

Development of Trip Guide System of the Osakikamijima Island, “Shima-NAVI”

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Abstract: In this study, we are developing Trip Guide System “Shima-NAVI”. This system supports the action of going out islanders, provides information about transportation and lifestyle-related information. The system consists of an electronic bulletin board that is installed at the main facility as a traffic contact, and an electronic bulletin board that is set in buses and ferry boats. By providing users with real-time information on destination, information on public transportation to be used, and information that is in close contact with the life(For example, the bargain sale information on a supermarket, the closing-the-office day of a hospital, etc.), this system supports the activation of islands and promotes the use of the bus.

Keywords: Trip guide system, public transportation, rural area

1. INTRODUCTION

Osakikamijima is an island of 8,500 inhabitants in the Seto Inland Sea, and aging and depopulation is progressing rapidly. Although many of islanders in Osakikamijima rely on the private car to move, due to the rapid aging of recent years, there has been an increase in people subject to restrictions on the movement of such vehicles can not go out driving. Under these circumstances, in Osakikamijima town, in order to compensate for the route bus services(Sanyo bus) from the past, began the operation of community bus(Otohime bus) from 2005. However, users of these two bus routes are not many necessarily. The cooperation is also not very good too. Therefore there is a strong demand for improving the convenience of these buses. In addition, Osakikamijima does not have a bridge connecting to the mainland, when people living in the island go out of the island, it is necessary to use the ferry. However, coordination of ferry and bus is not good, it is an obstacle when the elderly go outside of the island.

On the other hand, due to the activation of the island and improving the quality of life of the islanders, optical fiber network is in place. However, at present, some islanders only is used to connect to the Internet, have not been used almost as a public service.

In this study, by taking advantage of the optical fiber network, we aim to build a system to support the cooperation of ferry and bus, to provide information (life information of the islanders, information about transportation, and etc.) ferry terminal, public office, supermarket, hospital, etc.

This system supports movement inside an island and movement in a mainland from an

island, provides information from a public office and an event information in an island. We call "Shima-NAVI" this system.

2. THE MAIN FUNCTION OF THIS SYSTEM

This system consists of a touch-panel terminal, an electronic bulletin board, and a fiber-optic network. A touch-panel terminal is installed in the main institutions used as a traffic nodal point. An electronic bulletin board is installed into a bus or a ferry. A fiber-optic network is a network which connects these apparatus. The outline of this system is shown in Figure 1.



Figure 1. The outline of Trip Guide System “Shima-NAVI”

2.1 The Function of a Touch-Panel Terminal

In this system, a touch-panel terminal is installed in the ferry terminal, a public office, a supermarket, a hospital, etc. The main functions are described below. A touch panel terminals installed at the bus stop is shown Figure 2. A touch panel terminals installed at the ferry terminal is shown Figure 3.



Figure 2. A touch panel terminals installed at the bus stop



Figure 3. A touch panel terminals installed at the ferry terminal

- 1) It indicates that a means of transportation approached automatically using the position information by the GPS receiver carried in the bus or the ferry. The destination and connection information on a means of transportation are also displayed.
- 2) By operating a touch panel, the information on a means of transportation used in order to go to the destination, and the information on the destination are offered. At this time, this system also offers real-time information on the used time. For example, when the destination is a supermarket, the inexpensive information on the day, etc. are shown, and when the bus is used, the next departure time, connection information, the arrival time, etc. are displayed.
- 3) When the touch panel is not operated, various advertisements, the information from a public office, etc. are displayed at random. The permitted user offers these pieces of information via a network.

2.2 The Function of an Electronic Bulletin Board

An electronic bulletin board is carried in bus(Sanyo bus and Otohime bus) services on the island and the ferry. An electronic bulletin board installed in bus is shown Figure 4.



Figure 4. An electronic bulletin board installed in Otohime bus

- 1) By using the position information by the GPS receiver carried in a means of transportation, when a bus stop and the ferry terminal are approached, it indicates that it approached. The real-time information on the neighborhood facilities of a bus stop or the ferry terminal is also displayed. For example, when the bus stop of the super neighborhood is approached, the bargain sale information on the day is displayed, and when the ferry terminal is approached, the connection information which suited at the time is displayed.
- 2) At the place away from the bus stop, life pertinent information, such as various kinds

of advertisements and information from a public office, is shown at random like a touch-panel terminal. The user who got permission offers these pieces of information via a network.

2.3 Other Functions

In addition to the above function, in this system, the function in which information providers, such as a supermarket and a public office, can make the input and correction of real-time information through a network from PC or a mobile phone is due to be realized.

3. THE REALIZATION METHOD OF THIS SYSTEM

In order to realize the function described so far, construction of the system shown in Figure 5 is aimed at. As shown in figure 5, this system operates, when the information control server and the information browsing system communicate mutually. The information browsing system controls an electronic bulletin board installed in a movable body such as the bus and the ferry, and a touch-panel terminal installed in main institutions such as ferry terminal and public office. The outline of the information control server and the information browsing system, and the structure of the communication performed among these are explained below.

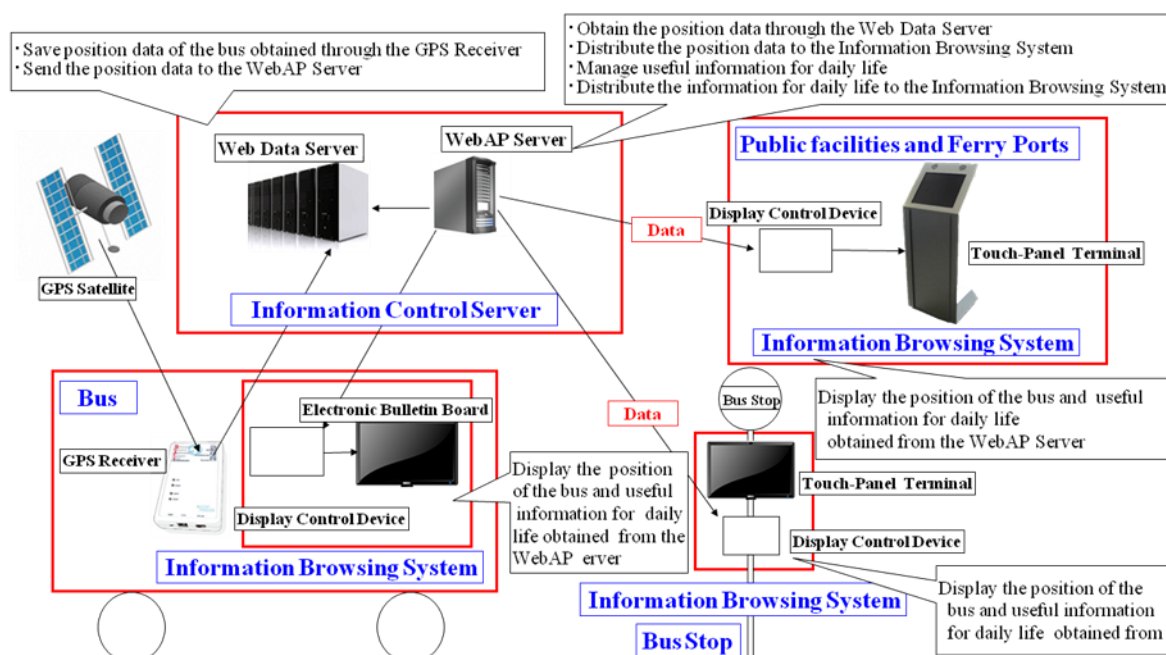


Figure 5. The system configuration of “Shima-NAVI”

3.1 The Information Control Server

The information control server consists of a Web data server which saves position information transmitted from a bus or the ferry, and a WebAP server which distributes position information received from the Web data server to the information browsing system. A WebAP server can manage not only position information, but the data displayed on a touch-panel terminal and an electronic bulletin board explained by 2.1 or 2.2. And WebAP server distributes such data to the information browsing system.

3.2 The Information Browsing System

The information browsing system consists of an information display device and a display control device. A display control device displays position information on the bus and various data which were distributed from the WebAP server on an information display device (if it is movable bodies such as the bus, on an electronic bulletin board, or if it is an institution, on a touch-panel terminal).

3.3 The Communication Procedure Between the Information Control Server and the Information Browsing System

The information browsing system which controls the touch-panel terminal installed in an institution and the information control server communicate through the fiber-optic network constructed in the island. On the other hand, the information browsing system installed in the bus or the ferry and the information control server communicate using a mobile phone. In the case of a bus or the ferry, the position information received from the GPS receiver installed in the bus or the ferry is transmitted to the Web data server of the information control server through a mobile phone.

4. THE FEATURE OF THIS SYSTEM

This system has the following features as compared with the existing system.

Like this system, a touch-panel terminal is installed in an institution and the system which offers various information by using it exists conventionally. However, the most is turned to the people who visited the area for the purpose of sightseeing etc. On the other hand, the system developed by this study provides with information people who live in Osakikamijima, and the users itself differ. Therefore, the information to offer also differs from the conventional contents. For example,

- It aims at displaying the information stuck to the life (the bargain sale information which changes every day, closing-the-office day of a hospital, and so on) in real time.
- It aims at telling automatically that bus approached.
- It aims at offering bus's destination and connection information.

In recent years, almost all buses on a regular route offer with the sound the information on the bus stop stopped at the next, and the information on the neighborhood of a bus stop. However, it is the sound recorded by the tape, and these are offered mainly by a driver's operation and are the always same contents. The electronic bulletin board of this system aims at offering these pieces of information automatically (having no a driver's operation).

There is the feature shown below in the electronic bulletin board installed in the bus or the ferry.

- If a supermarket is near the bus stop to approach, it aims at offering automatically the bargain sale information on a supermarket that it changes every day.
- If there is the ferry terminal, it aims at offering the connection information on the ferry automatically as real time information fitted between an operation day or the

arrival time.

- While not displaying the information about a bus stop or its neighborhood, other various life pertinent information is shown.

In the electronic bulletin board of the Shinkansen, a station which are stopped at the next, the latest news, and so on are offered. Although the system of the Shinkansen resembles the electronic bulletin board of this system, it aims at providing focusing on the information stuck to an inhabitant's life in Osakikamijima.

The employee of the supermarket and The employee of the supermarket on an island, the personnel of a hospital, etc. input the information offered by this system through a network. the personnel of a hospital on an island, etc. input the information offered by this system through a network. Anyone will be enabled to offer information if it is those who got permission.

5. THE STATUS OF DEVELOPMENT OF A SYSTEM AND A FUTURE SUBJECT

Now, we are developing the prototype of this system. The outline of a prototype is shown below.

- The electronic bulletin board installed in a movable body was installed in one set of Otohime bus.
- A touch-panel terminal was installed in three places of an island; bus stop (Kinoe branch office) of Otohime bus, the ferry terminal (Shiromizu ferry terminal) which connects a mainland to an island, and the information plaza which is public facilities.
- The information control server was installed on the fiber-optic network constructed by the island.
- Most information inspection systems were completed.
- Although the communication function is operating almost satisfactorily, about the position information on a bus, it may lack accuracy a little and the further adjustment is required for it.
- The contents displayed by this system are also created.

The example of a display of the position information on the bus under development is shown in Figure 6.



Figure 6. The example of a display of the position information on the bus under development

In order to increase use of a bus with few users, it is required to learn island people's needs and the display method of information. Therefore, we conducted the opinion poll to the bus user, especially elderly people. A system is due to be improved so that the contents which the user wants can be effectively displayed based on the result of an opinion poll.

From now on, we are planning realization of the function to show the information (waiting time, the time required, a charge, and so on) for transferring two or more transportation and moving, and the function to show the information relevant to the target institution. We think it required to realize environment where the permitted island people can offer information easily. Therefore, it is required to build a data input system.

6. CONCLUSION

In this paper, we introduced Trip Guide System of the Osakikamijima Island, "Shima-NAVI" that is currently developing. As mentioned in the text, we are developing a prototype of the system now. In the development of contents, we have been in cooperation with the incorporated nonprofit organization "KAMIJIMA NO KAZE" and students of Hiroshima National College of Maritime Technology major department. We think that it should refer not only to the opinion of Osakikamijima islander but to the opinion of more people. Therefore, we plan to make a presentation in cultural meetings or cultural seminars to be held on the island in the future.

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