A Design and Structure of Travel SNS Application

Kyeonhoon Kwak, Hankyu Lim(corresponding author)

Abstract—This paper designed and structured SNS (Social Network Service) targeting young backpacking travelers. Considering the characteristics of young backpacking travelers, several functions that are appropriate for them were designed (travel cost calculation and division process, footprint process, trip note process). Gathered in public SNS, we upload our emotions and information in a form of text, image or videos and share them with others. With abundant information in diverse fields, a huge amount of traffic is generated. Vertical SNS such as Instagram and Pinterest that induce large traffic by focusing on a specific topic and style began to emerge. Web application was materialized using HTML5, while footprint function was materialized using Geo location which is one of the HTML5 functions. When application is materialized using HTML5, materialization is possible regardless of the types of platform.

Keywords-component; SNS, Vertical SNS, HTML5, backpacker, application, DFD

I. INTRODUCTION

A number of applications for Smart device have been developed since the emergence of Smart device. Among them, SNS has established itself as one of the most broadly used service[1]. SNS has common functions including messaging, media, networking and communication and many people use a variety of functions using computer and software as a medium. In SNS, people can build linkage by sharing their full or limited personal information within a specific group. These kind of linkages are connected to each other to create a network that people can use.

Gathered in public SNS such as Twitter, Facebook and Google plus, we upload our emotions and information in a form of text, image or videos and share them with others [2, 3, 4]. With abundant information in diverse fields, a huge amount of traffic is generated. In these days, vertical SNS such as Instagram and Pinterest that induce large traffic by focusing on a specific topic and style began to emerge. Since their approach is focused on a specific issue such as hobby, culture and tourism, users can share more profound information. In particular, restaurant and accommodation information related to tourism are provided through diverse types of service. However, considering that the share of information is done in text, pictures and videos, more specific form of information regarding travel will be helpful. In this paper, a vertical SNS for college student backpackers was designed and materialized. In

addition to sharing information based on previous vertical SNS, the new vertical SNS supports sharing of users' own travel records and other people's travel records travel using GPS information and it also supports the formation of community for finding travel companions. Reactive web technology of HTML5 and GPS API were used for the materialization which can be used in diverse Smart devices.

Additionally, we presented high-level map and low-level map of the whole system in DFD (Data Flow Diagram). DFD presentation of the travel cost calculation process, footprint process, trip note process and famous restaurant introduction process is presented for better understanding of the whole system. UI (User Interface) of each process is also shown in images.

II. RELATED RESEARCH

A. HTML5

HTML5 is a web programming language that was confirmed as a next-generation web standard. HTML5 expands previous HTML that was capable of displaying text and hyperlinks only such that it can present diverse applications including multimedia to provide them to users. As it can provide diverse functions such as audio, video, graphic processing and location information, the functions that can be processed on web have remarkably enhanced [5]. HTML5 is a technology aimed at web application rather than web contents. In particular, diverse functions are standardized and provided for rich interaction regardless of the platform. Moreover, realistic web application can be programmed thanks to the additional API function.

In this paper, web application was materialized using HTML5, while footprint function was materialized using Geo location which is one of the HTML5 functions. When application is materialized using HTML5, materialization is possible regardless of the types of platform.

B. GPS(Global Positioning System)

GPS (Global Positioning System) is a satellite navigation system that computes the current location of the user by receiving signal from GPS satellite. It is largely used in navigation devices of aircrafts, ships, and automobiles and it is also being used in Smartphone, tablet PC, etc. these days. Here, the coordinate is obtained by calculating the distance between the GPS satellite and GPS receptor. If we have accurate location and distance of GPS satellite, three GPS satellites are sufficient to find a precise location [6].

In this paper, location information was easily materialized using Open API of Daum Map by making use of GPS

technology [7, 8]. Convenience and usability of the application can further be enhanced when the travelers share their own location and check the footprint of other travelers to add travel information and entertaining function to the application.

C. Questionnaire Survey Analysis

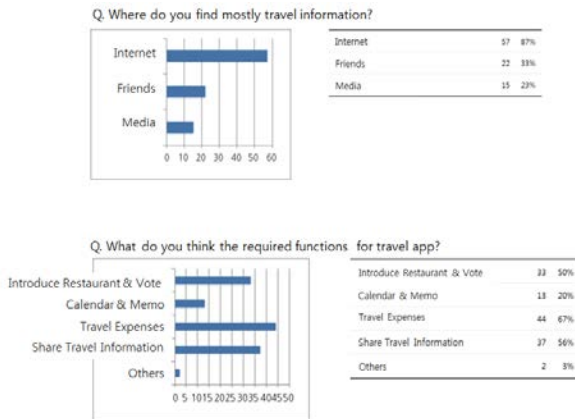Figure 1 below is an excerpt from a survey result that was conducted offline on 64 college students.

Fig. 1.   Questionnaire Survey

According to the survey results, 35 respondents (53%) complained about insufficient travel information when going on a trip and 44 respondents (67%) pointed out the additional expenses. Moreover, 44 respondents (67%) said they wanted an additional function of travel expense calculation, while 37 (56%) hoped for an additional function of travel information share. Most of the college students showed strong interest in travel expenses and they also wanted shared information about the places where others visited or are planning to visit. This paper applied these results to the functional materialization of vertical SNS.

III.   DESIGN AND IMPLEMENTATION

A. Data Flow Diagram

Figure 2 is the top-level map of the data flow chart. There are five processes in the top-level map. Members put their information for log-in and member registration. They can enter in other processes.
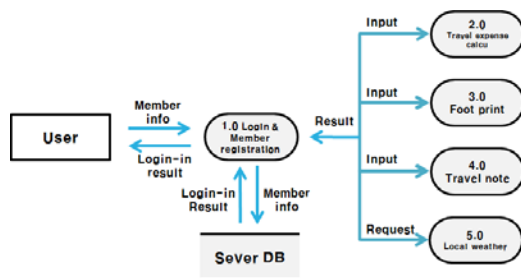

Fig. 2.   Top-level Map of the Data Flow Chart

Figure 3 is the low-level map of the travel cost calculation process. Travel cost process is a function that stores cost in the trip note and calculates the cost required for the trip. After the user log-in, travel cost calculation can be implemented. In travel cost calculation, cost information that was selected in trip note is transferred to compute the total travel cost. List of cost is transferred to add or delete the travel cost.
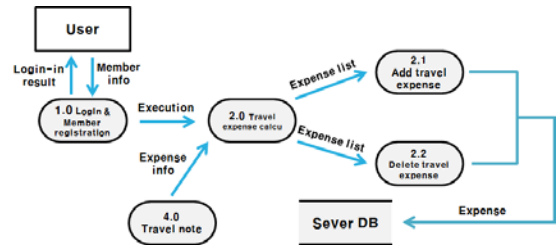

Fig. 3.   Low-level Data Flow Diagram for 2.0.

Figure 4 is the low-level map of the footprint process. Footprint process is a processor that stores and prints one's own location and the contents about it. After the user log-in, footprint function can be implemented. Footprint Show retrieves location information from the database and displays the contents. Footprint Mark retrieves location information to store in the database.
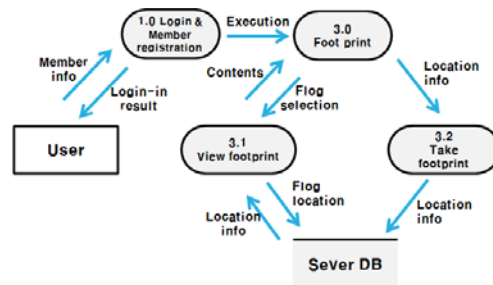

Fig. 4.   Low-level Data Flow Diagram for 3.0.

Figure 5 is the low-level map of the trip note process. Trip note process is a note that summarizes the itinerary and cost of the trip. After the user log-in, trip note can be implemented. Itinerary from DB are presented and the users can add or delete the trip schedule.
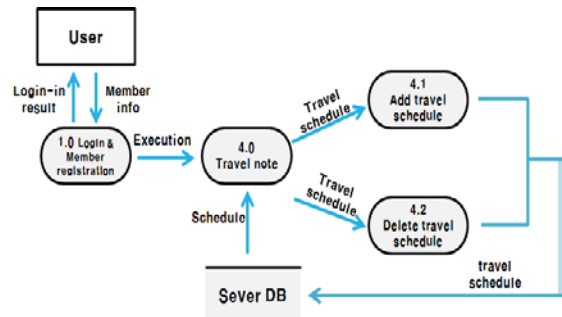

Fig. 5.   Low-level Data Flow Diagram for 4.0.

B. Flowchart

Figure 6 shows a flowchart where there is a DB for storing and retrieving the travel information and user location and the functions of providing users with information are defined.
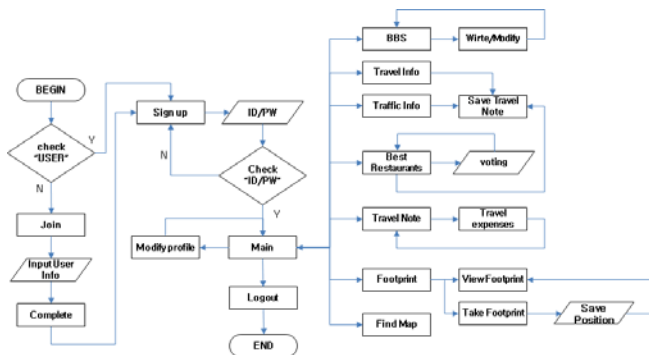

Fig. 6.   Flowchart of vertical SNS

Figure 7 shows a flow chart of the member registration and travel cost calculation of the application. In member registration, users enter their information and check whether their id can be used. the member registration is completed after storing the information in the DB. In travel cost calculation, users add relevant items to the note in the trip information page. The travel cost calculation calculates the cost of items that are added to the note at the time of running the trip note and shows the cost.
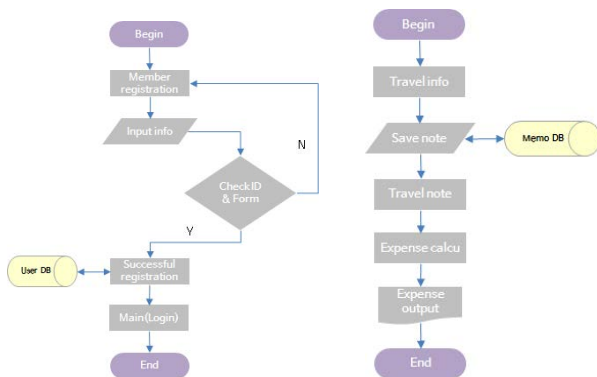

Fig. 7.   Flowchart of Member Registration Travel Expense Calculation

Figure 8 shows a flow chart of the footprint function of the application. Users can select Footprint Show and Mark in the footprint page. Footprint Show prints a map to display the current location and the footprints in database that users have made. Footprint Mark stores only the user's location in the database the moment the user selects. Footprint does not show the owner of the footprint.
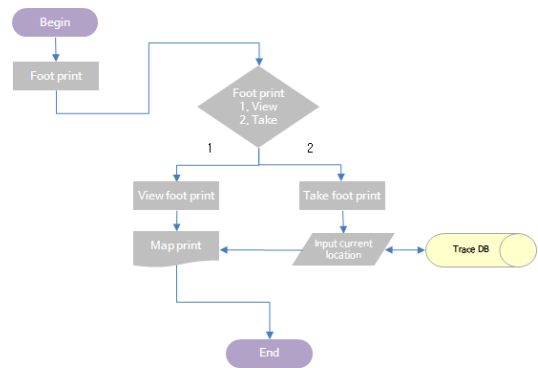

Fig. 8.   Flowchart of Foot print

C. UI Design

Figure 9 a below is a screenshot after login. There is a profile and background screen that can be changed by users and the main menus of the application are listed in a single row. There are six image buttons that enable easy movement of the core functions of the application. Figure 3b shows the travel note page. The menus selected by the traveler are listed and the total expenditure is calculated at the bottom.

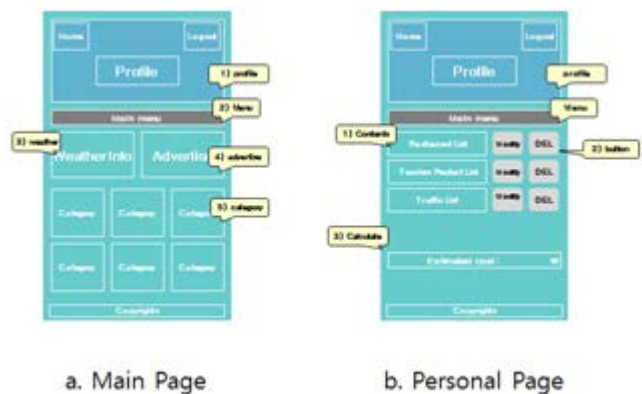a. Main Page   b. Personal Page

Fig. 9.   UI Design

Figure 10 provides information about food to users with pictures and simple introduction. Users can check some food which can be contained in My Trip Note.
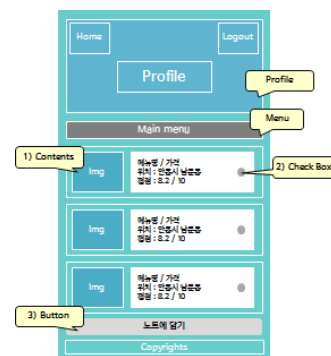

Fig. 10. Famous Restaurant Introdution UI

Figure 11 shows footprint page. There are Footprint Show and Mark button below the screen menu button, below which there is a map that shows the current location and the footprints. On map screen, the current location is marked with blue marker and the footprints are marked with yellow marker.
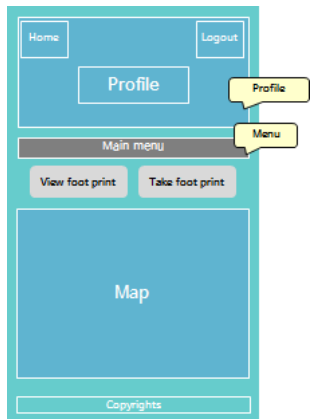

Fig. 11. Foot print Page UI

D. Implementation

In this paper, three functions including member registration and login, travel expenditure calculation function and footprint shot function were realized.

Figure 12 below shows the main page screen. It is displayed in case of successful log-in and the profile at the top is locked for non-members. Home-link button and log-out button are at left and right side of the top of the profile domain, respectively, so that users can click them whenever they need.
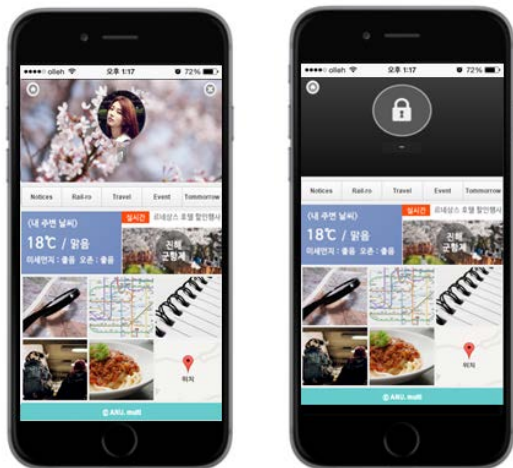

Fig. 12. Main Page Screen

Figure 13 below shows the login and member registration page. The login page has a members-only area in the title part so that it can induce users' member registration. The member registration page uses minimum amount of contents and textbox to lessen the pressure of member registration.

Those other than id, password, name and sex can be skipped for registration approval.

Fig. 13. Login and Member Registration

Figure 14 below is a screenshot of famous restaurant bulletin board and user note of each location. In bulletin board, the users can look for the menu, prices and location of famous restaurants and they can select menu and contain them in their note. Information about the food such as pictures and brief introduction are given to the users who can give scores to the food. Moreover, they can check the foods and contain them in their travel note. Each user can have one user note and it shows the items selected in the bulletin board. The users can check the menu they chose which can be revised or deleted. A total calculation fee is expressed at the bottom.

Fig. 14. Screen Shot of Famous Restaurant and User Note

Figure 15 below is a screenshot after running footprint function. In the screen, yellow marker shows the location checked by the application users, while blue marker indicates the current location of the user. The users can express their own location by clicking footprint store button. Footprint guarantees anonymity and the id information is not put into the DB.

Fig. 15. Screenshot of Footprint Function

IV. CONCLUSION

Vertical SNS such as Instagram and Pinterest that induce large traffic by focusing on a specific topic and style began to emerge. In this paper, vertical SNS service was designed and materialized for college student backpackers. IN addition to sharing information based on previous vertical SNS, the new vertical SNS supports sharing of users' own travel records and other people's travel records travel using GPS information and it also supports the formation of community for finding travel companions. Reactive web technology of HTML5 and GPS API were used for the materialization which can be used in diverse Smart devices.

Considering the characteristics of young backpacking travelers, several functions that are appropriate for them were designed (travel cost calculation and division process, footprint process, trip note process). The vertical SNS for sharing travel information was designed such that not only the share of basic travel information about backpacking, but also the real-time communication about the travel expenses, visited spots and accompanying destination are possible. The users can search for other backpackers near them using GPS information and the system is also designed such that the users can make use of the information by the previous backpackers. Moreover, HTML5 technology was used for the materialization that can respond to diverse Smart devices.

Additionally, we presented high-level map and low-level map of the whole system in DFD (Data Flow Diagram). DFD presentation of the travel cost calculation process, footprint process, trip note process and famous restaurant introduction process is presented for better understanding of the whole system. UI (User Interface) of each process is also shown in images.

REFERENCES

[1] K.H. Kwak, M.W. Yoon, Y.W. Lim, H.K. Lim, "A Design and Implementation of vertical SNS for Student Backpackers" Proceeding of the International Conference on Communications and Computer, PP. 11-13, 2015.

[2] Richter, Alexander, and Michael Koch. "Functions of social networking services." Proc. Intl. Conf. on the Design of Cooperative Systems. pp.87-98, 2008

[3] Daegeun Kwon , .., Yangwon Lim and Hankyu Lim, "Action Simulation Game Design using the Leap Motion Controller", 12th International Conference on Knowledgement, Economy and Management Proceeding, pp381-391, Nov. 2014.

[4] Hyeonpyo Hong, and Hankyu Lim, ″Application of Smart Device Usage Control adopting Secure Coding for Hacking Protection:, NNGT International Journal on Internet and Web Application, Vol. 2, pp1-8, Feb. 2015

[5] Changgu Kim, Junsu Jeong, Munsik Choo, Seokgi Hong, Chunghyun Lee, Yangwon Lim and Hankyu Lim, ″Design and Implementation of Vertical SNS in the Big Data era", Proceeding of JCCIS Conference, pp109-112, Nov. 2012.

[6] http://www.w3.org/TR/html5/

[7] https://en.wikipedia.org/wiki/Global_Positioning_System

[8] http://apis.map.daum.net/

Kyeonhoon Kwak is students of Multimedia Engineering Department of Andong National University, Korea.

Hankyu Lim received the B.S. degree in Electronics Engineering from the Kyungbook National University in 1981. He received the M.S. degree in Computer Engineering from the Yonsei University in 1984. He received the PH. D. degree in Computer Engineering from the Sung Kyun Kwan University in 1997. He is a professor of Andong National University.