Mobile accident report and road assistance application

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Abstract

The number of mobile applications has been increasing rapidly in every field of life with the increasing use of smart devices. Smartphones and tablets make our lives easier with their properties and application they include. Minor or major accidents in traffic are always present in the daily life resulting in financial damage and loss of lives. There have been a number of studies done to speed up the processes to be done from the moment an accident happens. This study aims to enable people to perform all of the post-accident processes quickly and accurately with the use of mobile devices. In this way, papers and documents like photographs will be sent to the competent authorities without wasting time and effort. In addition, access to the road assistance needed will be quite easy.

Keywords: Traffic accident, loss assessment and proceedings, mobile application.

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1. Introduction

The Internet, which has become a fundamental part of everyday life, continues to amaze us with the new products that are integrated into the Internet and cell phones are at the top of the list (Simsek, Erdemli, Aydemir & Tasdelen, 2013). Cell phones are the best seller technology in the world (Pehlivan & Baz, 2007). Especially smartphones have gained more importance today. The users who want to spend their time in an effective way are the reason that mobile devices have become that popular and a valuable part of everyday life. As a result of the mobile device use of the individuals, both the mobile device producers and mobile network operators have to make revisions and innovations to keep up. Application stores offering users more applications to make life more organised and fun and the Internet whose price has been getting lower are typical examples for that (Ozcan, 2013).

The number of vehicles in traffic has also increased in parallel with the developments in technology, economy and social life in Turkey. This number keeps growing with the increasing use of both public transport and private vehicles which causes problems in traffic and transport. The main causes of traffic accidents are humans, vehicles, environment, roads, controls and implementations. A problem in one of those factors also affects the others which creates bigger problems (Demir Sengul, 2010). Drivers who do not obey the traffic rules and who do not make the necessary changes according to the road conditions are one of the most important factors that increase the number of traffic accidents that result in considerable financial damage and injuries. It can be said that recently, we have made some progress with better roads, vehicle designs and efforts to improve driving skills in terms of road safety (Demirel & Akgungor, 2001). On the other hand, the issue has not drawn attention in nationwide.

In this context, the aim of the application that was developed is to minimise the time needed for filling the accident report to make the process easier for the users.

2. Accidents and the process for accident reports

2.1. Accidents and accident reports

Accident reports constitute the milestone for all kinds of possible analyses for individual accidents. All countries, and even states within a country, have their own accident report formats. There are six different sections in the accident reports prepared by the police in our country, including date, environmental conditions, the information of the vehicles and drivers involved in the accidents besides the places left for a brief description and sketch of the accident.

In general, the following issues must be described in an accident report;

• The place where the accident happened, maps and sketches,
• The hour and date of the accident,
• The information of the people, vehicles, animals and properties involved in the accident,
• The consequential injuries, deaths and financial damage, if there are any,
• The environmental conditions during the accident such as lighting, weather and pavements.
• Detailed explanation of how the accident happened (Demirel & Akgungor, 2001).

Until 1986, 'Traffic Accident Form' that was prepared by State Institute of Statistics, General Directorate of Security Affairs and General Directorate of Highways was used. These forms that were filled at traffic offices in cities were replaced with 'Traffic Accident Detection Report' starting from 1st January 1986 (Sert, 2004).

According to the article 81 of the Highway Code with law no. 2918, all of the people involved in an accident which resulted in financial damage only can leave the site of the accident providing that they

make a written agreement describing the accident without calling the officers (2918 sayili Karayollari Trafik Kanunu, Trafik Kazalari).

In addition to the Highway Code with law no. 2918, the circular letter with no. 2007/27 dated 28.12.2007 also defines how the traffic accident report should be written if the parties agree in case of accidents involving financial damage only.

With the circular letter dated 01.04.2008, the accident reports filled by the parties involved in an accident with financial damage only have come into use. According to this circular letter, if the parties reach an agreement, how the accident happened should be described in the 'Accident Resulting in Material Damage Report' and signed.

However, there are cases when the reports cannot be arranged by drivers.

In case of a situation described below, the report should be arranged by the police;

- If the driver do not have a driving license or the driving license is not valid for the type of vehicle s/he drives,
- If the driver is under age,
- If the driver is suspected of alcohol or mental illness,
- If the vehicle(s) involved in the accident is publicly owned,
- If public properties are damaged,
- If a third party get harmed,
- If the vehicles involved in the accident do not have traffic insurance,
- If the accident results in physical injuries and death.

2.2. Mobile accident report

Mobile Accident Report helps users to get through the process using a mobile phone. With the help of the mobile accident report application on a smartphone, drivers can make use of the data entries that was created before the accident and after taking photos of the vehicles and the accident scene, drivers can fill the report form in a fast and easy way.

Mobile accident report is almost lifesaving for the drivers who do not keep an accident report form in their vehicles. After the application is downloaded, information such as name, address and phone number are saved. In case of an accident, the hour and date of the accident are saved on the form automatically by means of GPS. Drivers can choose the options to describe how the accident happened. The places where sketches are needed can be filled with the photos taken without wasting time and effort. The signing process is also held easily. When the data required is entered, the form is sent to the related insurance company and the e-mail addresses of the parties.

2.3. Software development environment and tools

Windows operating system, SQLite database, a mobile phone and a tablet with Android system were used during the development of the software.

Additional software used during the development of application:

- Android Software Development Kit,
- Eclipse: Java IDE,
- Android Development Tools: Eclipse add-on,
- SQLite,
- Photoshop; interface and icon designs,
- Microsoft Office: documentation.

3. System design

The aim of the application we designed is to fill the accident reports in a fast and easy way for the accidents that result in material damage only using an Android device.

The following interfaces are provided for the user at the time of the accident;

• Profile,
• Accident report,
• Quick accident report,
• Roadside assistance,
• Emergency calls.

With *the profile option*, the identity, driving license, vehicle and insurance information that is needed in case of an accident are saved on the database. The data entries are retrieved and displayed on an interface and this data are stored for the final form of the report.

With *the accident report option*, the hour and date of the incident are set in addition to the option for the accident scene and identity photos. In this section, time and date are saved for the results page to be sent as e-mail. In addition, detailed location information is displayed in a separate page, including coordinates, address, postcode and city. Next, the part of the vehicle involved in the accident is specified. After the type of the vehicle is chosen, such as car, motorbike or truck, the part that is damaged is sketched. After the vehicle type is selected and the sketch of the damage is done, the image is saved on the device. There is also a list of violations by drivers. Therefore, the related violation is selected and saved on the database. The signatures of the parties are saved on an interface. The data saved on the device are checked and sent as e-mail. The images saved using the interface to send all the data saved to the insurance company or e-mail addresses can be accessed on gallery.

The aim of *Quick Accident Report* option is to send the accident report on paper to the insurance company directly without getting help from a third person. After the photos of accident report, accident scene and the vehicles involved, the number plates, the identity cards and driving license of the drivers are taken and they are sent to the head office as e-mail.

With the *Roadside Assistance,* you can see the roadside assistance services that can be needed after an accident. The options include vehicle removal truck, gas, keys and accommodation with quick searches and short messages and emails for location can be sent. There are also quick *Emergency Call* options that may be needed after the accident.

4. Results and discussion

The aim of the application that was developed within the scope of this study is to enable parties involved in an accident with material damage only to create an accident report by means of an Android device without getting any help.

By using the profile option, the driver can save time as the driver, vehicle and insurance information required in case of an accident is ready to use. The accident report option saves the time and date of the accident. After that, a map image of the accident scene and full address are displayed and saved. The part of the vehicle which is damaged, driver violations, comments on the accident with eyewitnesses and their information and signatures of the drivers are included within this option. The final forms of this data are saved and emailed with the access to the gallery.

Quick accident report option can be used in cases where no agency help is desired. Therefore, the report, including photos of the vehicles, identity cards, driving licenses, number plates and accident scene can be sent as mail attachments.

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With roadside assistance, you can get the contact numbers that can be needed after an accident, including vehicle removal truck, gas, keys and accommodation with quick searches and short messages and emails for location can be sent. There are also quick emergency call options.

As current accident report applications available seem to cover only identity, vehicle and insurance information, we tried to design a more comprehensive one in this study. With the upgrades for this application, the users can also define more than one vehicle. The project can be improved in line with the needs and wishes of insurance companies. iOS and Windows Phone versions of the applications can also be developed.

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