Project Planning

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Contents

1 Introduction

1.1 Purpose and scope

This document is the Project Planning document for the MyTaxiService platform. The purpose of this document is to provide an estimation of the resources needed for the end-to-end development of the platform (namely money, time, and manpower), of the time schedule of the development and of the size of the project itself.

This will be achieved with the aid of standard industrial tools like the COCOMO and Function Point analysis.

This document is intended for software engineers, developers, and the management team assigned to the project.

1.2 Definitions, acronyms, abbreviations

Throughout this document, the definitions specified in the previous documents will be used without further explanation (refer to section 1 of the RASD and SDD documents).

The following acronyms will also be used in place of the extended form:

- **COCOMO**: COnstructive COst MOdel;

- **LOC**: Lines Of Code;

- **FP**: Function Points;

- **SDD**: Software Design Document;

- **RASD**: Requirement Analysis and Specification Document;

- **ITPD**: Integration Plan Testing Document;

as well as the other abbreviations defined in this same section of the other documents.

The following convention will be used to refer to different items in the document:

- **sec.** / **secs.**: section / sections

- **req.**: requirement.

A typical use of the aforementioned abbreviation would be in the form "element Xx, sec. x.x.x" (e.g. req. 1, sec. 1.3 - if this section contained a numbered requirement with index 1).

One last observation is to be done regarding the use of the singular they, which will be used to refer to single persons throughout the whole document.

1.3 Reference documents

As stated before, this document will assume that the following documents have been read or are accessible to the reader:

- RASD;

- SDD;

- ITPD;

- "COCOMO II Model Manual v2.1".

2 Size, effort, and cost estimation

2.1 Size estimation

The final size of the project will be estimated in the LOC measure, through the use of Function Point analysis applied to the platform as described in the DD.

Function points refer to different functional groups as described in the following table:

Functional group	Weights		
	Simple	Medium	Complex
Internal logic files	7	10	13
External logic files	5	6	7
Inputs	3	4	5
Outputs	5	6	7
Inquiries	2	4	6

2.1.1 Internal logic files

Element	Weight	FP
User Information	Simple	7
Reports	Simple	7
Pending Notification	Simple	7
Ride	Medium	10
Total		**31**

Most ILF of the platform will reside on the back-end side and are of little impact on the project size, with the exception of the ride objects which will need to store more information than the rest of the ILF such as routes.

2.1.2 External logic files

Element	Weight	FP
Map information	Complex	7
Total		**7**

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ELF are limited to the maps information necessary to display the taxi route on the client-side apps, and are related to the client-side apps.

2.1.3   Input

Element	Weight	FP
Login	Simple	3
Logout	Simple	3
Customer sign-up	Simple	3
Taxi sign-up	Medium	4
Edit info	Simple	3
Submit report	Simple	3
Edit request	Simple	3
Reply to request	Simple	3
Change availability	Medium	4
Total		**29**

See RASD sec. 2.2 for a detailed perspective of the platform's functionalities, which are obviously related to the input functions.

2.1.4   Output

Element	Weight	FP
Notification to customer	Complex	7
Notification to taxi	Complex	7
Total		**14**

Output functions are limited to the push notification services which are both considered complex due to the stateless nature of the standard.

2.1.5   Inquiries

Element	Weight	FP
Get user position	Complex	6
Select taxi	Medium	4
Total		**10**

External inquiries are considered of complex and medium size, but are limited to few functions, therefore impacting the project's size less than the core functionalities (i.e. I/O).

2.1.6   Function points

Functional group	FP
Internal logic files	31
External logic files	7
Input	29
Output	14
Inquiries	10
Total	**91**

From this brief estimation of the project's FP, we can produce an estimation of the final LOC (more precisely SLOC) count of the project:

$$SLOC = FP \cdot CR = 91 \cdot 53 = 4823$$

where CR is the conversion ratio for the Java programming language[1].

2.2   Effort and cost estimation

Using the FP estimation derived in the previous section, we can produce an estimation of the required effort and financial resources using COCOMO with the following input:

which yields the following output:

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[1] The value for the conversion ratio is taken from "COCOMO II Model Manual v2.1".

Results

Software Development (Elaboration and Construction)

Effort = 11.4 Person-months
Schedule = 8.2 Months
Cost = $22891

Total Equivalent Size = 4823 SLOC

Acquisition Phase Distribution

Phase	Effort (Person-months)	Schedule (Months)	Average Staff	Cost (Dollars)
Inception	0.7	1.0	0.7	$1373
Elaboration	2.7	3.1	0.9	$5494
Construction	8.7	5.1	1.7	$17397
Transition	1.4	1.0	1.3	$2747

Staffing Profile
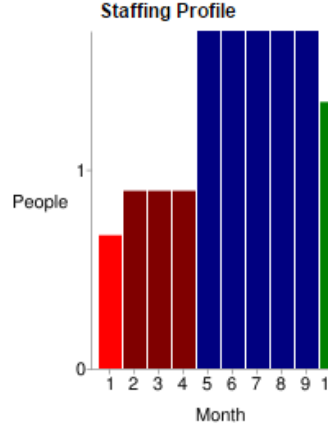
Software Effort Distribution for RUP/MBASE (Person-Months)

Phase/Activity	Inception	Elaboration	Construction	Transition
Management	0.1	0.3	0.9	0.2
Environment/CM	0.1	0.2	0.4	0.1
Requirements	0.3	0.5	0.7	0.1
Design	0.1	1.0	1.4	0.1
Implementation	0.1	0.4	3.0	0.3
Assessment	0.1	0.3	2.1	0.3
Deployment	0.0	0.1	0.3	0.4

By rounding the COCOMO estimation to the most safe integer relaxation we find that a total of 9 months will be required for the platform to be operative, with a required team ranging between 1 and 2 people (depending on the development phase).

3 Schedule and resource allocation

This section will provide a specific guideline to schedule the team's tasks, taking into account the design guidelines provided in the DD and the availability of the team's members.

The development of the platform must be divided as specified in the COCOMO standard in 4 phases:

1. Inception: which will start in October 2015 and will last approximately until the beginning of November 2015.

Month	Task	Member
October	Client meetings	Grattarola
	Team organization	
	RASD	
November	T.B.D.	Inajjar

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2. Elaboration: which will start in November 2015 and will last approximately until the beginning of February 2016.

Month	Task	Member
November	DD (Architectural design)	Inajjar
December	DD (Algorithm, UI and UX design)	Grattarola
January	ITPD	Lui
February	T.B.D.	Lui

3. Construction: which will start in February 2016 and will last approximately until the end of June 2016.

Month	Task	Member
February	Request manager	Grattarola, Lui
	Ride manager	
	User manager	
March	Queue manager	Inajjar, Lui
	Restful API	
	Notification manager	
April	Customer-side mobile app	Inajjar
	Customer-side web app	
	Taxi-side mobile app	Grattarola
May	Component integration and first test deployment	Grattarola, Inajjar
June	Integration testing	Inajjar, Lui

4. Transition: which will approximately start in July 2016 and will last until August 2016.

Month	Task	Member
July	T.B.D.	T.B.D.
August	T.B.D.	T.B.D.

Refer to the DD for a more detailed explanation about the choices made in the schedule.

4 Project risks

This section contains a list of potential risks that the project may undergo, taken and adapted from http://management.simplicable.com/management/new/130-project-risks.

4.0.1 Scope

1. Scope is ill defined (i.e. the general risk of an error or omission in scope definition).

   Risk: low

   Solution: adapt RASD and DD to omitted parts.

2. Uncontrolled changes and continuous growth of scope.

   Risk: low.

   Solution: try to moderate communication with client.

4.0.2   Cost Management

1. Cost forecasts are inaccurate.

   Risk: medium

   Solution: modify architecture to fit budget.

4.0.3   Communication

1. Project team misunderstand requirements.

   Risk: low

   Solution: adapt project to include new requirements.

4.0.4   Architecture

1. The architecture is incapable of supporting change requests.

   Risk: low

   Solution: adapt architecture design.

2. The architecture is impossible to implement, excessively costly or doesn't support the requirements.

   Risk: low

   Solution: adapt architecture to fit budget and requirements.

4.0.5   Design

1. The design isn't possible, is excessively costly or doesn't support the requirements.

   Risk: medium

   Solution: adapt design to fit budget and requirements.

4.0.6   Technical

1. Critical systems such as the test environments go down.

   Risk: low

   Solution: use temporary backup system.

4.0.7   Requirements

1. Requirements are unclear and open to interpretation.

   Risk: medium

   Solution: schedule more and frequent meetings with clients.

2. Requirements are incomplete

   Risk: medium

   Solution: schedule more and frequent meetings with clients

4.0.8   External

1. Legal & regulatory change impacts project.

   Risk: low

   Solution: adapt project to new regulations.

2. Force Majeure (e.g. act of nature) impacts project.

   Risk: low

   Solution: T.B.D.

4.0.9   User Acceptance

1. Users reject the product.

   Risk: medium

   Solution: market analysis and UX restructuring

5   Additional comments

The production of this document has been a joint effort of all the authors, with a fair distribution of the mansions which caused each member of the group to work on all the parts of the document. The production has been carried out between 25/1/2016 and 2/2/2016 for a total time expense of:

- **Group work**: 4 hours

- **Individual work**:

Daniele Grattarola (Mat. 853101)	6 hours
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