PRCS252 – Travel Management System Software:

Initial Planning Document

Overview:

This document is intended to provide a description of the travel management system that is to be created for the integrating project. The system will be for coaches which will factor in a database to communicate information between mobile, website and desktop clients through an API.

Based off the specification we will be using coaches as our mode of transport to base the system around so that a coach company can manage their coaches and routes.

Team Information:

1. **William Butler** – Team member, database developer and C# programmer
2. **Andrew Bellas** – Team member, web developer, HCI and C# programmer
3. **Goel Biju** – Team member, database developer and C#/Java programmer
4. **Vincent Castellani** – Team member, database developer and HCI

**•** All team members will be contributing to various elements of the project.

Technologies and Tools:

* **Oracle SQL Developer**; used to develop the database and all associated database objects: triggers, views, constraints.
* **.NET API**; will be used to transfer data to and from the database and clients, this middleware will be hosted on an Xserve server.
* **Java** (NetBeans); for development of the desktop application for staff.
* **Android** (Java); development of mobile application for customers.
* **HTML/CSS/JavaScript**; used to develop website for admin to manage the system.
* **GitHub**; repository for version control and project management through the project board.

Scenario

The travel system we are developing will focus on coaches as a means of transport around the UK. The company we are making the system for is **NationalCoach**, they are new and have not currently got a system in place. NationalCoach has moving stock in the form of **coaches**. In terms of the systems users there will be *administrators*, staff (in the form of *managers* and *coach drivers*) and *customers*. Customers are in the form of passengers who will use their coach services to travel to stops around the UK.

A customer will use the mobile application to access the coach travel system. After registration for an account, once confirmed by an administrator, the customer will be able to login to the system. Customer details should be able to be modified and account termination can be requested for approval by an admin.

Customers can view available routes from initial criteria such as where they are travelling from and where they are travelling to. Additionally, the customer can provide further details such as the date and time of their journey which will be able to refine routes they can select. The timetable for a stop can be viewed on the application so that the customer can see which coaches will be departing from or arriving to that stop.

A customer’s search for a journey should indicate the beginning of a booking. For a customer to make a booking they must be aged 16+. Customers can add more than one passenger to a booking. Types of passengers available include that of adult (16-59), infant (0-2), senior (60+), children (3-15) and disabled. If a customer creates a booking with passengers in addition to them, then the customer is the lead passenger for that booking meaning the booking will be created in their name. Payment for bookings will be provided through PayPal from the mobile application. The customer will receive an e-ticket once their payment information has been confirmed. The currently active bookings should be easily accessible for the customer and all their e-tickets should be stored in one place on the application. The customer should be able to view previous journey details and make a new booking based on their previous journey’s.

The staff are the drivers, they will use a free-standing desktop application. This device will be fitted both in the depot and within the cabin of the vehicle the driver is operating.

Once logged on the driver's use for the system is to view their shift which will show the coach they will use, the route they will be taking with the timetable of when they should arrive and depart from each station. In terms of the view of the route, it will display their start destination which is where they currently should be, each station along the way and the end destination.

The device that is fitted into the cabin should have a simple UI that will allow the coach status to be update. To keep track of the journey the driver will use the system to update when they have arrived and departed from the coach station. They can also update the status in between each stop by updating that they have broken down. If the coach has broken down, then the driver will need to input their location, so that a road side rescue can find them, or a new coach can be sent down from the nearest station. This will be used to update the customer on where the coach is currently, based on where the coach last departed, they can also compare it to the time they have been given for their journey start. The update on delays and breakdowns should also update the customers that there will be some delay on their journey.

When boarding the customers, the driver will view the current journeys passengers and view the list of booking references. They will then get the booking reference from the customer and confirm it on the system. This will allow the driver to know if everyone is on the coach.

There will be a manager who will be managing the drivers. They will need to be able to assign a driver to a coach and given them a route for their shift. To do this they will need to retrieve the drivers available, routes that need covering and the timetables that are connected to those routes. If the manager wishes to change a driver shift, they need the ability to remove it, but this cannot be done on the day and when the driver is working the shift.

The administrator will be accessing the travel system by logging on via a web application. Their main use for the application is to maintain the Staff, Coaches, Routes and Timetables. When new staff members join the administrator will need to create an account. They should also be able to update and archive the staff accounts when requested.

NationalCoach have already have routes and timetables decided that they want to operate on, but they would need the ability to change them as time goes on or add new routes and times to the system.

When new coaches are joining the fleet, they will need to be registered onto the system and current coach status should be updateable and archivable. The coaches all have a unique ID that is printed on the side, allowing them to be identifiable. The ID must contain two letters at the start and four numbers (e.g. AC1425). Even though the coaches have ID’s they are not assigned routes dependent on that ID. When a coach breaks down the administrator will receive the update, they should then be able to send a replacement service that is closest to the broken-down coach.

Overtime there will be more coaches and staff members joining the company and routes will be changed to accommodate for different routes and journey lengths. The administrator will need to be able to create new routes. All routes will have a route number (e.g. 412) and so the driver will be assigned a coach and route. They will need to be able to update current routes but not when there are already bookings for that route, it must be updated and implemented later. Any routes that are no longer in use should be archived allowing them to be retrieved if in demand again.

Each route will have its own timetable of when it will run during the week. This will include the stations it will stop at and the departure and arrival times at each station. The administrator will need to create and update the timetable when new routes or services have been added. When a change has been made to the timetable it will need to be implemented later so that there is enough warning for the customers. When a route is archived the timetable that was associated with that route will also need to be archived.

**Functional requirements**

1. Customer (mobile) application:

* Customer can register an account via the mobile application
* Customer can log into account once registration has been approved by admin
* View routes
* View timetables for routes
* View coach status on current route (on time/delayed)
* View history of prior bookings
* Create booking (minimum age of the passenger must be at least 16 in order to make an independent or group booking)
* Pay for a booking through integrated payment system – PayPal
* Customer can book a new journey from a prior journey.
* Customer can view booked journeys which has booking information e.g. booking reference code.
* Customer can update their account details (e.g. name, email, mobile number, address/postcode)
* Customer can request account termination.

1. Driver (desktop) application:

* Log into the system – log in details are stored until the driver signs out; a session is created upon logging in.
* View shift schedule
* Start a service for a valid route.
* Complete a service for a valid route.
* View current stock (Coach).
* View route.
* View coach service information: coach capacity, remaining seats, bookings made for the journey, locations to pick up booked passenger from.
* Accept booking reference number/ticket number in order to validate passenger’s right of travel (from a list of all bookings made for that journey).

1. Admin (web) application

* Log into the system

1. Admin – Staff

* Create staff member account
* Update staff member account
* Retrieve staff member account
* Archive staff member account when they leave

1. Admin – Timetables

Timetables need to meet the exact route and station

* Create records of the timetables of coaches
* Update records of the timetables of coaches
* Retrieve records of the timetables of the coaches
* Delete/archive records of the timetables of the coaches

1. Admin – Routes

* Create routes and each station
* Retrieve routes and each station
* Update routes and each station
* Archive routes and each station
* Create records of the starting and ending points of the coach journeys
* Update records of the starting and ending points of the coach journeys
* Retrieve records of the starting and ending points of the coach journeys
* Delete/archive records of the starting and ending points of the coach journeys

1. Admin – Coaches

* Create/Add coaches
* Retrieve coaches
* Archive coaches (If they get replaced or out of use)
* Create records of what coaches are in the depot and their status
* Update records of what coaches are in the depot and their status
* Retrieve records of what coaches are in the depot and their status
* Archive what coaches are in the depot and their status
* Deploy replacement services in the event of a coach breakdown and therefore assist passengers.

1. Manager

* Retrieve driver
* Retrieve routes
* Retrieve timetables
* Assign driver a coach for a shift
* Update drivers shift
* Assign driver a route for shift (this will then have an individual coach number)
* Remove a driver shift assignment