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A Carpool System Using Genetic Algorithm

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ABSTRACT

In carpooling, occupancy rate of cars is increased by decreasing the number of empty seats, thereby creating an effective solution for traffic congestion. This paper proposes an intelligent carpool system, Blue Net, which comprises two important modules. These two modules are called the Mobile Client module and the Cloud Global Carpool Services module. By using hand held devices, users can submit carpool requests and obtain matches within the Mobile Client module via Cloud Global Carpool module. The Cloud Global Carpool module generates acceptable matches via the Genetic-based Route of carpool and Matching algorithm. The algorithm furthers the solution to the carpool service problem by reducing the time dramatically, which is important to match a large number of users. In regard to the quality of the matches and processing time, the results shows that the proposed Genetic-based Carpool Route and matching algorithm is able to find route and matching results that are most optimal, and operates with significantly less computational complexity to require less computing time.

Keywords :- Genetic Algorithm, Carpooling, Smartphone,GPS.

I. INTRODUCTION

Consequently the higher number of cars on roadways has led to worsened traffic congestion in large cities throughout the world, so we proposed a system carpooling. In carpooling drivers share their vehicles with one or more additional riders whose destinations are similar.

II. LITERATURE SURVEY

In literature, we study most of carpool service systems which have been developed to lessen traffic congestion. Several web-based systems supply simple carpooling functions including the option to send requests for a specified date and time, and search for applicable users. The first of these comprises systems which are based on web and which transmit carpool information to an online community platform. One such system is Global carpool, which supplies an interfacing service for willing drivers and prospective passengers. With this system, users can search all posted carpool requests and contact the creators of applicable posts. However, systems of this category do not include geographic information system (GIS) technology and consequently cannot provide real-time location-based support. The second category of carpool service systems provides digital GIS support in order to match requests by using location information. An example system of this category is the ShareYourRide platform by which users can readily succumb carpool requests and offers via its map-based interface. In addition ShareYourRide supplies a GIS-based routing service. However, this system has limited applicability in situations requiring instant service due to the fact that it cannot provision the use of Global Positioning System (GPS) handheld devices which provide pertinent information regarding user location In this project, we present a Genetic-based Carpool Route and Matching (GCRM) algorithm with which to solve the Carpool Service Problem (CSP) by dramatically reducing the time required to match a large number of users. The proposed intelligent carpool system is organized as follows:

1) An environment is supplied by the framework in which drivers and passengers can readily access the intelligent carpool system from anywhere and at any time.
2) The proposed intelligent carpool system utilizes the global information of open GIS technology to facilitate its use by users around the world.
3) We propose a GCRM to supply prompt carpool service and thereby significantly reduce the time required by services computing to match a large number of users.

III. EXISTING SYSTEMS

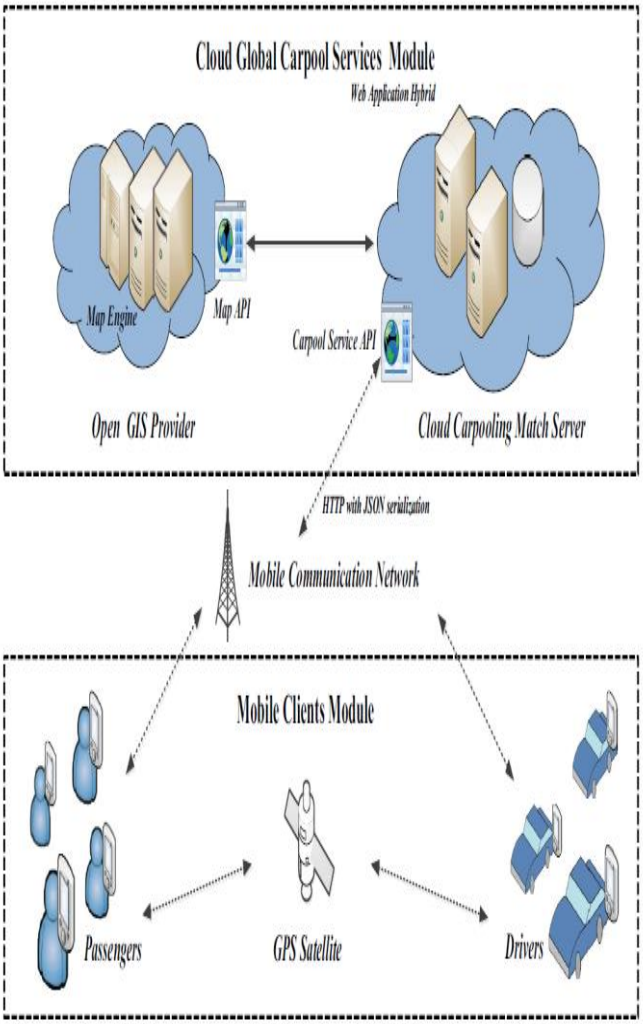
Many carpool service systems have been projected which can be divided into two broad categories based on their features. The first of these involves systems which are web-based and

which transmit carpool information to an online public platform. One such system is Carpool Global which supplies an interfacing service for willing drivers and prospective passengers. With this system, users can search all posted carpool requests and contact the creators of applicable posts. However, systems of this category do not include geographic information system (GIS) technology and consequently cannot provide real-time, location-based support. The second category of carpool service systems provides digital GIS backing in order to match requests via location information an example system of this category is the ShareYourRide podium by which users can readily submit carpool requests and offers via its map-based interface. In addition, ShareYourRide supplies a GIS-based routing service. However, this system has limited applicability in situations requiring instant service due to the fact that it cannot boost the use of Global Positioning System (GPS) handheld devices which provide apposite information regarding user location. Many carpool service systems have been developed to lessen traffic congestion .Of these, several web-based systems supply simple carpooling functions including the option to send requests for a specified date and time, and search for applicable handlers. In addition, several systems feature a digital GIS mapping ability by which to provide a pictorial tool with accurate location information to users. Unfortunately, these systems are neither efficient nor convenient for handlers who need real-time carpool matches. In order to transcend these shortcomings and make carpool system operation easy to achieve, we propose an intelligent carpool system called BlueNet which has a service-oriented architecture (SOA).Our proposed system incorporates mobile communication technology with GIS to create a carpool service which is practicable in real time. Subsequently, users can instantly submit carpool requests to the intelligent carpool system which imitate their current locations via the use of smart, handheld, communication devices which feature GPS abilities. The system will use the carpool matching algorithm to generate and return match results within a short amount of time.

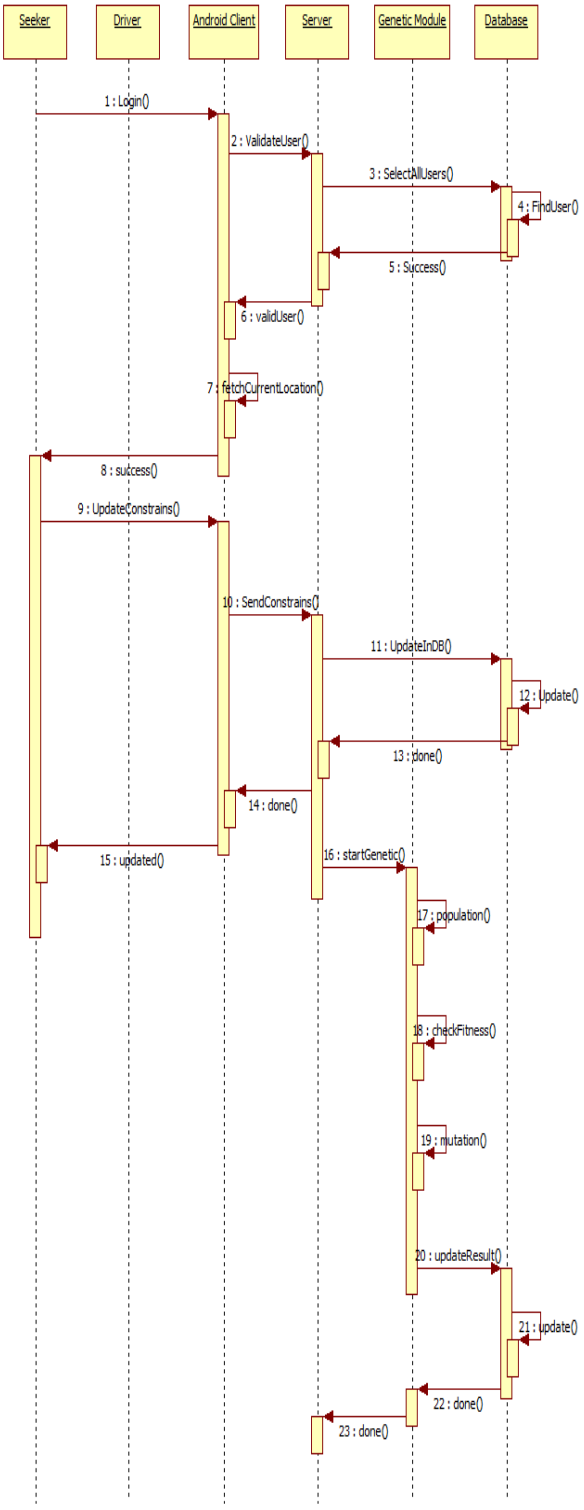
FIGURE

The application of the RESTful web service enables the proposed intelligent carpool system to be globally implemented. This is due to its support of the interoperability between the MC and CGCS modules, and the integration of the open GIS systemand CGCS module. Open GIS systems include Google Maps, Bing Maps, and Open Layers, and feature ample global geographical information. The digital maps and routing functionality provided by these systems can be used to augment the ability of the proposed intelligent carpool system to provide global carpool services via the proposed carpool matching algorithm. In addition, open GIS systems are utilized to gauge the travel costs associated with these functions. After the carpool requests and pertinent user information have been received via the MC module, the

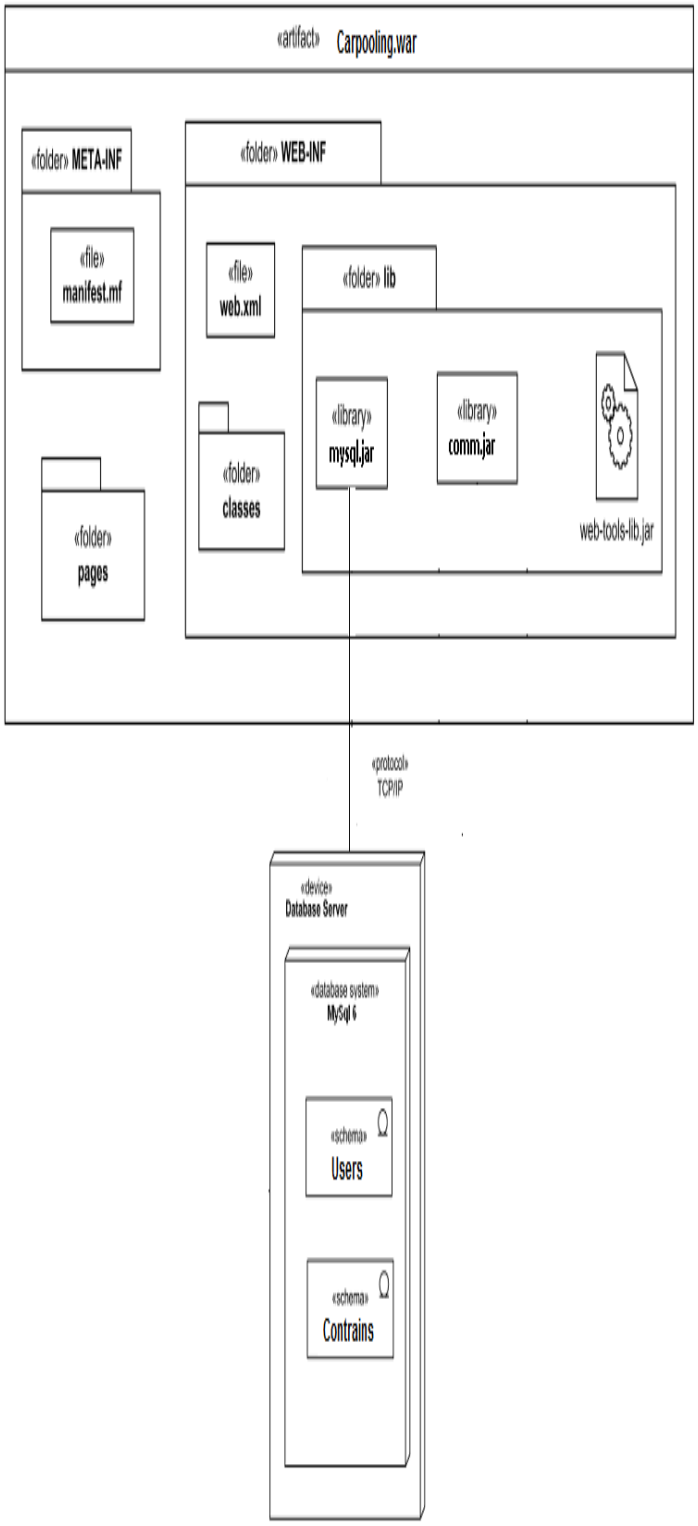
proposed algorithm matches the respective requirements of drivers and passengers of corresponding radial regions. The service oriented carpool match server subsequently transmits these match results to the users, whereupon it will continue to track and interact with them until they reach their destination location(s).



SEQUENCE DIAGRAM



DEPLOYMENT DIAGRAM



IV. SCOPE

We offer an intelligent carpool system called *Blue Net* which has a service-oriented architecture (SOA). Our proposed system combines mobile communication technology with GIS to create a carpool service which is operable in real time. Consequently, users can instantly submit carpool requests to the intelligent carpool system which reflect their current locations via the practice of smart, handheld, communication devices which feature GPS capabilities. The system will use the carpool corresponding algorithm to generate and return match results within a short amount of time.

V. CONCLUSION

This project proposes an intelligent carpool system *which provides an environment in which users can* readily search for and trace carpooling alternatives in any location and at any time.

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