BonVoyage

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Abstract

1.2 million people die in road accidents each year. A child is killed in an accident every three minutes. Road safety is increasingly becoming a major killer and a worldwide concern. Most number of road accidents reported last year that caused injuries and deaths were caused by two wheelers. Most number of road accident victims are in the age group of 20 to 55. Most accidents are caused by over speeding or rash driving. BonVoyage is a web app that implements a credit scoring system which promotes safe driving and acknowledges the good samaritans for abiding by the traffic rules.

I. Introduction

Road accidents are a leading cause of death and injury worldwide. By 2020 the World Health Organisation (WHO) projects that road crash injuries will be the third highest threat to public health, outranking other serious public health problems such as tuberculosis, diarrheal diseases, HIV/AIDS, and lower respiratory infections.

Most of the victims of road accidents are not even in a motor vehicle. Pedestrians, cyclists and motorcycle riders are the most vulnerable road users and account for the majority of traffic deaths in low and middle income countries. In Delhi, India, pedestrians and bicyclists account for around 55 percent, and pedestrians, bicyclists and motor cyclists account for over 80 percent of the total road traffic deaths. [1]

BonVoyage is a web application that implements a credit scoring system which promotes safe driving habits and acknowledges the good Samaritans for abiding by the traffic safety rules. The current system is only focusing on enforcing the traffic rules and punishing people who break the rules. A credit scoring system will encourage people to follow safe driving habits without having the authorities to exert firm rules on them.Thus, BonVoyage aims to promote safe driving without enforcing any rules on the people. The idea is to make people feel good about themselves when they follow proper safety rules on the road.

It also provides a platform for appreciating the people who follow traffic rules by rewarding them with gifts. BonVoyage focuses on applauding for the good deeds of people on the road rather than scrutinizing on their faults.

The BonVoyage

A crude model of the app was developed and presented to a distinguished panel of judges during the Kerala Road Safety Hackathon [2] which was a partnership initiative between the World Bank, IFC and AXA, in association with the Kerala Road Safety Authority and Department of Information Technology, supported by AngelHack and GTech. Participants were asked to create concepts for software or hardware-based program/applications for the 4 Es of Road Safety.
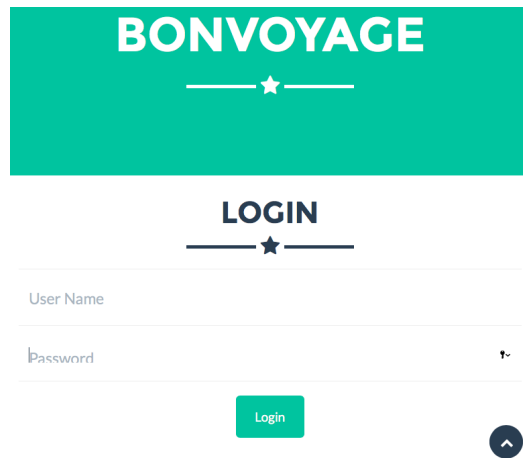
- Engineering
- Enforcement
- Education

- Emergency Care Management (Post-Crash Management)

The app won the prize for 'The Most Innovative Solution'.

II. THE CREDIT POINT SYSTEM : BONVOYAGE

a. Basic Working

Login page

The BonVoyage starts with providing the user the log-in page. Once logged in the user is given the options to view his total credit, the Map feature, and to claim the credits. The Map feature provides the user with the facility of Directions from the current position of the user to desired destination. When the user chooses a destination and starts the journey, the app starts reading the user positions and calculates the user's travel speed. If the user is found to be keeping his speed within the speed limits of the locality, the credits awarded to him is increased. If the user overspeeds, the credit points are reduced. In the end of the journey, the user credit points are updated to the user database. When a person acquires a certain number of points, they can redeem these points for gift coupons, fuel coupons, etc based on the number of points they have.

b. Architecture

Web application or web app is a software application that follows the client-server model in which the client (or user interface) runs in a web browser.
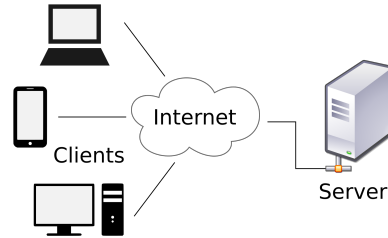
The Client-Server architecture

The Web Applications [3] are popular due to the wide spread popularity of web browswers, and the convenience of using a web browser as a client to update and maintain web applications without distributing and installing software on potentially thousands of client computers. This forms the key reason for the popularity of web apps, giving it the inherent support for cross-platform compatability.Common web applications include webmail, online retail sales, online auctions, wikis, instant messaging services and many other functions. The general distinction between an interactive web site of any kind and a "web application" is unclear. Web sites most likely to be referred to as "web applications" are those which have similar functionality to a desktop software application, or to a mobile app. HTML5 introduced explicit language support for making applications that are loaded as web pages, but can store data locally and continue to function while offline.

A Web framework (WF) [4] or web application framework (WAF) is a software framework that is designed to support the development of web applications including web services, web resources and web APIs. Web frameworks aim to alleviate the overhead associated with common activities performed in web development. For example, many web frameworks provide libraries for database access, templating frameworks and session management, and they often

promote code reuse. Though they often target development of dynamic websites they are also applicable to static websites.

The BonVoyage uses Python-Flask [5] web framework which follows the MVC model. The Model-view-controller(MVC)[6] architectural pattern to separate the data model with business rules from the user interface. This is generally considered a good practice as it modularizes code, promotes code reuse, and allows multiple interfaces to be applied. In web applications, this permits different views to be presented, such as web pages for humans, and web service interfaces for remote applications.

c.   Technical Overview

BonVoyage follows a Client Server[7] model. Each user device is a client and there is a central server which stores the database and manipulates the data of all users. The credit scoring system is implemented by the server. The client sends the data to the server when the user logs in and enters the data. While on the journey, the client continuously sends the speed and location of the user to the server who compares it to the speed limit of the location given.If the comparison gives a true value, points are credited to the user's account else points are deducted from the user's account. According the number of points in the user's account, each user is entitled to some form of redemption in the form of online shopping gift coupons, fuel coupons, tax exemption, insurance premium benefits, etc.

BonVoyage uses Python-Flask framework, Google Maps Java Script API[8] and the MySQL[9] database for its functioning. Being a web application, it is accessible from any platforms independent of the operating systems, thus making it portable.

The Python-Flask framework forms the back end, controlling the web-application. Flask is a micro web application framework written in Python and based on the Werkzeug toolkit and Jinja2 template engine. The framework handles the log-in, log-out sessions, the querying and updation of the credit points etc.

The username-password combination taken from the form is validated in the flask program and the user is redirected to the personal page. The personal page contains the details of credit awarded for the user, options to redeem the credits and a facility for maps for journey. The alpha version of the BonVoyage provides the user with Maps for vehicle transit from current location to a desired destination. The Google-Maps Java script API is used to provide the functionality.
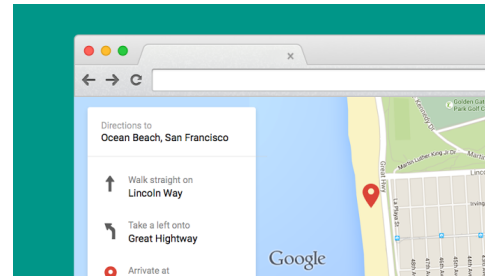
The Google Maps Direction service

The Google Maps Javascript API is used to provide the map functionalities to the Bon-Voyage. The Direction service [10] and Places library[11] are used in the application to provide the basic necessities of the maps. The Directions services are used to get the directions from the current location to a desired destination. The current location is estimated using the HTML Geolocation API[12]. The destination is accepted from the user in a text input, aided by the Places-autocomplete[13] feature. This feature lists down the autocomplete possibilities for the user's entry. Once the destination is set, the user can start the journey. Throughout the journey, the location of the user is marked in between a period of 1 second and the distance travelled is calculated between the location points using the compute-Distance() method available with the API. In the alpha version, the speed-limit of the roads are taken as a static value. Each time the user successfully completes a kilometer within the speed limits, the credit for the journey is incremented by an amount. If the user goes over the speed limits for more than 30seconds, the credit incrementing process is paused for a spe-

cific distance that follows the point. The credit updation in the alpha version is a experimental model and it can be varied by the authorities, based on the location of implementing the system, before the application deployment. Once the user stops the journey, the final value of the credit for the journey is send to the server and, updated in the Database. The user is then redirected back to the personal page.

The MySQL database is used in the system to store the user details, credit details and the login-logout credentials. The flask program accesses the database for the login purpose, and for the updation of the credits.

III. FUTURE SCOPE

The app can be used for validating driving licenses. Licenses can be awarded to people only after they earn a certain number of points on the app. The app can be used by driving schools to cultivate a proper driving habits from the beginning in its students.Since over speeding and rash driving are the major reasons for road accidents, this app can be used to instill safe driving habits in people thus reducing the chances of accidents occurring. Since the app acknowledges the people for following the traffic rules, it will also create a 'feel good' factor which will encourage more people to follow the rules without compulsion. The app can also be used while hiring drivers by checking how many points they have earned on the app which can act as an indicator as to how well a person drives without breaking any traffic rules.

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