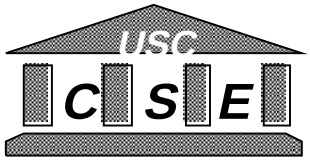
USC

User Manual

COCOMO II.2000
Post-Architecture Model
Spreadsheet Implementation
(Microsoft Excel 1997)

Center for Software Engineering
University of Southern California



Manual for the Spread Sheets of Post-Architecture Model

I. Explanation of COCOMO Spreadsheet Manual for Post Architecture Model

There are 24 spreadsheets in this COCOMO Spreadsheet Post Architecture Model. The users can find the following information at this manual.

- the functions of each spreadsheet
- the functions and operations of some specific cells
- the specific linkages of the factors in the spreadsheets

The Sources Of The Rating Values And The Formula

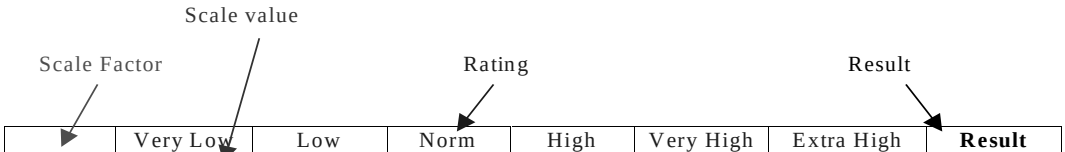
Rating Values : COCOMO manual
Sunita Chulani

Formula : COCOMO Manual

PostArch

Scale Factor (SF) Section

This section contains Scale Factors : PREC, FLEX, RESL, TEAM, and PMAT.
For the full titles and the explanations of above factors, please check COCOMO II manual.



	Very Low	Low	Norm	High	Very High	Extra High	**Result**
PREC	6.20	4.96	3.72	2.48	1.24	0.00	6.20
FLEX	5.07	4.05	3.04	2.03	1.01	0.00	4.05
RESL	7.07	5.65	4.24	2.83	1.41	0.00	7.07
TEAM	5.48	4.38	3.29	2.19	1.10	0.00	5.48
PMAT	7.80	6.24	4.68	3.12	1.56	0.00	7.80

The Scale Values are linked to the spreadsheet of the specific Scale Factor individually.

All the results are from the input of each file of each factor. Users can go to each file of each factor to change the values.

The buffer values of the scales of each factor are listed as follows.

	Very Low	Low	Norm	High	Very High	Extra High
PREC	6.20	4.96	3.72	2.48	1.24	0.00
FLEX	5.07	4.05	3.04	2.03	1.01	0.00
RESL	7.07	5.65	4.24	2.83	1.41	0.00
TEAM	5.48	4.38	3.29	2.19	1.10	0.00
PMAT	7.80	6.24	4.68	3.12	1.56	0.00

SF
The SF formula is PREC+FLEX+RESL+TEAM+PMAT

B Calculation Section

The formula is as follows.
B= 0.91+ 0.01*(PREC+FLEX+RESL+TEAM+PMAT)

EM section

This section contains all effort multipliers used in Post Architecture Model.
For the full titles, and the explanations of above factors, please check COCOMO II manual.

The values of the scales are linked to files of the factors individually.

The buffer values of the scales of each factor are listed as follows.

	Not Apply	Very Low	Low	Nominal	High	Very High	Extra high
RELY	<--->	0.82	0.92	1.00	1.10	1.26	<--->
DATA	<--->	<--->	0.90	1.00	1.14	1.28	<--->
CPLX	<--->	0.73	0.87	1.00	1.17	1.34	1.74
RUSE	<--->	<--->	0.95	1.00	1.07	1.15	1.24
DOCU	<--->	0.81	0.91	1.00	1.11	1.23	<--->

Platform Factors

	Not Apply	Very Low	Low	Nominal	High	Very High	Extra high
TIME	<--->	<--->	<--->	1.00	1.11	1.29	1.63
STOR	<--->	<--->	<--->	1.00	1.05	1.17	1.46
PVOL	<--->	<--->	0.87	1.00	1.15	1.30	<--->

Personnel Factors

	Not Apply	Very Low	Low	Nominal	High	Very High	Extra high
ACAP	<--->	1.42	1.19	1.00	0.85	0.71	<--->
PCAP	<--->	1.34	1.15	1.00	0.88	0.76	<--->
APEX	<--->	1.22	1.10	1.00	0.88	0.81	<--->
PLEX	<--->	1.19	1.09	1.00	0.91	0.85	<--->
LTEX	<--->	1.20	1.09	1.00	0.91	0.84	<--->
PCON	<--->	1.29	1.12	1.00	0.90	0.81	<--->

Project Factors

	Not Apply	Very Low	Low	Nominal	High	Very High	Extra high
TOOL	<--->	1.17	1.09	1.00	0.90	0.78	<--->
SITE	<--->	1.22	1.09	1.00	0.93	0.86	0.80
SCED	<--->	1.43	1.14	1.00	1.00	1.00	<--->

EM

EM= RELY * DATA * CPLX * RUSE * DOCU * TIME * STOR * PVOL * ACAP * PCAP * APEX * PLEX * LTEX * PCON * TOOL * SITE * SCED

Calculation Section

PM formula

PM=EM*A*[(1=BRAK/100)*SIZE]^{B}+[(ASLOC*AT/100)/ATPROD]

EM Cost drivers that have a multiplicative effect on predicting effort are called Effort Multipliers (EM). Each EM has a rating level that expresses the impact of the multiplier on development effort, PM. These rating can range from Extra Low to Extra High. For the purposes of quantitative analysis, each rating level of each EM has a weight associated with it. The nominal or average weight for an EM is 1.0. If a rating level causes more software development effort, then its corresponding EM weight is above 1.0. Conversely, if the rating level reduces the effort then the corresponding EM weight is less than 1.0. The selection of effort-multipliers is based on a strong rationale that they would independently explain a significant source of project effort or productivity variation.

A is a constant. The buffer value is set as 2.94.

BRAK should be input by the users. COCOMO II uses a breakage percentage, BRAK, to adjust the effective size of the product. Breakage reflects the requirements volatility in a project. It is the percentage of code thrown away due to requirements changes. For example, a project which delivers 100,000 instructions but discards the equivalent of an additional 20,000 instructions has a BRAK value of 20. This would be used to adjust the project's effective size to 120,000 instructions for a COCOMO II estimation

SIZE should be input by the users.

B is the sum of project scale factors. It is linked from result at B Section in this spreadsheet.

ASLOC should be input by the users. It is use to estimate the amount of code to be adapted

AT should be input by the users.

ATPROC should be input by the users.

PM is the estimated person-months with the SCED effort multiplier

'EM is the result of the calculation of EM without SCED.

'PM is the estimated person-months without the SCED effort multiplier

TDEV is the calendar time in months from the determination of a product's requirements baseline to the completion of an acceptance activity certifying that the product satisfies its requirements. The formula is $[3.67*'PM^{(0.28+0.2*(B-1.01))}]*SCED\%/100$

SCALE FACTORS

PREC

Type : Scale Factor
The spreadsheet contains the features of PREC and the evaluation rates.
Features of Evaluate PREC : Users should select ratings by type "xxxx" under each selected value**.** The selected rating values are overridable in the purple cells.
SUM : The SUM of the results would be calculated and presented next to "SUM".
Your rating : According to the SUM, the users can choose the rating value from the scale list by typing "xxxx" under the selected rate. The selected rating values are overridable in the purple cells.
The COCOMO II-1998 calibrated values of the scales of PREC are listed as follows.

	Very Low	Low	Norm	High	Very High	Extra High
PREC	6.20	4.96	3.72	2.48	1.24	0.00

PREC (B39): The selected value of PREC is shown next to "PREC" on this page and one the PostArch summary worksheet "selected value" column for PREC.

FLEX

Type : Scale Factor
The spreadsheet contains the features of FLEX and the evaluation rates.
Features of Evaluate FLEX : Users should select ratings by type "xxxx" under each selected value**.** The selected rating values are overridable in the purple cells.
SUM : The SUM of the results would be calculated and presented next to "SUM".
Your rating : According to the SUM, the users can choose the rating value from the scale list by typing "xxxx" under the selected rate. The selected rating values are overridable in the purple cells.
The COCOMO II-1998 calibrated values of the scales of FLEX are listed as follows.

	Very Low	Low	Norm	High	Very High	Extra High
FLEX	5.07	4.05	3.04	2.03	1.01	0.00

FLEX (B34) : The selected value of FLEX is shown next to "FLEX" on this page and one the PostArch summary worksheet "selected value" column for FLEX.

RESL

Type : Scale Factor
The spreadsheet contains the features of RESL and the evaluation rates.
Features of Evaluate PREC : Users should select ratings by type "xxxx" under each selected value**.** The selected rating values are overridable in the purple cells.
SUM : The SUM of the results would be calculated and presented next to "SUM".
Your rating : According to the SUM, the users can choose the rating value from the scale list by typing "xxxx" under the selected rate. The selected rating values are overridable in the purple cells.

The COCOMO II-1998 calibrated values of the scales of RESL are listed as follows.

	Very Low	Low	Norm	High	Very High	Extra High
RESL	7.07	5.65	4.24	2.83	1.41	0.00

RESL (B59) : The selected value of RESL is shown next to "RESL" on this page and one the PostArch summary worksheet "selected value" column for RESL.

TEAM

Type : Scale Factor
The spreadsheet contains the features of TEAM and the evaluation rates.
Features of Evaluate PREC : Users should select ratings by type "xxxx" under each selected value**.** The selected rating values are overridable in the purple cells.
SUM : The SUM of the results would be calculated and presented next to "SUM".
Your rating : According to the SUM, the users can choose the rating value from the scale list by typing "xxxx" under the selected rate. The selected rating values are overridable in the purple cells.
The COCOMO II-1998 calibrated values of the scales of TEAM are listed as follows.

	Very Low	Low	Norm	High	Very High	Extra High
TEAM	5.48	4.38	3.29	2.19	1.10	0.00

TEAM (B38) : The selected value of TEAM is shown next to "TEAM" on this page and one the PostArch summary worksheet "selected value" column for TEAM.

PMAT

Type : Scale Factor
The spreadsheet contains PMAT evaluation rates.
Features of Evaluate PMAT : Users should select ratings by type "xxxx" under each selected value**.** The selected rating values are overridable in the purple cells.
The COCOMO II-1998 calibrated values of the scales of PMAT are listed as follows.

	Very Low	Low	Norm	High	Very High	Extra High
PMAT	7.80	6.24	4.68	3.12	1.56	0.00

PMAT is not applied to some specific situations, such as some short-term student projects. We suggest the users put **9.36** as the value of "**for not apply**" in PMAT.
Your rating : The users can choose the rating value from the scale list by typing "xxxx" under the selected rate. The selected rating values are overridable in the purple cells.
PMAT (B13) : The selected value of PMAT is shown next to "PMAT" on this page and one the PostArch summary worksheet "selected value" column for PMAT.

PMAT Eval

PMAT Eval is to assist to evaluate PMAT. It is the sub-spreadsheet for PMAT.
The spreadsheet contains the PMAT features, Key Process Areas, and the evaluation rates.

Rating : The users can choose the rating value from the scale list by typing "x" in the selected rate of each feature. The selected rate would be presented at **rating** column.

GROUP OF PRODUCT FACTORS

It is evaluated by RELY, DATA, CPLX, RUSE and DOCU.

RELY

Type : Effort Multiplier
Rating : After evaluating RELY by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
RELY (B12) : It is linked from G9.

DATA

Type : Effort Multiplier
Rating : After evaluating DATA by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
DATA (B24) : It is linked from G23.

CPLX

Type : Effort Multiplier
CPLX spreadsheet contains CPLX features and the its evaluation rates.
Rating : After evaluating CPLX by its features, the users should select the ratings by type "xxxx" under the selected values**.** The selected rating values are overridable in the purple cells.
SUM (B74) : It is the sum of the rating grades.
Rating : Based on the SUM and the suggested ratings, the users should select a rating value (from B79 to L79) by type "xxxx" under the selected value. The result would be presented at M78 and M79.
CPLX (B83) : It is linked from M78.

RUSE

Type : Effort Multiplier.
RUSE spreadsheet contains RUSE features and the its evaluation rates.
Rating : After evaluating RUSE by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.

RUSE (B36) : It is linked from G35.

DOCU

Type : Effort Multiplier
Rating : After evaluating DOCU by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
DOCU (B48) : It is linked from G47.

GROUP OF PLATFORM FACTOR

It is evaluated by TIME, STOR, and PVOL.

TIME

Type : Effort Multiplier

Rating : After evaluating TIME by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.

TIME (B12) : It is linked from G9.

STOR

Type : Effort Multiplier

Rating : After evaluating STOR by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.

STOR (B26) : It is linked from G24.

PVOL

Type : Effort Multiplier

Rating : After evaluating PVOL by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.

PVOL (B42) : It is linked from G40.

GROUP OF PERSONNEL FACTORS

It is mainly evaluated by ACAP, PCAP, AEXP, PEXP, LTEX, and PCON.

PCON

Type : Effort Multiplier
Rating : After evaluating PCON by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
PCON (B12) : It is linked from G9.

ACAP

Type : Effort Multiplier
Rating : After evaluating ACAP by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
ACAP (B23) : It is linked from G21.

PCAP

Type : Effort Multiplier
Rating : After evaluating PCAP by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
PCAP (B37) : It is linked from G35.

APEX

Type : Effort Multiplier
Rating : After evaluating APEX by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
APEX (B51) : It is linked from G49.

PLEX

Type : Effort Multiplier
Rating : After evaluating PLEX by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
PLEX (B64) : It is linked from G62.

LTEX

Type : Effort Multiplier
Rating : After evaluating LTEX by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
LTEX (B77) : It is linked from G75.

GROUP OF PROJECT FACTORS

It is mainly evaluated by TOOL, SITE, and SCED.

TOOL

Type : Effort Multiplier
Rating : After evaluating TOOL by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
TOOL (B14) : It is linked from G12.

SITE

Type : Effort Multiplier
Rating : After evaluating SITE by its feature, the users should select the rating by type "xxxx" under the selected value**.** The selected rating value is overridable in the purple cell.
SITE (B31) : It is linked from G29.

SCED

Type : Effort Multiplier.
Rating : After evaluating SITE by its features, the users should select the ratings by type "xxxx" under the selected values**.** The selected rating value is overridable in the purple cell.

SCED (B50) : It is linked from G43.
Percentage(B51) : It is linked from G48 and applied to spreadsheet PostArch.

II. The Relationship Of The Spreadsheets