Shri Vile Parle Kelavani Mandal's
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC Accredited with "A" Grade (CGPA : 3.18)

Department of Information Technology

COURSE CODE: DJS22ITL601   **DATE:**

COURSE NAME: Software Engineering Laboratory   **CLASS: T.Y.BTech**

EXPERIMENT NO. 6

CO/LO Analyze real world problem using software engineering principles.

AIM / OBJECTIVE: Perform Project Management Activity

DESCRIPTION OF EXPERIMENT: Project Management activities:

   a. Perform Project Scheduling using WBS Gantt Chart

   b. Perform Project cost estimation using appropriate FP based / COCOMO Techniques.

   c. Perform Risk Analysis and Design RMMM plan for the system under development.

OUTPUT:

   a. Gannt Chart
   b. Cost Estimation using FP/COCOMO Technique
   c. At Least Five RMMM plan

QUESTION:

1. How does complexity of weights affect FP Calculation?
2. What is risk exposure and how it is calculated?

REFERENCE

www.geeksforgeeks.com

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1. Project Scheduling using WBS and Gantt Chart

Work Breakdown Structure (WBS)

The WBS for the Codeforces Visualizer project is as follows:

Task ID	Task Description	Subtasks
1	Requirement Analysis	Collect requirements, define features
2	Design	UI Design, System Architecture
3	Frontend Development	Search UI, Chart display, Responsive design
4	Backend/API Integration	Codeforces API, Caching, Error handling
5	Visualization Module	Rating graph, Tag analysis, Heatmap
6	Testing & Debugging	Unit tests, UI tests, API tests
7	Deployment	Hosting, Documentation, Feedback integration

Gantt Chart

A Gantt chart maps each task with estimated durations (in weeks):

Task	Week 1	Week 2	Week 3	Week 4	Week 5
Requirement Analysis	X				
Design	X	X			
Frontend Development		X	X		
Backend/API Integration		X	X	X	
Visualization Module			X	X	
Testing & Debugging				X	X
Deployment					X

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2. Project Cost Estimation

a. Function Point (FP) Based Estimation

Count of Components:

Component	Count	Weight (Avg)	Total FP
External Inputs (EI)	5	4	20
External Outputs (EO)	4	5	20
External Inquiries (EQ)	3	4	12
Internal Logical Files	2	7	14
External Interface Files	2	5	10
Total FP			**76**

Assuming Productivity Rate = 10 FP/Person-Month
Estimated Effort = 76 / 10 = 7.6 Person-Months

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b. COCOMO (Basic Model) Estimation

Assuming Organic Mode:

- Estimated KLOC = 2.5

- Effort = a × (KLOC)^b = 2.4 × (2.5)^1.05 ≈ **6.3 Person-Months**

Development Time (TDEV) = c × (Effort)^d = 2.5 × (6.3)^0.38 ≈ 4.3 Months

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3. Risk Analysis and RMMM Plan

a. Risk Identification:

Risk ID	Risk Description	Probability	Impact
R1	Codeforces API changes or downtime	High	High
R2	Data visualization bugs	Medium	Medium

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Risk ID	Risk Description	Probability	Impact
R3	Integration issues between frontend/backend	Medium	High
R4	Incomplete requirements	Low	High

b. Risk Mitigation, Monitoring, and Management (RMMM) Plan

Risk ID	Mitigation Strategy
R1	Use versioned API endpoints and maintain fallback error pages
R2	Perform unit testing for all charts and validate sample data
R3	Use Swagger/OpenAPI for contract clarity between frontend/backend
R4	Conduct regular stakeholder meetings for clarity and scope lock