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Improving the Accuracy of Mobile LBS Applications

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ABSTRACT

Today, In this paper, from the viewpoint of improving LBS system performance, various technologies for data distribution processing methodologies related to analysis of user's movement information are being developed. LBS is developing as a representative function of mobile applications. In the existing LBS-based in-formation service, the user's coordinates were provided and the surrounding in-formation was provided statistically. Today, a method of analyzing location in-formation as big data and providing more accurate information by linking with an information processing platform is being studied. To this end, a methodology is being researched on how to accurately provide practical services needed by users by refining user route information in real time. This paper analyzes big data on user movement information and processes exception information As a result, the most efficient route information is analyzed. It will be provided as accurate route information by finding commonalities in the movement routes of residents walking on the same route and excluding exception information.

Keywords: Location based service, Big Data, System architecture, Intelligent platform

I. INTRODUCTION (12 BOLD)

This study introduces a method for users to obtain more accurate location information using LBS applications. LBS measures the user's location information, collects and provides this information, and is used for map information service, marketing information, navigation, entertainment, and shopping mall recommendation [1].

This study analyzed the method that can most accurately present the route to the origin and destination. As a methodology, we analyzed the data of local residents who have relatively high-accuracy information on various roads in a specific area, and provided a way to apply it to the LBS application. The LBS system is configured in connection with the data analysis system. In order to handle multiple accesses of the linked systems,

the information processing servers are interconnected based on the user's regional unit. It has a process of controlling the raw data resources of location information distributed in each server to be processed in parallel [2]. This process allocates the tasks of each system in the structure of a single tree connection in order to facilitate information interlocking. The system throughput per unit time is distributed in the form of round robin. Big data information is calculated in the process of collecting mobile information, and the size and shape of the data are not suitable for storage in the RDBMS. Therefore, Hadoop technology, which is widely used in distributed storage technology, is introduced. Hadoop is based on the MapReduce function and corresponds to the implementation of the Hadoop Distributed File System (HDFS) as an improved structure of the Google file system. From the viewpoint of improving LBS system performance, various technologies for data distribution processing methodologies related to the analysis of user's movement information are being developed. In particular, active research is being conducted in each technology field, such as a method for comparing route information prediction and performance, an analysis method for route information, a method for improving route accuracy, and an analysis method for data in the form of big data[3]. This study refines the data that can be used for analysis of route information from big data produced by users who use route information, and reorganizes a methodology that can be analyzed as data that can be used for analysis. Based on these results, research was conducted to provide optimal movement information to users and to continuously improve the results.

II. METHOD

It is important for the LBS system to secure the stability of the mobile information data provided by the system. As a method of verifying the stability of the collected path itself, the data collection server identifies the user's location in units of a predetermined time and analyzes the data used for the progress direction and history in-formation of the path to generate path information. In this process, exceptional in-formation may be collected according to an exception case caused by the weather or the unique characteristics of the user.

This information causes noise in the entire data, and since heterogeneous results included in the data set can affect the reliability of the raw data, it is necessary to continuously classify the exception cases separately through probabilistic calculations. In addition to the normalized path, exceptional information movement information is also continuously accumulated in the server, thereby accumulating system know-how for exception handling. The error is compensated for by separately providing the user with the best route and the choice of movement through the analysis result of only this exception information. Various situations may occur on a general road, and for various paths provided in each situation, users select and use the most stable path at the present time. It implements a module that manages performance with a multi-instance structure used for big data processing of mobile information and improves the processing performance of the system with data distribution function. This module cleans the data generated by the system and provides the module's exception handling operation. The resulting data is connected to the interface connected to the linkage adapter and applied

to the standardized framework-based linkage environment configuration applied to independent web services.

The real-time processed data generated by the applications constituting the mobile information service collects route information every three hours and updates the information. This data performs a batch job for information collection within the linkage module, and the consistency check of the refined data through the analysis system linked with the user's function information is performed as a batch job

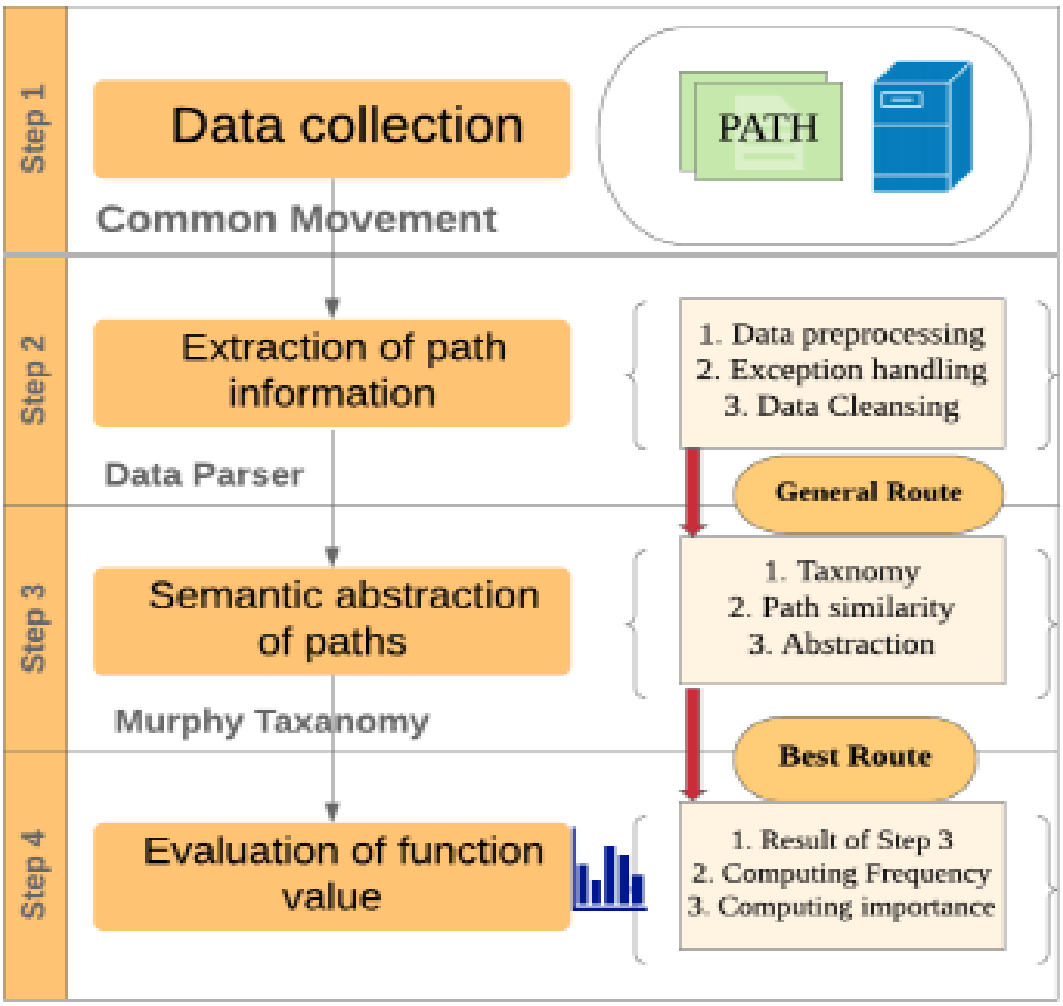

Fig. 1. LBS-based information analysis procedure

Fig. 1 shows the purification process and flow of system data. In the process of refining the data collected in the system, the user first collects the data created by the information provider. Based on the route data generated in Step 1, information of users traveling on the same route is collected in a case higher than a specific value through similarity verification. Step 3 configures the system by applying the data analysis module, and has a decision algorithm function to guide more accurate movement information.

III. SIMULATION TEST

First, the server collects the movement information of local residents in the form of big data, and the processing module analyzes the movement data to derive the most efficient route information. In this process, a statistical model to be used in the application is developed, and the data is verified by substituting the movement information of each user. In this process, data is analyzed in the central server in real time, and information is delivered in response format in the same way as a person who knows the way guides. This service provides users with more accurate route information than the current navigation application, and as a result, it will develop as a central technology of the platform industry along with various modern commercial map information web services.

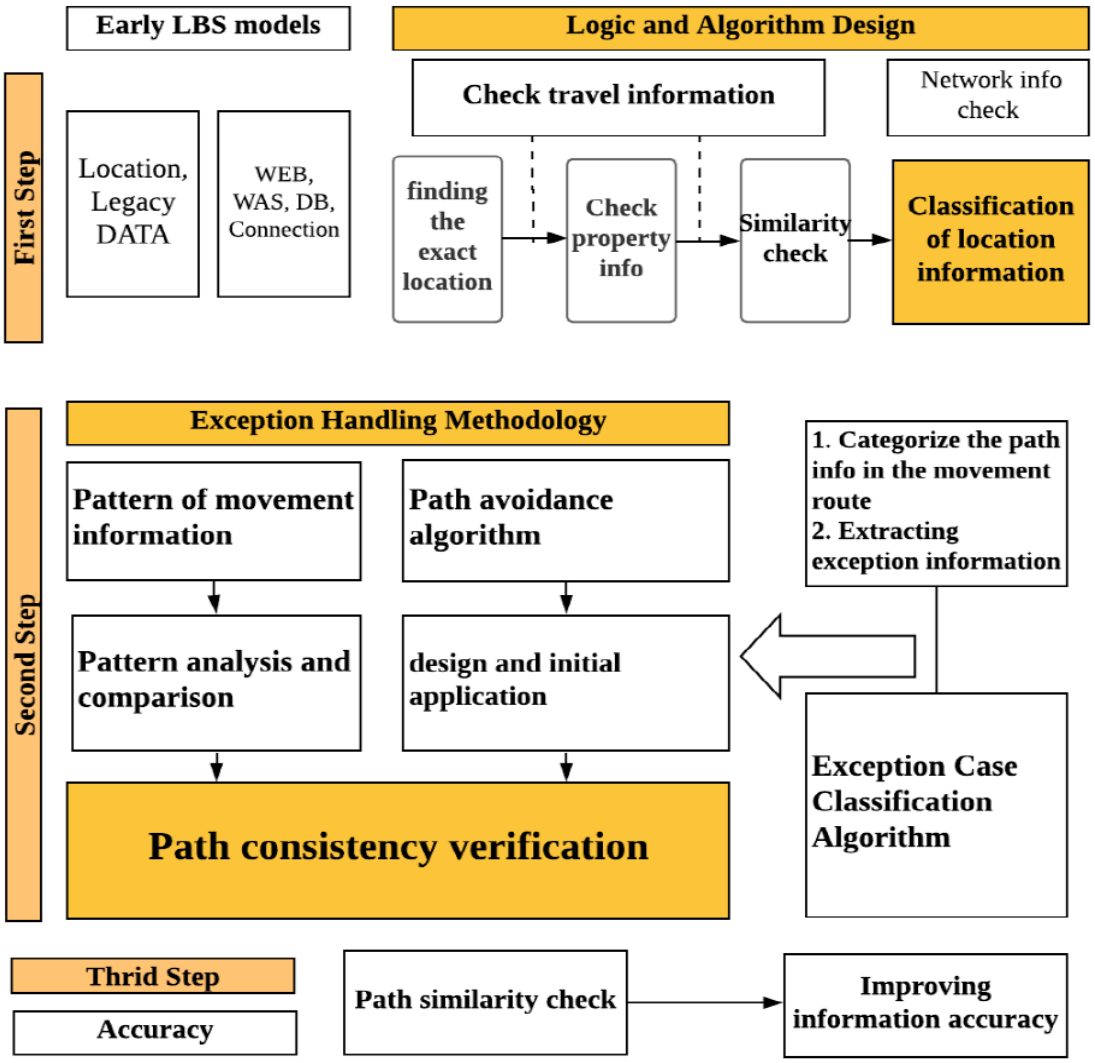

Fig. 2. A data distributed processing methodology

Fig. 2 shows the processing logic of the analysis data system. The flow of data generated after the user runs the application processes the process of additionally collecting and comparing information of the user moving the same route based on the route data. By analyzing the information of users moving similar routes, the routes of the users are classified and exceptions are handled to finally calculate the information.

IV. CONCLUSION AND DISCUSSION

To This service provides users with more accurate route information than the current navigation application, and as a result, it will develop as a central technology of the platform industry along with various modern commercial map information web services. In conclusion, this study uses the system data refining process to judge the common movement path of users as the optimal path. In order to recommend the correct route of the system, it goes through a process of classifying unusual items in the user's moving route and extracting exception information. The function of exception handling and supplementary path suggestion that occurs in the movement in-formation will complement the functions of the modern LBS system.

ACKNOWLEDGEMENTS

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