A prototype of Requesting a Taxi by Mobile Application in Iraq

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نموذج اولي لنظام طلب سيارة الأجرة بواسطة الهاتف المتنقل في العراق

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Abstract

   Technology plays a vital role in different parts of our life so it has been necessary to invest it to serves our society. In addition, the rapid growth of spread of mobile phones among people led to motivate to design of a prototype for requesting a taxis in Iraq at any time and any place   by using phones that run on Android, java language of java and Global Positioning System (GPS) to locate the positions through the Internet and Google Cloud Messaging (GCM). The proposed application could be used by both the customer and the driver of the taxi at the same time and this application is electronic service (E-service) applications.

Keywords:
Request a taxi application, GPS, GSM, Android, JSON, mobile application, E-service and Iraq.

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الخلاصة

لقد أخذت التكنولوجيا المعلومات تدخل بشكل حيوي في شتى مجالات الحياة، لذلك أستوجب الحالة من العمل على توظيفها بشكل مناسب لخدمة المجتمع، كما أن انتشار الهواتف المحمولة الذكية بين الناس بشكل كبير كان دافعا لتصميم نموذج أولي لتطبيق خدمة طلب سيارات الأجرة في العراق في أي وقت وآي مكان وبشكل مباشر. إن حيث يستخدم نظام التشغيل Android و لغة البرمجة java بالإضافة إلى تطبيق Global Positioning System (GPS) لتحديد موقع وأيضاً تطبيق(GCM) Google Cloud Messaging و يتطلب النظام استخدام شبكة الانترنت ، إن التطبيق المقترح من الممكن استخدامه من قبل كلا من الزبون وسائق سيارة الأجرة في نفس الوقت ويعتبر هذا التطبيق ضمن تطبيقات الخدمة الالكترونية.

الكلمات المفتاحية:

تطبيقات طلب سيارة الأجرة ,GPS, GCM,الاندرويد, JSON, تطبيقات الهواتف النقالة ,الخدمة الالكترونية ,العراق.

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Introduction

Taxis now is very important for people to reach to a specific location.In most advanced societies has taken look at how to develop this aspect of taxi services and at the same time how to take advantage of information technology specifically in mobile field andinvestit for taxiservices. Most people have used to use mobiles and large proportion of them depend android as the operating system.The goal of this paper is to provide a customer taxi at anytimeand anywhere by using an application.

Related work

- In [2011] the Ramana Seesan, Tippakorn Rungkasiri, Nagul Cooharojan they present a survey to help   passengers to determine vehicle and driver through suggest taxi friend survey.
- In [2012] the Nirupama Mrinalini present to cabs application from any location state of Kansas. The system provides email or text to make confirmation and notification.
- In [2013]theAfian Anwar, Mikhail Volkov and Daniela Rus the show the queuing model to determine a taxi efficiently to reach terminal of Changi Airport by using smart phone .
- In[2015] Cosmina Ivan , Razvan Popa they propose an approach to create an application for taxi request ,depend on distributed system to help driver to interact with client.

The design of system

This system will be used to request a taxi at anytime and anywhere (the nearest, in service and available one) by using a mobile application which is used a certain database to store and retrieve all the necessary information to response the request of the customer. The system requires internet network to make communication between the customer and taxi's driver. The system consists of three main parts: the database, the web server and the application.

The Data Base of the System

The relational database which is used to store the data of each order (from customer) and its response of taxi's driver to retrieve it later when it needed. The proposed database contains four tables. Each one contains both primary and foreign keys to connect tables as shown in figure 1.
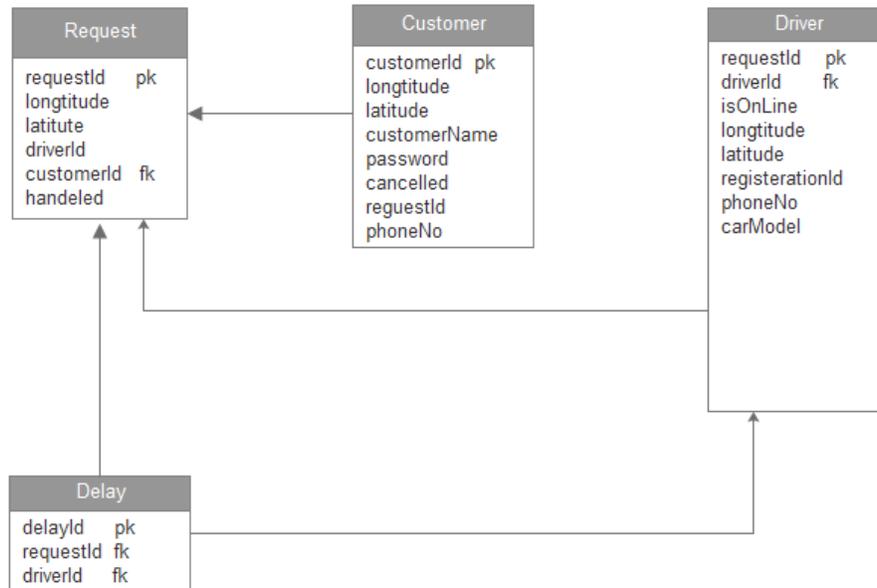
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Figure 1. The structure of the database

1. **Driver table**: this table will be used to store all the information about taxi's driver. The fields are the identifier (Id) of registration's device, if a driver is working or not ,the status(busy or not), the Id of the request that handled, the current position of the driver (longitude   and the latitude), the model of his car (if the customer wants   a certain model), his phone number and finally the Id of the request that handled.
2. **Customer table**: this table will be used to store all the information of customers. The fields are the Id of customer, the Id of registration's device, the phone number, the location of starting place, the user name to login to the system and the associated of Id of request.
3. **Request table:** the third table will be used to store all the information about the requests of customers. The fields are the Id of a request, the location of a place to be accessible, handled (if any taxi's driver accepts a particular request), the Id of an associated driver that accepted the request, the Id of an associated customer that send the request and finally if the customer   cancels his (or her) request, this field will be saved a true value.
4. **Delay table**: this table is responsible for storing the Ids' of both request and its corresponding driver. In another words, this table is used to store information when there is no reply to a specific request sent by customer.

Web service

This part is the engine of the system. The function of this part is to link between the rest parties of the system by preparing the suitable format of data to transfer through them. It provides a way to interact with the customer devices and driver's devices by implementing of data queries (from database) and making the needed processes based on data input and output from the customer.

Figure2. The design of the system

1. **Customer's device:** the type of device smart mobile which will install the application. This part represents the starting point of ordering a new request through a customer's phone by using Java script Object Notation (JSON). By this application, the customer will enable to receive a response from the driver through web service by using JSON and accept the request if it suitable to him (or her) and also confirm or cancel the request. The system is also determined the customer's location automatically when ordering a request.
2. **Taxi's driver device**: depends on this application which it has already been installed in the driver device, will be determine the driver's location by GPS and send it by specific tools (for example, in Android phone usually used GCM which provide the Id of registration's device when the driver is logging) to send the location to the web service to save it in the database. It will be refreshed automatically after each period of time. And also to interact with different requests.

The algorithm Registration of Customer

This algorithm shows the registration process as the following below:

Algorithm Registration of customer (user name, password)

Customer Id = 0;
Begin
If (Log in to system) then
Customer Id = Customer Id+1;
Save (user name, password, phone number)   // save in database//
End
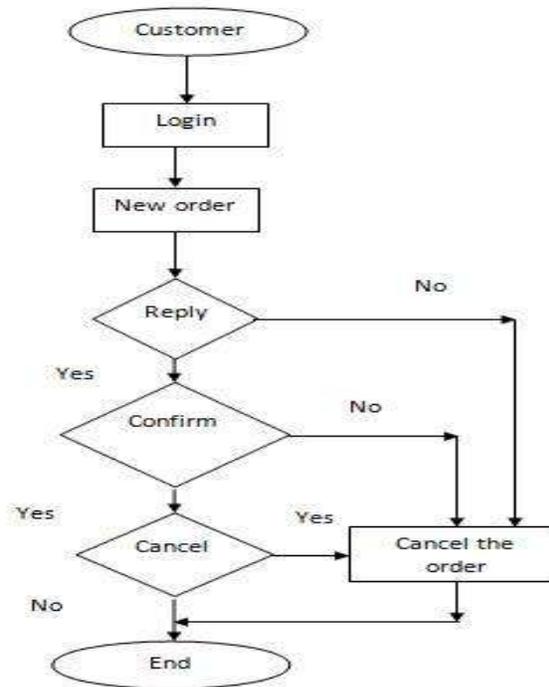
The following flow chart describes the request of customer

Figure 3. The flow of the system according to the customer

System according to the Taxi's Driver

Web service (for example in Android, through JSON which is a tool that responsible for fetching information from web server). It will be used to send messages between web service and the specific device. The application will bring the coordinate of the customer's location through GPS application.

Algorithm request _taxi_Driver (id register, username latitude, longitude, request id, phone number, car model)
Begin {
   isOnLine : true;
If (driver get notification request) the
{
     If (Get id of customer registration) then (Store the information in data base)
       // Send message from customer's device to web service //
          If (customer change request to different location) then
            If (drive (replay) (not busy) and (online)) then {
          Count: =2; // counter replay only twice //
            If (replay=true) and (count not equal   0) then
             Else save (driver name, delay time)// save in delay table//
           Count: = count-1;
            No taxi available
           Send Message (phone number, estimate time to reach to the source location)
           Select (nearest driver) and (car model)
             }
          Else   (Request cancelled and   Search to another driver)
        End
  The request according taxi driver shows in the following flowchart
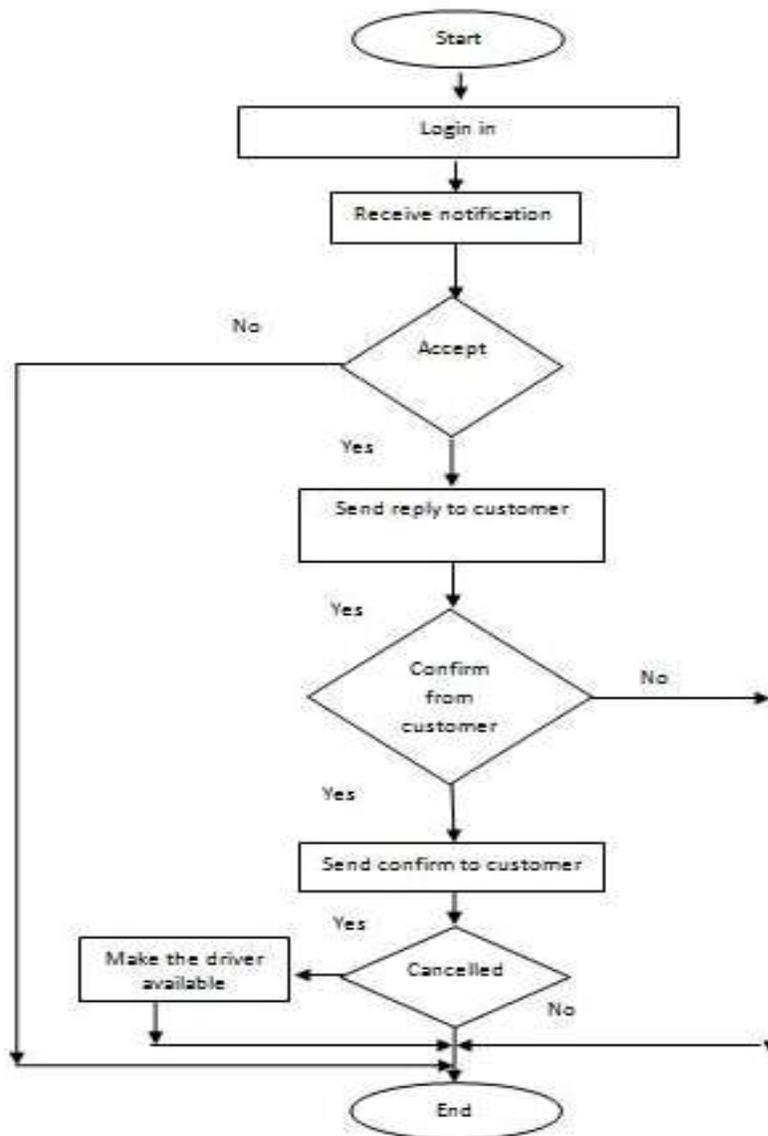
Figure 4. The flow of the system according to the taxi's driver

The flow of the system

1. In this part, if the customer wants to cancel the request, a message will be sent to web server and it will send a message to the driver to ignore it. Figure 5 shows the flow of the whole system.
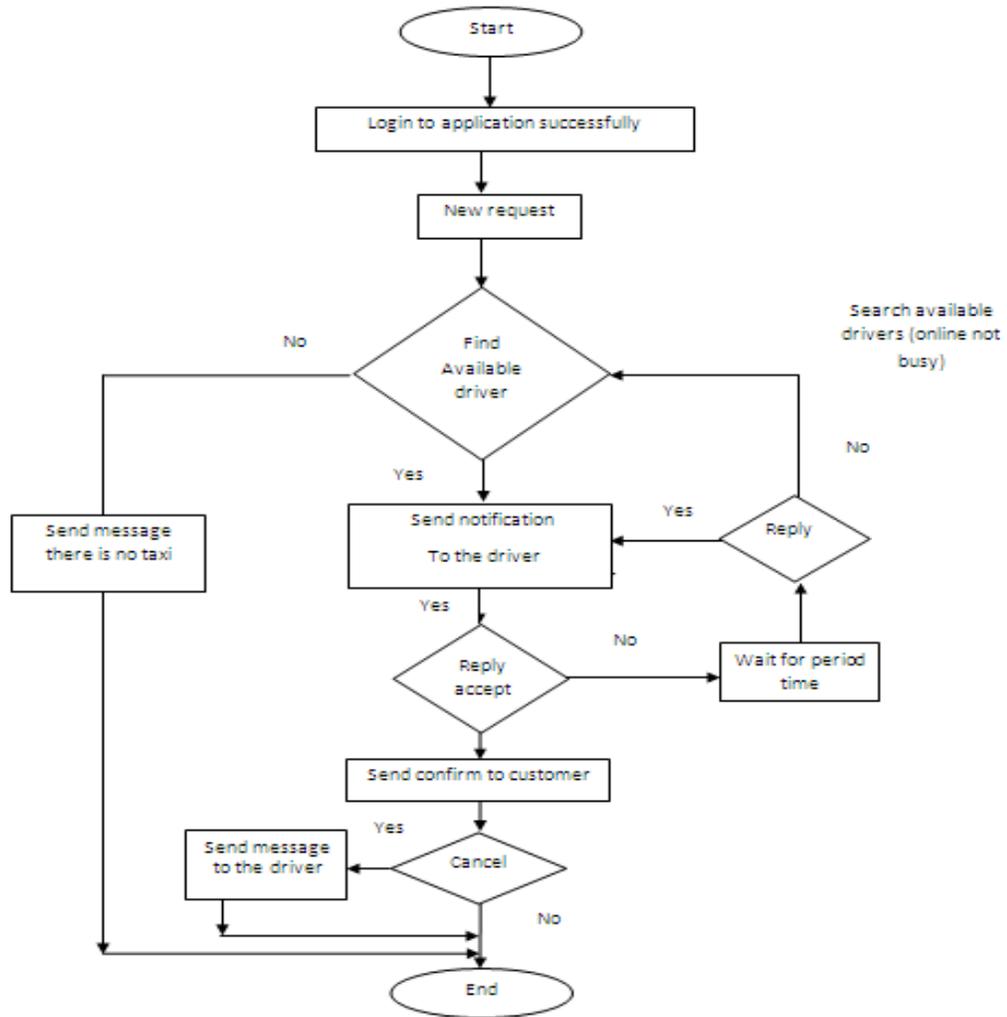
Figure 5. The flow of the system

Conclusions

In this research it has been proposed online mobile application to request a special taxi by the customer. A customer can request a taxi for him (or her location) or to another person in different location.The customer can choose the suitable car for him (or her), also the system is designed to request the nearest, in service, suitable and available taxi available, This application is depending on cloud computing technology (GCM) for sending and receiving messages between sever side, customer or driver in other side, so the system needs Internet to work correctly. The system allows to keep tracking of customers and driver's .Another advantage of the system is to serve people in emergency situations such as women giving birth or the elderly so the system provides the ability to access the exact location at anytime and anywhere.

References

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