Analytical the Large-scale Collection of Data on the Results of the Guides for Foreigners Visiting Japan

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***Abstract*—In previous research that has been done, there were issues like the precision of GPS data for an analysis of tourist behavior patterns, difficulties with long-term studies, and it was difficult to conduct an analysis based on detailed data like what language people were speaking, what nationality they were, what they bought and when and where they bought it. However, this study reports that the efforts and enthusiasm in the creation of a system that works in close cooperation with local guides are making it possible to perform an analysis that overcomes the limitations of the research surveys that have been done until now. Additionally, the data collection handled in this text that uses a system that works closely with local guides is not only in place for the Tokyo Metropolitan Area. It is also expanding to areas like the Kansai, Tohoku, and Kyushu regions, and more new items are being added. This makes it possible to follow the elaborate and detailed trends of tourists to Japan.**

Keywords-component; Foreigners; GPS;

I. THE OBJECTIVE AND BACKGROUND FOR THE DATA COLLECTION

The government's policies and the decision to hold the 2020 Olympics in Tokyo have led to an increase in the number of tourists who visit Japan (2.404 million people in 2016), and the types of trips that people take to Japan are shifting from group to individual travel (74%). Until now, the studies on tourism have conducted analyses on behavior patterns and questionnaire and tracing surveys; however, accumulating data and carrying out an empirical analysis are still considered to be real challenges [1]. The precision of chronologically ordered information is still inadequate, and there continue to be many challenges [2].

In 2016, the total amount of travel expenses (according to a definite report) by all of the foreigners visiting Japan was estimated at 3.7476 trillion yen, and this was a 7.8% increase compared with the previous year (3.4771 trillion yen). When the travel expenses are broken down according to the tourists' nationalities or the region that they are from, it has been reported that China spent the most at 1.4754 trillion yen (39.4% of the whole). This was followed by Taiwan that spend 524.5 billion yen (14.0%), then by South Korea that spend 357.7 billion yen (9.5%), then by Hong Kong that spent 294.7 billion yen (7.9%), and finally by America that spent 213 billion yen (5.7%). These top five nations were reported to have comprised 76.5% of all the travel expenses spent in Japan [3].

In this situation, the present authors have had the idea that they would like foreigners to know Japan's true charm and that they would like to increase the number of people across the globe who are fans of Japan. To this end, it is essential to grasp the needs of tourists visiting Japan, and therefore, the present study has been active collecting and analyzing the data that will serve as a foundation for this understanding. Previous studies have used GPS/GIS in Kamakura to study the walking paths of tourists [4]. However, this type of study has faced difficulties in conducting large-scale surveys that cover the whole country and in obtaining detailed data about what tourists bought, when and where they bought it, and whether or not they went somewhere afterwards.

The data that has, until now, been generally known to be used to grasp the behavior of tourists has been GPS data obtained through smartphone tourism applications, the location update history for roaming cell phones, SNS data, and data like comments being posted to virtual sites [5,6]. This

type of data allows researchers to grasp macro trends, but it is difficult to use this sort of data to anticipated future fads or to find the beginnings of new trends. In recent years, it has become possible to solve the above-mentioned issues by discovering new tourist attractions and by getting the results of analyzing the behavior patterns tourists have for going on outings based on the order in which they visited places.

Deeply detailed regional information seems to be quite useful for effectively marketing relevant businesses and service providers to tourists. It allows for an understanding their diverse needs and shows the signs of emerging trends. The present author received permission to perform an analysis that tourist information records from several groups where there was an interpreter guide who went along on a FIT (Foreign Independent Tour / Free Individual Traveler). The present text shows the results of analyzing this data. The data set dealt with in this thesis detailed information on the behavioral pattern of tourism that we covered in the previous research (where we were taken, where we were pleased, how much money we spent, what kind of meal we had, The accompanying record, such as what he bought), information of more than 50 items is entered in one action unit. In that respect too, it is very rich compared with the data set in conventional behavioral pattern analysis and it can be said to be an important data set for understanding the behavioral patterns of people in big tourism which can be further increased statistically significantly in the future.

II. FEATURES OF THE DATA OBTAINED FROM GROUPS GUIDED BY AN INTERPRETER

Many foreigners who come to Japan individually and hire interpreter guides are seeking an experience that is not found in ordinary guidebooks or on standard package tour courses. These guides make it possible for them to come into contact with Japanese culture and life, to have exchanges with local people, and to discover spots that Japanese people have not noticed. Every day groups that provide interpreter guides get requests like "I will be coming to Japan at a certain time, so I want you to guide me to such and such a place." The guide that responds to this request creates an individual course based on the tourist's request, and then they go with the tourist to guide them around the location they want to see for either a full or half day. The guide sometimes accompanies them for meals and shopping. The interpreter-guides keep records of where they took the tourist that day, what sort of places they enjoyed, about how much money they spent, what they ate, and what they bought. These are then kept so the guides can review them later, so they can be used by other guides, or so they can be used to train future guides.

NEC Solution Innovators, Ltd， provides a "support system for interpreter-guide groups" to support interpreter-guide groups in this series of activities, and by doing this, they are contributing to providing hospitality for tourists visiting Japan. The present study received permission to write about some of the content of the data about guiding tourists that was logged and collected in the study that was done jointly with Ohnishi Laboratory at the University of Tokyo.

III. DATA ACQUISITION METHODS

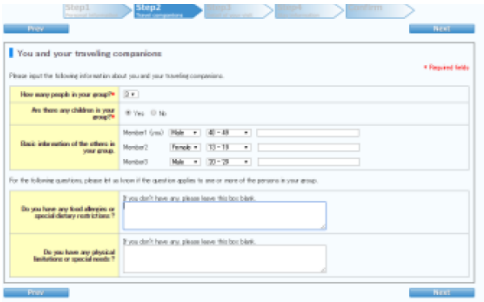

Figure 1. The online registration allows the tourists to enter their diverse desires and conditions, and it allows us to apply geographic and chronological information to them.

A. An approach to the technical side of data acquisition

Registration in the tourist information journal is the basis for the data that is being used by this study, and because it is possible to register in this journal using a online system, people can register using any type of device like a PC, tablet or smartphone.

Registration in the tourist information journal is input in a standard format where one's itinerary can be systematically registered.

The tourist areas and sightseeing spots that are registered are put into a list of choices that are displayed to help people input their destinations, and this reduces the burden put on the person doing the registration. It also reduces the possibility of spelling inconsistencies caused by manual input.

Figure 2. It is part of the screen that the guide itself inputs. Records reflecting time series and geographical information are available on-line for details of tourist's diverse behavior in behavioral units

B. Features of the data columns

The data is used in a manner that differs from the analysis that used for data like the location update history of roaming cellular phones, the GPS data obtained via smartphone tourism applications, or the data obtained from comments on SNS or virtual forums, and it is used to get an understanding

of the types of attributes (nationality, language, age, gender, group size, having children or not, and dietary restrictions) travelers have. It is also used to understand what types of areas, facilities and shops the travelers with various attributes go to and how much they spend on goods and services at these locations.

Figure 3. It is also possible to confirm on the map whether the traveler is traveling by which route and which facility / store in which area

IV. RESULTS OF THE ANALYSIS

This text will touch on the results of an analysis of trends in the total of 4,225 groups of tourists who visited Japan using a tour guide within Tokyo Metropolitan area and for whom there is a total of 67,437 columns of data that collected from December 1st, 2015 until March 31st, 2017. And This paper caught in the analysis result in total activity unit of one and a half years.

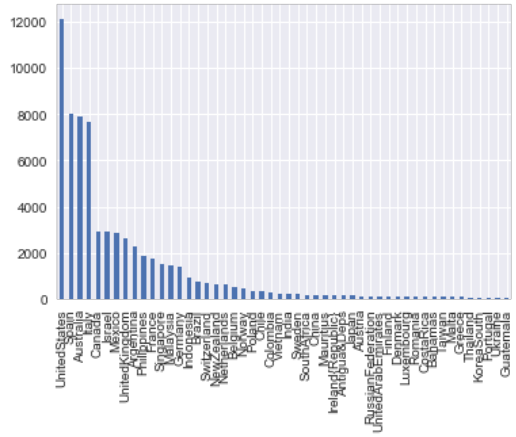

Figure 4. Number of groups divided according to nationality who used a guide of the Tokyo suburbs activity

Based on Figure 2, it is safe to say that there are very many people who have used guides in the Tokyo Metropolitan Area from the United States of America, and this is followed by people from Spain, Australia, Italy, Canada and Israel. Looking at the nationalities and regions in the recent studies on the spending trends of visitors to Japan, we see that "women" did more than 50% of the spending for Taiwan, Hong Kong, China, Thailand, Malaysia, and the Philippines. This value was particularly high for Thailand where women spent 67.8% of the total. For India, the percentage of spending by men is quite high at just under 80%, and it became apparent that the guide users in this study varied widely among North America, Europe, and the Islamic world [7].

As a difference from the nationalities and regions in the recent studies on the spending trends of visitors to Japan, this data set can further preempt plans that respond to individual needs and various needs. Therefore, this data set is private.

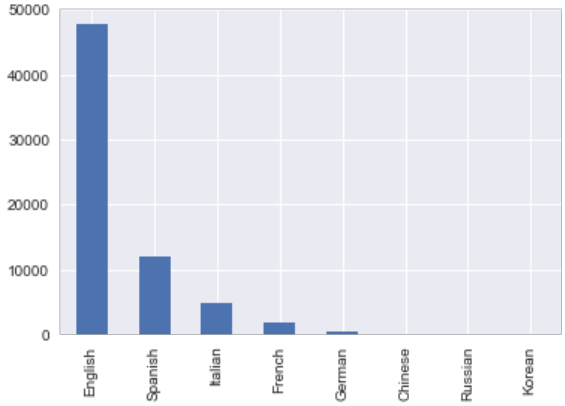

Figure 5. Number of groups who used a guide of the Tokyo suburbs activity

Figure 5 shows that there are many tourists who mainly use English, and the next most frequently used languages are Spanish and Italian. (The person in charge of guides who was doing the contracts for this study dispatches guides based on the language used by the tourists visiting Japan.)

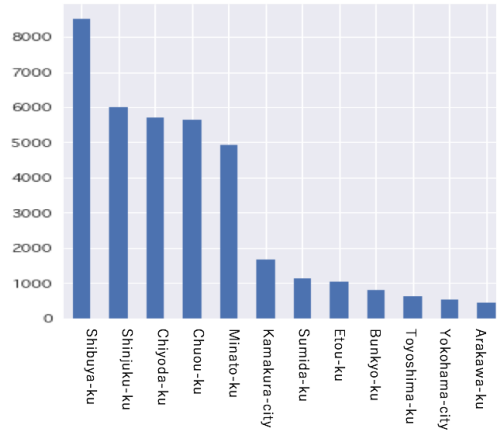

Figure 6. Spots where purchases were made by groups who used a guide of the Tokyo area activity

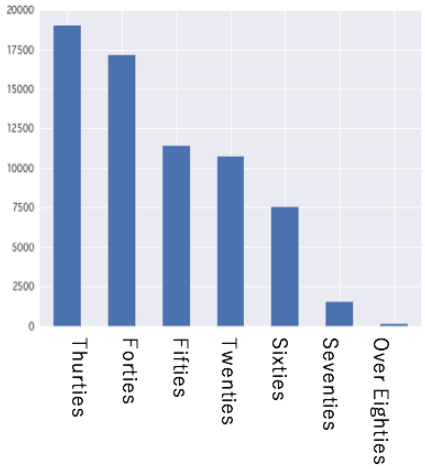

Figure 7. Age ranges of the groups who used a guide of the Tokyo suburbs activity

Based on Figure 7, it is safe to say that there are few young tourists and that tourists to Japan are mainly in their 30s to their 50s. This suggests different trends in the guide users in this study compared with the Japanese questionnaire a "study of spending trends by foreign tourists to Japan," and by doing a comparison with them and studying more detailed data, it seems possible to study behavior patterns according to the visitor's age range and according to language. It is also possible to study food preferences and what people are interested in within Japanese culture. This sort of study could be a reference for foreigners from various countries to look into visiting Japan, and it would also be fortunate if it could become a reference that is examined for its survey methods.

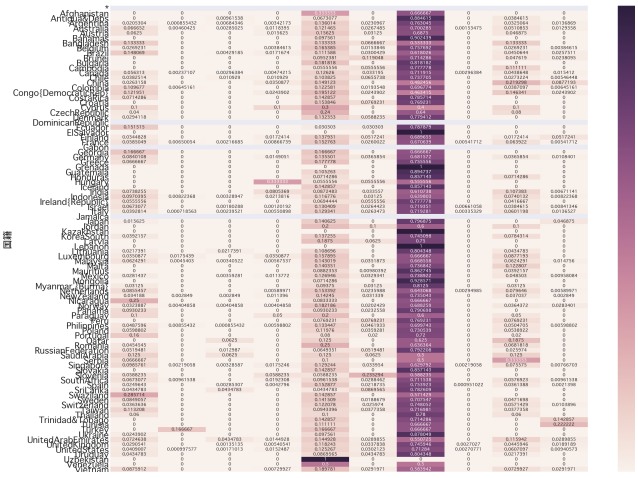

Figure 8. Purchased items (standardized) by action by nationality who used a guide of the Tokyo suburbs activity

V. DISCUSSION

In previous research that has been done, there were issues like the precision of GPS data for an analysis of tourist behavior patterns, difficulties with long-term studies, and it was difficult to conduct an analysis based on detailed data like what language people were speaking, what nationality they were, what they bought and when and where they bought it. However, this study reports that the efforts and enthusiasm in the creation of a system that works in close cooperation with local guides are making it possible to perform an analysis that overcomes the limitations of the research surveys that have been done until now. Additionally, the data collection handled in this text that uses a system that works closely with local guides is not only in place for the Tokyo Metropolitan Area. It is also expanding to areas like the Kansai, Tohoku, and Kyushu regions, and more new items are being added. This makes it possible to follow the elaborate and detailed trends of tourists to Japan. This sort of data will continue to increase, and when it expands to every area in Japan, it will make it possible to not only overcome the traditional limitations faced by studies on tourist activities but also make it possible to conduct anthropological and cultural surveys on behavior patterns according to the nationalities and religions of the tourists who come to Japan from various countries. It will also be possible to study each nation's demand for Japan. Additionally, these types of surveys contain a lot of potential. By combining such data with chronological data about land values in Japan and phone book data that can give suggestions about urban industrial development, it is possible to understand goals for regional stimulation through tourism for regions all over Japan, get suggestions for Cool Japan policy strategies, and it is possible to get suggestions about popular spots that could be sites for safe tour routes for people from various countries who will come for the Tokyo Olympics. Based on this, data will continue to be collected going forward, and an attempt will be made to acquire valuable expertise.

By further applying these techniques, it was possible to expand on the activities being done in all of the regions that created culture in Japan, and it was possible to get an understanding of the activities of NPO groups. Moreover, in the future, research will be expanded beyond Tokyo, and studies will be done on cases where a region has a sparse population but is actively promoting its culture to the many tourists who are visiting it. Moreover, in regions where there is a lot of tourist activity, GIS data obtained from smartphone applications, location data from cellular phones, and data on human activities like how other industries are having an impact will be used, and we would like to have a more detailed discussion based on data analysis about what sorts of trends can be found for cultural promotion and in human movements.

ACKNOWLEDGMENT

The present study received permission to write about some of the content of the data about guiding tourists that was logged and collected in the study that was done jointly with Ohnishi Laboratory at the University of Tokyo.

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