Politecnico di Milano

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Project Planning Document

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PowerEnjoy

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CONTENTS

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

1.3 Referce 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 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
Sing-up	Simple	3
Search Available Car	Medium	4
Select Car	Medium	4
Check Payment History	Simple	3
Unlock request	Medioum	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

4. PROJECT RISCK

This section contains a list of potential risck 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 meating with the client

4.1.3 Developer misunderstand requirements

Risk:low
Solution: schedule more meating 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 limitede 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