CHAPTER 05 - ESTIMATIONS

Software estimation is the process of predicting the amount of effort, time, and resources required to develop software or complete a project. It involves analyzing and defining the requirements, breaking down tasks, and evaluating various factors that can impact the development process.

5.1 Function Points

Function points are a technique used to measure the size and complexity of a software system based on the user's interactions with the system. Function points are needed because they provide a way to estimate the resources needed to develop, test, and maintain software systems.

Count Justification :-

1. User Input
Drag and drop circuit maker:
User selects a component from the available components: Simple
User places the component at a specific location on the circuit board: Simple
User connects the components by drawing wires: Average

Ohm's law calculator:
User enters the value of voltage: Simple
User enters the value of current: Simple
User enters the value of resistance: Simple

Total User Inputs = 6
Average Weighing Factor = Simple

2. User Output
Drag and drop circuit maker:
Displaying the circuit diagram created by the user: Simple

Ohm's law calculator:
Displaying the calculated value of voltage: Simple
Displaying the calculated value of current: Simple
Displaying the calculated value of resistance: Simple

Total User Outputs = 4
Average Weighing Factor = Simple

3. User Inquiries
Login:
Authenticating user credentials and logging the user into the system: Average

Password reset:
Processing user request to reset password: Simple

Support request:
Processing user request for technical support: Complex

Total User Inquiries = 3
Average Weighing Factor = Average

4. Files

Drag and drop circuit maker:
None

Ohm's law calculator:
None

Login:
User account data file: Simple

Password reset:
User account data file: Simple

Support request:
User account data file: Simple

Total Files = 3
Average Weighing Factor = Simple

Total User Inquiries = 3
Average Weighing Factor = Average

5. External Interfaces

Drag and drop circuit maker:
None

Ohm's law calculator:
None

Login:
User account database: Simple

Password reset:
User account database: Simple
Email server: Average

Support request:
User account database: Simple
Email server: Average

Total External Interfaces = 5
Average Weighing Factor = Average

Measurement parameter	**Count**	**simple**	**Average**	**Complex**	**Weighing Factor**	**total**
Number of User Inputs	6	3	4	6	3	18
Number of User Outputs	4	4	5	7	4	16

Number of user inquiries	3	3	4	6	4	12
Number of files	3	7	10	15	10	30
Number of external interfaces	5	5	7	10	7	35
COUNT TOTAL						111

Table 5.1: Measurements Parameters

To compute Function Points (FP), the following formula is used:

FP= Count Total * [0.65 + 0.01 * ∑(Fi)]

Where the count total is the sum of all FP entries obtained from Table 5.1 . ∑(Fi) is the sum of allresponses to the question in Table 5.2. It is called Value Adjustment Factor (VAF).

The response values in the value adjustment table are typically integers between 0 and 5. A response value of 0 means that the particular question does not apply or is not relevant to the software being developed. A response value of 1 means that the question is somewhat applicable or relevant, while a response value of 5 means that the question is highly applicable or relevant. The response values for each question are added up to determine the total response value, which is used to calculate the value adjustment factor (VAF).

S No.	Question	Response
01	Are there any hardware or platform dependencies that significantly affect the design or implementation of the system?	0
02	Does the software require high performance or real-time processing?	4
03	Does the software require a good documentation?	3
04	Is the software expected to be used by a large number of users?	4
05	Is the software developed using new technologies or frameworks?	5
06	Does the software require extensive data privacy measures?	5
07	Does the software require a exceptional UI/UX design?	3
08	Are there any third party libraries that has been used to develop this software?	2
09	Are there any hardware or software platform dependencies to run this software?	0
10	Is the software being developed for a highly competitive or rapidly changing market, requiring extensive feature development and iteration?	2
11	Does the software require maintenance and support over time?	4
12	Is the software expected to have large number of features for users?	3
13	Does the system requires a payment gateway?	1

Based on the above results following calculations are done:

Count Total = 111

∑(Fi)=36

FP = Count Total * [0.65 + 0.01 * ∑(Fi)]

FP = 111 * [0.65 +0.01 * 36]

FP= 112.11

5.1 Effort Estimation

Effort describes the estimated amount of effort required to develop the software. Table 5.3 specifies productivity on the basis of developer's experience and capability.

Developer's experience/capability	Very Low	Low	Normal	High	Very High
Environment maturity/capability	Very Low	Low	Normal	High	Very High
PROD	4	7	13	25	50

Table 5.3 Productivity Chart

PROD=13

Effort=FP/PROD

Effort=112.11/13

Effort=8.62pm

5.2 Cost

Cost refers to the approximated cost of the project. It is calculated based on the efforts that the project requires.

Cost=Effort(pm) * Labour Rate(INR/pm)

Cost=8.62 * 25,000

Cost=215,000