Politecnico di Milano

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Project Planning Document

Version 1.0

PowerEnjoy

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1. INTRODUCTION

1.1 Purpose and scope

This document is the Project Palnning Document form the PowerEnJoy paltform application. The mai purpose of this document is to provide an estiomation of the resource needed for the development of the platform. This document is intended for software engineers, developers and the management team assigned to the project.

1.2 Definitions, acronyms, abbreviations

- RASD : Requirements Analysis Specification Document
- DD: Design Document
- ITPD: Integration Test Plan Document
- PP: Project Planning Document
- CI: Code Inspection
- LOC: Lines Of Codes
- FP: Function Point (UFP = Unadjusted FP)
- COCOMO: Constructive Cost Model

1.3 Reference documents

- Project description: Assignments AA 2016-2017.pdf
- RASD
- DD
- ITPD

2. SIZE, EFFORT AND COST ESTIMATION

2.1 Size estimation

The final size of the project will be estimated in the LOC measure throught the use of Function Points. The following table show the weight assigned to each function points:

Function Types	**Weight**		
	Simple	Medium	Complex
Inputs	3	4	6
Outputs	4	5	7
Inquiries	3	4	6
Internal Logic Fiels (ILF)	7	10	15
External Logic Fiels (ELF)	5	7	10

2.1.1 Inputs

Element	**Weight**	**FP**
Registration	Simple	3
Log-in	Simple	3
Personal Info	Simple	3
Sign-up	Simple	3
Search Available Car	Medium	4
Select Car	Medium	4
Check Payment History	Simple	3
Unlock Request	Medium	4
Total		**30**

2.1.2 Output

Element	**Weight**	**FP**
Notification to costumer	Complex	7
Total		**7**

2.1.3 Inquiries

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

2.1.4 Internal Logic Files

Element	Weight	FP
User information	Simple	7
Notifications	Simple	7
Ride	Medium	10
Total		**24**

2.1.5 External Logic Files

Element	Weight	FP
Map information	Complex	10
Total		**10**

2.1.6 Total number of UFPs

Function group	Points
Inputs	30
Outputs	7
Inquiries	10
Internal logic files	24
External logic files	10
Total	**81 UFP**

2.2 Effort and cost estimantion

2.2.1 COCOMO II

The *COCOMO II* model is an evolution from the *COCOMO 81* and is used to express **effort** as *PERSON-MONTHS*.

In particular it uses the following formula to estimate the total **effort** :

$$\text{Effort} = A \times SIZE^E \times \prod_i EM_i \tag{1}$$

where :

- A is given statistically and is equal to 2.94
- $SIZE$ is the size of the software expressed in KLOC
- E is an aggregation of five scale factors (SF)
- EM are the *effort multipliers* of the *cost drivers*

In the follwing sections we will calculate all the parameters mentioned above, in order to generate the final result of the formula.

2.2.2 Scale factors estimation

This section provides the estimation for the scale factors.

Name	**Factor**	**Value**
Precedentedness	Nominal	3.72
Development flexibility	High	2.03
Risk resolution	High	2.83
Team cohesion	Very High	1.10
Process maturity	High	3.12
Total	$E = 0.91 + 0.01 \times \sum_i SF_i$	1.038

Table 1: Scale Drivers estimations

2.2.3 Cost drivers effort multipliers estimation

This section provides the estimation for the effort multipliers of the cost drivers.

C_i	**Name**	**Factor**	**Value**
RELY	Required Software Reliability	Nominal	1.00
DATA	Data base size	Nominal	1.00
CPLX	Product Complexity	Nominal	1.00
RUSE	Required Reusability	High	1.07
DOCU	Documentation match to life-cycle needs	High	1.11
TIME	Execution Time Constraint	Nominal	1.00
STOR	Main Storage Constraint	Nominal	1.00
PVOL	Platform Volatility	Low	0.87
ACAP	Analyst Capability	Nominal	1.00
PCAP	Programmer Capability	Very High	0.76
AEXP	Application Experience	Nominal	1.00
PEXP	Platform Experience	Low	1.09
LTEX	Language and Tool Experience	Nominal	1.00
PCON	Personnel Continuity	Very high	0.81
TOOL	Usage of Software Tools	High	0.90
SITE	Multisite Development	Nominal	1.00
SCED	Required Development Schedule	Nominal	1.00
Total	$EM = \prod_i C_i$		0.624

Table 2: Effort multipliers estimation

2.2.4 Final effort estimation

Now that we have all the parameters of the formula, we can calculate the final result:

- $A = 2.94$
- $SIZE = 81UFP \times 53 = 4.293KLOC$ (53 is the JAVA multiplier)
- $\prod_i EM_i = 0.624$
- $E = 1.038$

$$\text{Effort} = A \times SIZE^E \times \prod_i EM_i = 8.32PM \tag{2}$$

So the effort to develop the project is 8.32 person-months.
We are 3 people, so this means less than 3 months development.

3. SCHEDULE AND RESOURCE ALLOCATION

The fulfillment of the project requires a list of tasks to be completed in the order they are presented here, it is important to note, however that this list of tasks is intended to be used as a general guideline and all the tasks may receive updates along the way. Small changes can be made to the order, especially the last two and the first two steps that will be re-iterated over and over as new requirements emerge. So, the first version of each task will have strict deadlines, so that the following task can start, while the re-iterations will have specific deadlines that will be specified along the process.

Here is the a table that summirises the main tasks to be completed:

Order	**Task**
1	RASD
2	DD
3	ITPD
4	PP
5	CI

Here we explain what each task is for:

1. Prepare a document that specifies the goals of the system, the assumptions that had been made, and the requirements of the *system-to-be*, namely the RASD.

2. Prepare a document that specifies the design and architecture of the *system-to-be*, namely the DD.

3. Prepare a document that specifies the plan to follow in order to perform the integration testing, namely the ITPD.

4. Prepare a document that specifies the plan of the project, namely the PP.

5. Perform the Code inspection from the material that professors gave us.

3.1 Schedule

In this subsection we present a schedule that must followed, however, as always, small changes can always be made.

The following table summarizing the main deadlines.

Order	Start date	Task	Deadline
1	20-10-2016	RASD	13-11-2016
2	16-11-2015	DD	11-12-2016
3	18-12-2016	ITPD	15-01-2017
4	27-12-2016	PP	22-01-2017
5	16-01-2017	CI	05-02-2017

3.2 Resource allocation

In this section we specifiy the resource allocation, that is, for each task we specify to whom its subtasks are allocated. The timetables have already been defined in section 3.1. We choose to represent this data by means of tables. As far as the documents are concerned, we specify the resources for each section of the document.

RASD

Subtask	Resource
Introduction	Simone Claudia Yannick
Overall Description	Simone Claudia Yannick
Specific Requirements	Simone Claudia Yannick
Appendices	Simone Claudia Yannick

DD

Subtask	**Resource**
Introduction	Simone Claudia Yannick
Architectural Design	Simone Yannick
Algorithm Design	Simone Claudia
User Interface Design	Claudia Yannick
Requirements Traceability	Simone Claudia Yannick
Appendices	Simone Claudia Yannick

ITPD

Subtask	**Resource**
Introduction	Simone Claudia Yannick
Integration Strategy	Simone Claudia Yannick
Individual Steps and Test Description	Yannick
Tool and Test Equipment Required	Claudia
Program Stubs and Data Test Required	Simone
Appendices	Simone Claudia Yannick

PP

Subtask	**Resource**
Introduction	Simone Claudia Yannick
Size, Effort and Cost Estimation	Simone Claudia
Schedule and Resourse Allocation	Simone Claudia Yannick
Project Risks	Yannick
Appendices	Simone Claudia Yannick

CI

Subtask	**Resource**
Introduction	Claudia
Functional role of classes	Simone Yannick
List of issues	Simone Claudia Yannick
Appendices	Simone Claudia Yannick

4. Project risk

This section contains a list of potential risck that might happen or not.

4.0.1 Requirements

1. Requirements changes
   Risk: Medium
   Solution: adapt the project to include the new requirements

2. Requirements are unclear
   Risk: Medium
   Solution: Plan a meating with the client

3. Developer misunderstand requirements
   Risk:low
   Solution: schedule more meating with the clients

4.0.2 Architecture

1. The architecture is incapable of supporting change requests
   Risk: Low
   Solution: adapt architecture design

4.0.3 Design

1. The design is not possible and overly expensive
   Risk: medium
   Solution: adapt design to fit budget

4.0.4 Forecasts

1. Cost forecasts are inaccurate
   Risk: Medium
   Solution: modify the architecture in order to fit the budget

2. Software development require more time
   Risk: low
   Solution: Plan for more releases with a set of limited functionalities

4.0.5 External

1. Legal change
   Risk: low
   Solution: adapt the project to the new regulations

4.0.6 User

1. Build a product that noone wants
   Risk: Medium
   Solution: adapt the product to the market demand

5. APPENDICES

5.1 References

The following tools where used in the creation of this document:

- *TexMaker 4.5* as Editor

5.2 Effort Spent

- Simone Amico 9h
- Chianella Claudia Beatrice 9h
- Giovanakis Yannick 9h