Car Pool System

Software Engineering Course Project

Project Plan Document

Group 6

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Session 2012-2013

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Contents

Project Plan Document

Project Type

Car Pool System is a Web Application designed to provide a car-sharing service to students commuting to and from LUMS. It will provide a platform where people with transport can optimize on cost of travel and help save resources by sharing it with those who are looking for a conveyance and are headed to the same route.

Process Model

Our software will follow rapid-prototyping model. We intend to build a basic working prototype of the system with all the essential functionalities by the end of this course. The prototype will then be forwarded to IST for testing and if approved, we will tailor our system according to their requirements in an iterative and incremental way to develop a fully functional Car Pool Software that can actually be employed for the LUMS community.

Project Deliverables

1. Requirements document
2. Project plan
3. System design document
4. Test reports
5. Final code
6. Software manuals e.g. user, installation

Project Tasks

Tasks to determine product statement

1. Identify needs and benefits
2. Meet with Instructor
3. Milestone: Project proposal defined

Tasks to determine functional specification

1. Define project purpose and scope
2. Identify user characteristics
3. Define desired input/output
4. Identify project constraints
5. Input functions/output functions
6. Review with team members
7. **Milestone:** requirements document

Tasks for scheduling

1. Division of responsibilities
2. Gantt charts
3. Resource Allocation graph
4. **Milestone:** scheduling accomplished

Tasks to determine estimation

1. Software model specified
2. Functional point Analysis
3. Use case point Analysis
4. Project based estimations
5. H/w and s/w cost estimations
6. **Milestone**: estimations calculated

Tasks for designing phase

1. Identifying Entity, Boundary and Control classes
2. Data flow diagrams for the proposed system
3. Database design
4. Entity relationship diagrams
5. Normalization of tables
6. Data dictionary
7. **Milestone**: final design

Tasks for coding/implementation

1. Designing the database
2. Designing forms
3. Connectivity handling
4. Coding of all modules and algorithms for lift-matching
5. **Milestone:** coding accomplished

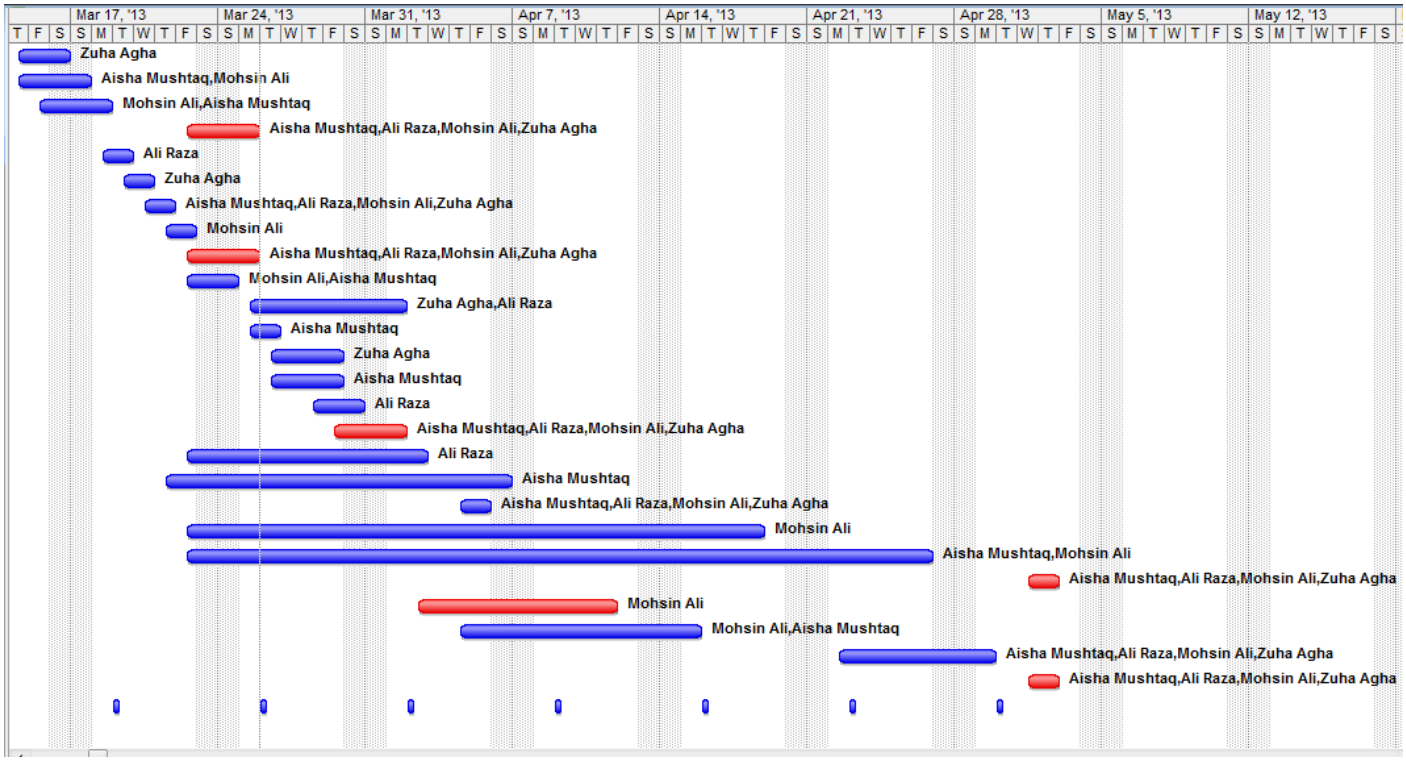
Tasks for testing

1. Devising test cases
2. Test cases run
3. User acceptance activity
4. **Milestone:** system tested

Project Scheduling

The plan for the scheduling covers the entire life cycle of the project. It entails all the activities that must be performed before starting the development work. Scheduling estimation and staff requirement estimations are perhaps the most important activities after cost estimation. As there is a strong relationship between the project duration and the staff time (measured in staff -months) required for completing the project. Later this schedule can be used for monitoring the progress of the project.

Timeline Chart



Team Structure

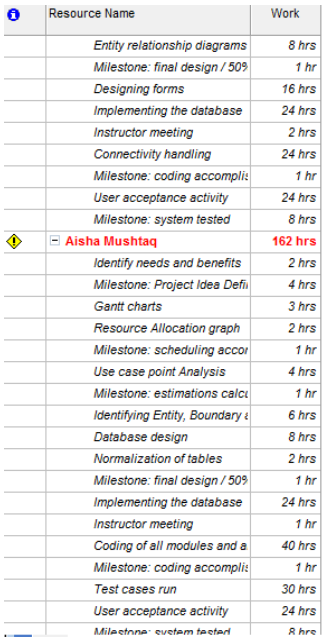
Role	Responsibility	Person
Team Leader ,Technical Writer, Co-Designer	Organizing Team, dividing tasks, documentation, estimation, diagramming, interface designing	Zuha Agha
Lead Programmer and Tester	Handling back-end coding, implementation, testing and debugging	Mohsin Ali
Technical Writer and Programmer	Handling coding, implementation, documentation, estimation, diagramming	Aisha Mushtaq
Interface Designer	Interface and form design using HTML	Ali Raza

Task and Member Assignment Table

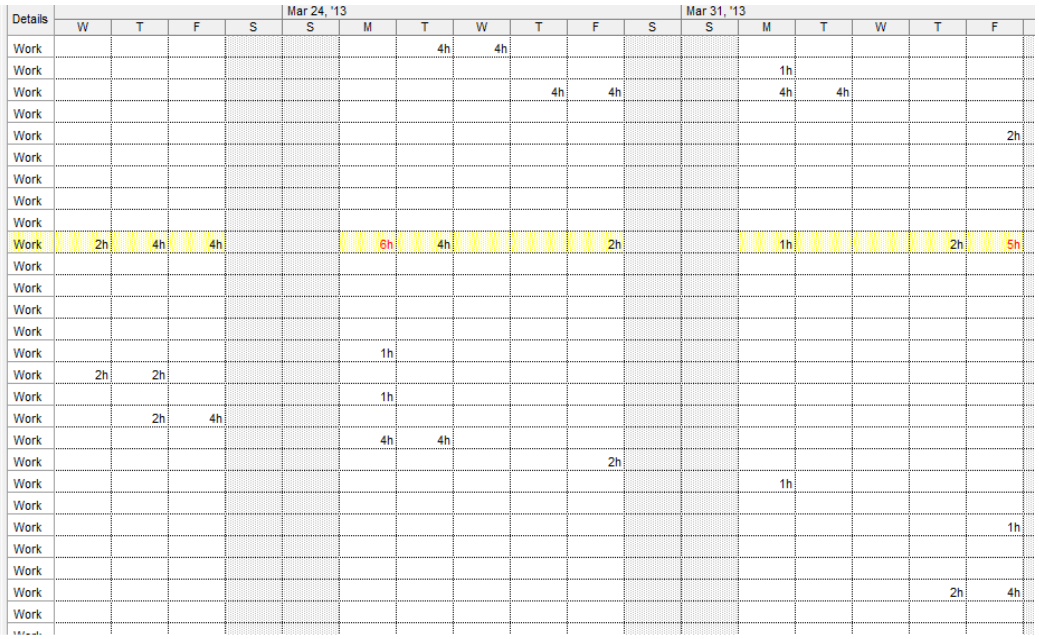
Allocation of People to Activities

No.	*Activities*	*Members*
1	Tasks to determine product statement	Aisha Mushtaq, Zuha Agha
2	Tasks to determine functional specification	Zuha Agha, Mohsin Ali , Ali Raza
3	Tasks for scheduling	Aisha Mushtaq, Mohsin Ali, Zuha Agha, Ali Raza
4	Tasks to determine estimation	Zuha Agha, Aisha Mushtaq, Mohsin Ali
5	Tasks for designing phase	Zuha Agha, Ali Raza, Aisha Mushtaq
6	Tasks for coding/implementation	Mohsin Ali, Aisha Mushtaq, Ali Raza, Zuha Agha
7	Tasks for testing	Mohsin Ali, Ali Raza, Aisha Mushtaq

Resource Allocation



Resource Name	Work
Entity relationship diagrams	8 hrs
Milestone: final design / 509	1 hr
Designing forms	16 hrs
Implementing the database	24 hrs
Instructor meeting	2 hrs
Connectivity handling	24 hrs
Milestone: coding accompli	1 hr
User acceptance activity	24 hrs
Milestone: system tested	8 hrs
Aisha Mushtaq	**162 hrs**
Identify needs and benefits	2 hrs
Milestone: Project Idea Defi	4 hrs
Gantt charts	3 hrs
Resource Allocation graph	2 hrs
Milestone: scheduling accor	1 hr
Use case point Analysis	4 hrs
Milestone: estimations calc	1 hr
Identifying Entity, Boundary	6 hrs
Database design	8 hrs
Normalization of tables	2 hrs
Milestone: final design / 509	1 hr
Implementing the database	24 hrs
Instructor meeting	1 hr
Coding of all modules and a	40 hrs
Milestone: coding accompli	1 hr
Test cases run	30 hrs
User acceptance activity	24 hrs
Milestone: system tested	8 hrs



Details	Mar 24, '13 W	T	F	S	S	M	T	W	T	F	S	Mar 31, '13 S	M	T	W	T	F
Work							4h	4h									
Work													1h				
Work									4h	4h			4h	4h			
Work																	
Work																	2h
Work																	
Work																	
Work																	
Work	2h	4h	4h			6h	4h			2h			1h			2h	5h
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Work																	
Work																	1h
Work																	
Work																	
Work																2h	4h
Work																	

Project/Product Estimates

Project Estimation by Function Point Analysis

External Inputs

- Form for Initial System Registration (Average)
- User Login (Low)
- Selection from Main Menu - Confirmation/Cancellation/New Ride (Low)
- Selection of role for new ride (Lift-provider/ Lift-taker) (Low)
- Forms for information about the ride from the user (schedule/route/fuel cost) (High)

External Outputs

- Message displayed if lift-match has been found or not (Low)
- If lift-match found, an automated email message is sent to the users with the trip information along with lift-provider's and lift-taker's profile information (High)
- Users notified again via email after confirmation/cancellation (Low)

External Inquiry

- Search for lift-match (High)

Internal Logic Files

- Users profile database (High)
- Users current trip's information database (High)
- MySQL Wordpress forms (High)
- Users authentication database (Low)

External Interface Files

- Automated email management file (Low)

	Low	**Average**	**High**	**Total**
External Inputs	3x3 = 9	1x4 = 4	1x6 = 6	19
External Outputs	2x4 = 8	-	1x7 = 7	15
External Inquiry	-	-	1x6 = 6	6
Internal Logic Files	1x7 = 7	-	3x15 = 45	52
External Interface Files	1x5 = 5	-	-	5
Total Unadjusted Function Points				97

Value Adjustment Factor Calculation

0 Not present or no influence
1 Incidental influence
2 Moderate influence
3 Average influence
4 Significant influence
5 Strong influence throughout

1	Data communications	**4**
2	Distributed data processing	**0**
3	Performance	**5**
4	Heavily used configuration	**1**
5	Transaction rate	**5**

6	. On-Line data entry	**5**
7	End-user efficiency	**4**
8	On-Line update	**5**
9	. Complex processing	**4**
10	Reusability	**4**
11	. Installation ease	**5**
12	Operational ease	**4**
13	Multiple sites	**1**
14	Facilitate change	**3**
	TOTAL	**50**

VAF = 0.65 + (50/100) = 1.15

Total Unadjusted Function Points	97
Multiplied with VAF	97*1.15
Total Adjusted Function Points	111.55

Project Estimation by Use Case Point Analysis

Use Case Complexity

Use Case	Number of Transactions	Use Case Complexity
Initial Registration	13	Complex
User Login	7	Average
Selection from Main Menu (Confirmation/Cancellation/New Ride)	2	Simple
Select Role (Lift-Provider/Lift-Taker)	4	Average
Offer a Lift	11	Complex
Take a Lift	7	Average

Reconfirm a Lift	4	Average
Cancel a Lift	5	Average

Unadjusted Use Case Weight (UUCW)

Use case complexity	**Weight**	**Number of use cases**	**Product**
Simple	5	1	5
Average	10	5	50
Complexity	15	2	30
Total			**85**

Actor Complexity

Actor	**Actor Type**
Lift-Provider	Complex (interacts via a Graphical Interface)
Lift-Taker	Complex (interacts via a Graphical Interface)
Database Server	Simple (another system through an API)

Unadjusted Actor Weight (UAW)

Actor Type	**Weight**	**Number of Actors**	**Product**
Simple	1	1	1
Average	2	X	
Complexity	3	2	6
Total			**7**

UUCP = UUCW + UAW

= 85 + 7

= 92

Adjusting for Technical Complexity

Factor	Weight	Assessment	Impact
Distributed system	2	0	0
Performance objectives	2	5	10
End-user efficiency	1	5	5
Complex processing	1	4	4
Reusable code	1	4	4
Easy to install	0.5	5	2.5
Easy to use	0.5	5	2.5
Easy to change	2	5	10
Concurrent use	1	5	5
Security	1	3	3
Access for third parties	1	1	1
Training needs	1	0	0
Portable	2	5	10
Total			**57**

TCF = 0.6 + (0.01 x 57) = 1.17

Adjusting for Environmental Complexity

Factor	Weight	Assessment	Impact
Familiar with the development process	1.5	3	4.5
Application experience	0.5	2	1
Object-Oriented Experience	1	4	4
Lead analyst capability	0.5	4	4
Motivation	1	5	5
Stable requirements	2	3	6
Part-time staff	-1	0	0
Difficult programming language	-1	2	-2
Total			**22.5**

EF = 1.4 + (-0.03 x 22.5)

= 0.725

UCP = UUCP x TCF x EF

= 92 x 1.17 x 0.725

= 78.039

Tools and Technology with reasoning

Front End Tools

Word Press, PHP and HTML, Photoshop

Reasons

Word Press is an easy to use tool for designing the interface of our web application. It is an open source software with readily available tutorials and forum help. HTML is necessary for integration with Word Press. PHP and Photoshop will be used to design forms, buttons and images for the interface of the website, as it is one of the best options available.

Documentation Tools

Microsoft Word, Microsoft Project

Reasons

Microsoft Word and Microsoft Project will be used for documentation and technical writing and compilation purposes. Some project schedules will be created in Project and then imported in Word.

Modeling Tools

Microsoft Visio

Reasons

All the UML design diagrams will be created in Microsoft Visio.

Project Management Tools

Microsoft Project, GitHub

Reasons

Microsoft Project will be used basically to track the progress of our project to see how it is going according to schedule. It helps to visually track and manage the ongoing project.
All the code will be maintained on GitHub, so the entire team can work on the project concurrently. The new code will be easily accessible by all.

Back End Tools

SQL Server or Oracle, J2EE

Reasons

The project deals with a huge amount of data of the users which include storing information about students, faculty and staff and their path information. We have a choice to use either SQL Server or Oracle.

Our application is requires implementing business logic at application level which can be efficiently implemented in java. Java is scalable, portable and secure. J2EE will help us set up our website so that users will not need to download any extra packages such as JRE which is not built in browsers any more.