an employee.

Detailed description of the invention

Technical objectives

20 The present invention is to provide a guide information providing system for

providing guide information to a mobile terminal.

Technical solutions

According to one aspect of the present invention, there is provided a guide
5 information providing system comprising a guiding terminal configured to receive an
input for a selected point from a user; and a guiding server configured to generate guide
information responsive to the selected point and an identification information of the
guiding terminal received from the guiding terminal, and transmit the guide information
and address information to access to the guide information to the guiding terminal,
10 wherein the guiding terminal provides the address information to a mobile terminal.

The guiding terminal may display a QR code containing the address
information, or provides the address information through a RFID (Radio Frequency
Identification) tag or a NFC(Near Field Communication) module to the mobile terminal.

The guiding server may calculate a route between the selected point and the
15 guiding terminal if the selected point and the guiding terminal are located on the same
floor, while it may calculate a route between the guiding terminal and a moving means
that is located at the nearest distance from the guiding terminal among predetermined
moving means, and calculate a route between the moving means and the selected point
if the selected point and the guiding terminal are not located on the same floor, to
20 generate the guide information including the route.

The guiding server may select a reference point on a moving line that is located at the nearest distance from a starting point, and repeat selecting a moving line of which one end point is located at the nearest distance from a destination point among moving lines having the other end point adjacent to the reference point as a route, and moving
5 the reference point to the one end of the selected moving line as the route until a distance between the reference point and a destination point becomes equal to or less than a predetermined distance, wherein the starting point is a location of the guiding terminal or the moving means, and the destination point is a location of the moving means or the selected point.

10 The guiding server may calculate each route between the guiding terminal and a selected point and generate the guide information having a route that is located at the nearest distance from the guiding terminal among the calculated routes if there is the plurality of selected points for the same purposes.

According to another aspect of the present invention, there is provided a
15 method of providing guide information in a guide information providing system, comprising: in a guiding terminal, receiving an input for a selected point from a user; in a guiding server, generating guide information responsive to the selected point and an identification information of the guiding terminal received from the guiding terminal; in the guiding server, transmitting the guide information and an address information to
20 access to the guide information to the guiding terminal; and in the guiding terminal,

providing the address information to a mobile terminal.

The generating the guide information comprises in the guiding server,
calculating a route between the selected point and the guiding terminal if the selected
point and the guiding terminal are located on the same floor; in the guiding server,
5 calculating a route between the guiding terminal and a moving means that is located at
the nearest distance from the guiding terminal among predetermined moving means,
and calculating a route between the moving means and the selected point if the selected
point and the guiding terminal are not located on the same floor; and in the guiding
server, generating the guide information including the route.

10 The calculating a route between the selected point and the guiding terminal or
the calculating a route between the guiding terminal and a moving means comprises
selecting a reference point on a moving line that is located at the nearest distance from a
starting point; repeating selecting a moving line of which one end point is located at the
nearest distance from a destination point among moving lines having the other end point
15 adjacent to the reference point as a route, and moving the reference point to the one end
of the selected moving line as the route until a distance between the reference point and
a destination point becomes equal to or less than a predetermined distance, wherein the
starting point is a location of the guiding terminal or the moving means and the
destination point is a location of the moving means or the selected point.

20 The generating guide information is calculating each route between the guiding

terminal and a selected point and generates the guide information having a route that is located at the nearest distance from the guiding terminal among the calculated routes if there is the plurality of selected points for the same purposes.

5 Useful effects

According to the present invention, a user can have a guide by using a mobile terminal.

Also according to the present invention, a user can input into a large terminal such as a kiosk rather than a mobile terminal that is not easy for the user to input.

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Brief description of accompanying drawings

FIG. 1 is a block diagram of briefly showing a guide information providing system according to one embodiment of the present invention.

FIG. 2 is a flowchart showing a procedure of providing guide information for a certain point that a user requests in the guide information providing system according to one embodiment of the present invention.

FIG. 3 is a flowchart showing that the guiding server in the guide information providing server generates route information to be included in guide information.

FIG. 4 is a flowchart showing that the guiding server of the guide information providing system calculates the route from a starting point to a destination point.

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FIG. 5 illustrates a map with a starting point and a destination point.

FIG. 6 is a flowchart showing a procedure of providing guide information for a certain point that a user requests in the guide information providing system according to another embodiment of the present invention.

5 FIG. 7 is a flowchart showing a procedure of providing guide information for a certain point that a user requests in the guide information providing system according to still another embodiment of the present invention.

Embodiments of the invention

10 Since there can be a variety of permutations and embodiments of the present invention, certain embodiments will be illustrated and described with reference to the accompanying drawings. This, however, is by no means to restrict the present invention to certain embodiments, and shall be construed as including all permutations, equivalents and substitutes covered by the ideas and scope of the present invention.

15 When one element is described as “transmitting” a signal to another element, it shall be construed as transmitting the signal to the other element directly but also as possibly having another element in between. On the other hand, if one element is described as “transmitting” a signal to another element, it shall be construed that there is no other element in between. Hereinafter, certain embodiments of the present invention
20 will be described in detail with reference to the accompanying drawings.

FIG. 1 is a block diagram of briefly showing a guide information providing system according to one embodiment of the present invention.

The guide information providing system comprises a guiding terminal 110, a mobile terminal 130 and a guiding server 120.

5 The guiding terminal 110 such as kiosk is placed at a certain point to provide a route guide for the point associated with a user's input, detailed information on that point and so on. For example, the guiding terminal 110 has a touch screen to receive an input for selecting a certain point from the user. The guiding terminal 110 transmits a request for guide information to request guide information to the point associated with
10 the user's input to the guiding server 120. The request for guide information may comprise identification information of the guiding terminal 110 or identification information of location of the guiding terminal 100 and the point that is selected by the user (hereinafter, 'selected point'). Also, guide information may be a web page containing a route between the current point and the selected point, and detailed
15 information about the selected point (for example, shop name, category of goods, etc.). In addition, the guiding terminal may receive an URL for the mobile terminal 130 to access to the web page containing guide information (hereinafter 'mobile communication access information') as well from the guiding server 120. The guiding terminal 110 may receive guide information from the guiding server 120 and display the
20 guide information on the touch screen. At this moment, the guiding terminal 110 may

produce a QR code showing mobile communication access information to display on the touch screen. Also, the guiding terminal 110 may be equipped with RFID (Radio Frequency Identification) tag or NFC(Near Field Communication) module to write mobile communication access information onto the RFID tag or the NFC module.

5 When receiving the request for guide information from the guiding terminal 110, the guiding server 120 calculates the route between the selected point and the guiding terminal 110 included in the request for guide information and generates the web page showing the calculated route.

 The mobile terminal130 receives mobile communication access information
10 from the guiding terminal 110, and accesses to the guiding sever 120 to receive guide information. The mobile terminal 130 may be equipped with at least one of QR code reader, RFID reader and NFC module. Thus, the mobile terminal 130 may read QR code displayed on the touch screen of the guiding terminal 110 to obtain mobile communication access information, or may receive mobile communication access
15 information from RFID tag or NFC module. The NFC module in the guiding terminal 110 may operate in a card mode that functions as RFID tag, or operate in a peer-to-peer mode to provide mobile communication access information.

 FIG. 2 is a flowchart showing a procedure of providing guide information for a
20 certain point that a user requests in the guide information providing system according to

one embodiment of the present invention.

Referring to FIG. 2, the guiding terminal 110 receives an input for the selected point from a user at 210.

The guiding terminal 110 transmits a request for guide information having
5 identification information of the selected point and the guiding terminal 110 to the guiding server 120 at 220.

The guiding server 120 calculates a route between the selected point and a location corresponding to identification information of the guiding terminal 110, which is current point, at 230. The procedure of calculating the route will be described in detail
10 with reference to FIG. 3. The guiding server 120 generates guide information having the calculated route.

The guiding server 120 assigns an address to access to guide information that is calculated at 230, and transmits address information having guide information and the assigned address to the mobile terminal 110 at 240.

15 The guiding terminal 110 displays guide information to the user and provides address information to the mobile terminal 130 at 250. At this, the guiding terminal 110 may generate and display QR code containing address information, or may transmit address information by using RFID tag or NFC module to the mobile terminal.

The mobile terminal 130 accesses to the guiding server 120 by use of address
20 information that is received from the guiding terminal 110, and requests a web page

showing guide information at 260.

In response to the request at 260, the guiding server 120 transmits guide information to the mobile terminal 130 at 270.

5 Since the guide information providing system as described with reference to FIGS 1 and 2 stores all information of points to be guided onto the server and the guiding terminal and the mobile terminal use the web page received from the guiding server, the guide information providing server can be updated wholly by amending data stored on the server even when locations or additional information of points to be
10 guided are changed.

FIG. 3 is a flowchart showing that the guiding server in the guide information providing server generates route information to be included in guide information.

Referring to FIG. 3, the guiding server 120 determines whether the selected
15 point and the guiding terminal 110 are located on the same floor at 310. The guiding server 120 is equipped with a database that may store coordinates of all points that can be selected on the guiding terminal 110, coordinates of the guiding terminal 110, information about floors, and additional information in advance. Thus, the guiding server 120 can determine whether the guiding terminal 110 and the selected point are
20 located on the same floor by searching the database.

In case that the selected point and the guiding terminal 110 are located on the same floor, the guiding server 120 calculates the route between the current point and the selected point at 320. The procedure of calculating the route between the current point and the selected point will be described in detail with reference to FIG. 4.

5 In case that the selected point and the guiding terminal 110 are located on different floors, the guiding server 120 selects moving means such as escalator, elevator, stair, etc., that is located at the nearest distance from the current point at 330.

The guiding server 120 calculates the shortest route between the moving means selected at 330 and the current point at 340.

10 The guiding server 120 calculates the route between the between the moving means selected at 330 and the selected point at 350.

The guiding server 120 generates guide information having the route that is calculated at 320 or at 330 through 350 and additional information at 360. If the route is calculated at 330 through 350, the guiding server 120 may generate guide information

15 having all routes calculated at 340 and 350.

FIG. 4 is a flowchart showing that the guiding server of the guide information providing system calculates the route from a starting point to a destination point. The procedure of calculating the route at 320, 340 and 350 with reference to FIG. 3 is also

20 performed in the procedure to be described below even though the starting point and the

destination point are different. Hereinafter, a moving line means a way where a human can move along. The moving line can be represented by two coordinates for indicating one endpoint and the other end point. An obstacle represents a building, a wall, a road, etc., which a human cannot go through. The obstacle may be in a rectangular shape, and be represented by two coordinates for indicating the upper-left corner and the lower-right corner (or upper-right corner and the lower-left corner). The guiding server 120 may store coordinates for each moving line and obstacle in advance.

Referring to FIG. 4, the guiding server 120 designates the current point as a reference point at 410. The reference point is referred as a point to be used for selecting a next moving line on pre-selected moving line.

The guiding server 120 selects a moving line that is located nearest from the reference point at 420. The guiding server 120 establishes a route connecting the reference point to one of points on the moving line, which is selected at 420, that is located at the nearest distance from the reference point. In addition, the guiding server moves the reference point to one of points on the moving line that is located at the nearest distance from the reference point.

The guiding server 120 moves the reference point to one of endpoints of the moving line, which is selected at 420, that becomes the shortest distance when being connected to the destination point via a straight line at 430. At this, a straight line between the original reference point and the moved reference point is established as a

route.

The guiding server 120 selects a moving line that is adjacent to the current reference point and is located at the nearest distance from the destination point among moving lines that are not selected as a route at 440. For example, a moving line that is
5 located at the nearest distance from the destination point is selected among moving lines having same coordinate of one end point as the coordinate of the current reference point.

The guiding server 120 establishes the selected moving line at 440 as a route and moves the reference point to the other end point of the moving line at 450.

The guiding server 120 determines whether the reference point reaches the
10 destination point at 460. For example, the guiding server 120 determines whether the distance between the reference point and the destination point is equal to or less than a predetermined distance.

In case that the reference point does not reach the destination point, the guiding server 120 repeats the procedure from 440.

15 In case that the reference point reaches the destination point, the guiding server 120 finishes the procedure for calculating the route between the starting point and the destination point. At this, the guiding server 120 selects a moving line that is located at the nearest distance from the destination point among moving lines adjacent to the current reference point, and establishes the first straight line connecting the selected
20 moving line to the destination point and the second straight line connecting the first

straight line to the reference point as a route.

Although an example of one selected point that is inputted by a user is described above with reference to FIGS 3 and 4, if there are a plurality of selected
5 points such as a restroom, the guiding server 120 may select the destination point differently. For example, when receiving a request for guide information to a restroom, the guiding server 120 may calculate routes for each restroom and then finally select a route having the shortest distance among the calculated routes.

10 Hereinafter, the procedure described above with reference to FIG. 4 will be illustratively described with reference to FIG. 5.

FIG. 5 illustrates a map with a starting point and a destination point.

Referring to FIG. 5, assume that point 510 is a starting point. In FIG. 5, each line illustratively represents moving lines, and both end points of each moving line are
15 emphasized by marking circles.

The guiding server 120 selects the starting point as a reference point. The guiding server 120 calculates distances between the reference point and each moving line, and selects a moving line A that is located at the nearest distance from the reference point. The guiding server 120 establishes a straight line 512 connecting the
20 reference point to the point 511 that is located at the nearest distance from the reference

point among points that are located on the moving line 520 as a route. Among end points 521 and 522 of the moving line 520, the guiding server 120 selects the end point 522 that has the shortest straight distance to the destination point. The guiding server 120 establishes a straight line 523 between the point 511 where the reference point is located and the end point 522 as a route, and moves the reference point to the end point 522. Among moving lines B and C that have same coordinate of one end point 523 as coordinate of the reference point and are not established as a route, the guiding server 120 selects the moving lines C of which the one end point 532 has the shorter distance to the destination than the other end point 531 (which has the shortest distance between the destination point and the end points 531, 532). The guiding server 120 establishes a straight line from the current reference point to the end point 532 on the moving line C as a route, and moves the reference point to the end point 532. By repeating the aforementioned procedure, the guiding server 120 establishes a route to the points 540 and 550. Since the distance between the reference point and the destination point is equal to or less than a predetermined distance, among moving lines E and F that are established as a route, the guiding server 120 establishes a straight line 555 connecting the destination point to the moving line E that is located at the nearest distance from the destination point as a route, and establishes a straight line 556 connecting the straight line 555 to the reference point as a route. The guiding server 120 generates guide information including routes that are established so far.

Since the procedure of calculating a route from the starting point to the destination point with reference to FIGS 3 through 5 does not consider distances of all moving lines but considers a part of moving lines to calculate the route, the complexity of calculation is less than the conventional procedure of calculating route. Thus, it is possible that a terminal with low performance can easily perform the procedure of calculating a route according to the embodiment of the present invention.

Thus, although the guide information providing system is described above with reference to FIGS 1 and 2 to be performed by a server, it is possible to modify in a way that the guiding terminal 110 and the mobile terminal 130 calculate the route.

Hereinafter, a guiding information providing system in which a guiding terminal 110 and a mobile terminal 130 calculate a route will be described.

FIG. 6 is a flowchart showing a procedure of providing guide information for a certain point that a user requests in the guide information providing system according to another embodiment of the present invention.

Referring to FIG. 6, the guiding terminal 110 receives an input for the selected point from a user at 610.

The guiding terminal 110 calculates a route between the selected point and a

current point corresponding to identification information of the guiding terminal 110 at 620. The procedure of calculating the route is described in detail with reference to FIGS 3 through 5. The guiding terminal 110 generates guide information having the calculated route.

5 The guiding terminal 110 transmits a request for guide information having identification information of the selected point and the guiding terminal 110 to the guiding server 120 at 630.

 The guiding server 120 calculates a route between the selected point and the current point corresponding to identification information of the guiding terminal 110 at 640.

10 640.

 The guiding server 120 assigns an address to access to guide information that is calculated at 640, and transmits address information having the assigned address to the guiding terminal 110 at 650.

 The guiding terminal 110 displays guide information to the user and provides address information to the mobile terminal 130 at 660. At this, the guiding terminal 110 may generate and display QR code containing address information, or may transmit address information by using RFID tag or NFC module.

15 address information to the mobile terminal 130 at 660. At this, the guiding terminal 110 may generate and display QR code containing address information, or may transmit address information by using RFID tag or NFC module.

 The mobile terminal 130 accesses to the guiding server 120 by use of the address information that is received from the guiding terminal 110, and requests a web page showing guide information at 670.

20 page showing guide information at 670.

In response to the request at 670, the guiding server 120 transmits guide information to the mobile terminal 130 at 680.

Since the guiding information providing system described with reference to FIG. 6 provides a route that the guiding terminal itself calculates a route and provides it to a user, it may reduce the time that is caused mainly by lagging over a network to display guide information on the guiding terminal 110.

FIG. 7 is a flowchart showing a procedure of providing guide information for a certain point that a user requests in the guide information providing system according to still another embodiment of the present invention.

Referring to FIG. 7, the guiding terminal 110 receives an input for the selected point from a user at 710.

The guiding terminal 110 calculates a route between the selected point and a current point corresponding to identification information of the guiding terminal 110 at 720. The procedure of calculating the route is described in detail with reference to FIGS 3 through 5. The guiding terminal 110 generates guide information having the calculated route.

The guiding terminal 110 transmits route information having the route that is calculated at 720 and identification information of the selected point to the guiding server 120 at 730.

The guiding server 120 generates guide information having additional information corresponding to route information and identification information of the selected point at 740.

The guiding server 120 assigns an address to access to guide information that is
5 generated at 740, and transmits address information having the assigned address to the guiding terminal 110 at 750.

The guiding terminal 110 displays guide information to the user and provides address information to the mobile terminal 130 at 760. At this, the guiding terminal 110 may generate and display QR code containing address information, or may transmit
10 address information by using RFID tag or NFC module.

The mobile terminal 130 accesses to the guiding terminal 120 by use of address information that is received from the guiding terminal 110, and requests a web page showing guide information at 770.

In response to the request at 770, the guiding server 120 transmits guide
15 information to the mobile terminal 130 at 780.

The guiding information providing system described with reference to FIG. 7 may provide guide information to a user without lagging time caused by a network and eliminate loads to calculate a route from the guiding server as well. Thus, according to
20 the embodiment of the present invention, it becomes possible to provide a guide

information providing system that can provide guide information over a large area.

Also, since the guide information providing system described with reference to FIGS 1 through 7 may be implemented in a medium or large size guiding terminal, it
5 may be much easier for a user to input. In addition, a user can obtain guide information that a large shopping mall provide without installing a certain application that provides a conventional geographical map on a mobile terminal.

The present invention is described with reference to embodiments. The
10 aforementioned embodiments and many other embodiments as well are in the accompanying claims of the present invention. It is apparent that those who are skilled in the art can appreciate that the present invention can be implemented in various modified forms without departing from the essential features of the present invention. Thus, the disclosed embodiments should be understood in an illustrative way rather than
15 definitive way. The scope of the present invention will be defined by the accompanying claims, and all equivalences should be interpreted to be construed in the present invention.

What is claimed is:

1. A guide information providing system, comprising:

a guiding terminal configured to receive an input for a selected point from a user; and

5 a guiding server configured to generate guide information responsive to the selected point and identification information of the guiding terminal received from the guiding terminal, and transmit the guide information and an address information to access to the guide information to the guiding terminal,

wherein the guiding terminal provides the address information to a mobile

10 terminal,

wherein the guiding terminal displays a QR code containing the address information, or provides the address information through a RFID (Radio Frequency Identification) tag or a NFC (Near Field Communication) module.

15 2. The guide information providing system of claim 1, wherein the guiding server calculates a route between the selected point and the guiding terminal if the selected point and the guiding terminal are located on the same floor,

wherein the guiding server calculates a route between the guiding terminal and a moving means that is located nearest from the guiding terminal among predetermined

20 moving means, and calculates a route between the moving means and the selected point

if the selected point and the guiding terminal are not located on the same floor,

wherein the guiding server generates the guide information including the route.

3. The guide information providing system of claim 2, wherein the guiding server

5 selects a reference point on a moving line that is located at the nearest distance from a starting point, and

repeats selecting a moving line of which one end point is located at the nearest distance from a destination point among moving lines having the other end point

adjacent to the reference point as a route, and moving the reference point to the one end

10 of the selected moving line as the route until a distance between the reference point and a destination point becomes equal to or less than a predetermined distance,

wherein the starting point is a location of the guiding terminal or the moving means and the destination point is a location of the moving means or the selected point.

15 4. The guide information providing system of claim 1, wherein the guiding server calculates each of routes between the guiding terminal and a plurality of selected points and generates guide information having a route that is located at the nearest distance from the guiding terminal among the calculated routes if there is the plurality of selected points.

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5. A method of providing guide information in a guide information providing system, comprising:

in a guiding terminal, receiving an input for a selected point from a user;

in a guiding server, generating guide information responsive to the selected

5 point and identification information of the guiding terminal received from the guiding terminal;

in the guiding server, transmitting the guide information and an address information to access to the guide information to the guiding terminal; and

in the guiding terminal, providing the address information to a mobile terminal,

10 wherein providing the address information to a mobile terminal is

displaying a QR code containing the address information, or providing the address information through a RFID (Radio Frequency Identification) tag or a NFC (Near Field Communication) module.

15 6. The method of providing guide information of claim 5, wherein the generating the guide information comprises

in the guiding server, calculating a route between the selected point and the guiding terminal if the selected point and the guiding terminal are located on the same floor;

20 in the guiding server, calculating a route between the guiding terminal and a

moving means that is located at the nearest distance from the guiding terminal among predetermined moving means, and calculating a route between the moving means and the selected point if the selected point and the guiding terminal are not located on the same floor; and

5 in the guiding server, generating the guide information including the route.

7. The method of providing guide information of claim 6, wherein the calculating a route between the selected point and the guiding terminal or the calculating a route between the guiding terminal and a moving means comprises

10 selecting a reference point on a moving line that is located at the nearest distance from a starting point;

 repeating selecting a moving line of which one end point is located at the nearest distance from a destination point among moving lines having the other end point adjacent to the reference point as a route, and moving the reference point to the one end

15 of the selected moving line as the route until a distance between the reference point and a destination point becomes equal to or less than a predetermined distance,

 wherein the starting point is a location of the guiding terminal or the moving means and the destination point is a location of the moving means or the selected point.

8. The method of providing guide information of claim 6, wherein the generating
guide information comprises calculating each of routes between the guiding terminal
and a plurality of selected point and generates the guide information having the route
that is located at the nearest distance from the guiding terminal among the calculated
5 routes if there is the plurality of selected points.