Politecnico di Milano A.A 2016/2017

Software Engineering 2 project:

PowerEnJoy

Project Plan Document

(PP)

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Version: 1.0 Release date: 22/01/2017

Content

Chapter 1
Introduction

1.1 Revision History

Version	Date	Description
1.0	22/01/2017	Document release. First version

1.2 Purpose and Scope

This document is the Project Plan (PP) of the PowerEnJoy project.
The aim of this document is to estimate the general complexity of the PowerEnJoy project and to compute an estimate of the workload and hours needed to complete the project. The document is also a guide on the resource allocation and scheduling of each task.

The document is structured as follows:

- **Chapter 1 - Introduction:** a brief introduction of the document.
- **Chapter 2 - Function Points and COCOMO:** utilizes the Function Points and the COCOMO II approach to estimate the length of the code required to complete the project and the effort and cost related to it.
- **Chapter 3 - Tasks and Schedule:** will present the project schedule based on the values calculated in the previous chapter.
- **Chapter 4 - Resource Allocation:** assigns the projected tasks to the members of the development team.
- **Chapter 5 - Risks:** is dedicated to the individual and general risks that the project and its components possess. In this chapter risks and related possible solutions will be listed.
- **Chapter 6 - Effort Spent:** contains information about the effort spent by the group.

1.3 List of Definitions and Abbreviations

All the definitions from the previous documents remain valid. Here, only the new ones are listed.

COCOMO: Constructive Cost Model.

FP: Function Points.

ILF: Internal Logic File

ELF: External Logic File.

EI: External Input.

EO: External Output.

EQ: External Inquiries.

1.4 List of Reference Documents

All the following documents are available at the GitHub project directory: *https://github.com/AlessandroPerini/PowerEnJoy*

[1] PowerEnJoy specification document: *"ASSIGNMENTS AA 2016-2017.PDF"*.

[2] Requirements Analysis & Specification Document - *"PowerEnJoy RASD"*;
Alessandro Perini, Federico Saini, Ali M. Türkçapar.

[3] Design Document - *"PowerEnJoy DD"*;
Alessandro Perini, Federico Saini, Ali M. Türkçapar.

[4] Integration Test Plan Document - *"PowerEnJoy ITPD"*;
Alessandro Perini, Federico Saini, Ali M. Türkçapar.

[5] Function Point Language Table:
http://www.qsm.com/resources/function-point-languages-table

[6] COCOMO II Model Definition Manual:
http://csse.usc.edu/csse/research/COCOMOII/cocomo2000.0/CII_modelman2000.0.pdf

[7] Project Schedule and Resource Allocation:
https://github.com/AlessandroPerini/PowerEnJoy/tree/master/referenceDocs

Chapter 2
Function Points and COCOMO

This chapter is focused on providing an estimation of the size, cost and required effort of the PowerEnJoy project. First the project dimension will be evaluated in terms of lines of code using the function points. Then, the cost and the effort will be evaluated using the COCOMO approach.

2.1 Function Points

Function points provide an estimation of the size of the project based on the amount and complexity of the functionalities that provides. The size is estimated by quantifying the information processing functionality associated with major external data or control input, output, or file types.
To compute the size estimation the tables listed below are used.

UFP Complexity Weight	**Complexity Weight**		
Function Type	**Low**	**Average**	**High**
Internal Logic Files	7	10	15
External Interface Files	5	7	10
External Inputs	3	4	6
External Outputs	4	5	7
External Inquiries	3	4	6

Internal 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

External Output and External Inquiry		**Data Elements**	
Record Elements	**1-5**	**6-19**	**20+**
0-1	Low	Low	Avg
2-3	Low	Avg	High
4+	Avg	High	High

External Input		**Data Elements**	
Record Elements	**1-4**	**5-15**	**16+**
0-1	Low	Low	Avg
2-3	Low	Avg	High
4+	Avg	High	High

2.1.1 Internal Logic Files (ILFs)

Set of data used and managed by the system. The complexity is evaluated based on the dimension of every logic files.

ILF	Complexity	FPs
User information (credentials, payment info)	Low	7
Car information (status)	Low	7
PG information (number of plugs)	Low	7
Race/Reservation information (time, cost, MSO result)	Avg	10
Issues	Low	7
Transaction	Low	7
Information about the ending of the race	Low	7
Data coming from sensors	Low	7
Total		**59**

2.1.2 External Interface Files (EIFs)

Files passed or shared between software and external interfaces.

EIF	Coming from	Complexity	FPs
GPS position	Application	Low	5
Map Data	Application	Avg	7
Total			**12**

2.1.3 External Inputs (EIs)

Operations that elaborate data coming from the external environments and inserted by users.

External Inputs From User App

- *Registration:* this is a complex operation because involves many components that need to: check for the format of the credentials and payment information, read the database, create a random password, compile the registration email and send it. It also triggers the verification of the payment information that will be performed by the central system. For these reasons we apply 6 FPs.
- *Login:* this is a simple operation that involves only a reading of the database, for this reason we assign 3 FPs.
- *Search for a car:* a query to the database must be performed to retrieve the available cars. Then they must be sorted based on the distance from the user address. This is a simple operation that yields 3 FPs.
- *Reserve a car:* this is a simple operation that will only change the car status, create a new tuple in Race and a related process in the BackOffice. For this reason we assign 3 FPs.
- *Unlocking the reserved car:* this operation requires the Central System to check if there is a registration associated to that user and the related car and possibly contact that car. Because this operation involves many components and let interacts Central System with Car, it yields 4 FPs.
- *Report an Issue and possibly delete the reservation:* this operation only reports the issue to the Central System that will then write it in the database. Even the deletion of the race is a write operation on the database. We consider them together because the deletion of the race is possible only after an issue report. Here are applied 2x3 = 6 FPs.

External Inputs From The Car

- *Number of passengers:* this simple information is sent to the Central System before the ending of the race. It is only a data transfer so we assign to it a cost of 3 FPs.
- *Asking for the Money Saving Option:* is intended only as a request coming from the car. Then, for the same reason of the previous external input, it costs 3 FPs.
- *Report an issue from the car:* this function sends a new issue to the central system, again it is a data transfer so it will cost 3 FPs.

External Inputs From The Technician App

- *Unlocking the car with the issue:* as for the unlocking of the car by the user, the permissions must be checked and a communication between Central System and the Car must be established. For this, 4 FPs.
- *Removing the issue flag on a car:* after the issue has been physically removed, the technician remove the issue flag using the application. Only a simple data sending to the Central System is required, so 3 FPs can be applied.

External Inputs From The PGSs

- *Sending the number of free plugs:* only an information transfer from PGS to the Central System: 3 FPs.

Input Summarizing Table

EI	Complexity	FPs
External Inputs From User App		
Registration	High	6
Login	Low	3
Search for a car	Low	3
Reserve a car	Low	3
Unlocking the reserved car	Avg	4
Report an Issue and possibly delete the reservation	Avg	2x3
External Inputs From The Car		
Number of passengers	Low	3
Asking for the Money Saving Option	Low	3
Report an issue from the car	Low	3
External Inputs From The Technician App		
Unlocking the car with the issue.	Low	4
Removing the issue flag on a car.	Low	3
External Inputs From The PGSs		
Sending the number of free plugs.	Low	3
Total		**44**

2.1.4 External Outputs (EOs)

Operations that generates data for the external environments that includes a significant elaboration.

- *Show the list of available cars*: this is a simple query on the DB, we assign to it a cost of 4 FPs.
- *Show user information:* it retrieves the user credentials, the payment information and the associated races searching in the database and looking for any active race in the race processes. It yields 5 FPs.
- *Send confirmation email:* during the registration phase a mail is sent to the user, this function costs 4 FPs.
- *Notifying the time left in a reservation during a race:* this function periodically computes and shows the cost of race, as no data and no complex computation is needed, we assign it a cost of 4 FPs.
- *Show the result of MSO algorithm:* computing the best PGS to leave the car is not a simple operation because it involves queries on the DB in order to get the state of each station and the destination address of the user, also the data needs to be exchanged between the car and the central system so we assign to it a cost of 5 FPs.
- *Show the list of car with an issue:* again this operation is a simple query on the DB so it will cost 4 FPs.
- *Perform a payment:* using the Bank API this operation need only an update on the DB, the cost is 4 FPs.

EO	Complexity	FPs
External output for the User App		
Show the list of available cars	Low	4
Show user information	Low	4
Send confirmation email	Low	4
Notifying the time left in a reservation during a race	Low	4
External output for the Car		
Show the result of MSO algorithm	High	7
External output for the Technician		
Show the list of car with an issue	Low	4
External output for the Bank		
Perform a payment	Low	4
Total		**31**

2.1.5 External Inquiries (EQs)

Operations, triggered by an input request from the user, that generate data for the external environments without significant elaborations.

- *View the reserved car:* this is an operation that involves the Application and the Central System modules and a simple read operation from the database. Since there is no relevant elaborations, this can be considered as an external inquiry of low complexity.

EQ	Complexity	FPs
View the reserved car	Low	3
Total		**3**

2.1.6 Overall Estimation

Function Type	Value
Internal Logic Files	59
External Logic Files	12
External Inputs	44
External Outputs	31
External Inquiries	3
Total	**149**

Considering Java Enterprise Edition as the development platform and considering the Applications as data presentation with a little business logic, we can estimate the total number of line of code.

Using the proper JEE parameters [5] we calculate a lower and an upper bound:

$$\textit{Lower Bound SLOC} : \ 149 * 46 = 6854$$

$$\textit{Upper Bound SLOC} : \ 149 * 67 = 9983$$

2.2 COCOMO

In this chapter the COCOMO II approach is used to compute an estimation of the cost and the effort needed to develop the entire PowerEnJoy project.

The post-architecture approach is used because we already have a clear and detailed description of the architecture of the entire system. Post-Architecture is also a more detailed model that gives a better approximation of the effort needed to develop the project.

2.2.1 Scale Drivers

The following is the official table used to evaluate the scale drivers.

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

Description of each scale factor:

- PREC: it reflects the experience of our development team in this field and in this kind of projects, as we have never participated in other development projects we assign to it the low level. Assigned value: **4.96**.
- FLEX: the development flexibility reflects the possibility of derogation from the requirements and specification, in our case the requirements are very strict but no indication about the duration and cost of the project was given so we assign to it an average value of **3.04**.
- RESL: the Risk Resolution reflects the examination and awareness of all possible risks that can occur to our project, as we have deeply examined this part we assign to it the value high, **2.83**.
- TEAM: the team cohesion reflects the ability of a development team to work together for a common goal. Because this is our first project and we have a good cohesion we assign a coefficient of **2.19**.
- PMAT: the Project Maturity reflects the state of a projects with respect to requirements and goals, as we have already discussed these parts we can say that it's level is average. We assign a value of **4.68**.

Here our evaluation summarized:

Scale Factor	**Factor**	**Value**
PREC	Low	4.96
FLEX	Avg	3.04
RESL	High	2.83
TEAM	High	2.19
PMAT	Avg	4.68
Total		**17.7**

2.2.2 Cost Drivers

We are using the post-architecture approach so the cost drivers considered are the followings:

- *Required Software Reliability*: our system would not cause any physical harm in case of failure, however as we deal with people's money and data, a failure can lead to important financial losses or privacy problems so the RELY cost driver is set to nominal: **1.00**.
- *Database Size*: we will deal with an uncertain size of data (depending on the success of the project), we can set the DATA to high: **1.14**.
- *Product Complexity*: as we have many different module that form the system, we set the CPLX cost driver to high: **1.17**.
- *Required Reusability*: just a few components are intended to be reused in our project and no one should be built in order to be reused in other projects, so the RUSE cost driver is set to low: **0.95**.
- *Documentation Match to Life-Cycle Needs*: this parameter describes the relationship between the documentation and the application requirements. In our case we can set the DOCU cost driver to nominal: **1.00**.
- *Execution Time Constraint*: our system needs a lot of resources because it involves many components working in parallel, we set the CPU cost driver to high: **1.11**.
- *Storage Constraint*: for our project the storage is not a relevant problem. We do not have to store a great amount of data, so we set the STOR cost driver to nomina: **1.00**.
- *Platform Volatility*: we don't except the central system and the car softwares to change during the years, however the UI's may require some adjustment or update. For what concerns the hardware, as we consider the Cars and PGSs as physical component external to the project, we set the PVOL cost driver to nominal: **1.00**.
- *Analyst Capability*: we have spent a lot of time reasoning on the problem during the requirements and design phases so we set the ACAP cost driver to high: **0.85**.
- *Programmer Capability*: this parameter is only an estimation because we have not yet implemented the project and we do not know the team programming ability and efficiency. For this we set the PCAP cost driver to nominal: **1.00**.
- *Application Experience*: we don't have any experience with this kind of application so the APEX cost driver is set to low: **1.10**.
- *Platform Experience*: we have low experience with the Java EE and database management. Our PLEX cost driver is set to low: **1.09**.

- *Language and Tool Experience*: we have some experience with databases, user interfaces and java development so the LTEX cost driver is set to nominal: **1.00**.
- *Personnel Continuity*: the time we can spend on the project is limited so we set the PCON cost driver to low: **1.12**.
- *Usage of Software Tools*: we used some of the testing and development tools so we set the TOOL cost driver to high: **0.90**.
- *Multisite Development*: we all work on the same university campus so we set the SITE cost driver to very high: **0.86**.
- *Required Development Schedule*: we spent a lot of time in the previous phases of the project so the SCED cost driver is set to high: **1.00**.

Here the resulting table:

Cost Driver	**Factor**	**Value**
RELY	Nominal	1.00
DATA	High	1.14
CPLX	High	1.17
RUSE	Low	0.95
DOCU	Nominal	1.00
CPU	High	1.11
STOR	Nominal	1.00
PVOL	Nominal	1.00
ACAP	High	0.85
PCAP	Nominal	1.00
APEX	Low	1.10
PLEX	Low	1.09
LTEX	Nominal	1.00
PCON	Low	1.12
TOOL	High	0.90
SITE	High	0.86
SCED	High	1.00
Total		**1.243**

2.2.3 Effort Equation

The effort equation gives us a measure of the effort expressed in Person-Month to complete the entire project.

$$Effort = A * EAF * KSLC^{E}$$

where:

- $A = 2.94$
- $EAF = Product\ of\ Cost\ Drivers = 1.243$
- $E = exponent\ from\ scale\ factors = 1.087$

$$Lower\ Bound\ Effort = A * EAF * KSLOC^{E} = 2.94 * 1.243 * 6.854^{1.087} = 29.61\ PM$$

$$Upper\ Bound\ Effort = A * EAF * KSLOC^{E} = 2.94 * 1.243 * 9.983^{1.087} = 44.56\ PM$$

For the duration we will use this formula: $Dur = 3.67 * Effort^{F}$

where $F = 0.28 + 0.2 * (E - B) = 0.28 + 0.2 * 0.177 = 0.3154$

$$Lower\ Bound\ Duration = 3.67 * (29.61)^{0.3154} = 10.68\ M$$

$$Upper\ Bound\ Duration = 3.67 * (44.56)^{0.3154} = 12.15\ M$$

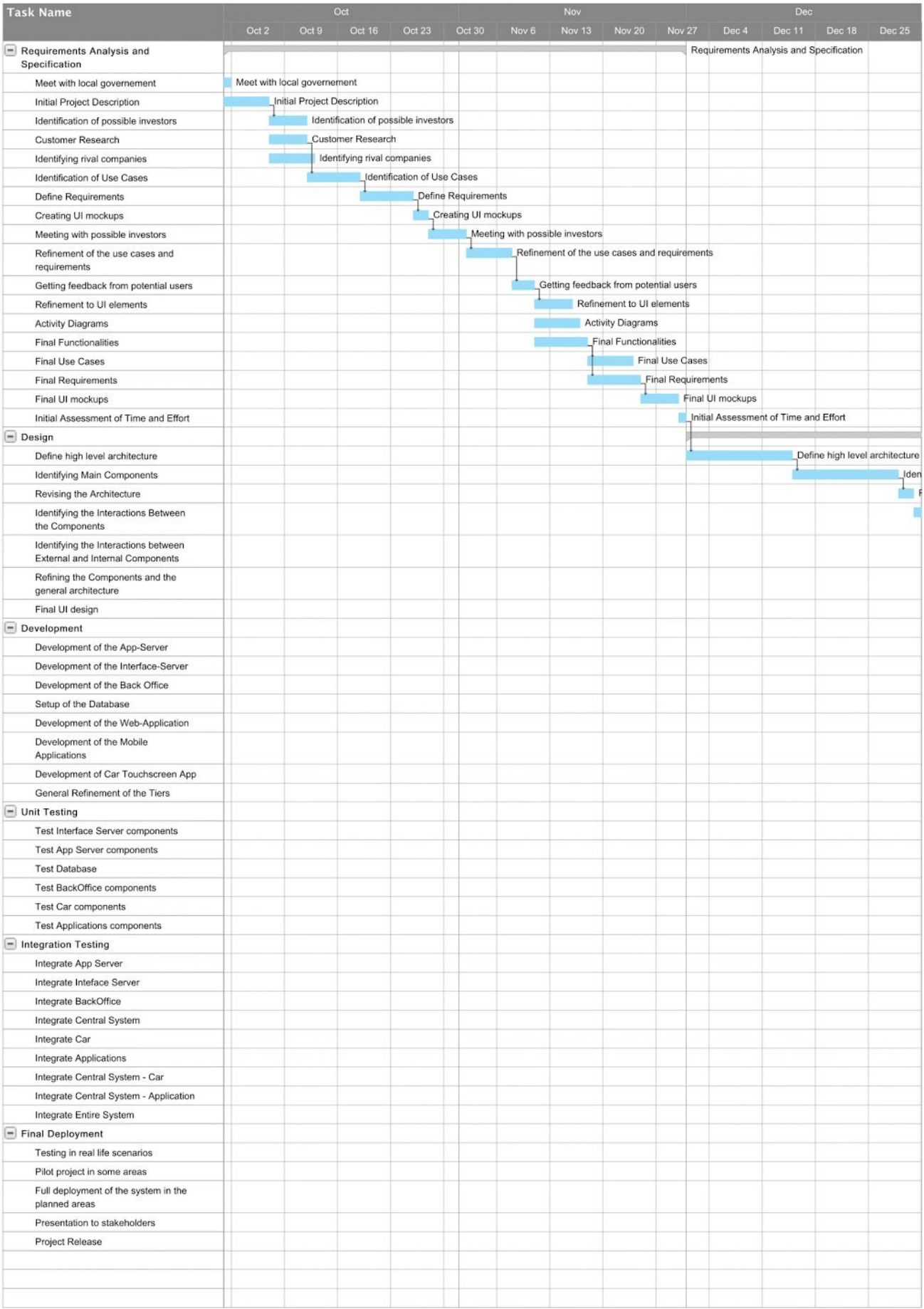
Chapter 3
Tasks and Schedule

In this chapter, a sample schedule and a set of tasks are presented. There can be additions and removals in each part in the development process. The durations of these tasks can also vary with the group working on them and various conditions.

In this section we must also tell that this schedule is only for didactic purpose and the implementation and testing are not parts of our work. The inclusion of these parts are only to improve realism of our schedule.

The schedule is presented in a Gantt chart and divided into 3 month sections to improve readability and styling.

The complete chart is available on the project repository listed in the document references [7].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Nov
Dec
Oct 2
Oct 9
Oct 16
Oct 23
Oct 30
Nov 6
Nov 13
Nov 20
Nov 27
Dec 4
Dec 11
Dec 18
Dec 25
1 Requirements Analysis and Specification
2 Meet with local governement
3 Initial Project Description
4 Identification of possible investors
5 Customer Research
6 Identifying rival companies
7 Identification of Use Cases
8 Define Requirements
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25 Identifying the Interactions between External and Internal Components
26 Refining the Components and the general architecture
27 Final UI design
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29 Development of the App-Server
30 Development of the Interface-Server
31 Development of the Back Office
32 Setup of the Database
33 Development of the Web-Application
34 Development of the Mobile Applications
35 Development of Car Touchscreen App
36 General Refinement of the Tiers
37 Unit Testing
38 Test Interface Server components
39 Test App Server components
40 Test Database
41 Test BackOffice components
42 Test Car components
43 Test Applications components
44 Integration Testing
45 Integrate App Server
46 Integrate Inteface Server
47 Integrate BackOffice
48 Integrate Central System
49 Integrate Car
50 Integrate Applications
51 Integrate Central System - Car
52 Integrate Central System - Application
53 Integrate Entire System
54 Final Deployment
55 Testing in real life scenarios
56 Pilot project in some areas
57 Full deployment of the system in the planned areas
58 Presentation to stakeholders
59 Project Release
60
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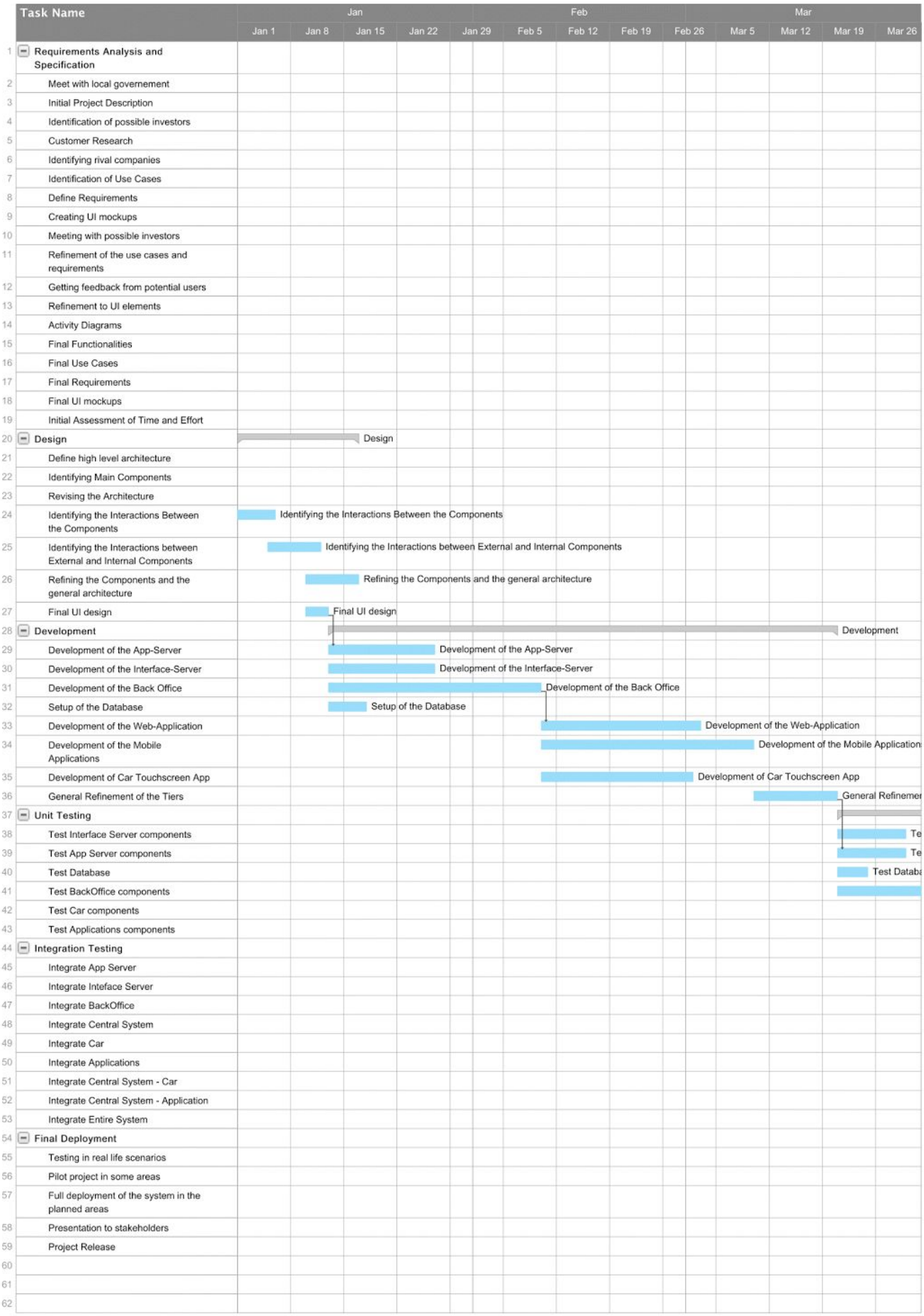
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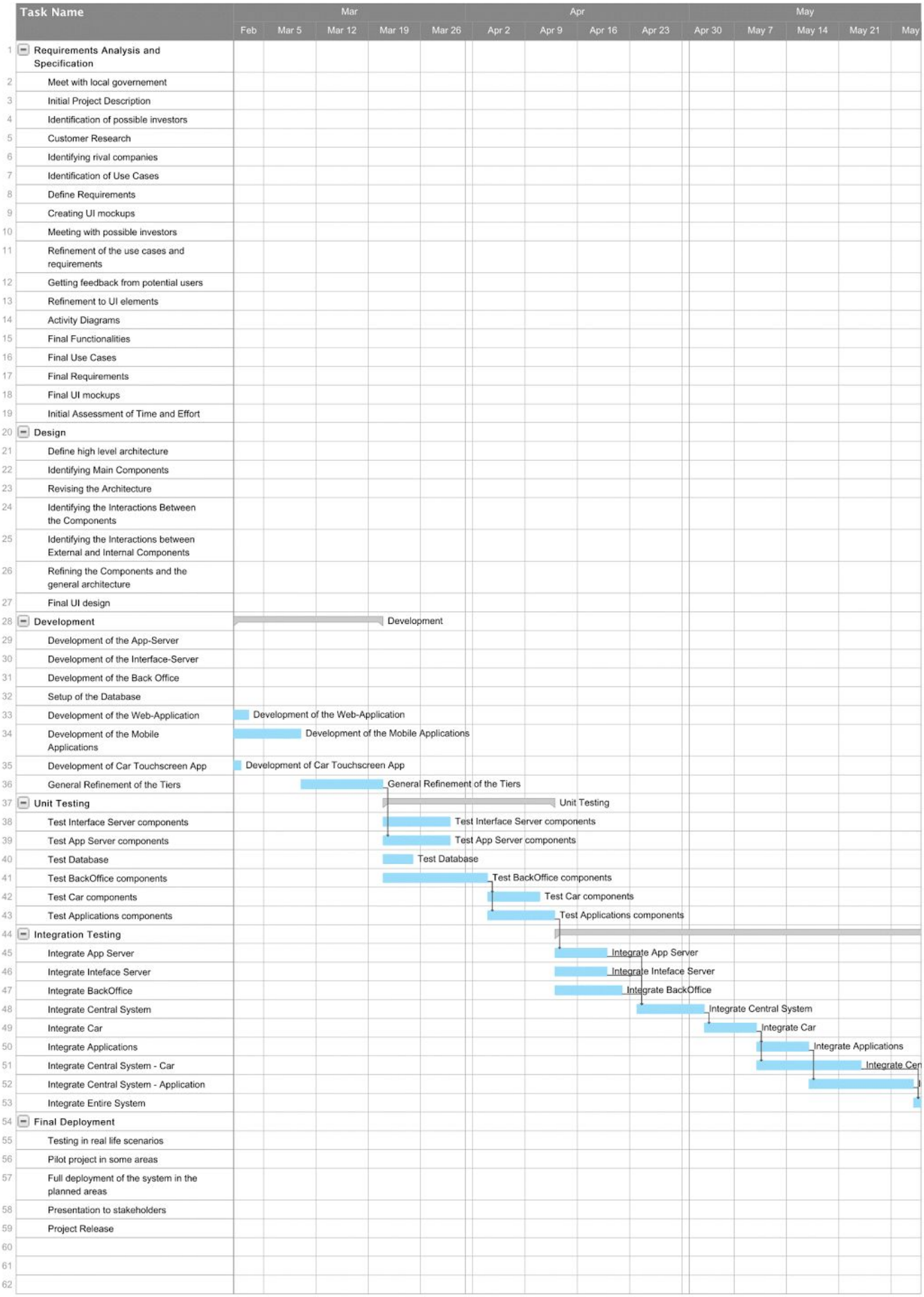
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May 14
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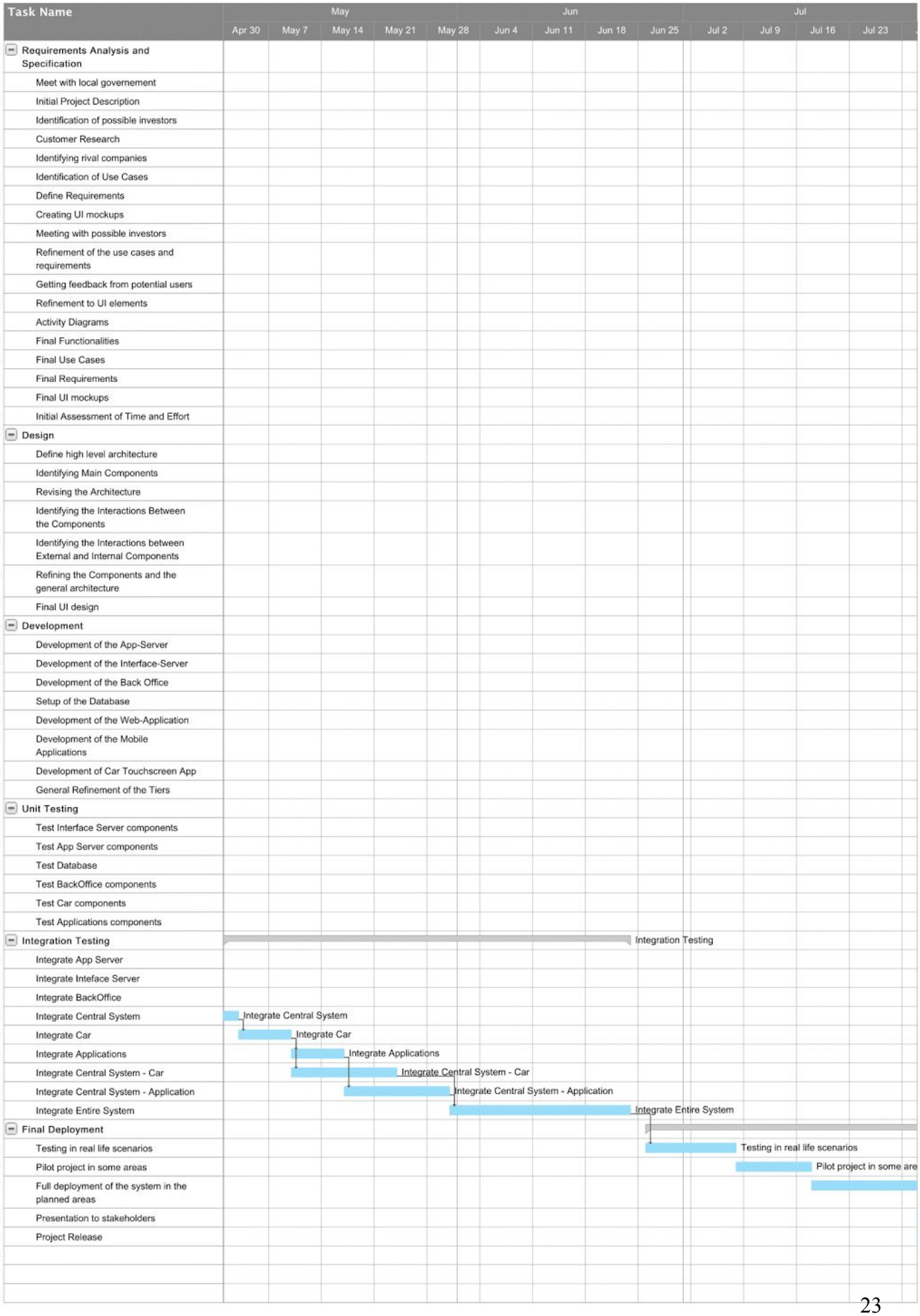
Task Name
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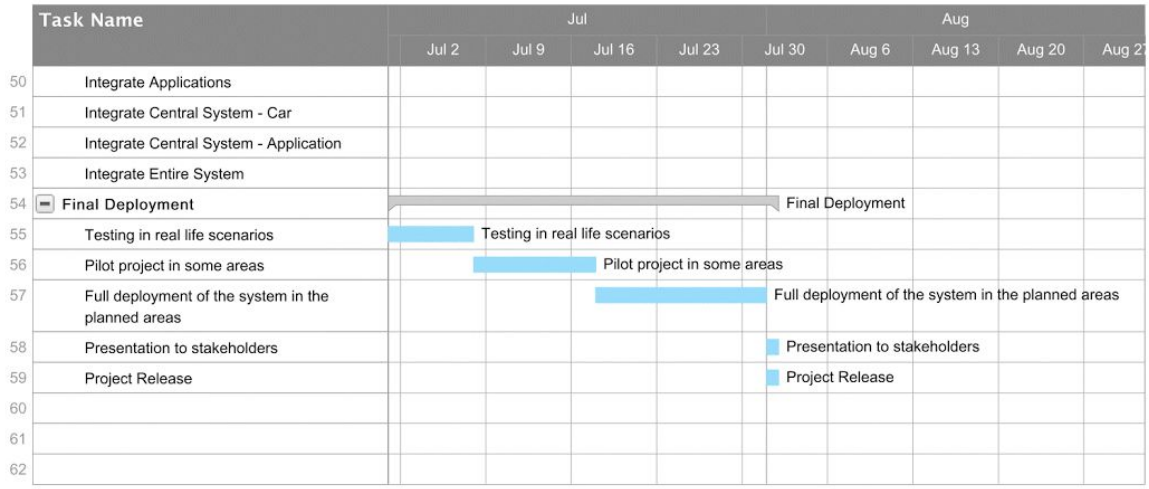
Task Name
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50 Integrate Applications
51 Integrate Central System - Car
52 Integrate Central System - Application
53 Integrate Entire System
54 Final Deployment
Final Deployment
55 Testing in real life scenarios
Testing in real life scenarios
56 Pilot project in some areas
Pilot project in some areas
57 Full deployment of the system in the planned areas
Full deployment of the system in the planned areas
58 Presentation to stakeholders
Presentation to stakeholders
59 Project Release
Project Release
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62

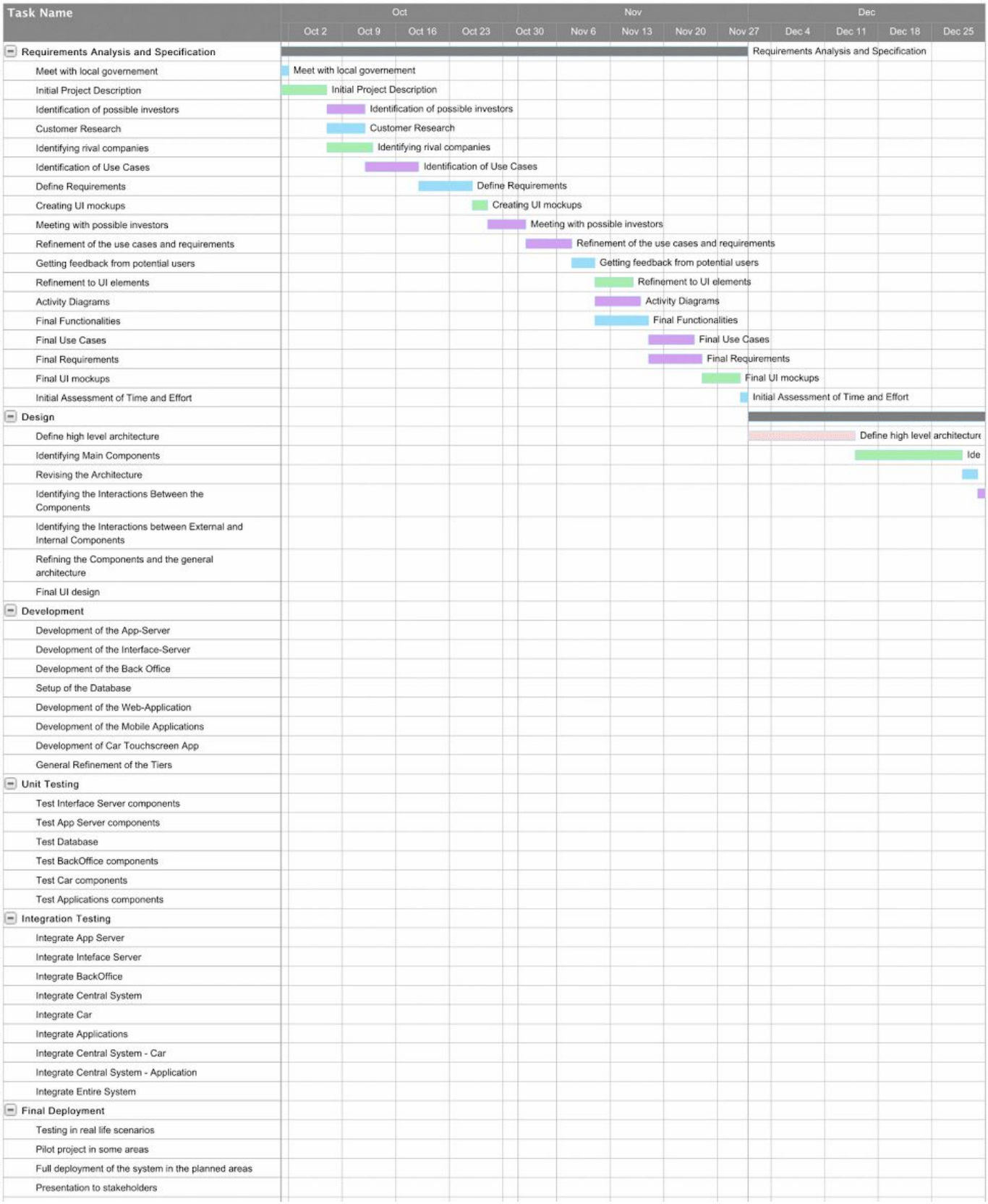
Chapter 4
Resource Allocation

In this chapter the tasks described in the Chapter 3 of the document are divided among the project members namely the contributors of this document. This allocation is just a sample one and a more detailed one shall be made during the development of each phase.

The tasks are divided into 4. Blue, green and purple represent the task that are assigned to a group member and red represents the tasks that must be discussed and done with the entire development team.

Color	**Team Member**
Blue	Federico Saini
Green	Alessandro Perini
Purple	Ali Merd Türkçapar
Red	Entire Team

As for the Project Schedule, the complete chart is available on the project repository listed in the document references [7].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Dec 18
Dec 25
1 Requirements Analysis and Specification
2 Meet with local governement
3 Initial Project Description
4 Identification of possible investors
5 Customer Research
6 Identifying rival companies
7 Identification of Use Cases
8 Define Requirements
9 Creating UI mockups
10 Meeting with possible investors
11 Refinement of the use cases and requirements
12 Getting feedback from potential users
13 Refinement to UI elements
14 Activity Diagrams
15 Final Functionalities
16 Final Use Cases
17 Final Requirements
18 Final UI mockups
19 Initial Assessment of Time and Effort
20 Design
21 Define high level architecture
22 Identifying Main Components
23 Revising the Architecture
24 Identifying the Interactions Between the Components
25 Identifying the Interactions between External and Internal Components
26 Refining the Components and the general architecture
27 Final UI design
28 Development
29 Development of the App-Server
30 Development of the Interface-Server
31 Development of the Back Office
32 Setup of the Database
33 Development of the Web-Application
34 Development of the Mobile Applications
35 Development of Car Touchscreen App
36 General Refinement of the Tiers
37 Unit Testing
38 Test Interface Server components
39 Test App Server components
40 Test Database
41 Test BackOffice components
42 Test Car components
43 Test Applications components
44 Integration Testing
45 Integrate App Server
46 Integrate Inteface Server
47 Integrate BackOffice
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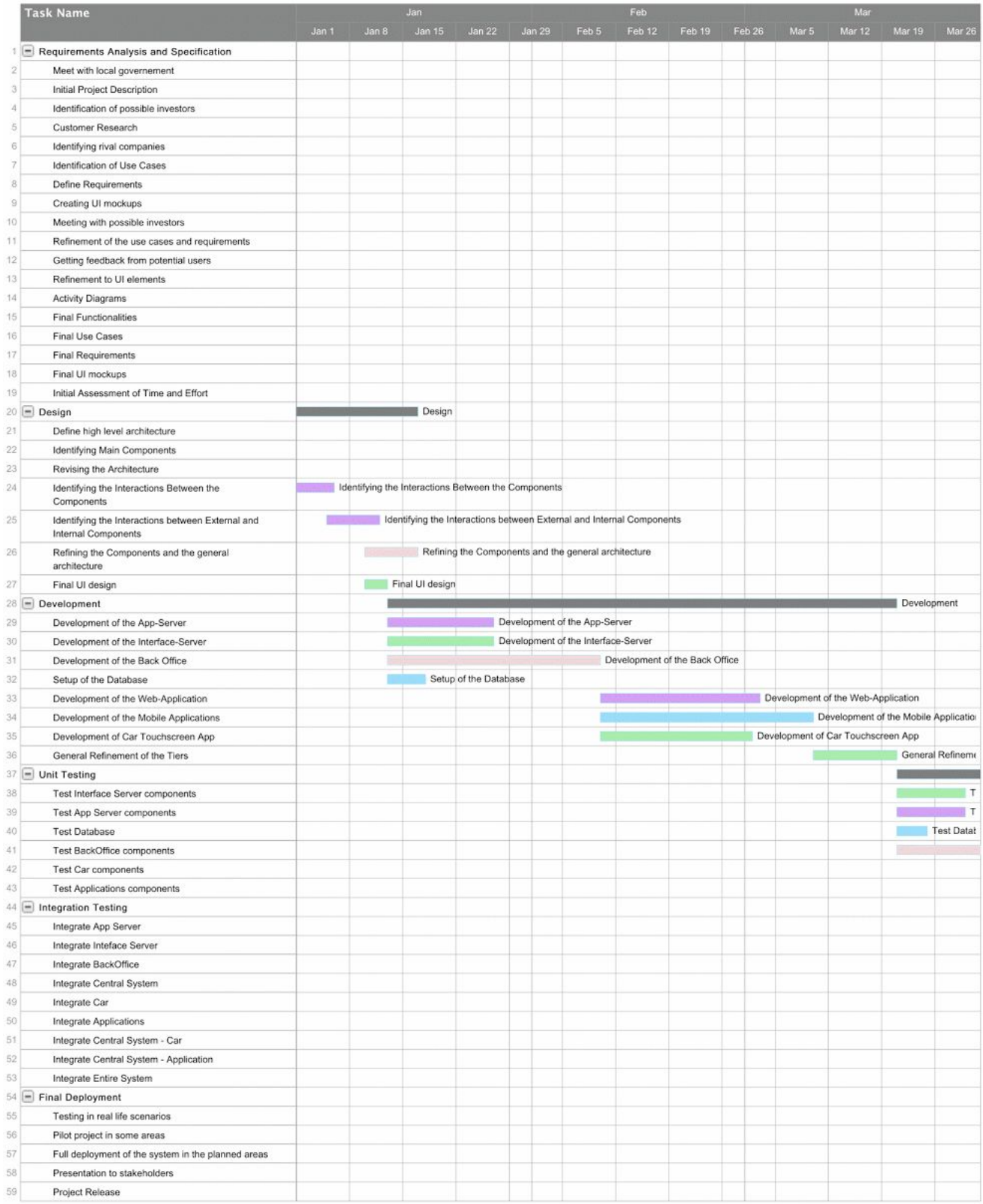
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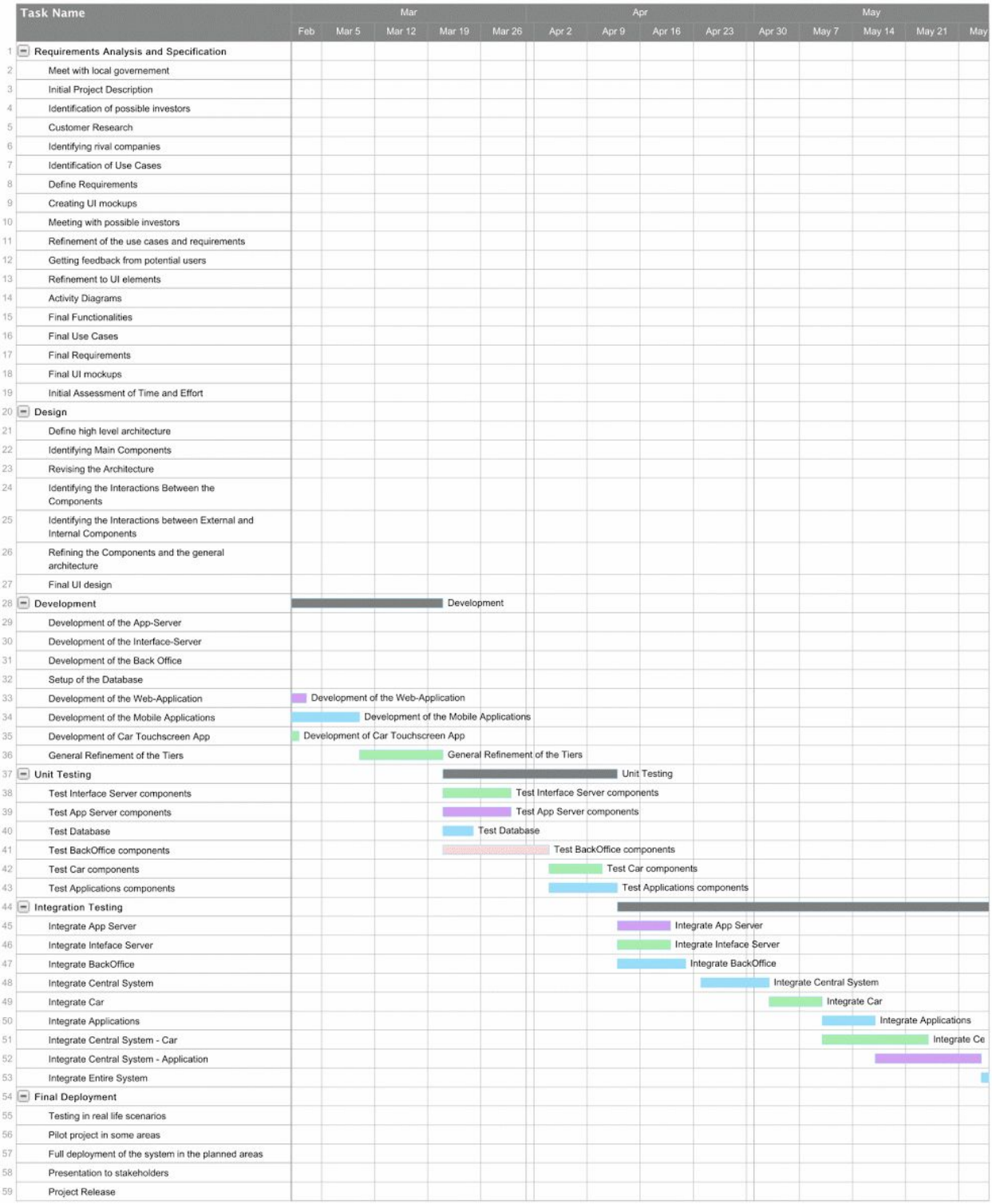
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Chapter 5
Risk Management

This section is devoted to the risks that the project and its components possess, also will speculate on their probabilities, ways to avoid them and provide some solutions. These risks can be classified as project, technical and business risks.
In the following tables, the most relevant risks are presented along with predicted probabilities and effects. For every risk, a strategy that can be used to avoid the risks or minimize their effects is presented.

5.1 Project Risks

These are risks that threaten the project plan. If a project risk happens, it is likely that the project schedule will slip and the costs will increase.

Project Risks				
ID	**Risk**	**Probability**	**Effects**	**Solution**
PR1	Key project members leaving their jobs.	High	Catastrophic	Assign multiple people to each task, organize the group meetings to give each member knowledge about what each person is doing. Maintain good communication between members and management to foresee the leaves and organize replacements.
PR2	Members are absent in critical moments.	Moderate	Serious	
PR3	Design Failures that will require major design changes.	Low	Catastrophic	Spend more time for the design phase and during that try to forecast possible problems.
PR4	Fail to achieve milestones.	Moderate	Critical	Try to identify the milestones that require more resources and create a plausible schedule. If a problem occurs during the project, try to allocate more people to achieve the milestone. If this is not possible try to cut out the less important functionalities to decrease the amount of work and insert it in a future software version.

5.2 Business Risks

These risks threaten the viability of the software product. The happening of one of this risks could make the project worthless. They are strictly related to the economical success or unsuccess of the project.

Business Risks				
ID	**Risk**	**Probability**	**Effects**	**Solution**
BR1	Failure to provide competitive pricing.	Moderate	Serious	Try to reduce the costs of the ride by researching about alternatives coming up with new price plans.
BR2	A competitor releases a similar product.	Moderate	Serious	Try to decrease the price if the competitor offers a better one. If it is not possible, try to find the product characteristics that make our product better and highlight it in the advertises.
BR3	The project fails to attract customers. Poor user feedback and commitment.	Moderate	Catastrophic	Provide discounts for the first time users and for the ones who invite their friends and share about the service in social media. Highlight in the advertising the benefits that the use of the service provides.
BR5	City Legislation changes.	Low	Serious	Try to apply little changes on the terms of use document if the legislation modification refers to the use of the system. If it does not resolve the problem, try to negotiate a special licence for the service with the legislators.

5.3 Technical Risks

Technical risks threaten the quality of the software to be product. If they become real, implementation may become difficult or impossible.

Technical Risks				
ID	**Risk**	**Probability**	**Effects**	**Solution**
TR1	The hardware of the car fails.	Low	Serious	Make deals with the maintenance company for regular maintenance. Try to stipulate with it an insurance that will cover possible car issues.
TR2	Losses in database.	Moderate	Catastrophic	Keep multiple database backup copies.
TR3	Loss of source code.	Low	Catastrophic	Keep multiple copies of the source code and different versions of it.
TR4	Hacking of the system.	Moderate	Serious	Obtain better security measures, keep up with new technology and security updates.
TR5	Integration failures between the modules.	Moderate	Catastrophic	Try to think about modules communication in the design phase. If the failure occurs during the integration phase try to find a solution without changing the system design.
TR6	Problems (hardware, power, communication) on the Power Grid Stations.	Low	Serious	Maintain a close relationship with the power suppliers to know about planned shut downs and take precautions.

TR7	Legislation on Driving License changes.	Low	Moderate	No problem for the already existing ones. Must only be modified the authentication component in order to let it able to verify the new Driving Licences.
TR8	Failure of transaction due to banking failures.	Low	Moderate	Contact immediately the bank and if the problem is only about the communication between the system and the bank, continue to provide the service postponing the bank transactions.
TR9	Unavailability of the Google Maps service	Low	Negligible	Make an alternative component that will replace the Google Maps service and will provide the basic functionality in order to let the map service available and the system usable.
TR10	Poor hardware performance on the Central System (Database and Server problems).	Low	Serious	Buy better alternatives or investigate ways to optimize the server flow.
TR11	System is too difficult to use by the average users	Moderate	Serious	Revisit the design based on customers feedbacks.
TR12	Cars get stolen.	Moderate	Serious	Get car insurances and keep a good contact with public services and the police.

Chapter 6
Effort Spent

Date	Description	Perini	Saini	Türkçapar
16/01/2017	Team Work	2h	2h	2h
16/01/2017	Risk Management			2h
17/01/2017	Team Work	3h	3h	3h
19/01/2017	Finished Risks Chapter	1h		
20/01/2017	Team Work	2h	2h	2h
21/01/2017	Team Work	3h	3h	3h