Project Reporting

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Contents

1 Introduction

In this document we will analyse the project we developed, first presenting the actual data regarding the project, as its size and the duration, and then comparing our data with the *Function Points* method and the *COCOMO II* method.

2 Project data

2.1 Size

The project's size was calculated on the following folder ignoring eventual XML files.

`meteocal-se2/src/main/`

Only actual code lines were counted, while comments and blanks were ignored.

Type	**Size in SLOC**
Java	1260
JSF	322
Total	**1582**

2.2 Time

We consider in this section only the time spent working on the `meteocal-se2` project and not on testing the other project.
The duration in hours was estimated at the end of each phase but it still is an approximation.

Phase	**Duration in hours**
RASD	20
DD	18
Implementation	75
Total	**113**

These 113 hours span approximately across 2 months.

3 Function Points

3.1 Premise

In the following FP analysis we will use the table below to evaluate the weights of the function types.

Function Types	**Weight**		
	Simple	Medium	Complex
Inputs	3	4	6
Outputs	4	5	7
Inquiry	3	4	6
ILF	7	10	15
EIF	5	7	10

3.2 Internal Logic File

In our application we use three main entities: User, Event and Notification.

Data	**Weight Type**	**Weight**
User	Medium	10
Event	Medium	10
Notification	Simple	7
Total	**27 FPs**	

3.3 External Interface File

The application retrieves externally only the weather forecast through a third party library.

Data	Weight Type	Weight
Weather	Simple	5
Total	**5 FPs**	

3.4 External Input

The application external input comes from its users.

Interaction	Weight Type	Weight
Sign up	Medium	4
Login	Simple	3
Logout	Simple	3
Create event	Complex	6
View event	Simple	3
Update event	Simple	3
Delete event	Simple	3
Accept invitation	Simple	3
Refuse invitation	Simple	3
View notification	Simple	3
Total	**34 FPs**	

3.5 External Output

No data is generated for the external environment.
We consider this as **0 FPs**.

3.6 External Inquiry

Operation	Weight Type	Weight
Retrieve notifications	Simple	3
Retrieve events	Simple	3
Retrieve event details	Medium	4
Total	**10 FPs**	

3.7 Final Result

Category	FPs
ILF	27
EIF	5
External Input	34
External Output	0
External Inquiry	10
Total	**76 UFPs**

We consider the AVC parameter for Java (and JSF) to be the mean of the 4GL interval, which is 2-40, we obtain thus

$$\textbf{AVC} = 21$$

We can now calculate the LOC estimate given by the FP method.

$$\textbf{LOC} = AVC \times FPs = 21 \times 76 = 1596$$

We can observe that the estimated FP LOC count is close to the actual SLOC count which is 1582.

3.8 Conclusions

We can see that our project and in particular its functionalities are aligned with the model given by the Function Points method.
The final weight of the project in UFPs and the associated LOC count are quite close to the actual complexity of the project and its size.
We still feel the need to point out that the results of the Function Points method are greatly influenced by the Function Types Weights table chosen for the analysis and the AVC parameter chosen for the language.

4 COCOMO II

4.1 Premise

In the following COCOMO II analysis we will use the following table, derived from the *COCOMO II.2000.0 Model Manual*. The table is table 62 and can be found at page 75.
We will highlight in bold the values chosen for our analysis.

Baseline Effort Constants: **A** = 2.94; **B** = 0.91							
Baseline Schedule Constants: **C** = 3.67; **D** = 0.28							
Driver	**Symbol**	**Very Low**	**Low**	**Nominal**	**High**	**Very High**	**Extra High**
PREC	SF1	6.20	4.96	**3.72**	2.48	1.24	0.00
FLEX	SF2	5.07	4.05	**3.04**	2.03	1.01	0.00
RESL	SF3	7.07	5.65	**4.24**	2.83	1.41	0.00
TEAM	SF4	5.48	4.38	3.29	2.19	1.10	**0.00**
PMAT	SF5	7.80	**6.24**	4.68	3.12	1.56	0.00
RELY	EM1	0.82	**0.92**	1.00	1.10	1.26	
DATA	EM2		**0.90**	1.00	1.14	1.28	
CPLX	EM3	0.73	**0.87**	1.00	1.17	1.34	1.74
RUSE	EM4		**0.95**	1.00	1.07	1.15	1.24
DOCU	EM5	0.81	0.91	**1.00**	1.11	1.23	
TIME	EM6			**1.00**	1.11	1.29	1.63
STOR	EM7			**1.00**	1.05	1.17	1.46
PVOL	EM8		**0.87**	1.00	1.15	1.30	
ACAP	EM9	1.42	1.19	1.00	**0.85**	0.71	
PCAP	EM10	1.34	1.15	1.00	**0.88**	0.76	
PCON	EM11	1.29	1.12	1.00	0.90	**0.81**	
APEX	EM12	1.22	**1.10**	1.00	0.88	0.81	
PLEX	EM13	1.19	**1.09**	1.00	0.91	0.85	
LTEX	EM14	1.20	1.09	**1.00**	0.91	0.84	
TOOL	EM15	1.17	1.09	1.00	0.90	**0.78**	
SITE	EM16	1.22	1.09	**1.00**	0.93	0.86	0.80
SCED	EM17	1.43	1.14	**1.00**	1.00	1.00	

4.2 Effort

The effort required for the project can be calculated as

$$\textbf{Effort} = A \times KLOC^{E} \times EAF$$

With

$$E = B + 0.01 \times \sum_{i=0}^{5} SF_i$$

and

$$EAF = \prod_{i=0}^{17} EM_i$$

The $KLOC$ parameter is simply the SLOC size of the project divided by 1000, so we will use 1.58.

We obtain the following values

$$E = 0.91 + 0.01 \times 17.24 = 1.0824$$
$$EAF \approx 0.34$$

The effort is thus

$$\textbf{Effort} = 2.94 \times 1.58^{1.0824} \times 0.34 \approx 1.64 \text{ person-months}$$

4.3 Duration

The duration of the project can be calculated as

$$\textbf{Duration} = C \times Effort^{(D+0.2\times(E-B))}$$

We have then

$$\begin{aligned}\textbf{Duration} &= 3.67 \times 1.64^{(0.28+0.2\times(1.0824-0.91))} \\ &= 3.67 \times 1.64^{0.31447} \approx 4.28 \text{ months}\end{aligned}$$

4.4 Staffing

Having calculated the effort required for the project and the duration of the project we can see how many members should be assigned to the project.
We simply have to proceed as follows

$$\textbf{Members} = Effort/Duration$$

We obtain thus

$$\textbf{Members} = 1.64/4.28 \approx 0.38 \text{ persons}$$

We need to assign one person to this project.

Using the real duration of the project

$$\textbf{RealDuration} \approx 2 \text{ months}$$

and keeping the effort the same the *Members* requirement quickly grows while still being approximated by one person as we can see below

$$\textbf{Members} = 1.64/2 = 0.82 \text{ persons}$$

4.5 Conclusions

All the results of this analysis are influenced by the choices made for the drivers parameters and, being this the first cost estimation made by us on a project, some inaccuracies may be present.
Having said this we think that the results of the COCOMO II method reflect the reality in which the project was developed.
We think that the duration of the project, as given by our calculations, is somewhat too high but if it had been adopted it would have led to less day by day weight on the developer as highlighted by the members parameter.

5 Informations

5.1 Sources used

Project Management Criticals: Cost Estimation by
Damian Andrew Tamburri, for the Function Types Weight table.
`Available on BeeP`

COCOMO II Model Definition Manual for the COCOMO drivers table and the formulas definitions
`http://csse.usc.edu/csse/research/COCOMOII/cocomo2000.0/CII_modelman2000.0.pdf`

5.2 Tools used

Texmaker 4.1 to write this document.
`http://www.xm1math.net/texmaker/`

LaTeX Table Generator to create some tables.
`http://www.tablesgenerator.com/`

Cloc 1.60 to count code lines.
`http://cloc.sourceforge.net/`