An Example on COCOMO II

An IIST airline sales system is to be built in C. This is a new project and the back-end database server has been built.

Application composition stage: (Using Object Point Estimation Techniques)

At the early stage, we need 3 screens and 1 report:

1. a booking screen to record a new advertising sale booking
2. a pricing screen showing the advertising rate for each day and each flight
3. an availability screen showing which flights are available
4. a sales report showing total sales for the month and year, and comparing them with previous months and years

The booking screen requires 3 data tables, namely, the table of customer contact details, the table that records the past history of the customer, and the table of available time slots. Only 1 view of the screen is enough. So, the booking screen is classified as simple. Similarly, the levels of difficulty of the pricing screen, the availability screen and the sales report are classified as simple, simple and medium, respectively. There is no 3GL component.

Table 1 Ratings for IIST airline sales system

Name	Objects	Complexity	Weight
Booking	Screen	Simple	1
Pricing	Screen	Simple	1
Availability	Screen	Medium	2
Sales	Report	Medium	5
		Total	9

The assessment on the developers and the environment shows that the developers' experience is very low (4) and the CASE tool is low (7). So, we have a productivity rate of 5.5.

According to COCOMO II, the project requires approx. 1.64 (= 9/5.5) person-months.

Early Design Stage:

Estimation on Size (FP → KSLOC)

Table 2 Function Point Estimation for IIST airline sales system

Name	External user types	Complexity	FP
Booking	External output type	Low	4
Pricing	External inquiry type	Low	3
Availability	External inquiry type	Medium	4
Sales	External output type	Medium	5
		Total	16

Total function points = 16

Converting to KSLOC in C (From published figures: 1 FP = 128 SLOC in C):

Estimated Size = 16 * 128 / 1000 = 2.048 KSLOC

Estimation of Scale Factor:

Table 3 Ratings on Scale Factor

Name	Very low (0.05)	Low (0.04)	Nominal (0.03)	High (0.02)	Very High (0.01)	Extra High (0.00)	Assessment	Value
Precedentedness	Thoroughly unprecedented	Largely unprecedented	Somewhat unprecedented	Generally familiar	Largely familiar	Thoroughly familiar	Very high	0.01
Flexibility	Rigorous	Occasional relaxation	Some relaxation	General conformity	Some conformity	General goals	Very high	0.01
Significant risks eliminated	Little (20%)	Some (40%)	Often (60%)	Generally (75%)	Mostly (90%)	Full (100%)	Nominal	0.03
Team interaction process	Very difficult	Some difficult	Basically cooperative	Largely cooperative	Highly cooperative	Seamless interactions	High	0.02
Process maturity	Level 1	Level 2	Level 2+	Level 3	Level 4	Level 5	Low	0.04
							Add	**1.01**
							Total	**1.13**

Estimation of Effort Adjustment Factor:

Ratings on Effort Adjustment Factors

Identifier	**Name**	**Ranges (VL – EH)**	**Assessment VL/L/N/H/VH/EH**	**Values**
RCPX	product Reliability and ComPleXity	0.5 – 1.5	low	0.75
RUSE	required reusability	0.5 – 1.5	nominal	1.0
PDIF	Platform DIFficulty	0.5 – 1.5	high	1.1
PERS	PERSonnel capability	1.5 – 0.5	high	0.75
PREX	PeRsonnel EXperience	1.5 – 0.5	very high	0.65
FCIL	FaCILities available	1.5 – 0.5	nomial	1.0
SCED	SChEDule pressure	1.5 – 0.5	low	1.2
			Product	**0.4826**

The effort estimation of IIST airline sales system is:

$$\text{Effort} = 2.45 \times (2.048)^{1.13} \times 0.4826 = 2.66 \text{ person-months}$$