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Assignment 5: Project Plan

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Alessandro Baldassari (mat. 841561)
Alberto Bendin (mat. 841734)
Francesco Giarola (mat. 840554)

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1 Introduction

1.1 Purpose and Scope

The main purpose of the project plan is to plan time, cost and resources adequately to estimate the work needed and to effectively manage risk during project execution. A failure to adequately plan reduces the project's chances of successfully accomplishing its goals.

Project planning generally consists of:

- Identifying deliverables and creating the work breakdown structure;
- Identifying the activities needed to complete those deliverables and networking the activities in their logical sequence;
- Estimating the resource requirements for the activities;
- Estimating time and cost for activities;
- Developing the schedule;
- Developing the budget;
- Resource allocation (organization of work loads);
- Risk planning.

This document is based on an analysis made with two different algorithmic metrics of the system for *myTaxiService*. The first one is the Function Points (FP), which is used to estimate the software dimension (code size), which is directly used to evaluate the cost. The second is the COCOMO II that is used to estimate the efforts required in the development of a project by taking in account: characteristics of people, products and process.

1.2 List of Definitions and Abbreviations

The following acronyms are used in this document:

- FP: Function Points
- COCOMO: COnstructive COst MOdel
- ILF: Internal Logic File
- EIF: External Interface File
- PM: Person-Months
- SLOC: Source Lines of Code
- KSLOC: Thousands of SLOC
- SD: Scale Drivers

The following definitions are used in this document:

- Deliverables: are work that are delivered to the customer, e.g. a requirement document for the system.

2 Function Point analysis

2.1 Introduction

The Function Point estimation approach is based on the amount of functionalities in a software and their complexity. Indeed the effort to develop a software project grows with the number of external inputs and outputs, user interactions, files and interfaces used by the system; therefore a weight is associated to all these functionalities and the total effort is computed summing all the partial values.

The parameters used to perform this estimation are summarized in the following tables, taken from COCOMO II, Model Definition Manual at:
http://csse.usc.edu/csse/research/COCOMOII/cocomo2000.0/CII_modelman2000.0.pdf

The schema below defines the weights assigned to every level of complexity for all the FP types.

Table 3. UFP Complexity Weights

Function Type	Complexity-Weight		
	Low	Average	High
Internal Logical Files	7	10	15
External Interfaces Files	5	7	10
External Inputs	3	4	6
External Outputs	4	5	7
External Inquiries	3	4	6

Here is a brief explanation of the FP types:

- Internal Logic File: homogeneous set of data used and managed by the application
- External Interface File: homogeneous set of data used by the application but generated and maintained by other applications
- External Input: elementary operation to elaborate data coming from the external environment
- External Output: elementary operation that generates data for the external environment (it usually includes the elaboration of data from logic files)
- External Inquiry: Elementary operation that involves input and output (without significant elaboration of data from logic files)

2.2 FP types estimation

- ILF

Functionalities	**Complexity**	**FP Count**
Users	Simple	7
Ride	Complex	15
Request	Medium	10
Zone	Medium	10
Taxi	Simple	7
Payment-Receipts	Simple	7
Total:		56

- EIF

Functionalities	**Complexity**	**FP Count**
Payment Data	Medium	7
Google Maps	Medium	7
Push notification metadata	Simple	5
Total:		19

- Ext. INPUT

Functionalities	**Complexity**	**FP Count**
Login	Simple	3
SignUp	Simple	3
Create request	Simple	3
Pay	Medium	4
Delete request	Complex	6
Set taxi availability	Simple	6
Accept/reject ride request	Simple	3
Update taxi position	Simple	3
Managers taxi drivers	Medium	4
Create ride	Complex	6
Allocate taxi	Complex	6
Total:		44

- Ext. INQUIRY

Functionalities	**Complexity**	**FP Count**
Request history	Simple	3
Manage profile	Simple	3
Ride history	Simple	3
Public API	Medium	4
DB	Medium	4
Total:		17

- Ext. OUTPUT

Functionalities	**Complexity**	**FP Count**
SMS	Medium	4
Email	Simple	4
PushNotification	Simple	4
Zone	Simple	10
Total:		17

The total number of FPs it then 153.

3 COCOMO II analysis

3.1 Introduction

This estimation is achieved through a complex, statistical model that takes in account the characteristics of the product but also of people and process. The result of this technique is the estimation of Person-Months required to develop the project.
The COCOMO II calculations are based on the estimated of the software dimension in source lines of code (SLOC).

4 Tasks identification and schedule

5 Resources allocation

6 Risk planning and management

7 References

Material from Wikipedia

- Project management: https://en.wikipedia.org/wiki/Project_management#Planning

8 Appendix

8.1 Software and tools used

- TeXstudio 2.10.6 (http://www.texstudio.org/) to redact and format this document.
- Astah Professional 7.0 (http://astah.net/editions/professional)

8.2 Hours of work

The time spent to redact this document:

- Baldassari Alessandro: 12 hours.
- Bendin Alberto: 12 hours.
- Giarola Francesco: 12 hours.