



Experiment No. 6

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Aim: Estimate effort and cost required using FP/COCOMO for the project. Create WBS and Gantt Chart for the same. Use a PM Tool to depict a project plan.

Theory:

Work Breakdown Structure:

Work Breakdown Statement

A work breakdown statement (WBS) is a categorized list of tasks with an estimate of resources required to complete the task. An example WBS appears below.

WBS #	Task Description	Est Person -Hrs	Who	Resources	M&S
5	Profile motor power				
5.1	Design test stand	20	SE, JM	Pro/E	
5.2	Build test stand	15	SE, JM	Frame & brake parts	\$35
5.3	Test 3 motors	3	SE, JM	Stroboscope	\$75



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5.4	Plot torque vs. speed	2	JM	Excel	
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(M&S = Materials & Supplies)



Gantt Chart Basics

Gantt charts are a project planning tool that can be used to represent the timing of tasks required to complete a project. Because Gantt charts are simple to understand and easy to construct, they are used by most project managers for all but the most complex projects.

In a Gantt chart, each task takes up one row. Dates run along the top in increments of days, weeks or months, depending on the total length of the project. The expected time for each task is represented by a horizontal bar whose left end marks the expected beginning of the task and whose right end marks the expected completion date. Tasks may run sequentially, in parallel or overlapping.

As the project progresses, the chart is updated by filling in the bars to a length proportional to the fraction of work that has been accomplished on the task. This way, one can get a quick reading of project progress by drawing a vertical line through the chart at the current date. Completed tasks lie to the left of the line and are completely filled in. Current tasks cross the line and are behind schedule if their filled-in section is to the left of the line and ahead of schedule if the filled-in section stops to the right of the line. Future tasks lie completely to the right of the line.

In constructing a Gantt chart, keep the tasks to a manageable number (no more than 15 or 20) so that the chart fits on a single page. More complex projects may require subordinate charts which detail the timing of all the subtasks which make up one of the main tasks. For team projects, it often helps to have an additional column containing numbers or initials which identify who on the team is responsible for the task.

Often the project has important events which you would like to appear on the project timeline, but which are not tasks. For example, you may wish to highlight when a prototype is complete or the date of a design review. You enter these on a Gantt chart as "milestone" events and mark them with a special symbol, often an upside-down triangle.



Practical:

1) For Estimation:

FP ESTIMATION :

External inputs: Product details, Order placement, Payment details

External Inquiry: Order status, Product availability, Product price comparison

Internal Logical Files: Product database, Order database, User account details

External Outputs: Order confirmation, Shipping details

External interface files: Blockchain transactions

Information Domain Value	Count	Simple	Average	Complex	Total
External inputs	3	3	4	6	$3*6=18$
External enquiry	3	4	5	7	$3*7=21$
Internal Logical Files	3	3	4	6	$3*6=18$
External Outputs	2	7	10	15	$2*15=30$
External interface files	1	5	7	10	$1*10=10$
Total					97



Total-Count = 97

Value Adjustment Factors:

Does the system require reliable backup and recovery?

3 - The system requires reliable backup and recovery as it deals with important transactions and user data.

Are specialized data communications required to transfer information to or from the application?

4 - Specialized data communications are required as the platform utilizes blockchain technology for secure transactions.

Are there distributed processing functions?

3 - The platform may require distributed processing functions to handle high volume transactions.

Is performance critical?

5 - Performance is critical as the platform needs to handle real-time transactions and user interactions.

Will the system run in an existing, heavily utilized operational environment?

0 - The platform is a new product with no existing operational environments.

Does the system require online data entry?

4 - The platform requires online data entry for various transactions and user interactions.

Does the online data entry require the input transaction to be built over multiple screens or operations?

3 - Some functionalities may require input transactions over multiple screens.

Are the ILFs updated online?

5 - The ILFs are updated online as the platform deals with real-time transactions.

Are the inputs, outputs, files, or inquiries complex?

2 - Most of the inputs, outputs, files, and inquiries are simple.



Is the internal processing complex?

2 - The internal processing is not complex as the platform focuses on user interactions and transactions.

Is the code designed to be reusable?

3 - The code can be reused over multiple functionalities with minor modifications.

Are conversion and installation included in the design?

3 - Conversion and installation are included in the design.

Is the system designed for multiple installations in different organizations?

4 - The system is designed to be easily installed in different organizations.

Is the application designed to facilitate change and ease of use by the user?

5 - The application is designed to be user-friendly and easy to use.

Hence $\Sigma (F_i) = 46$

The estimated number of FP is derived:

FP estimated = count-total x $[0.65 + 0.01 \times \Sigma (F_i)]$

$$= 97 * [0.65 + 0.01 \times 46]$$

$$= 107.67$$

Therefore, FP estimated is **107.67 pm**



For WBS and Gantt Chart

WBS:

Level 1: Project Management

- 1.1 Project Initiation**
- 1.2 Project Planning**
- 1.3 Project Execution**
- 1.4 Project Monitoring and Control**
- 1.5 Project Closure**

Level 2: Requirements Analysis and Design

- 2.1 Define Business Requirements**
- 2.2 Analyze User Requirements**
- 2.3 Develop System Architecture**
- 2.4 Design User Interface**
- 2.5 Design Database Schema**

Level 3: Frontend Development

- 3.1 Develop Home Page**
- 3.2 Develop Category Pages**
- 3.3 Develop Product Pages**
- 3.4 Develop Cart and Checkout Pages**
- 3.5 Develop User Account Pages**
- 3.6 Develop Help and Support Pages**
- 3.7 Develop Marketing Pages**

Level 4: Backend Development

- 4.1 Develop User Management System**
- 4.2 Develop Payment Gateway Integration**
- 4.3 Develop Order Management System**
- 4.4 Develop Inventory Management System**
- 4.5 Develop Shipping and Delivery System**
- 4.6 Develop Customer Support System**
- 4.7 Develop Reporting and Analytics System**



Level 5: Blockchain Integration

- 5.1 Determine Appropriate Blockchain Platform**
- 5.2 Integrate Blockchain with Payment Gateway**
- 5.3 Integrate Blockchain with Order Management System**
- 5.4 Integrate Blockchain with Inventory Management System**
- 5.5 Integrate Blockchain with Shipping and Delivery System**

Level 6: Testing and Quality Assurance

- 6.1 Develop Test Plan**
- 6.2 Perform Unit Testing**
- 6.3 Perform Integration Testing**
- 6.4 Perform System Testing**
- 6.5 Perform Acceptance Testing**
- 6.6 Perform Security Testing**

Level 7: Deployment and Maintenance

- 7.1 Deploy to Production Environment**
- 7.2 Monitor and Maintain Production Environment**
- 7.3 Upgrade System as Necessary**
- 7.4 Provide User Support and Help Desk Services**



Team members and tasks:

Project Manager: oversees the entire project and ensures timely delivery

Business Analyst: responsible for requirements gathering and analysis

UI/UX Designer: designs the platform's user interface and user experience

Frontend Developer: develops the frontend of the platform using HTML, CSS, JavaScript and ReactJS

Backend Developer: develops the backend of the platform using a web framework such as Node.js or Django

Blockchain Developer: integrates Web3 features into the platform such as blockchain payments, decentralized storage, and smart contracts

Quality Assurance Engineer: tests the platform for functionality, performance, and security

Deployment Engineer: deploys the platform to a test environment and then to production

Support Engineer: provides maintenance and support for the platform

Estimated effort:

Based on the estimated effort of 107.67 person months, we can distribute the effort as follows:

40% of the effort (43.068 person months) can be allocated to analysis, design, and planning

20% of the effort (21.534 person months) can be allocated to coding and implementation

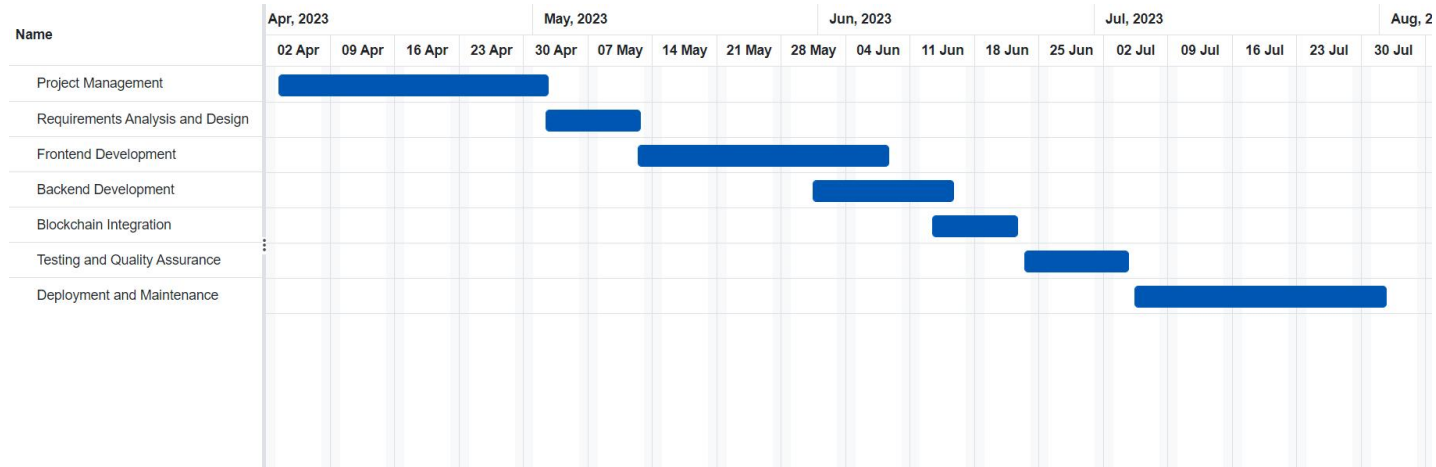
40% of the effort (43.068 person months) can be allocated to testing, deployment, and maintenance.



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GANTT TIMELINE CHART:



ID	Name	Duration	Start Date	End Date
1	Project Management	22 days	Apr 03, 2023	May 02, 2023
2	Requirements Analysis and Design	9 days	May 02, 2023	May 12, 2023
3	Frontend Development	20 days	May 12, 2023	Jun 08, 2023
4	Backend Development	12 days	May 31, 2023	Jun 15, 2023
5	Blockchain Integration	8 days	Jun 13, 2023	Jun 22, 2023
6	Testing and Quality Assurance	8 days	Jun 23, 2023	Jul 04, 2023
7	Deployment and Maintenance	20 days	Jul 05, 2023	Aug 01, 2023

Conclusion:

Thus, we are able to estimate the effort required for our project and also create a Gantt Chart.