Meteocal

Total Developing Hours

Software Engeneering 2

A.A. 2014/2015

Fabrizio Ferrai
Germano Gabbianelli
Andrea Grazioso

9 febbraio 2015

Parte I
Stima con UFP

1 Analisys

We are able to split functionalities of CalCARE in 5 categories classifing them on the complexity level, accordingly to the *function point* schema. The weighted average for each category and for each level of complexity permit us to define an evauation of the KLOC.

Tabella 1: Legend FP symbols

Simbol	Meaning
s	simple functionality
m	medium functionality
c	complex functionality

1.1 Internal logic file

Dataset of the application accessed via Database interactions.

Tabella 2: FP per ILF

File	Points
users	**1s**
events	**1s**
forecasts	**1s**
events_forecasts	**1s**
cities	**1s**
notification_type	**1s**
weather_conditions	**1s**
notifications	**1s**
partecipations	**1s**
calendars	**1s**
Total	**10s**

1.2 External logic file

Set of data generated and/or managed by external entities.

Tabella 3: FP per ILF

File	Points
forecasts	**1m**
Total	**1m**

1.3 External input

Elaboration from external sources including feebacks without elaboration.

Tabella 4: FP per EI

Functions	Points
Login, logout	**2s**
Registration and confirmation	**2s**
Password Retrieval/Reset	**2s**
Event invitation	**1s**
Event creation/modification	**1m**
Event delete	**1s**
Calendar view	**2s**
Total	**10s+1m**

1.4 External output

Set of operation that generate data for external use.

CalCARE does not provide this sort of output.

1.5 External inquiry

Elementar operations which produce data in reply to an external input, without meaningful elaboration.

Tabella 5: FP per EInq

Inquiry	Points
User search	**1s**
Event Detail	**1s**
Settings	**1s**
Total	**3s**

2 Recap

What follow is a brief recap of the UFPs and the associate conversions to KLOC.

Tabella 6: Summary FP per category

Category	Points	Weight
Internal logic file	**10s**	$10 \times 7 = 70$
External logic file	**1m**	$1 \times 4 = 4$
External input	**10s+1m**	$10 \times 3 + 1 \times 4 = 34$
External output	**0**	0
External Inquiry	**3s**	$3 \times 3 = 9$
Total	**–**	117 UFP

Assuming the coefficient and values of $^{LOC}/_{UFP}$ as reported in the following tables and assuming that the project as been implemented in the majority in java, followed by javascript and a little part of HTML, we are able to derive an evaluation of the KLOC

Tabella 7: FP Constants

Category	**s**	**m**	**c**
Internal logic file	*7*	10	15
External logic file	5	7	10
External input	*3*	*4*	6
External output	4	5	7
External Inquiry	*3*	4	6

Tabella 8: Conversion table $^{LOC}/_{UFP}$

Language	$^{LOC}/_{UFP}$
Java	53
Javascript	47
HTML	34

Tabella 9: KLOC Calculation Table

Language	Estimated Ratio
Java	0.75
Javascript	0.2
HTML	0.05

As result:
$(0.75 \times 53 + 0.2 \times 47 + 0.05 \times 34) loc/ufp \times 117 ufp = 5,9 kloc$

Parte II
Hour count

3 Code

3.1 Data

Tabella 10: Sintetic hour count per person

Person	Hours count	Equivalent days/worker
Ferrai	78h	13
Gabbianelli	82h	14
Grazioso	69h	12
Totale	229h	

3.2 Metrics

The finite project counts:

Tabella 11: Line of codes count

Language	Line of codes
Java	3865
Javascript	675
HTML	491
Totale	5031

3.2.1 CoCoMo II

Following the CoCoMo model:

$$S = 5.031, \quad \begin{cases} Effort = 2.49 \times 1.0 \times S^{1.0997} \approx 14.71 & Men/Month \\ Duration = 3.67 \times Effort^{0.3179} \approx 8.62 & Month\,of\,work \\ N = \frac{M}{T} \approx 1.70 & \#\,of\,team\,member \end{cases}$$

According to the model there should have been 2 person at work for 8 month.

Note: Our numbers are quite different because of several reason, first of all that our student condition doen't allow us to work as real developers.

3.3 Considerations

The real KLOC are about 15% more than the one calculated by UFPs, but we can assume that the evaluation is enough accurate.

4 Documentation

Apart from code, the documentation part of work has been splitted as follow:

Tabella 12: Documentation hour count

Activity	Ferrai	Gabbianelli	Grazioso
Documentation	1	1	1
Web-repository mantainance	–	0.5	–
Installation Manual	0.5	0.5	2
Hour count	–	–	2
Total	1.5	2	5