

Development of a Vehicle Monitoring System Based on HTML and ASP.Net

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Abstract—This article describes a vehicle monitoring system client based on HTML and ASP.NET. It involves the HTML technology, ASP.NET technology, etc. with excellent compatibility and expansibility. Their key functions are sort cars according to their colors, query the vehicle list, vehicle state information display, data report, terminal controls, etc. According to the distribution and running state of vehicles to achieve reasonable dispatch, monitor vehicles. It will increase the efficiency, benefit and safety of the whole system. The system has a broad development prospect and great market potential in public traveler information service system, logistic transportation supervision system, emergency management systems, etc.

Keywords—HTML; ASP.NET; vehicle monitoring

I. INTRODUCTION

Vehicle is a basic means of transportation. Vehicle is widely used in people's daily lives and production and brings great convenience to them. With vehicles mount rises gradually, the competition in the market transportation industry is also growing. So some enterprises put forward higher requirements in intelligent transportation system. They are badly in need of a monitoring and control system tailor made for them. The system can implement functions as register and manage vehicles, position monitoring, command and dispatch, etc. Such as a highly efficient and real-time vehicle monitoring system plays a vital role in reducing the cost and improving efficiency of logistic companies.

This system improves management of vehicle resources and operational efficiency. There will be more social and economic benefits along with its function become more perfect.

II. THE OVERALL DESIGN OF THE SYSTEM

The whole system comprises three sections: the remote terminal unit, the server unit, the client-side unit.

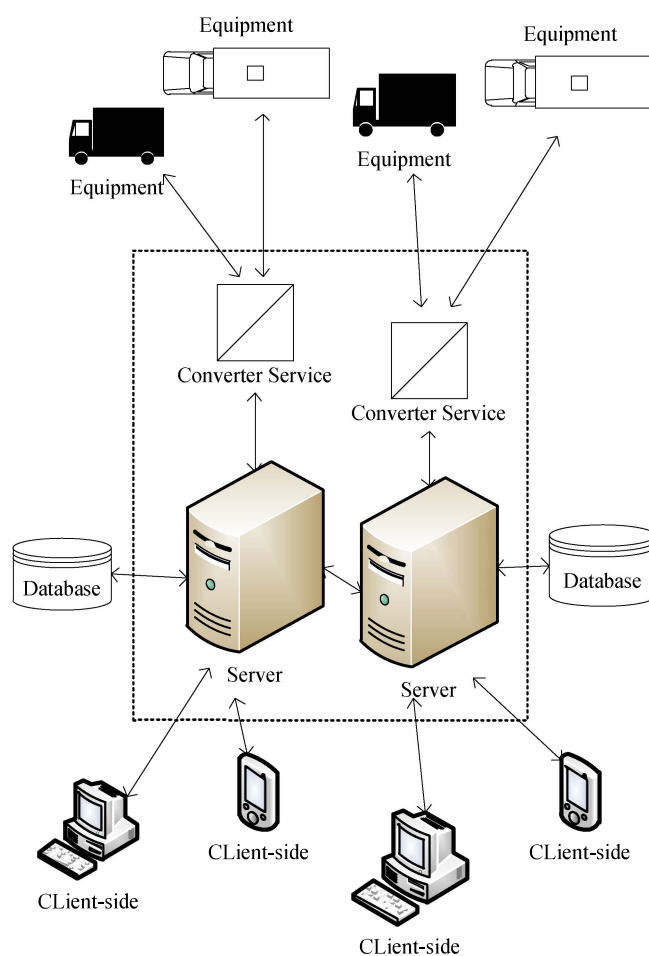


Figure 1. The overall structure of system

A. Remote terminal unit

Remote terminal unit (RTU) is equipment installed on the vehicle. It is in charge of gathering vehicle state information and vehicle control. The specific features of remote terminal are as follows:

- 1) Collect the data of vehicle's position.

- 2) Phone tap, using callback call, it can monitor the real-time voice of the vehicles around.
- 3) Photographed function, this can collecting image information around the vehicles through the cameras mounted on vehicles.
- 4) Speed monitoring, using the speed-monitoring unit, users can real-time monitor the speed of vehicles.
- 5) Volt-monitor, using monitor the real-time voltage state for vehicles, users can measure engine and other equipment state of vehicles.

B. Server unit

Messages enter the gateway which make the data collected from the device terminal use any protocol conversion to the same platform through converter service. The gateway center is responsible for data processing and data storage. And according to users' requirements, server will issue the data to users. Besides, server has historical data storage, statistics report, and other functions.

C. Client-side Unit

The client described in this article is based on the mode of B/S, which is designed in four types for respectively complete the different functions. The four modules include function list module, vehicle list module, vehicle's information module and map module.

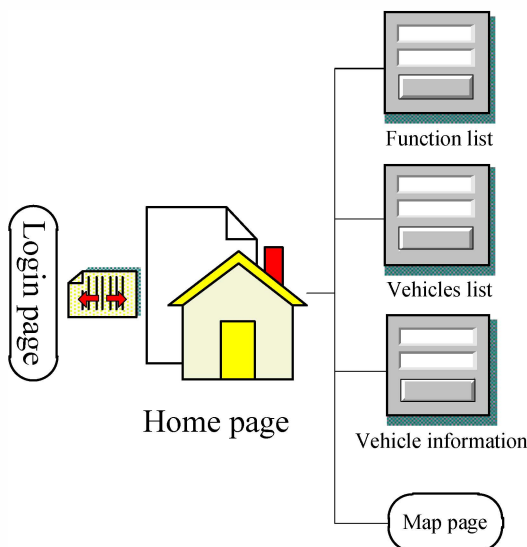


Figure 2. The overall structure of system of client-side

III. DETAILED DESIGN OF THE CLIENT-SIDE

A. Function List

The function list module mainly includes: system settings, data report, and some other functions.

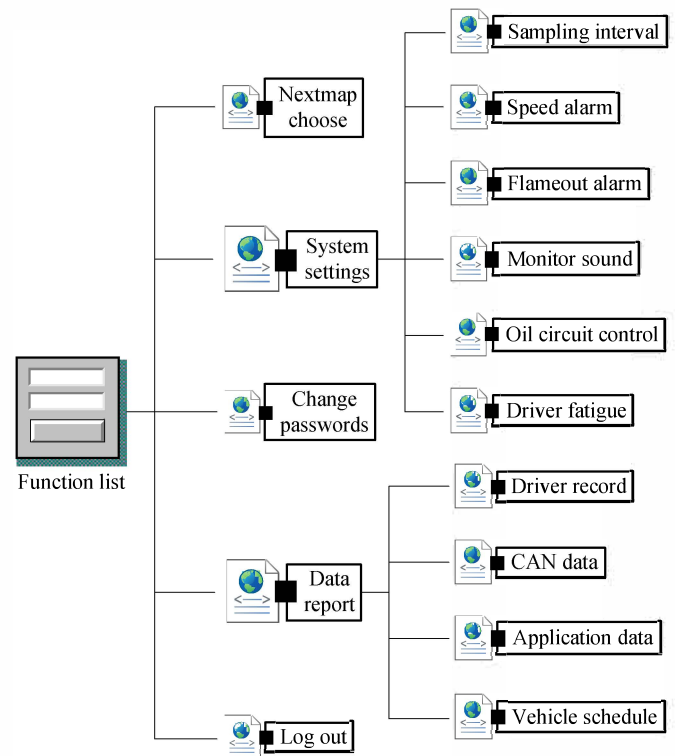


Figure 3. Design of function list

1) System settings:

- Set the sampling interval, are used to customize the sample time to the users' needs.
- Speed alarm. Users can cap the speed of vehicle at safety speed, if any vehicle over speed, the system will blare out a warning.
- Flameout alarm. Users can cap the length of flameout time, when the flameout time of a vehicle above the time limit. The system will also blare out a warning.
- Monitor sound. Dial the host machine's number directly using the master mobile phone, then you can monitor the sound around the host machine.
- Oil circuit control. Install a shut-off device for the fuel system and the circuit in the hidden place of the vehicles. Set the remote control switch to prevent car theft.
- Driver fatigue. The system carry out muscular fatigue detection base on vehicle hours traveled. If that by running a vehicle out to long time, the client will warning.

With the above settings, users can find the trouble during the running of the vehicle in time and take emergency measures. It will make the probability of danger smaller, so as to reduce losses.

2) Data Report

Based on data report, users can understand the history status and operations of vehicles clearly. Data report unit comprises four report forms: driver record, CAN data, application data and vehicle schedule.

- Driver record report includes the vehicle trail, flameout number, trip distance, alarm log.
- CAN data report includes the summary of vehicle fault, oil consumption.
- Application data report includes user online information, vehicles online information, in and out of area, maintenance information of vehicles.
- Vehicle schedule report is the use information of vehicles.

B. Vehicle List

The state of vehicles can be classified as not online, online and warning, online and nonlocating, online and driving, online and stop. The system uses different colors for each of the five state, so users can distinguish vehicle state easily. This paper designs the colors as follow: not online is black, online and warning is red, online and nonlocating is yellow, online and driving is green, online and stop is blue. When user receive an alarm message, he/she can find which vehicle the alarm message comes from. User can see the vehicles number of each state at a glance.

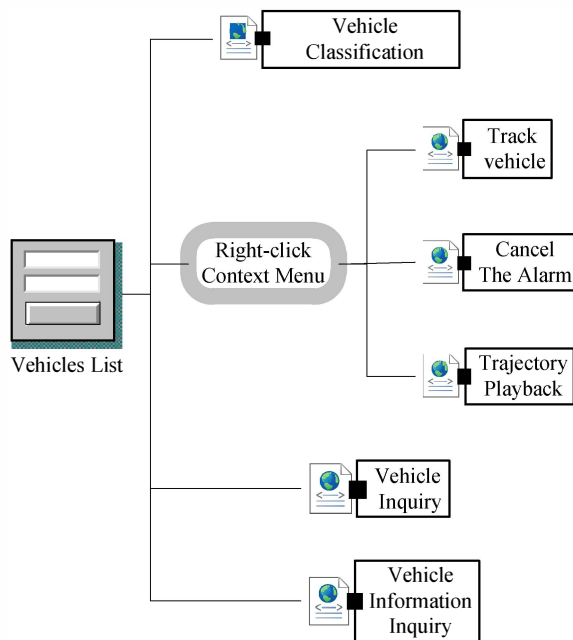


Figure 4. Design of Vehicle List

As user mouse over the vehicle list, a little bubble pops up showing user that you can use the right click. The right-mouse click menu have three main functions.

- 1) Track vehicle: Can track the vehicle automatically and lock the position on the map.

- 2) Cancel the alarm: For any vehicle been wrong, the system will blare out a warning. After user get the warning, user can turn off the alarms through right-mouse click menu.

- 3) Trajectory playback: The track of vehicle, as well as some other automotive dynamic parameters are replayed clearly in a friendly web of the playback module by opening those recording files in a certain period of time. User can set the speed of the playback. In addition to this, User can look in the version of the system and the state of the vehicle through the right-mouse click.

This system provides two methods to query vehicles list. Base on the combination of team name and license plate number or the combination of team name and system number, the user can find out vehicles he/she wanted. Each of the query criteria could be empty. The system supports obscure inquiry. Such as user can enter part of a license plate number, all of the vehicles that contain the entered will be displayed.

C. Vehicle's Information and Map Unit

When user select a vehicle, serve will query the related information and send it on to client. This includes license plate number, system number, sampling time, positioning state, ACC(engine state), speed, oil mass, mileage, current position. User can intuitively understand the information of every vehicle.

The system is using the one-page layouts for the map unit: layouts that use one single page to present the content of the website. This page can be used to show the position track of vehicle on the road of electronic map. User can zoom in to get more detail.

Baidu map JavaScript API is set of application program interface that be written by the JavaScript language. A map application that richly functional and interactive can be construction in web. This system will use following function of Baidu map.

- 1) Basic map function: display. translation, scaling and dragging.
- 2) Location function: It supports IP based location and locate in browser.
- 3) Route search: Route search covers starting point coordinate, starting point name, with support for LocalSearchPoi; return a navigation outcome based on one of the following conditions: minimum time path, shortest distance or avoid the highways.

IV. CONCLUSION

The vehicle monitoring system based on HTML and ASP.NET meets the demands that real time monitor the vehicles or the teams. These features, such as real-time data share, reliable data transmission and convenient operation, make it easier to avoid these disadvantages, the difficulties of construction and maintenance caused by traditional transmission method. This system has many advantages such as unlimited transmission distance, easy to achieve, low cost, high safety level, etc. HTML and ASP.Net are flexible to

extend to meet the different needs of different professions. This system has been used these fields of logistics industry, engineering vehicle, etc. So this system has good value in engineering applications and broad prospects for development.

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