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Project Planning Document
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PowerEnjoy

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1. INTRODUCTION

1.1 Purpose and scope

This document is the Project Planning Document for the PowerEnjoy platform application. The main purpose of this document is to provide an estimation 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

1.3 Reference documents

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

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 Points. The following table shows the weight assigned to each function point:

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

2.1.1 Inputs

Element	Weight	FP
Registration	Simple	3
Log-in	Simple	3
Personal Info	Simple	3
Sing-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 customer	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** :

$$\text{Effort} = A \times \text{SIZE}^E \times \prod_i EM_i \quad (1)$$

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 following 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)
- $\prod_i EM_i = 0.624$
- $E = 1.038$

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

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 summarises the main tasks to be completed:

Order	Task
1	RASD
2	DD
3	ITPD
4	PPD
5	Code Inspection

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 PPD.
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.

We explain the schedule through the Gantt chart that follows:

Since the precise deadlines are not legible from the Gantt chart, we give also a table summarising 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	PPD	22-01-2017
5	16-01-2017	Code inspection	05-02-2017

In this section we specify 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, whereas, for what concerns the *Implementation + Unit Testing* we provide a resource for each of the three main applications that will have to be developed. Of course also this allocation can be subject to small changes in the future.

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	Edoardo
Entry Criteria	Angelo Edoardo
Individual Steps	Angelo Giacomo
Tools and Test Equipment Required	Edoardo
Program Stubs and Test Data Required	Angelo Giacomo Edoardo
Appendices	Angelo Giacomo Edoardo

PPD

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

Code Inspection

Subtask	Resource
User Client Submodules	Edoardo
User Client - Server	Edoardo
Driver Client Submodules	Giacomo
Driver Client - Server	Giacomo
Server Submodules	Angelo

4. PROJECT RISCK

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

4.1 Project and product Risk

4.1.1 Requirements changes

Risk: Medium

Solution: adapt the project to include the new requirements

4.1.2 Requirements are unclear

Risk: Medium

Solution: Plan a meeting with the client

4.1.3 Developer misunderstand requirements

Risk: low

Solution: schedule more meeting with the clients

4.2 Business Risk

4.2.1 Cost forecasts are inaccurate

Risk: Medium

Solution: modify the architecture in order to fit the budget

4.2.2 Build a product that noone wants

Risk: Medium

Solution: adapt the product to the market demand

4.2.3 Software development require more time

Risk: low

Solution: Plan for more releases with a set of limited functionalities

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 h
- Chianella Claudia Beatrice h
- Giovanakis Yannick h