PowerEnJoy

Project Plan Document

A.Y 2016/2017

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Versione1.1

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1. Introduction

1.1 Purpose and scope

The project plan document has the main purpose to analyze the cost and effort estimation of PowerEnJoy, to schedule, after the estimation, how to divide the resources we have for completing the work in time, and finally to analyze the possible risk that during the works can occur.

The document is divided in three parts: the first parts focus on the cost and effort estimation. This estimation is done using the function points method and COCOMO.

The second part focus on the scheduling of the work. We divide the work in tasks and allocate these tasks to our resources.

The third and last part focus on risk that we could face during the development of PowerEnJoy. We will provide the probability of face that risk and the possible solution.

1.2 List of abbreviations

- **PP**: Project Plan.
- **FP**: Function Points.
- **ILF**: Internal logic file.
- **ELF**: External logic file.
- **EI**: External Input.
- **EO**: External Output.
- **EQ**: External Inquiries.
- **DBMS**: Database Management System.
- **DD:** Design Document.

2. Project size, cost and effort estimation

2.1. Overview

In this section, we will provide an estimation of the cost and the size of PowerEnJoy project.

This chapter will be divide into two parts. The first part belongs to the estimation of the size of the project. This estimation is done with a function points approach.

The second part belongs to estimation of the cost. This estimation is done with the COCOMO approach.

2.2. Size estimation: Function Points

The function points method provides an estimation of the size of the project, using the number of functionalities that the project provides to the client.

The estimation is done using the following tables. The tables belong to a statistical analysis.

For Internal Logic Files and External Logic Files

	Data elements		
Record elements	1-19	20-50	51+
1	Low	Low	Avg
2-5	Low	Avg	High
6+	Avg	High	High

For External Output and External Inquiry

	Data elements		
File Types	1-5	6-19	20+
0-1	Low	Low	Avg
2-4	Low	Avg	High
4+	Avg	High	High

For External Input

	Data elements		
File Types	1-4	5-15	16+
0-1	Low	Low	Avg
2-3	Low	Avg	High
3+	Avg	High	High

UFP Complexity Weights

	Complexity Weights		
Function Types	Low	Average	High
Internal Logic Files	7	10	15
External Logic Files	5	7	10
External Inputs	3	4	6
External Outputs	4	5	7
External Inquiries	3	4	6

2.3 Internal Logic Files(ILFs)

PowerEnJoy must store a lot of users because we think that a lot of people will use this service, and the information of the users are lots such as name, surname, password, e-mail, address, bank code. So, complexity is high.

For the car, we must store the availability and the actual position, because that two continue to change we deduce an average complexity.

We must store the reservation that is not simple because there to store the car, the user and date, and the right reservation hours for the timer of the reservation, so complexity is high.

Finally, we must store the bill of the use of the car. We need to store the possibly charge or discount, and the total amount of the ride so we deduce an average complexity.

This is the final table for the internal logic files:

ILFs	Complexity	FPs
User information	High	15
Car information	Avg	10
Reservation	Low	15
Bill	Avg	10
Total		50

2.4 External Logic Files(ELFs)

For the External Logic Files, we should store only the information that the external agency for the payment give to us about the last nonpayment of the ride. So, the complexity is quite easy but on average because we need to store and change only a boolean but every user has a different one.

This is the final table for the external logic files:

ELFs	Complexity	FPs
Payment information	Avg	15
Total		15

2.5 External inputs(EIs)

There are a lot of input that arrive from the different type of client of the application.

- **Registration:** is a complex operation, because involve a lot of information and so we need to do a lot of query.
- **Login:** is a simple operation because needs only the control of the e-mail and the password.
- **Password recovery:** we need to control the existence of the user and if is the right one. We will send again the password, so we need to do not simple operation and we deduce a high complexity.
- **Reserve car:** Complex input indeed we need to pass in a lot of component, so is a high complexity.
- **Unlock car:** Simple operation because we need only to control the user and the relative car reserved.
- **View reservation and payment history:** Simple operation that involve only the database of the application.
- **Send data sensor of the car:** Simple operation because is only a sending of the sensor that are in the car.

This is the final table for the External inputs:

EIs	Complexity	FPs
Registration	High	6
Login	Low	3
Password recovery	Avg	6
Reserve car	High	6
Unlock car	Low	3
Send data sensor	Low	3
Payment/reservation history	Low	3
Total		30

2.6 External Outputs(EOs)

The application must provide these outputs for the client

- Send the bill to the client, this operation is quite simple because have only to send an e-mail to the correspondent user, so complexity is low.
- Send the fee for the reservation lost. This operation is like the send bill one so, complexity is low.
- Open the car. This operation is on average complexity because the system must control the reservation information, the position of the car and the mobile that want to open the car, and control also if the time of the reservation is finish.
- Notify the user if he hasn`t paid the last ride so, until he doesn`t pay it, he can`t reserve another one car. This action is only a notification via e-mail, so is a low complexity action.
- Notify the user if the he has paid the last ride, and so he can restart to reserve a new car, like the before one, is a low complexity action for the same reason.
- Notify the bill to the external agency. The external agency for the payment and the application has a direct link to each other, so the complexity for this action is low.

This is the final table for the External input:

EOs	Complexity	FPs
Send bill	Low	4
Fee lost reservation	Avg	5
Open car	Low	4
Notify not pay	Low	4
Notify restart reserve	Low	4
Bill to external agency	Low	4
Total		25

2.7 External Inquiries(EQs)

The only external inquiries that the client can perform, is a request for the payment and reservation history. This action is quite simple to do, because have only to perform a query to the database of the user that asks for his history. So, complexity is low.

EQs	Complexity	FPs
Payment history	Low	3
Total		3

2.8 Overall estimation

The following table summarizes the results of our estimation activity:

Function Types	Value
Internal Logic Files	50
External Logic Files	15
External Inputs	30
External Outputs	25
External Inquiries	3
Total	123

We use JEE for the platform development:

SLOC=123*46=5.658

With an upper bound of

SLOC=113*67=8.241

2.9 Cost and effort estimation: COCOMO II

For estimating cost and effort, we use the Cocomo II method, statistical approach.

First step for arriving to an effort estimation is to understand in which case we are:

Post-Architecture: when we are extending an existing product line (we have already detailed information on cost).

Early Design: when we don't have clear information on the architecture of the system.

We decide to follow Post-Architecture method They have an assign document with a specification of what the customer wants and this document will be redact after RASD, DD and ITPD document so we have a clearly information about the product.

2.10 Scale factor

In order to evaluate the values of the scale drivers, we refer to the following official COCOMO II table:

Scale Factors	Very Low	Low	Nominal	High	Very High	Extra High
PREC	thoroughly unprecedented	largely unprecedented	somewhat unprecedented	generally familiar	largely familiar	thoroughly familiar
SF_j:	6.20	4.96	3.72	2.48	1.24	0.00
FLEX	rigorous	occasional relaxation	some relaxation	general conformity	some conformity	general goals
SF_j:	5.07	4.05	3.04	2.03	1.01	0.00
RESL	little (20%)	some (40%)	often (60%)	generally (75%)	mostly (90%)	full (100%)
SF_j:	7.07	5.65	4.24	2.83	1.41	0.00
TEAM	very difficult interactions	some difficult interactions	basically cooperative interactions	largely cooperative	highly cooperative	seamless interactions
SF_j:	5.48	4.38	3.29	2.19	1.10	0.00
PMAT	The estimated Equivalent Process Maturity Level (EPML) or					
	SW-CMM Level 1 Lower	SW-CMM Level 1 Upper	SW-CMM Level 2	SW-CMM Level 3	SW-CMM Level 4	SW-CMM Level 5
SF_j:	7.80	6.24	4.68	3.12	1.56	0.00

Precedentedness: this product is the first one that we have projected so we don't have experience in project development, the values will be low.

Development Flexibility: we can considerate this factor in two aspects:

- Need for software conformance with pre-established requirements: we have an assignment document with several implicit specifications and from this we create a Rasd document and define explicit requirements, so we have some requirements to achieve, the value of this sub-factor will be nominal.
- Need for software conformance with external interface specifications: in the project, will be necessary a communication among several different type of clients so the external interface will be well-defined for each type of client, providing specific service in base of client type, hence the value will be nominal.

The value of FLEX is based on these two parameters will be nominal.

Risk resolution: the risk plan that will be performed in the next chapter will be quite extensive and cover major aspects, the value will be high.

Team Cohesion: the team is formed by two persons that have already worked together for three projects, so the parameters constitute this factor:

- Consistency of stakeholder objectives and cultures.
- Willingness of stakeholders to accommodate other stakeholders' objectives: there is always a constructive discussion about main important point of the project.
- Stakeholder teambuilding to achieve shared vision and commitments.

All this parameter will be very high value; hence team cohesion will be very high.

Process Maturity: for define the level of our project we use CMMI, this is the first our project so in based of our experience we think that our specification can reach level 3 of CMMI certification, this set of document (RASD, DD, ITPD and PP) have the achieve of avoiding inconsistency and incoherency among processes that provide same or different service.

The result of our evaluation is the following:

Scale Driver	**Factor**	**Value**
Precedentedness (PREC)	Low	4.96
Development flexibility(FLEX)	Nominal	3.04
Risk Resolution(RESL)	High	2.83
Team Cohesion(TEAM)	Very High	1.10
Process Maturity(PMAT)	Level 3	3.12
Total		15,05

2.11 Cost driver

In order to evaluate the values of the cost drivers, we refer to the following official COCOMO II table:

Cost Drivers	Very Low	Low	Nominal	High	Very High	Extra High
RELY	slight inconvenience	low, easily recoverable losses	moderate, easily recoverable losses	high financial loss	risk to human life	
DATA		Testing DB bytes / Pgm SLOC < 10	10 ≤ D/P < 100	100 ≤ D/P < 1000	D/P > 1000	
CPLX	see Table 19					
RUSE		none	across project	across program	across product line	across multiple product lines
DOCU	Many life-cycle needs uncovered	Some life-cycle needs uncovered.	Right-sized to life-cycle needs	Excessive for life-cycle needs	Very excessive for life-cycle needs	
TIME			≤ 50% use of available execution time	70%	85%	95%
STOR			≤ 50% use of available storage	70%	85%	95%
PVOL		major change every 12 mo.; minor change every 1 mo.	major: 6 mo.; minor: 2 wk.	major: 2 mo.; minor: 1 wk.	major: 2 wk.; minor: 2 days	
ACAP	15th percentile	35th percentile	55th percentile	75th percentile	90th percentile	
PCAP	15th percentile	35th percentile	55th percentile	75th percentile	90th percentile	
PCON	48% / year	24% / year	12% / year	6% / year	3% / year	
APEX	≤ 2 months	6 months	1 year	3 years	6 years	
PLEX	≤ 2 months	6 months	1 year	3 years	6 year	
LTEX	≤ 2 months	6 months	1 year	3 years	6 year	
TOOL	edit, code, debug	simple, frontend, backend CASE, little integration	basic lifecycle tools, moderately integrated	strong, mature lifecycle tools, moderately integrated	strong, mature, proactive lifecycle tools, well integrated with processes, methods, reuse	

In the following table, we see the effort multiplier for each cost driver:

Baseline Effort Constants: **A** = 2.94; **B** = 0.91 Baseline Schedule Constants: **C** = 3.67; **D** = 0.28							
Driver	**Symbol**	**VL**	**L**	**N**	**H**	**VH**	**XH**
PREC	SF_1	6.20	4.96	3.72	2.48	1.24	0.00
FLEX	SF_2	5.07	4.05	3.04	2.03	1.01	0.00
RESL	SF_3	7.07	5.65	4.24	2.83	1.41	0.00
TEAM	SF_4	5.48	4.38	3.29	2.19	1.10	0.00
PMAT	SF_5	7.80	6.24	4.68	3.12	1.56	0.00
RELY	EM_1	0.82	0.92	1.00	1.10	1.26	
DATA	EM_2		0.90	1.00	1.14	1.28	
CPLX	EM_3	0.73	0.87	1.00	1.17	1.34	1.74
RUSE	EM_4		0.95	1.00	1.07	1.15	1.24
DOCU	EM_5	0.81	0.91	1.00	1.11	1.23	
TIME	EM_6			1.00	1.11	1.29	1.63
STOR	EM_7			1.00	1.05	1.17	1.46
PVOL	EM_8		0.87	1.00	1.15	1.30	
ACAP	EM_9	1.42	1.19	1.00	0.85	0.71	
PCAP	EM_{10}	1.34	1.15	1.00	0.88	0.76	
PCON	EM_{11}	1.29	1.12	1.00	0.90	0.81	
APEX	EM_{12}	1.22	1.10	1.00	0.88	0.81	
PLEX	EM_{13}	1.19	1.09	1.00	0.91	0.85	
LTEX	EM_{14}	1.20	1.09	1.00	0.91	0.84	
TOOL	EM_{15}	1.17	1.09	1.00	0.90	0.78	
SITE	EM_{16}	1.22	1.09	1.00	0.93	0.86	0.80
SCED	EM_{17}	1.43	1.14	1.00	1.00	1.00	

- Analyst Capability(ACAP):

  The analysis of requirements that we have computed in RASD and DD document try to cover all possible aspects of the project moreover we insert “very high” in TEAM scale factor because there is a great communication among team members so the of ACAP will be high.

Table 26. ACAP Cost Driver

ACAP Descriptors:	15th percentile	35th percentile	55th percentile	75th percentile	90th percentile	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	1.42	1.19	1.00	0.85	0.71	n/a

- Programmer Capability(PCAP):

  This evaluation is based on the whole team capability in programming, for our team the capability is nominal because we have worked at only programming project so our experience is neither low nor high, PCAP will be nominal.

Table 27. PCAP Cost Driver

PCAP Descriptors	15th percentile	35th percentile	55th percentile	75th percentile	90th percentile	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	1.34	1.15	1.00	0.88	0.76	n/a

- Personnel Continuity (PCON):

  The time for this project is limited so we set the value of this parameters very low.

Table 28. PCON Cost Driver

PCON Descriptors:	48% / year	24% / year	12% / year	6% / year	3% / year	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	1.29	1.12	1.00	0.90	0.81	

- Required Software Reliability(RELY):

  The reliability of the services is very important point for this project, a user should be performing a reservation when he wants, the major services like reservation and unlocking car must be available at any time.
  If there is a software failure maybe, we can loss the client so the RELY values is set to high.

Table 17. RELY Cost Driver

RELY Descriptors:	slight inconven-ience	low, easily recoverable losses	moderate, easily recoverable losses	high financial loss	risk to human life	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	0.82	0.92	1.00	1.10	1.26	n/a

- Database size(DATA):

  Database test should be quite large because our database should be memorizing all personal user data and providing the history payment data the database capture also all ride data for each user, DATA will be high.

Table 18. DATA Cost Driver

DATA* Descriptors		Testing DB bytes/Pgm SLOC < 10	10 ≤ D/P < 100	100 ≤ D/P < 1000	D/P ≥ 1000	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	n/a	0.90	1.00	1.14	1.28	n/a

- Product Complexity(CPLX):

  Complexity is divided into five points:
  - Control operations: the system must perform all request that clients send, only for this fact we must implement some control operation to control the incoming and outgoing stacks and the application must be supported for each type of device and system (Very-High).
  - Computational Operations: for develop the system we need to use structure like matrix and vector for controlling the queues and capture the user position for example (Nominal).
  - Device-dependent Operations: all operation I/O will be done with the simply methods GET or POST to capture the information that user sends (Low).
  - Data Management Operations: the database that we would build is a simple database containing with re-edit and change database structure is not contemplated, the DBMS manager create various type of queries (Low).
  - User Interface Management Operations: The various User interface is composed by GUI for providing the services (Low).

  Through this analysis, the value of CPLX is Nominal.

Table 20. CPLX Cost Driver

Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	0.73	0.87	1.00	1.17	1.34	1.74

- Developed for Reusability(RUSE):

  In the DD, we declare to use JEE for supporting our component architecture, one of the most advantage of using JEE is the code reusability because it's organize in "Beans" and if the customer wants another service is enough to add a new bean and create an interaction among the other ones (Very High).

Table 21. RUSE Cost Driver

RUSE Descriptors:		none	across project	across program	across product line	across multiple product lines
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	n/a	0.95	1.00	1.07	1.15	1.24

- Documentation match to life-cycle needs(DOCU):

  The documentation covers all parts of the product life-cycle (Nominal) but in RUSE we set very high so the documentation will be excessive for life-cycle needs in this way we have a fully reusability(High).

Table 22. DOCU Cost Driver

DOCU Descriptors:	Many life-cycle needs uncovered	Some life-cycle needs uncovered.	Right-sized to life-cycle needs	Excessive for life-cycle needs	Very excessive for life-cycle needs	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	0.81	0.91	1.00	1.11	1.23	n/a

- Execution Time Constraint (TIME):

  When the software system runs on server doesn't occupy much space because there isn't heavy process, the system just send/receive message (Nominal).

Table 23. TIME Cost Driver

TIME Descriptors:			≤ 50% use of available execution time	70% use of available execution time	85% use of available execution time	95% use of available execution time
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	n/a	n/a	1.00	1.11	1.29	1.63

- Main storage constraint (STOR):

  We think that the amount of storage usage is enough respect the availability of the hardware because when the software run occupy at most 50$ of available storage (Nominal).

Table 24. STOR Cost Driver

STOR Descriptors:			≤ 50% use of available storage	70% use of available storage	85% use of available storage	95% use of available storage
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	n/a	n/a	1.00	1.05	1.17	1.46

- Platform volatility (PVOL):

  Various applications don't change very often, even if the reusability of the code; maybe database maintenance every six months (Nominal)

Table 25. PVOL Cost Driver

PVOL Descriptors:		Major change every 12 mo.; Minor change every 1 mo.	Major: 6 mo.; Minor: 2 wk.	Major: 2 mo.;Minor: 1 wk.	Major: 2 wk.;Minor: 2 days	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	n/a	0.87	1.00	1.15	1.30	n/a

- Application Experience (APEX):

  The team members work on a project only one time for six months and the focus of that project is quite different from this project so the experience value will be low.

Table 29. APEX Cost Driver

APEX Descriptors:	≤ 2 months	6 months	1 year	3 years	6 years	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	1.22	1.10	1.00	0.88	0.81	n/a

- Platform Experience (PLEX):

  The team member never worked on any platform used in this project but they have a theory background on database and network platform and how these platforms are used hence the value of PLEX will be set to low.

Table 30. PLEX Cost Driver

PLEX Descriptors:	≤ 2 months	6 months	1 year	3 years	6 year	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	1.19	1.09	1.00	0.91	0.85	n/a

- Language and tool experience (LTEX):

  The team members have a theory background on programming language, networking and database management moreover the team have just worked on a programming project the value set for LTEX will be Nominal.

Table 31. LTEX Cost Driver

LTEX Descriptors:	≤ 2 months	6 months	1 year	3 years	6 year	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	1.20	1.09	1.00	0.91	0.84	

- Use of software tool (TOOL):

  We use tools for the basic life-cycle of the project, this tools support the project development, the value of TOOL will be Nominal

Table 32. TOOL Cost Driver

TOOL Descriptors	edit, code, debug	simple, frontend, backend CASE, little integration	basic life-cycle tools, moderately integrated	strong, mature life-cycle tools, moderately integrated	strong, mature, proactive life-cycle tools, well integrated with processes, methods, reuse	
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	1.17	1.09	1.00	0.90	0.78	n/a

- Multisite Development (SITE):

  The major part of the time the team is in the same building for discussing the project; so, the value of SITE will be very high.

Table 33. SITE Cost Driver

SITE: Collocation Descriptors:	Inter-national	Multi-city and Multi-company	Multi-city or Multi-company	Same city or metro. area	Same building or complex	Fully collocated
SITE: Communications Descriptors:	Some phone, mail	Individual phone, FAX	Narrow band email	Wideband electronic communicat ion.	Wideband elect. comm., occasional video conf.	Interactive multimedia
Rating Levels	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multipliers	1.22	1.09	1.00	0.93	0.86	0.80

- Requirement Development Schedule (SCED):

  The deadline for this project is fixed and the range of time for redact each document is variable, even if we are well-balanced the work the part of requirements and the component was quite long and after these parts we must accelerate to accomplish the deadline, so the value of SCED is set to high.

Table 34. SCED Cost Driver

SCED Descriptors	75% of nominal	85% of nominal	100% of nominal	130% of nominal	160% of nominal	
Rating Level	Very Low	Low	Nominal	High	Very High	Extra High
Effort Multiplier	1.43	1.14	1.00	1.00	1.00	n/a

The following table resume the results of cost driver:

Cost Driver	Rank	Value
Analyst Capability(ACAP)	High	0,85
Program. Capability(PCAP)	Nominal	1,00
Person. Continuity(PCON)	Low	1,12
Required Software Reliability(RELY)	High	1,10
Database size(DATA)	High	1,14
Product Complexity(CPLX)	Nominal	1,00
Developed for Reusability(RUSE)	Very High	1,15
Documentation match to life-cycle needs(DOCU)	High	1,11
Execution Time Constraint (TIME)	Nominal	1,00
Main storage constraint (STOR)	Nominal	1,00
Platform volatility (PVOL)	Nominal	1,00
Application Experience (APEX)	Low	1,10
Platform Experience (PLEX)	Low	1,09
Language and tool experience (LTEX)	Nominal	1,00
Use of software tool (TOOL)	Nominal	1,00
Multisite Development (SITE)	Very High	0,86
Requirement Development Schedule (SCED)	High	1,00
Total		**1.5714**

2.11 Effort estimation

The following formula permits us to calculate the effort estimation in terms of Person-Month:

$$\mathrm{Effort} = \mathrm{A} * \mathrm{EAF} * \mathrm{KSLOC}^{E}$$

A=2,94 in COCOMO II

Where EAF= $\prod_{i=1}^{17} EM_i$ =1.5714

E= exponent derived from the scale driver analysis = $\mathrm{B} + 0.01 * \sum_i SF[i]$
=0,91+0,01*15,05=1,0605

B=0,91 in COCOMO II

SLOC=5198=5,198KSLOC

So, with this parameter the effort estimation is:

Effort=2,94 * 1,5714 * 5.743KSLOC =26,532 PM=>27PM

2.12 Duration estimation

The following formula permits us to calculate the duration estimation:

$$\mathrm{Duration} = 3.67 * \mathrm{Effort}^{F}$$
$$\mathrm{F} = 0.28 + 0.2 * (\mathrm{E} - \mathrm{B})$$

F=0.28+0.2*(1.0605-0.91) = 0.3101

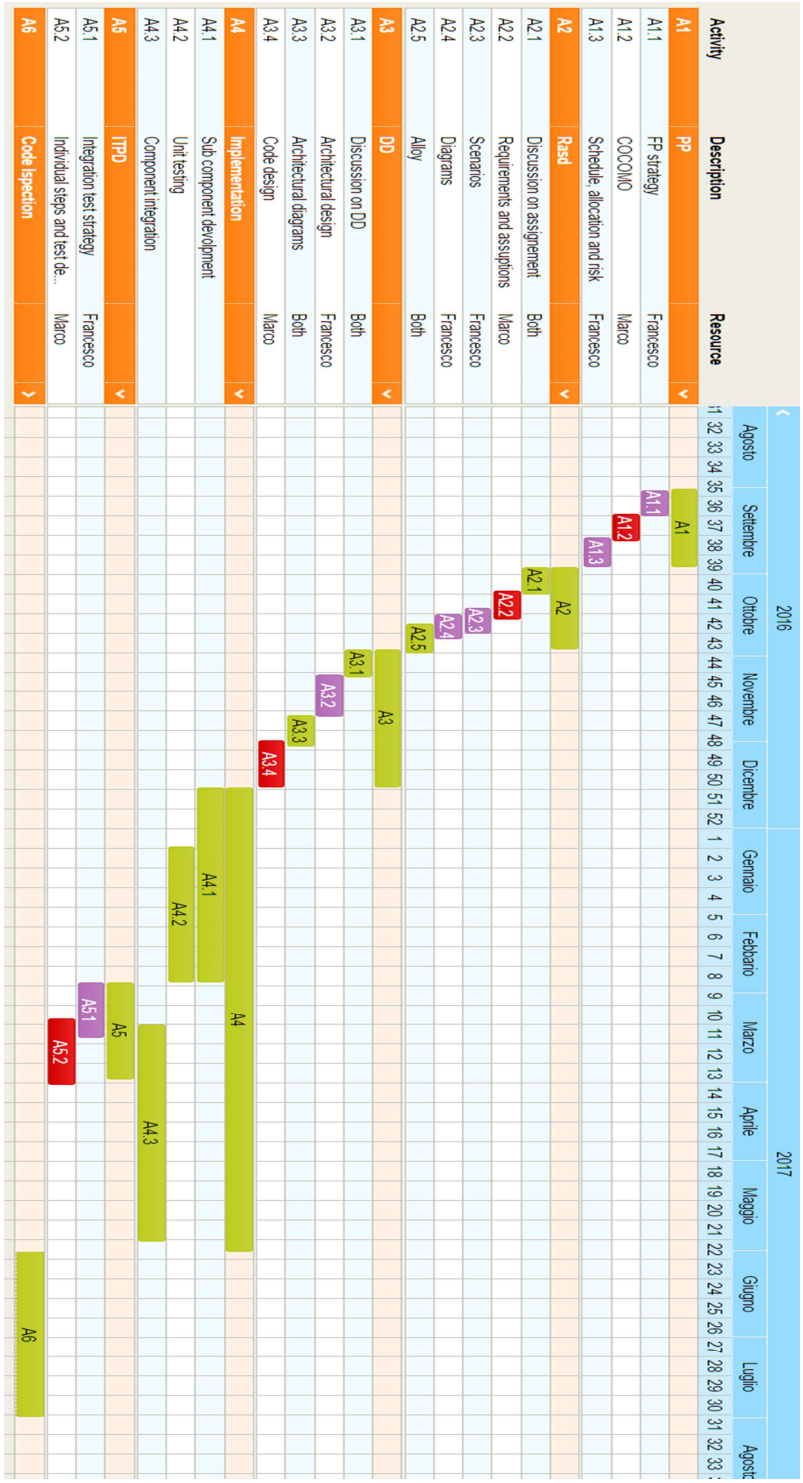
Duration= 3.67 * 26.532 PM ^ 0.3101=10,15 months => 11months

3. Schedule

In this part, we provide a scheduling of the work that we have divided in task.

Every task has been assigned or to Francesco Tinarelli or to Marco Wenzel or to both. We take in consideration the time estimation of COCOMO: 11 months.

The following graphics represent the schedule.



4. Project risk

Risk	Probability	Strategy	Effects
The Client don`t accept the requirements during the discussion after the ending of the Rasd document.	Moderate. The client can ask more than the requirements offers	Change the requirements analysis	Serious. We must redo the work on the requirements, time get shorter
The city change rules for the availability of some street in the center of the city	Moderate. It`s possible that the municipality decide to lock the traffic in some parts of the city for a better circulation.	Ask to the municipality for a normal circulation even in that part of the city.	Serious. We can lose client if we don`t find a solution with the municipality
Another company creates an electric car sharing system.	High. In this period a lot of car sharing system are springing up.	Add some functionalities that can improve the competition with the other company	Serious. We must improve functionalities for not losing client
Server belongs too slow, cause the lots of user	Low. The server can support a lot of client	Improve the server without create problem for the user.	Catastrophic. We must probably stop the service for same day due to fix the server and improve it.
Database can`t store other user, cause lots of him	Low. The database is made for lots of user	Enlarge the database	Serious. We have to pay lots for enlarge the database
The client says that the architecture we wont to realize it`s too much expensive	Low. The client tells us the maximum price, if the client doesn't change it we stay under that price	Change the architecture for stay under the established price	Catastrophic. We must redo all the previous work and reschedule all the work. Lots of time will be lost

5. Appendix

5.1 References

- Project Management Basics + Advanced Dec. 1
- 5_PPD_rev11
- Tom's planner (https://www.tomsplanner.com/)

5.2 Hours of work

Francesco Tinarelli: 12 Hours

Marco Wenzel: 12 Hours