

# **Design of Couriers Optimising System with Storage and Transportation Recognizement and Special Tracking**

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## **SUMMARY**

The purpose of this project is real time package tracking and positioning accessible to Internet users. *Socrates* is the WEB and cartography server. Vehicle positioning is achieved using GPS receivers installed in trucks and communications between server and vehicle is possible using the GSM network and sending SMS messages (Short Message Service). A PDA is also necessary in order to integrate all devices in the vehicle. Customers can make a position request of their packages, and the position will be shown by means of Internet digital cartography. Package identification is achieved using RFID (Radio Frequency Identification) ICODE tag's and saved information (64 bytes) can be modified on route by customers using the WEB.

Users can define route waypoints, and they will receive an SMS when the vehicle is close to these points. This is done by comparing the current position with these waypoints and is saved in the PDA. *Socrates* allows courier companies to undertake fleet management in order to improve productivity and communications between warehouses and drives and reduce costs, all by means of SMS. Tag information is not static like bar codes, and can be updated. Companies can use this to identify packages in warehouses and to improve their logistics.

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## 1. SOCRATES

Socrates has three different blocks:

- *Users*: users can be couriers companies, which sing the service, and their costumers. They log in to Socrates to check their packages, and save new information on I-Code tag.
- *IP Server*: users will connect to the WEB server, and will be able to access different information, depending on the kind of users they are. The server stores company, warehouse and customer databases and communicates with vehicles from various companies by means of the GSM modem. Communications are SMS-based. A web cartography provider is also installed in Socrates, and users can see the vehicle position on a map
- *On Board Equipment*: The system has devices installed on every vehicle belonging to these companies. These devices are GPS receivers, GSM Modem, RFid I-Code tag's reader – writer and PDA, in order to integrate all devices. PDA also stores the software.

## 2. SOKRATES USERS

Socrates users are all people who connect to WEB page, and log in with their name and password.



Figure 1: Web page

There are 4 kinds of users, so they can access to different information levels, and do different tasks. These users are:

- *Administrator:* is the person who manages the application. The options he has are: keep and include new companies, and control the statistics of them.
- *Companies:* can change the own data, include new warehouses, include new vehicles, new way points, and define new routes (paths between warehouses, or along distribution). Companies can also check statistics: number of SMS, packages, and costumers...
- *Costumers:* they login to the WEB page in order to control they packages. They will be able to change TAG information in real time. They could make position request, and see it using WEB cartography. Another option could be include new waypoint, and they will receive an E-mail and SMS when package is close to this point.
- *Warehouse:* it could be understand like an employee of the company, who works in the warehouse, and login to Socrates to include new package, new costumer, new costumer, define new route with their way points. The Warehouses will be able to send SMS directly to drivers, and they will read it in PDA screen. The Warehouses also alert Socrates that packages has been loaded onto or unloaded from trucks in warehouses

### 3. COMMUNICATIONS

Several messages can be send from server to vehicle, and the answer will be different. The most important are:

- *Position request:* server asks for the vehicle position, and PDA composes a message with latitude and longitude from GPS, and date and time.
- *New waypoint:* It will be saved in PDA waypoints database, and continuously compared with current position. When vehicle is close to one point, send a message to server with point identification, date and time
- *Comment to driver:* It will be show in PDA screen, so driver will be able to read it. Driver can write the answer and send it to warehouses or company.
- *Package Picked up or delivered:* when a driver collects or delivers a package, a message is sent to Socrates
- *New Tag information:* It will be saved in Tag when package will be unloaded.

### 4. TASKS

Several tasks must be made in order to achieve correct functioning of Socrates:

- *Tasks during truck load:* all tag's loaded in the truck must be read, and compared with database information saved in PDA.
- *Tasks during truck route:* continuous tracking of geographic position, by means of gps, real time sim card checking, in order to incorporate new instructions from user, and current position compared with way points defined by company or user.

- *Tasks during the truck unload in warehouse:* tag's reading, unloaded from vehicle, in order to erase the database record, and tag's updating, with new information modified by customer in route.

## 5. DISCUSSION AND CONCLUSION

Socrates improves the relation between costumers and their packages, and different information can be written in TAG. It is a totally open system, and can be modify depending on couriers companies necessities. Socrates is a application which enables users and companies to track and position packages in real time with direct access to information about their package. They can always know the vehicle's position which can be seen on the WEB map.

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