CSP-315

SMART TAXI MANAGEMENT

-MANAV GOEL(2008CS50215)
-ARUNIM SAMAT(2008CS50208)
-KSHITEEJ MAHAJAN(2008CS50214)
-DIPANSHU AGARWAL(2008CS50209)

MOTIVATION

The current staff taxi management is manual, therefore prone to resource wastage, time wastage, error and mishandling.

Our Motivation is to develop an efficient, autonomous Taxi Sharing System for the Institute.

OBJECTIVES

"AUTOMATING INSTITUTE STAFF TAXI SHARING"

The Institute has hired a few chauffeur driven taxis dedicated for the staff's travel. The problem in hand is to develop an efficient, autonomous Taxi Sharing System with key features:

- Booking process at the touch of a button.
- Transparent and automatic Billing process without human interference.
- Robust Passenger Authorization mechanism.

SPECIFICATIONS

INPUT

Online submission of Booking details by the user.

OUTPUT

- Immediate acknowledgement to the client through a SMS after online query.
- Journey Details to the Taxi driver at the start of the day and also each journey.
- Billing Details to the Institute on a monthly basis.

Approach

Booking Procedure

- Database of booked / available taxis on the central server.
- All the bookings would be Query based. All queries would be directed to the central server followed by Acknowledgement by the server.
- Any Query would be from a web portal.

Booking Protocol

- At start of the day Taxis will be stationed at fixed stations.
- Tasks segregated and allotted in an optimal fashion.
- First come first serve priority.
- If Booking is not available then request can be queued subject to availability in case of cancellation.
- Update / Reminder service to the taxi on journey to journey basis.

Billing Specification

- Assuming each Staff member has a unique RFID, the RFID reader integrated storage capable Taxi Meter will store the details (travel distance, time, and Client ID) of the journey.
- Synchronization of the Storage with the Server through a physical connection on a per day basis. The billing details for the day will be processed during this syncing
- The entire billing details can be obtained from the central server on a monthly basis.

DESIGN

Software

Booking

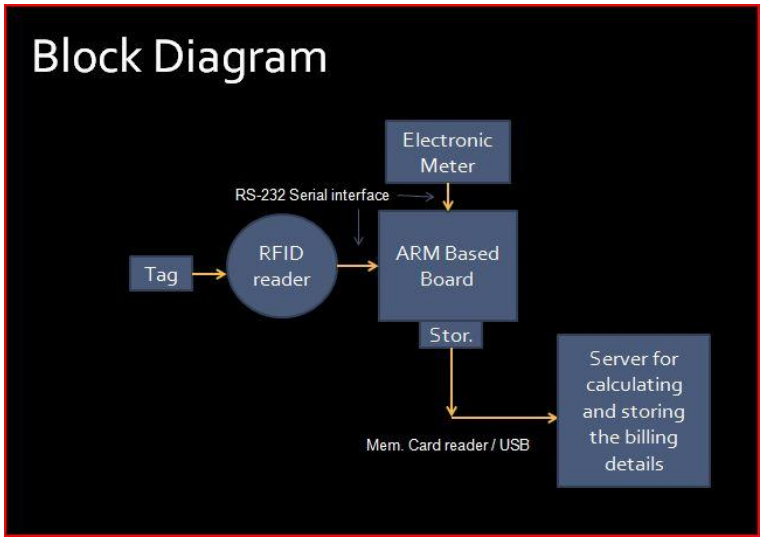
- Developing a Web Portal using PHP, MySQL for Database Management of incoming requests.
- Algorithm for checking Taxi availability so as to inform the client of the availability status.
- Algorithm for efficient Task Allotment to Taxi Drivers.
- Auto-SMS application for informing the Client and the Taxi Driver the journey details.
- Cumulating the above.

Billing

- Implementation of Tariff Calculator.
- Encrypting and securing the billing details.

Hardware

- We have decided to work on MCBSTR9 board by Keil as it has USB interface and RS232 serial ports. It uses ARM 9 based str9 microcontroller developed by ST microelectronics. RL-ARM library and its API's will be used for using the USB port for data transfer. We will use the uVision Microcontroller Development Kit for program development.
- Storage Device: We will be using the USB stick as our storage device.
- RFID Reader: We will be using the “Micro RWD Mifare” or “OEM-MIFARE” RFID reader by IBtechnology, UK.
- Taxi Meter: We are going to use the Electronic Fare Meter by Goldtech Scales.



STATUS

Software

Booking

- Familiarized with the basics of MySQL, PHP and implemented a basic Database Management System in the same.
- We have finished developing Algorithm for checking Taxi Availability and efficient Task Allotment for Taxi Drivers.
- In the Auto SMS application development front we have implemented in Java a code for sending bulk messages titled as TDSMARTTAXI via country SMS. The tariff rates are Rs. 750 for 5000 SMS's per month.

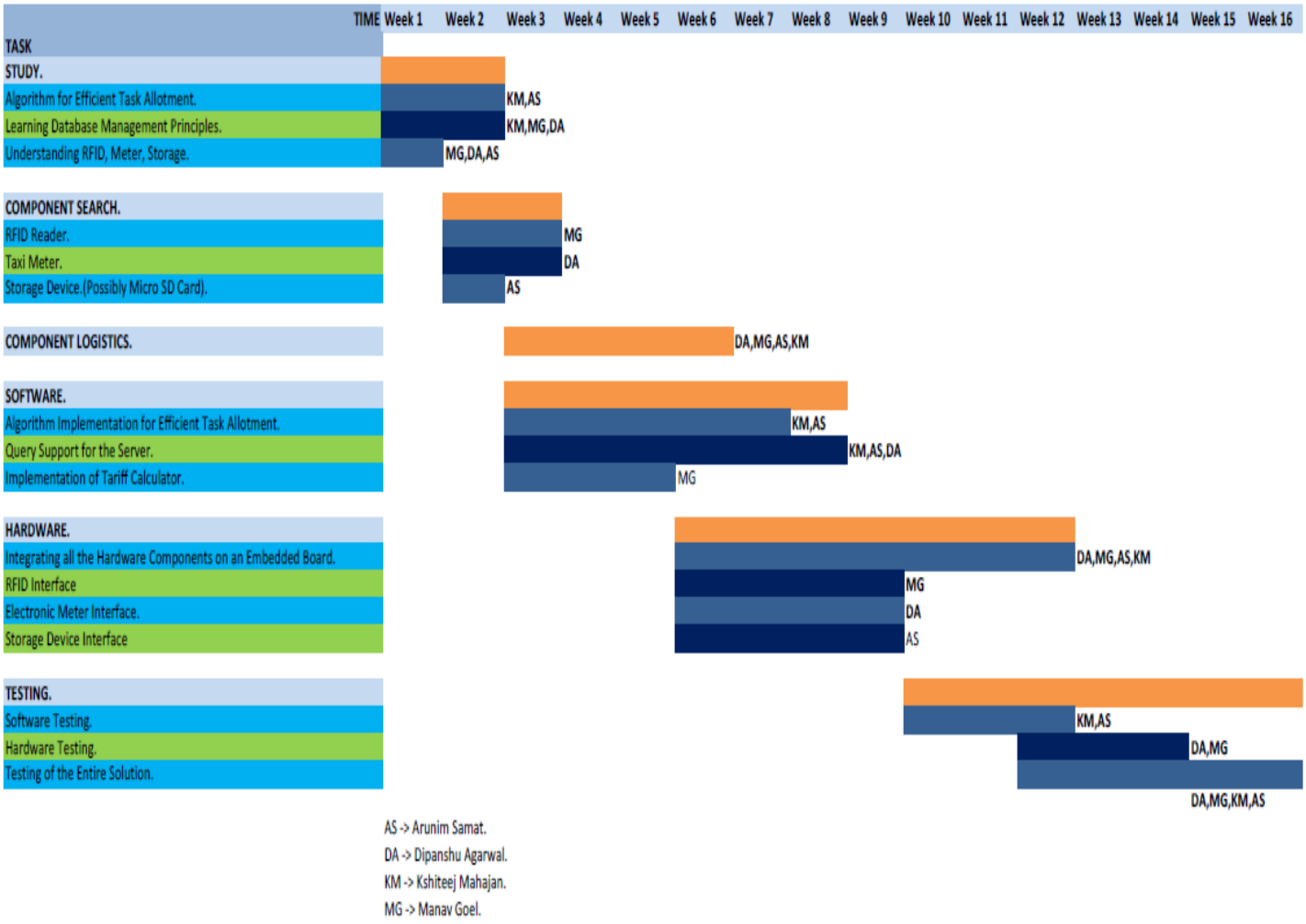
Billing

- We have implemented the Tariff Calculator assuming a simplistic Taxi Tariff Slab.

Hardware

- We initially familiarized with the ARM7 board. But we ultimately decided to use the ARM9 board as it also has an USB interface.
- Currently under process of implementing RFID Reader.
- Taxi Meter: We are currently in talks to convince "Goldtech Scales" to provide us an Open GPS/GPRS enabled Taxi Meter so that we can integrate the RFID Reader and the Storage Device in the Taxi Meter itself avoiding the use of the ARM7 board.

Timeline


TIME
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Week 13
Week 14
Week 15
Week 16
TASK
STUDY.
Algorithm for Efficient Task Allotment.
KM,AS
Learning Database Management Principles.
KM,MG,DA
Understanding RFID, Meter, Storage.
MG,DA,AS
COMPONENT SEARCH.
RFID Reader.
MG
Taxi Meter.
DA
Storage Device.(Possibly Micro SD Card).
AS
COMPONENT LOGISTICS.
DA,MG,AS,KM
SOFTWARE.
Algorithm Implementation for Efficient Task Allotment.
KM,AS
Query Support for the Server.
KM,AS,DA
Implementation of Tariff Calculator.
MG
HARDWARE.
Integrating all the Hardware Components on an Embedded Board.
DA,MG,AS,KM
RFID Interface
MG
Electronic Meter Interface.
DA
Storage Device Interface
AS
TESTING.
Software Testing.
KM,AS
Hardware Testing.
DA,MG
Testing of the Entire Solution.
DA,MG,KM,AS
AS -> Arunim Samat.
DA -> Dipanshu Agarwal.
KM -> Kshiteej Mahajan.
MG -> Manav Goel.