

Table 4.9(a): For screens

Number of views contained	# and sources of data tables		
	Total < 4 (< 2 server < 3 client)	Total < 8 (2 - 3 server 3 - 5 client)	Total 8 + (> 3 server, > 5 client)
< 3	Simple	Simple	Medium
3 - 7	Simple	Medium	Difficult
> 8	Medium	Difficult	Difficult

Table 4.9(b): For reports

Number of sections contained	# and sources of data tables		
	Total < 4 (< 2 server < 3 client)	Total < 8 (2 - 3 server 3 - 5 client)	Total 8 + (> 3 server, > 5 client)
0 or 1	Simple	Simple	Medium
2 or 3	Simple	Medium	Difficult
4 +	Medium	Difficult	Difficult

(iii) **Assign complexity weight to each object:** The weights are used for three object types *i.e.*, screen, report and 3GL components using the Table 4.10.

The weights reflect the relative effort required to implement an instance of that complexity level.

Table 4.10: Complexity weights for each level

Object type	Complexity weight		
	Simple	Medium	Difficult
Screen	1	2	3
Report	2	5	8
3GL Component	—	—	10

(iv) **Determine object points:** Add all the weighted object instances to get one number and this number is known as object-point count.

(v) **Compute new object points:** We have to estimate the percentage of reuse to be achieved in a project. Depending on the percentage reuse, the new object points (NOP) are computed.

$$NOP = \frac{(\text{object points}) * (100 - \% \text{ reuse})}{100}$$

NOPs are the object points that will need to be developed and differ from the object point count because there may be reuse.

(vi) **Calculation of productivity rate:** The productivity rate can be calculated as:

$$\text{Productivity rate (PROD)} = \text{NOP/Person month.}$$

PROD values Calculation requires NOP and total person-months of past projects in similar environments. COCOMO-II application composition model gives the following Table 4.11 containing the values of PROD based on their data and experience.

Table 4.11: Productivity values

Developer's experience & capability; ICASE maturity & capability	PROD (NOP/PM)
Very low	4
Low	7
Nominal	13
High	25
Very high	50

(vii) **Compute the effort in person-months:** When PROD is known, we may estimate effort in Person-Months as:

$$\text{Effort in PM} = \frac{\text{NOP}}{\text{PROD}}$$

Example 4.9

Consider a database application project with the following characteristics:

(i) The application has 4 screens with 4 views each and 7 data tables for 3 servers and 4 clients.

(ii) The application may generate two report of 6 sections each from 07 data tables for two server and 3 clients. There is 10% reuse of object points.

The developer's experience and capability in the similar environment is low. The maturity of organisation in terms of capability is also low. Calculate the object point count, New object points and effort to develop such a project.

Solution

This project comes under the category of application composition estimation model.

Number of screens = 4 with 4 views each

Number of reports = 2 with 6 sections each.

From Table 4.9, we know that each screen will be of medium complexity and each report will be of difficult complexity.

Using Table 4.10 of complexity weights, we may calculate object point count

$$= 4 \times 2 + 2 \times 8 = 24$$

$$\text{NOP} = \frac{24 * (100 - 10)}{100} = 21.6$$

Note: this is the extra image that represent the way to solve

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< 3	Simple	Simple	Medium
<u>3 - 7</u>	Simple	<u>Medium</u>	Difficult
> 8	Medium	Difficult	Difficult

Table 4.9(b): For reports

Number of <u>sections</u> contained	# and sources of data tables		
	Total < 4 (< 2 server < 3 client)	Total < 8 (2 - 3 server 3 - 5 client)	Total 8 + (> 3 server, > 5 client)
0 or 1	Simple	Simple	Medium
2 or 3	Simple	Medium	Difficult
<u>4 +</u>	Medium	<u>Difficult</u>	Difficult

(iii) **Assign complexity weight to each object:** The weights are used for three object types i.e., screen, report and 3GL components using the Table 4.10.

The weights reflect the relative effort required to implement an instance of that complexity level.

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