
Interactive geolocation system enhancing user-vendor relationship in automotive services

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Abstract

Geolocation technology is an important element of services in the twenty-first century. The author describes a concept and a case study which presents the conceptual design process of an application for automotive mobile services. This application is aimed to create and enhance positive relationship between the customer and the service provider, both using mobile technologies and geolocation.

Author Keywords

Geolocation; user-vendor; services; automotive; mobility; smartphone; application; GPS; case study

ACM Classification Keywords

H.5.3 Information interfaces and presentation (e.g., HCI): Group and Organization Interfaces: Web-based interaction

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Introduction

Interactivity between the customer and service provider has been developing a lot in recent years. Owing to modern information technologies, we can use the potential of devices with mobile Internet access increasingly well. With geolocation, mobile devices open up a new range of possibilities for enhancing user-vendor interaction also in geolocation context. The

objective of this article is to present a novel use of geolocation in the provision of services. We will consider a case study in which we will discuss new opportunities for using geolocation technologies in a specific automotive company.

Geolocation in services

Geolocation may be considered in the business aspect, not necessarily related to the marketing of services, but also to their delivery to end user as well as to building relationships with the customer. Special attention should be paid to those services which apply geolocation for enhancing interaction with the customer. Such a relationship becomes visible during a search for, for example, a hotel or restaurant of a familiar brand during a journey. Despite geolocation is a relatively new phenomenon, the number of reported applications of geolocation-based services grows constantly.

In this article, services in the automotive industry are the main focus of attention. The automotive industry is inseparably related to mobility. Therefore communication based on geolocation services should attract a special interest, focused on delivering an added value for the users. Mobile applications using geolocation may increase this kind of relationship by enabling us to find petrol or car service stations, and also facilitate more regular contact with our insurer. Many software applications of this type are already available on the market, but they usually rely on searching for the nearest service station of a given make/brand, or the nearest petrol station run by a specific company. The Shell application (presented in Fig. 1), which also offers the connection of the user's account in which we can check loyalty points .



Figure 1. Print Screen of example application.

Sample SHELL application, which informs the user on the location of the nearest fuel station while using geolocation

Geolocation has been used for a long time by the Google services, for displaying of advertisements (such as AdWords) dependent on the region in which we are at the moment. The popular use of geolocation by service providers includes selling of coupons or limited services, e.g. by Groupon. According to the Social Media Examiner service, when launched in accordance with the specific rules, geolocation may be a success. A situation in which we may find the best bargains in an unfamiliar area us may be an example [11]. Yet another example presented by the Spiders Web service is an application placing an order for medicines, which will be delivered within 24 h to our nearest pharmacy [12].

User-vendor relationship

The mobile application proposed in this paper aims at strengthening the user-vendor relationship giving a highly usable mobile application to customers – car drivers. The application will communicate with the automotive service vendor at any time and will provide support to the user if problems are encountered on the road. Moreover, the system will also be used to develop customer loyalty. The scoring system, always accessible to the customer, will enable him or her to check the score at their account and exchange the points for an appropriate reward. The relationship between the customer and service provider is to be developed not only by loyalty programmes, but first of all by a change of the approach towards service vendor and service brand. With the proposed application, the customer will be able to browse all the repairs that had been done in his or her car, send a question to the service station or arrange for a repair without a telephone. What is most important, the customer should feel as having a reliable car service (and care)

Selected functionalities of the "Mobile Service" application

Car information: after the user's car has been defined, this will enable access to an electronic version of the manual with an entry search; instructions are available in the abbreviated version (a lower data transfer) and in the full version for users with an unlimited Internet access

Tips: This section will contain articles on topics relating to, for example, preparation of a vehicle for a long trip, small repairs done by the owner, and education on the kinds of motor oils or differences between the kinds and dimensions of tyres

Reminders: Taking advantage of the weather forecast, we may inform the user about the oncoming need to change tyres.

at hand. A mobile application can change an approach to the customer-service provider relationship in a way that the customer knows that the service provider (a car service station in this case) is a kind of adviser who, while having a knowledge of the automotive industry, is able to offer best advice and assistance. With this mobile application, the customer feels safer as he or she knows that there is always someone who will help them in problems relating to the car, journey and other automotive issues. .

System concept

The idea of a "Mobile Service" application emerged from the need to develop a relationship with the customer. In the today's world, interactivity between the customer and service provider is a significant element influencing business success on a demanding automotive market. For instance automotive service companies often offer also comprehensive handling of motor insurance claims.. With such an application, the customers should feel that they deal with an automotive adviser (technical- and insurance-related) who will, at any time and place, deliver suitable assistance expected by the customer in a specific context.

SYSTEM CONCEPT - FUNCTIONALITY

In order to build a highly usable system, all situations in which such an application could become useful were analysed. In a preliminary study following situations were identified:

- Collision / accident
- Technical failure
- Call for help

- Information about the car (instructions, an error)
- Tips
- Arranging an appointment
- Introduction and saving of operational data
- Remembering about the dates of inspections, insurance, tyre replacement etc.

The above events (often posing a problem for the driver) can serve as touchpoints helpful for increasing the sense of security of the customer, who will treat the application on the smartphone as a mobile adviser available any time, any place. After preliminary analysis of the customers' expectations it became apparent that the preliminary list of functionalities might be developed. Let us take the functionality relating to a call for help as an example.

In the case of a collision or accident, we will need the following information:

Primary information:

How to behave in such a situation – what to do and in which order? In the case of such an event the application will take us step by step through the relevant procedure.

Secondary information:

We will want to call a tow truck to take our damaged car to the garage– in that case the interaction between the service and customer will be facilitated by geolocation, which will be used to locate the customer and to send the tow truck to that location. This functionality will give the customers the sense of security; no matter where they are, the application will display the GPS coordinates of a place, which can be

Selected functionalities of the "Mobile Service" application (cont'd)

Digital service book

Register of inspections:

the information system of the service station will enter inspections to be performed, but the user will be able to enter other activities, done by himself or herself, or at another service station.

Insurance information

When the customer has introduced information from the insurance policy, he or she will have access to all information and the system will remind them, e.g. a month before the policy expiry date, on the time limit for the renewal of the policy.

transmitted to the service station even if the mobile telephone signal is out of range.

Additionally, the application will be able to assist the customer in other similar extreme situations, where exact locating the car/driver is crucial.

A digital service book with mileage and the volume of fuel purchased is another useful functionality. This functionality will permit the customer to use the application not only in extreme situations, but also on the day-to-day basis. Entering mileage with all fuel data in the application:

- Kind of fuel purchased
- Volume of fuel purchased
- Price of the fuel per litre.

The application will calculate the information on average fuel consumption and will keep statistics on such consumption and mileage. The customer will be able to boast about those statistics on social portals and compare with other users who have a similar car with a similar engine.

SYSTEM CONCEPT – INTERACTION

The interactivity of the application consists in sending the user's location from his or her telephone number by means of GPS coordinates. Making that kind of data available will make it possible to send the nearest team able to help to the place of an event. That data is very detailed, and by clicking one button the customer can send to the system the coordinates which he or she

would be entering by more than half a minute in a stressful situation. Interaction is to be noticeable to the customer also by interactive making an appointment at a service station. Car-related emergencies usually arise in the least expected moment or when we simply have no time.

Another function available in the proposed application will check the nearest available date and time, and the service will automatically be checked and booked. Such interactivity gives customers the sense of security and they will manage in every unexpected situation with the help of the application.

As to the future development of the application, special controllers will be installed in cars which will monitor the condition of our vehicle on the 24 h basis and notify us accordingly if an element stops working or becomes damaged, and the application will show us the nearest service. Such possibilities will be offered to us through the use of telematics in combination with fast data transmission.



Figure 2. A screenshot of a prototype application.

The main interaction is situated under the "Wezwij pomoc" ("Call for assistance") button, which sends GPS coordinates to the system, which in turn notifies of the need to send assistance to the place of event.

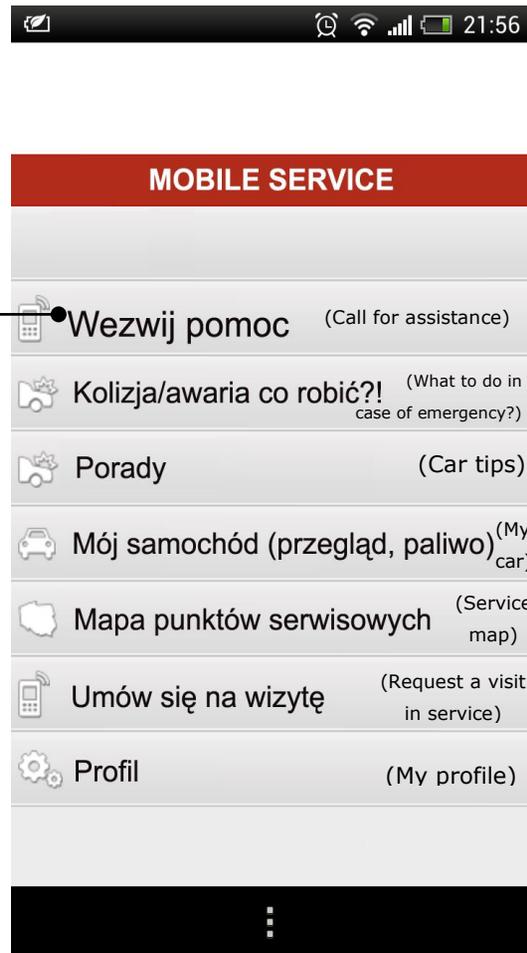


Figure 3. A screenshot of a prototype application.

Prototype testing

When planning the design of the functionality of the application, we decided to create its prototype and test

it with its future users. By testing the application we want to make sure that it will be useful and usable to car users on the day-to-day basis. It is planned at the test phase that the application and its future functions utilising geolocation will be presented to its prospective users.

PROTOTYPE TESTING – THE PLAN

1. Making the prototype
2. Selection of users for tests
3. Information meeting for testers
4. Preliminary selection questionnaire for testers
5. Division of testers into categories /groups
6. Start of testing by the users
7. Data collection
8. Meeting with testers to summarise the first stage of the tests

We reversed the course of the tests for the purposes of that application, i.e. after the analysis of the users' needs we made the prototype, which will be given to test users immediately. As far as the selection of testers is concerned, it is planned to select them from among the customers who use cars every day and have a smartphone. The number of persons testing the application is 30. To select a customer group to receive the application for test purposes, a decision was made to send an e-mail and text message with a request for

a reply whether the customer is interested in testing a new application improving safety on the road. The need to have a smartphone with the Android operating system was an additional criterion required (for which the prototype application will be constructed). Each declaration was verified by checking if a person indeed was using similar applications, and whether they are familiar with the general operation of a smartphone.

The test plan was divided into several sections. When the tester group has been selected, a short selection questionnaire will be circulated. The questionnaire is to demonstrate which persons may use some of the functions of the service more often than others. Based on the results of the questionnaire, some persons will be asked to make an appointment at a service station by the application rather than by telephone. Other users will be requested to test the digital service book with the register of fuel purchases and car operation expenses.

After the application has been tested for a month, it was planned to hold a meeting to which all testers will be invited. At that meeting, feedback and errors to be rectified will be collected. In view of the test nature of the application, we asked the users to also test the call for assistance system, which was able to specify the current user's location through the use of geolocation. On receipt of information, the service will contact the user to submit and verify the data of the place sent by the application upon one click. Dividing the tests into several sections will make them more detailed and generate more feedback. When the tests have been conducted, attachment to the application is expected.

The introduction of the application for testing purposes aims at giving the customers a tool which they will want to use every day and, most importantly, in which they will see the potential which is not only functional, but which also takes care of their sense of security during a car trip.

Conclusion

The preliminary concept of the proposed system proved a very useful tool in the hands of the users and gained their initial acceptance. Each of the persons testing the application admitted that they have found a functionality they would like to take advantage of every week or two. The initial version of the system was received positively. As a result of initial testing of the application, it may be stated that the users and, the customers of the service at the same time, expect increased interactivity between them and the service provider. They feel more safe having such an application in their smartphones, and the service provider knows that by providing such a solution it builds better and stronger relationships with its customers and develops their loyalty. Preliminary test results demonstrate how important interaction with the customer is. In the present times, applications of that kind will attract customers but, most importantly, while caring for their comfort and safety, those applications will take care of the customers thus building positive user-vendor relationships.

Potentially, similar geolocation-based applications may be implemented in various industries: medicine, the automotive industry mentioned above, and in catering and hotel services which are this way able to attract new customers.

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