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Functionality of Google Maps and Parameter-based Efficient Eateries route Detection

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Abstract:- Google Map has been giving us the best results as promised since 2007 without ever failing. It also keeps upgrading the data and eventually integrated my location service. However, occasionally Google Map does not function as intended when displaying the quickest routes. It's because the geospatial data isn't updated frequently. It takes a certain amount of time to update the data. Here, we've spoken about how it occasionally malfunctions and how it provides us with a route that accurately forecasts the outcome. In order to tackle the challenge of identifying a destination using approximation parameters, we reviewed the Google Maps technique in this study and suggested a system.

The issue is that if we want to locate a restaurant from source S that is decent and has average costs, the map should provide the path of the restaurant that is not the closest but effective by taking into account factors like the restaurant bill, distance, travel costs, service time, etc.

I. INTRODUCTION

These days, graphs are at the centre of all software. taking into account their edges and nodes as the links that connect the sources. Similar to this, Google Maps determines the shortest path between a source and a destination using the Dijkstra's algorithm. Because it determines the shortest path from a single source to several destinations and finds n sources for n users, it might occasionally increase complexity.

In this research, we have examined Google Maps' operational technique and determined which parameters it takes into account.Additionally, we have suggested a solution to the issues raised in the abstract. As anticipated, the suggested method performs well.

It determines the most efficient path using user data and satellite mapping imagery.This study also examines Google's many geospatial data retrieval methods and how they work together to create a useful model.

II. OBJECTIVE

A. To Understand the Structure and Operation of the Google Maps Algorithm.

In this paper, we clearly described how Google Maps gathers data from satellites and collaborates to provide consumers with the greatest possible outcome in a very linear and effective amount of time.

B. Provide an Acceptable Way to Address the Issue of Arriving at the Destination Within a Certain Parameter.

Here, we only reproduced the problem-solving process that is described in abstract form, along with the limitations that we would encounter. It also makes use of user data and satellite data for mapping. In addition to the various factors the user takes into account to obtain inadequate results

III. LITERATURE SURVEY

Roads, highways, traffic monitoring, satellite imagery, and topographic maps are all displayed on Google Maps. It also offers consumers the convenience of an API. Cell phones are becoming more and more common, and they are becoming an essential tool for information gathering. Google Maps, GPS, and mobile communication can all be combined in mobile phones. In this paper [1], we learn about a mobile navigation system that uses the Google Maps API to provide a practical technological solution for users to share information, including quick cell phone location positioning.

This method [2] of determining the dual-directional visibility and the optimal satellite selection strategy are being studied. This allows each satellite to obtain the best satellite combination with the best geometry according to the current positioning satellite. The autonomous orbit determination and the autonomous time synchronization with their own selection and search strategy are given. They are based on the dual-directional range measurement.

This study [3] examines how we gather information about the real world, such as traffic or weather, and how real-time prediction can be made using that information. It focuses on a serverless computing system that can manage varying workloads for geospatial data, or data pertaining to locations on Earth. Depending on the needs of the user, the study suggests a model that aids in balancing cost and performance. Amazon Web Services (AWS) Lambda was used to test the model, which measured things like system response time and delay frequency.

This study [4] suggests a novel approach to enhance data transfer in massive low-Earth orbit (LEO) satellite networks, which struggle with problems like protracted delays and frequent connection failures when using conventional techniques. Multiple paths are used by the solution, known as integrated multipath network coding (IMPNC), to transfer data more quickly and reliably.

Paper [5] Highlighted are the quick developments in satellite communication technology and its important applications across a range of industries. The development process, current state of research, payload types, networking techniques, and system composition of both domestic and international satellite communication systems are reviewed in this paper.

The use of Simultaneous Localization and Mapping (SLAM) techniques in Augmented Reality (AR) is discussed in the paper [6]. AR systems can better comprehend their environment and position themselves in real time with the aid of SLAM. By separating the mapping and localization processes, the authors present a novel method for SLAM.

This paper [7] talks about a new way to share land use information over the internet using Google Maps API and XML. The system combines Google's map data with user data to show and manage land use details

A promising approach to future mobile communications is the combination of satellite and terrestrial networks, which provide multi-scenario services, seamless connectivity, and worldwide coverage. However, establishing completely integrated networks is extremely difficult due to the intrinsic features of satellite communication systems proposed system dataset [8].

The way people obtain geographic information has changed as a result of online mapping systems. While more sophisticated Geographic Information Systems (GIS) offer more sophisticated analytical tools, platforms such as MapQuest, Google Maps, and Yahoo! Maps enable users to explore large volumes of data in an intuitive manner. From the earliest computerized mapping attempts to the current 3D visualizations, this article [9] examines the origins and evolution of online mapping.

This study [10] looks into the main issues that Google Maps has faced and considers creative ways to make it work better. Data ingestion, geospatial database administration, map rendering, routing algorithms, real-time data integration, user interface design, and scalability considerations are among the main areas of emphasis. By dissecting these elements, the study seeks to suggest an architectural framework that tackles the issues noted and makes use of cutting-edge technologies to improve Google Maps' functionality.

By concentrating on travel time and distance, this paper [11] introduces a location-based service designed to enhance access to medical services during emergencies. The system uses the Google Maps API to determine travel times and distances and uses the Haversine algorithm to find medical facilities in the area. The best choice is then found using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) algorithm. The outcomes show that this approach improves decision-making.

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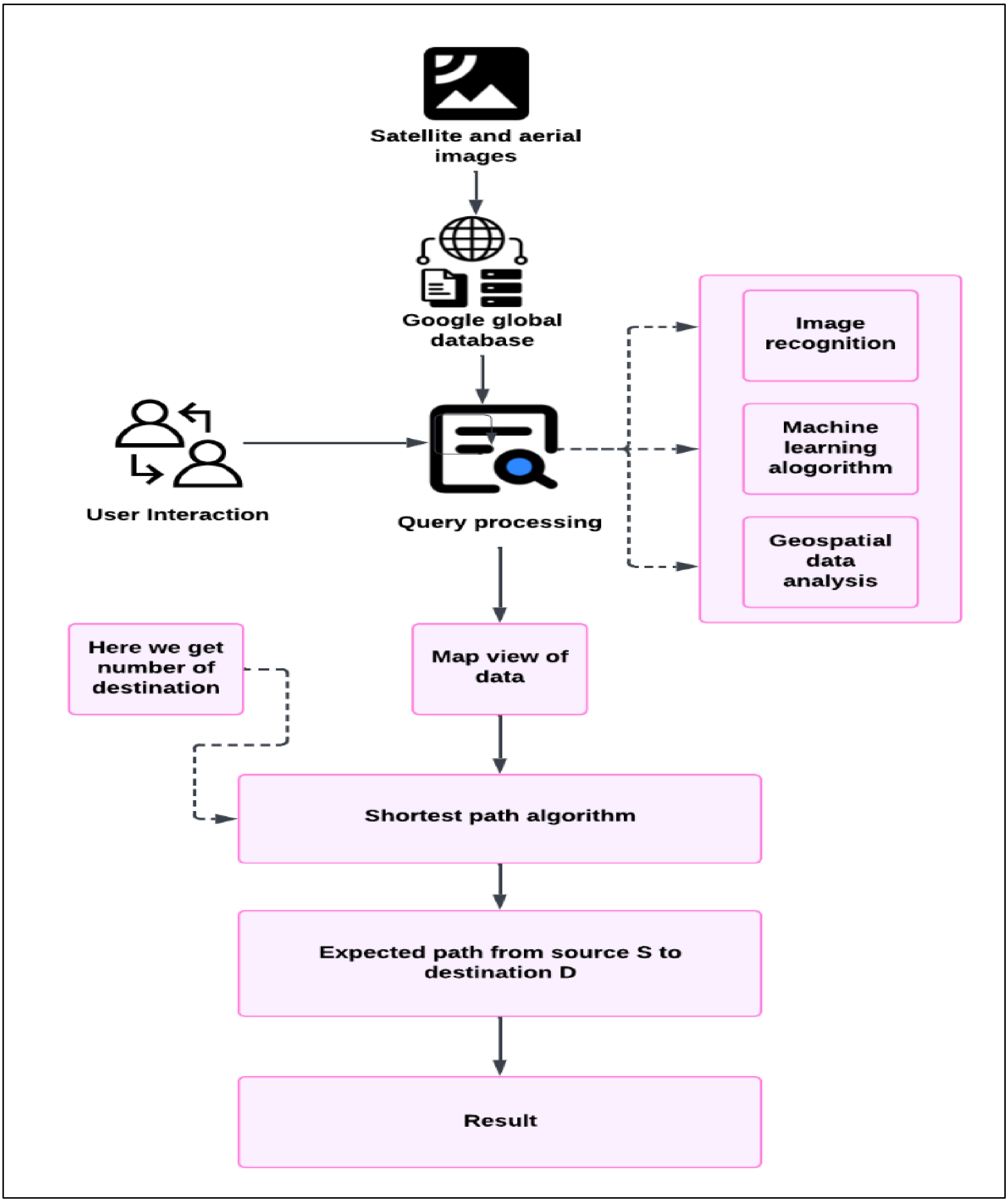

Fig.1 Google Maps Processing

Worldwide All of the data is gathered by the Google database from aerial and geostationary satellite sources. Large amounts of data from various classes are found in the Google database. With the aid of machine learning algorithms for image recognition and geospatial data analysis, the data is divided into various class clusters that will be used as the result of the user's query. With the aid of optical character recognition algorithms, Google was able to classify the data according to image class and extract text from the provided images.

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In addition to helping with parallel preprocessing for various algorithms, machine learning algorithms are used to correct raw data. An algorithm for classifying data about the earth's surface and its features is called geospatial data analysis. When a user requests a path from Google, query processing takes place, using inputs from the classes listed above that are unique to the Google database. Additionally, it recommends a few map views to the user.

To determine the true path, Google employs a variety of shortest path algorithms, such as the Dijkstra's and A star (A*) algorithms. The algorithm determines 1 to n-1 paths for the n number of users and chooses the shortest path based on cost. Similar to Dijkstra, A star employs a heuristic function, as seen in the figure 2. It calculates the distance and chooses the first nearby nodes based on greed.

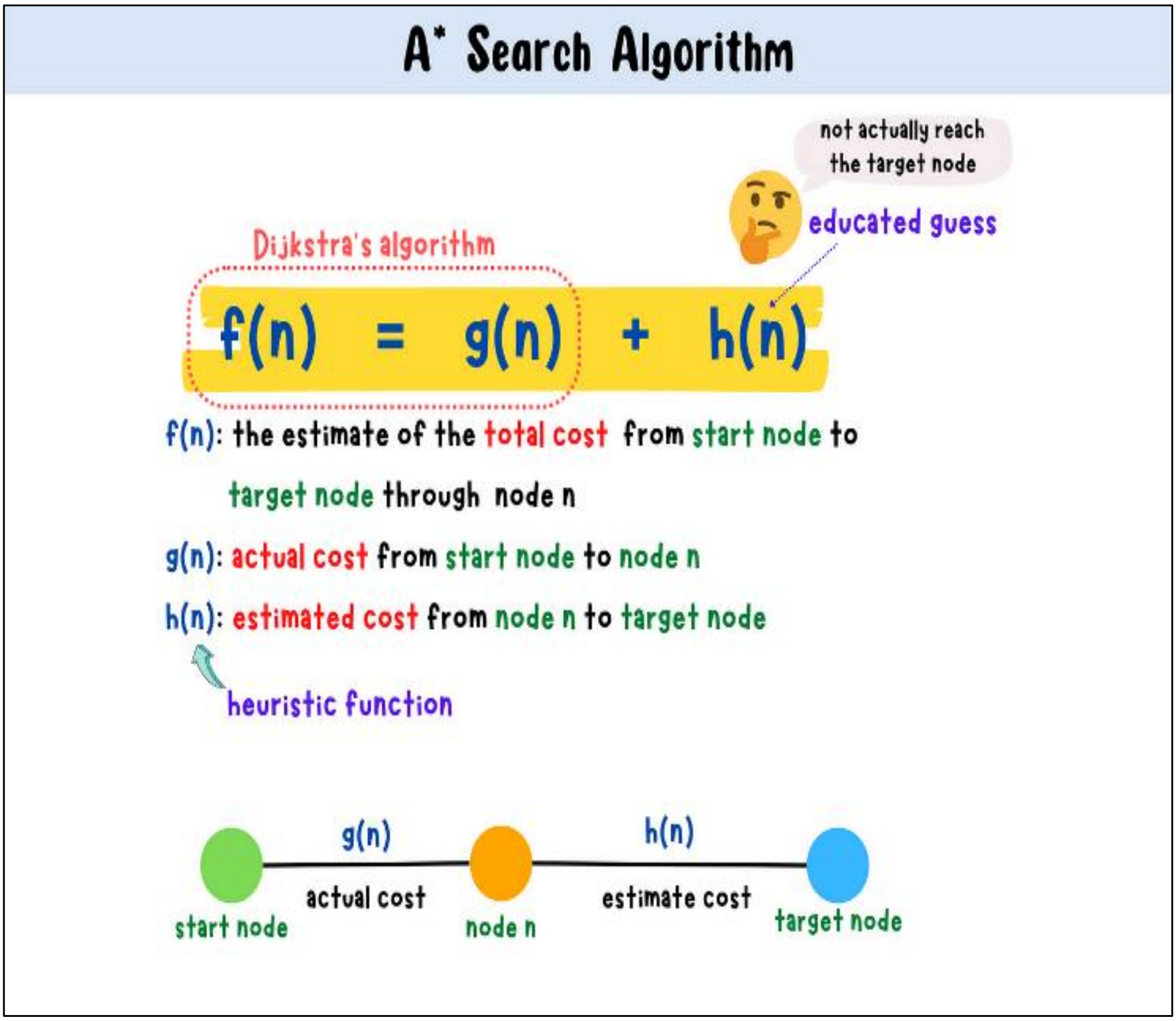

Fig.2 A* Search Algorithm

IV. PROPOSED SYSTEM

According to the issue mentioned in the abstract, there will be other restaurants in the area if you search for the restaurant using the sources. However, you prefer the path with certain conditional parameters over the restaurant that is closest to your source.

Using criteria like restaurant bill, distance from the sources, services offered, privacy, customer interaction, etc., you want Google Maps to show you the most efficient route.

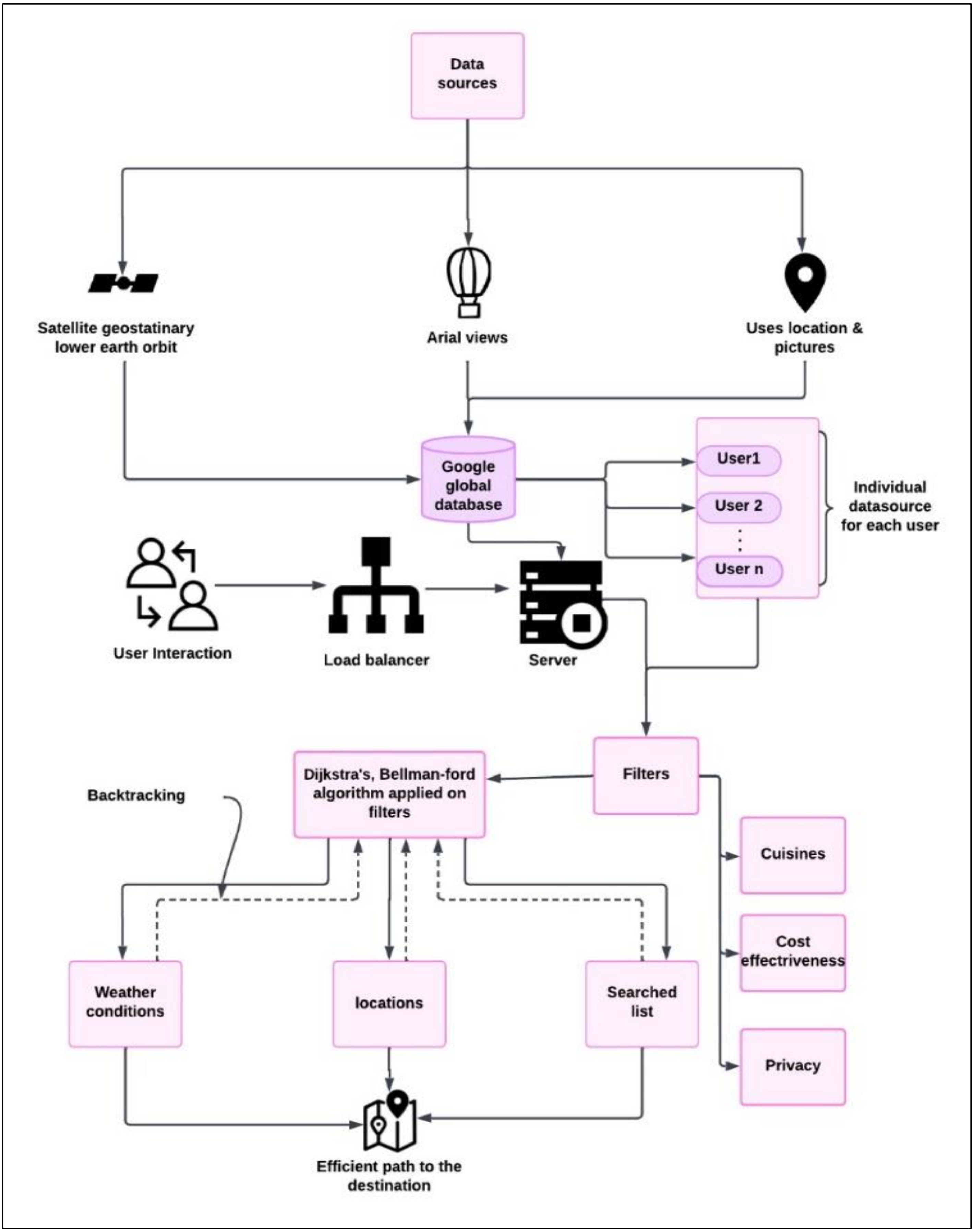

Fig. 3 Proposed System

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Data sources are the means by which Google gathers data, such as geostationary satellites, lower-Earth orbit satellites, aerial views, user locations, and user-uploaded photos. Everything is kept in a Google global database, which employs a geographic coordinate system [12]. Each physical object has a numerical value that the system uses to display it on the map.

While devices are forwarding controllers with central control over the network for forwarding the data from space to the database, software defines the network using low Earth orbit satellites to obtain global data and defines routing algorithms [14]. Integration of satellite and ground networks is necessary to achieve efficiency because of their short range, low transmission time, and low communication delay.

In essence [13], Google Server is a networking software that uses the extended Dijkstra's algorithm to transfer packets from the shortest path. It considers both the path weight and the note wait for high-level packet transfers using the defined declarative query language.

The user specifies a number of important parameters that determine how it wants its route to be recognized by optical character recognition, image recognition, and a high-level machine learning algorithm. The filters also take into account public transfer root planning [16], which takes into account working distance, traffic, and the number of transfers. The decision determines a new modified root by adding the penalty cost in the location where the working distance is obtained.

Filters identify two or three possible routes, and the Bellman-Ford algorithm and Dijkstra's take into account factors like location and the list of searches. Following coordination, the algorithm provides the path to the destination. The algorithm goes back and looks for the next effective option if any of the parameters don't produce the desired outcome. This is how the model's operation assists you in determining the course of your decisions.

All of this is accomplished by a state-of-the-art algorithm from a distributed system [15], which synchronizes the data globally.

V. RESULTS

This is the suggested outcome of our approach, in which Google provides the path that should be accurate based on user demands and parameters, ensuring that there isn't a more efficient path than the final one.

Imagine a scenario where a user wants to go out to a restaurant, intends to only eat Chinese food, has a budget of 800-1000 RS, and wants privacy. He plans to go with a close friend. as seen in the figure 4.

Google will then look for a restaurant with the features it wants, but since we already know that it will show him the closest route to any hotel, we don't want this response. Different hotels are depicted in the figure, and each one has unique features that are made public. As our proposed system will find out the path to the wished restaurant where user can eat. Using the method, we have approached earlier

After selecting a few restaurants that meet his criteria, Google will use its shortest path algorithm to arrive at the destination while taking certain factors into account. We have demonstrated in the previous figures 1&3 how Google will revert the option if it is not available at that moment and then display the quickest route to the restaurant that fits into his category.

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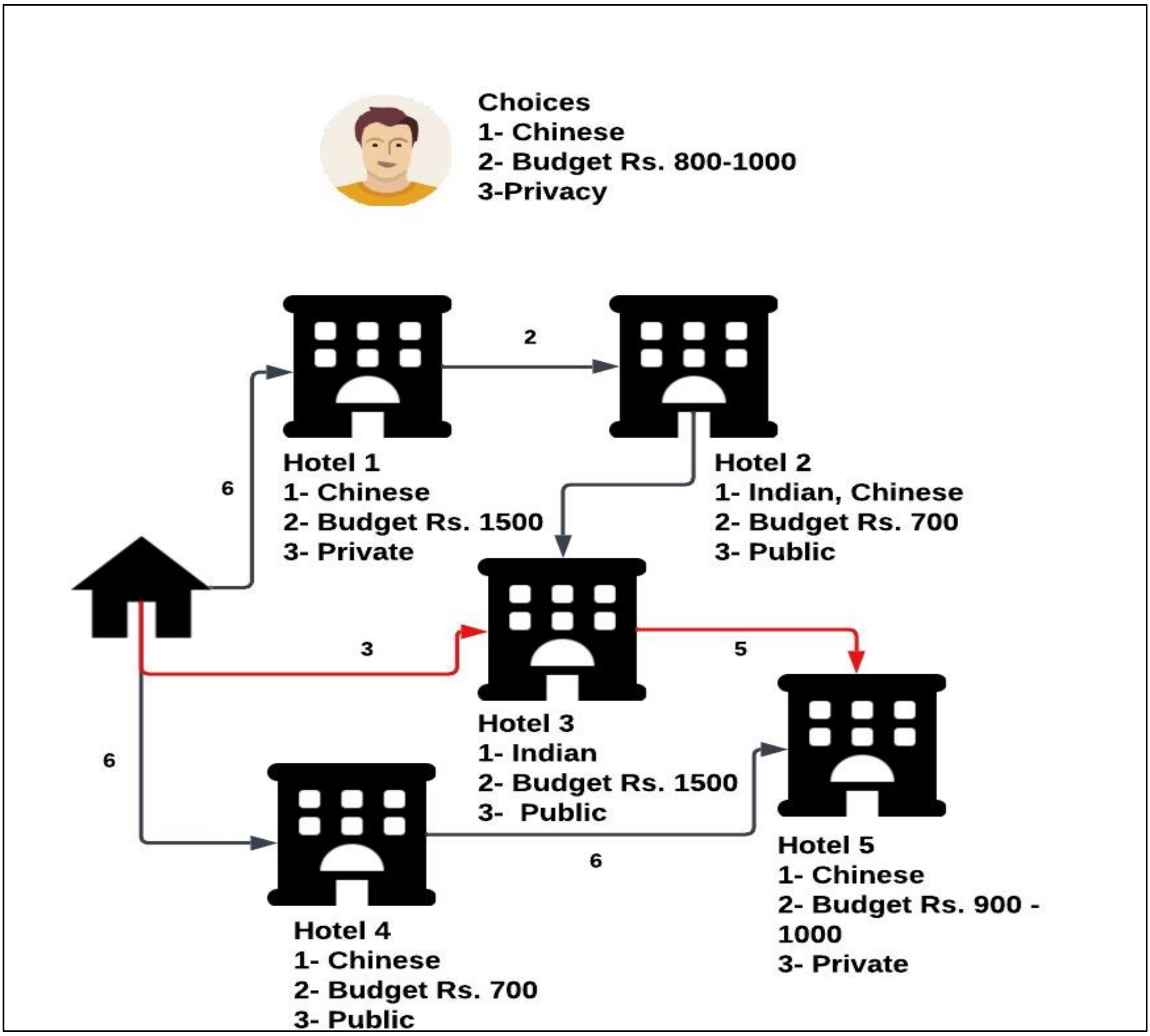

Fig. 4 Expected Result

VI. CONCLUSION

There are still a lot of issues that need to be resolved, but once a difficult problem is resolved, many others can be resolved as well. Using the mapping method that Google already uses to find the shortest path, we have proposed a method in this paper to solve the problem of finding a restaurant of defined parameters. We tried this suggested system to manually obtain the desired outcome, and it worked, as evidenced by the results phase.

We will definitely attempt to construct this approach using a less complex module and put it into practice. Since Google is constantly updating its system, it should be prepared to address any issues users may encounter with the best solution.

Users can define a number of parameters, but we believe that these are necessary, as stated by the majority of 7–10 people. This system will undoubtedly function as planned and can be extended to accommodate large amounts of data and numerous parameters.

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