MySpace – A socio-academic site for students

SOFTWARE PROJECT MANAGEMENT PLAN DOCUMENT

विश्वजीवनामृतं ज्ञानम्

Instructor: Dr. Santosh Singh Rathore

Group 3 Members: -

Abhisekh Yadav	2020BCS-003
Aditya Kumar Singh	2020BCS-004
Anamika Mallick	2020BCS-075

Table of Contents

1 SIZE ESTIMATION

The project size is the most fundamental parameter for a Software Project Management Plan Document. All other parameters like effort, duration, cost, etc., can be determined with precision if project size is estimated with very low margin of error.

For the purpose of our report, we are using the Function Point(FP) metric to estimate the project size.

1.1 Function Point Metric

Function Point metric proposes that the size of a project is directly dependent upon the number of different high-level functions or features it supports.

As the number of high-level features supported by the project increases, so does the project size, as the module supporting the added feature also gets added to the project size. This technique helps in estimating the project size directly form the problem specification.

1.1.1 UFP (Unadjusted Function Point) Computation

External Inputs(EI)

1. Google account details (during Sing Up)
2. Google e-mail id (during Log In)
3. Google e-mail id (during Password Reset)
4. Ask question and Post answers in Q&A section
5. Title and Body in the Technical Article section
6. Upvote and Downvote input for both Q&A and Technical Article section

Total number of EI = 6

External Outputs

1. Confirmation Message: Account Created Successfully
2. Confirmation Message: Successfully Logged In
3. Confirmation Message: Successfully Logged Out
4. Student Dashboard
5. Links for Resources
6. Displaying question and answers in Q&A section
7. Displaying articles in Technical Article section
8. Links of class schedules
9. Upcoming Event Details
10. Error Message: Account could not be Created
11. Error Message: Unable to Login

Total number of EO = 11

External Inquiries(EQ)

1. Request Resources using Search Bar
2. Request Resources to Download
3. Request to show answers to a specific question
4. Request to view schedule
5. Request to view upcoming event details

Total number of EQ = 5

Internal Logical Files(ILF)

1. List of Registered students with their personal details
2. List of Question
3. List of Answers
4. List of Articles

Total number of ILF = 4

External Interface Files(EIF)

1. Google API for accessing Google's OAuth 2.0 server for Google Sign Up functionality
2. Google Maps API

Total number of EIF = 2

Calculation

$UFP = (\#\ EI) * 4 + (\#EO) * 5 + (\#EQ) * 4 + (\#ILF)\ * 10 + (\#EIF) * 10$

= 6*4 + 11 *5 + 6*4 + 4*10 + 2*10 = 163

1.1.2 Refining Parameters

Type	Simple	Average	Complex
Inputs(EI)	3	4	6
Outputs(EO)	4	5	7
Inquiries(EQ)	3	4	6
Files(ILF)	7	10	15
Interfaces(EIF)	5	7	10

Table: Refined Weights of Parameters based on Complexity

External Inputs(EI) : 4 Simple + 2 Average
External Outputs(EO) : 9 Simple + 2 Average
External Inquiries(EQ) : 4 Simple + 1 Average + 1 Complex
External Logical Files(ILF) : 4 Simple
External Interface(EIF) : 1 Simple + 1 Average

Refined UFP = (4*3 + 2* 4) + (9*4 + 2 * 5) + (4 *3 + 1*4 + 1*6) + (4*7) + (1*5 + 1*7) = 128

1.1.3 Refine UFP based on complexity of the Overall Project

Several factors that can impact the overall project size are considered to refine the computed UFP such as high transaction rates, response time requirements, scope for reuse, etc.

Requirement for reliable backup and recovery	6
Requirement for data communication	3

Extent of distributed processing	2
Performance requirements	4
Expected operational environment	4
Extent of online data entries	6
Extent of multi-screen or multi-operation online data input	0
Extent of online updating of master files	5
Extent of complex inputs, outputs, online queries and files	5
Extent of complex data processing	2
Extent that currently developed code can be designed for reuse	4
Extent of conversion and installation included in the design	0
Extent of multiple installations in an organisation and variety of customer organisations	0
Extent of change and focus on ease of use	5
Degree of Influence (DI)	46

Technical Complexity Factor (TCF) = 0.65 + 0.01 * DI = 0.65 + 0.46 = 1.11

Function Point(FP) = **UFP * TCF** = 128 * 1.11 = 142.08 ≈ 142

2 EFFORT AND TIME ESTIMATION

2.1 COCOMO Model

COCOMO (COnstructive COst MOdel) proposed by Boehm in 1981 is a heuristic estimation technique. It is a single variable model which divides the software product development into three categories:

- Organic – Application Programs
- Semidetached – Utility Programs
- Embedded – System Programs and real-time system programs

Based on this categorisation and characteristics of our project (small team working on well understood application), this project belongs to **organic** category.

Considering the scale of the project we are using **Basic COCOMO** model for quick and rough estimation of project parameters.

2.1.1 Estimation of Source Lines of Code (SLOC)

Since, in this web project we'll be using mostly JavaScript (75-85%), HTML5(7-10%) and CSS3 (7-10%). So we are considering 1 FP ≈ 40 LOC. Hence,

SLOC = FP *40 = 142 * 40 = 5680 LOC = 5.680 KLOC

2.1.2 Estimation of Development Effort

Development Effort = $\mathbf{2.4 * (KLOC)^{1.05}}$

$= 2.4 * (5.680)^{1.05}$

$=$ 14.868 Person-Month

2.1.3 Estimation of Development Time

Development Time = $\mathbf{2.5 * (Effort)^{0.38}}$

$= 2.5 * (14.868)^{0.38}$

$=$ 6.97 Months

3 PROJECT SCHEDULE BREAKDOWN

The estimated development time using **basic COCOMO** model is approximately 7 months. However, considering the project submission deadline and the fact that the **basic COCOMO** model does not incorporate the reuse of existing frameworks, the project schedule is made for approximately 3 months duration.

3.1 Activity Network

An activity network is used to graphically show different activities involved in building a project, their estimated durations and interdependencies.

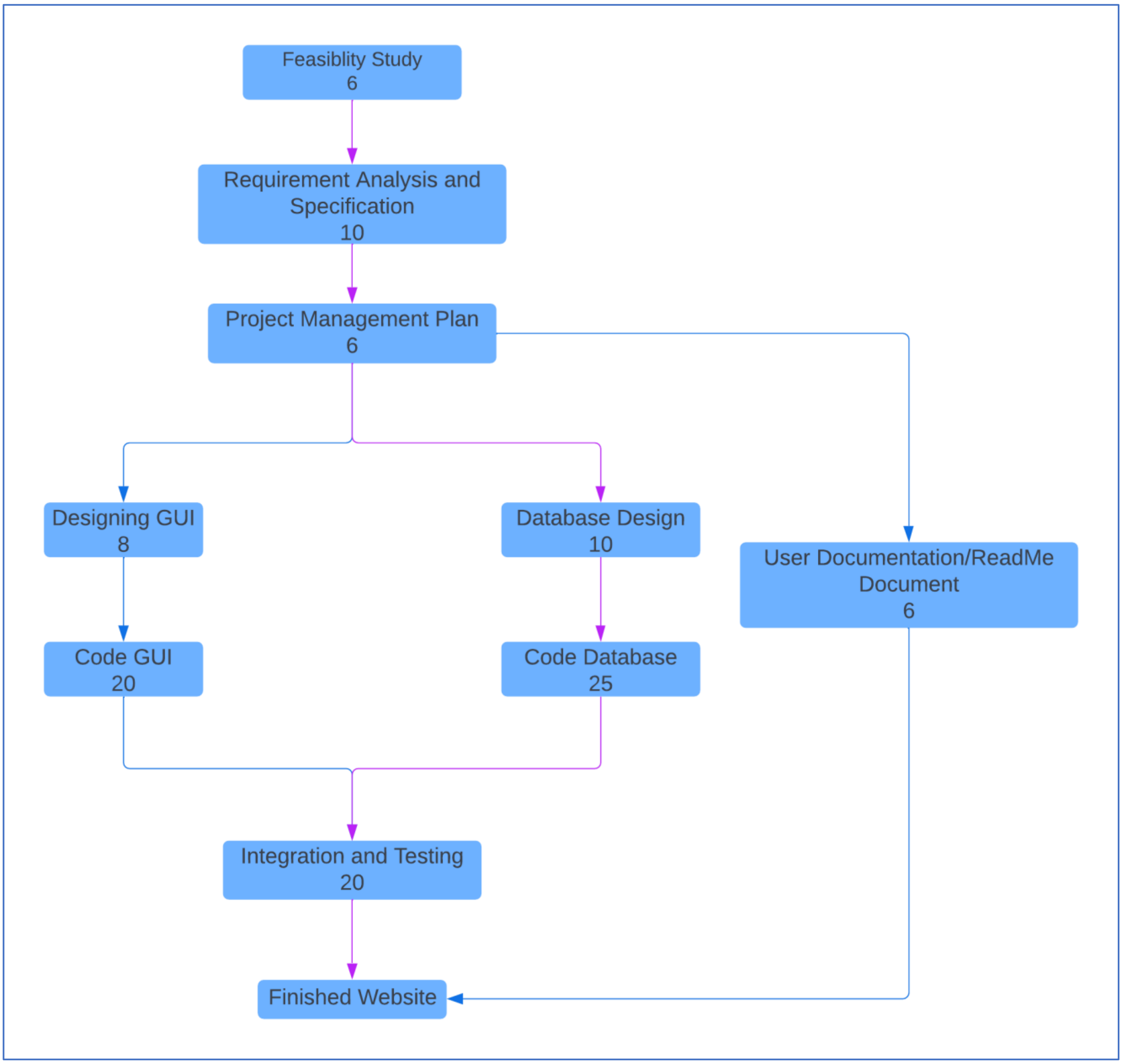


Fig: Activity Network Chart

Here the critical path is shown is purple colour.

3.1.1 Critical Path Method (CPM)

Minimum Time(MT) = 77 days

The (Earliest Start, Earliest Finish) and (Latest Start, Latest Finish) is shown in the following chart with corresponding **Slack Time** (which is LS - ES).

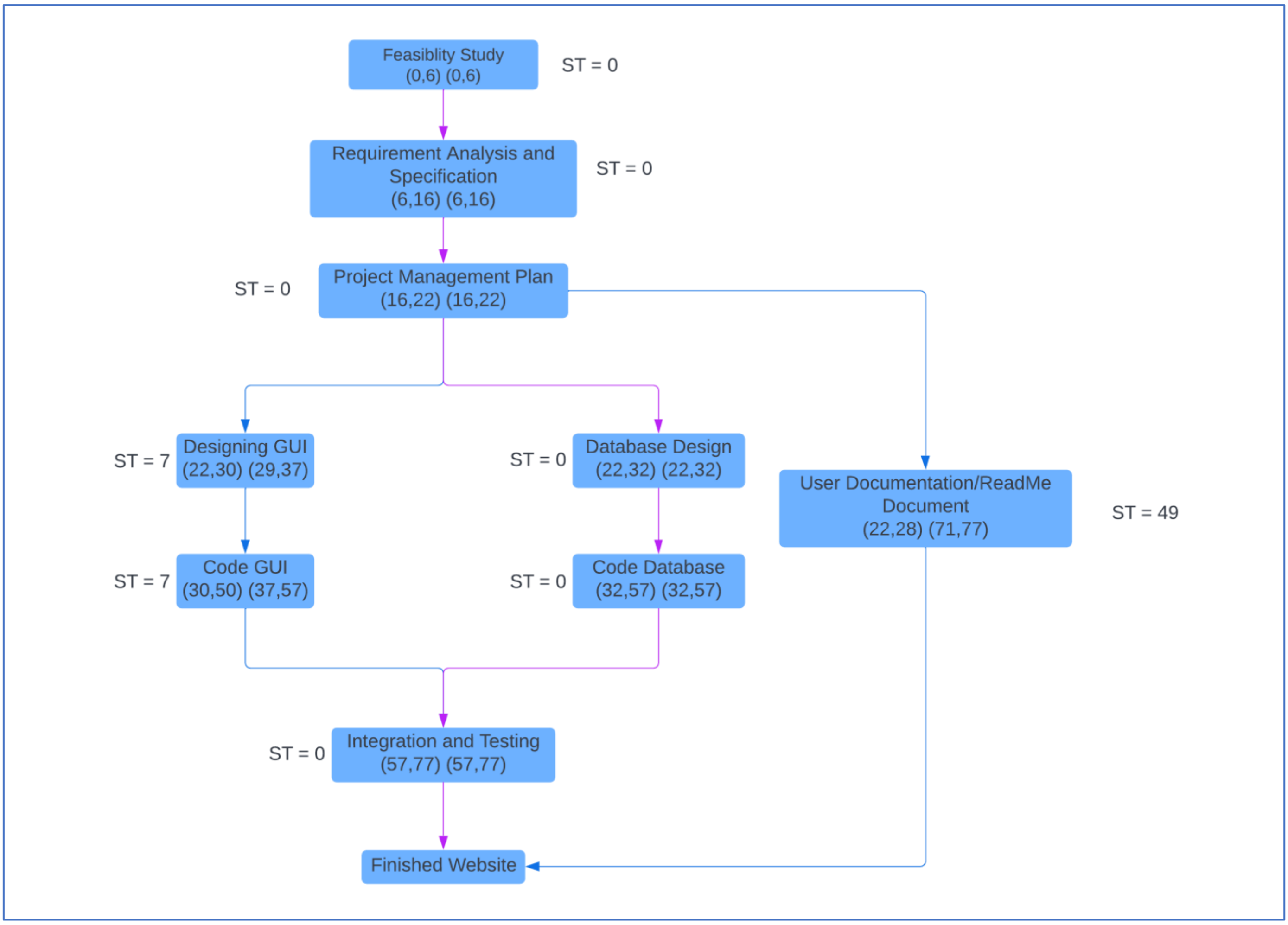


Fig: Activity Network Chart with (ES,EF) (LS, LF) and ST

3.1.2 Tabular Representation of Activity Network with CPM parameters

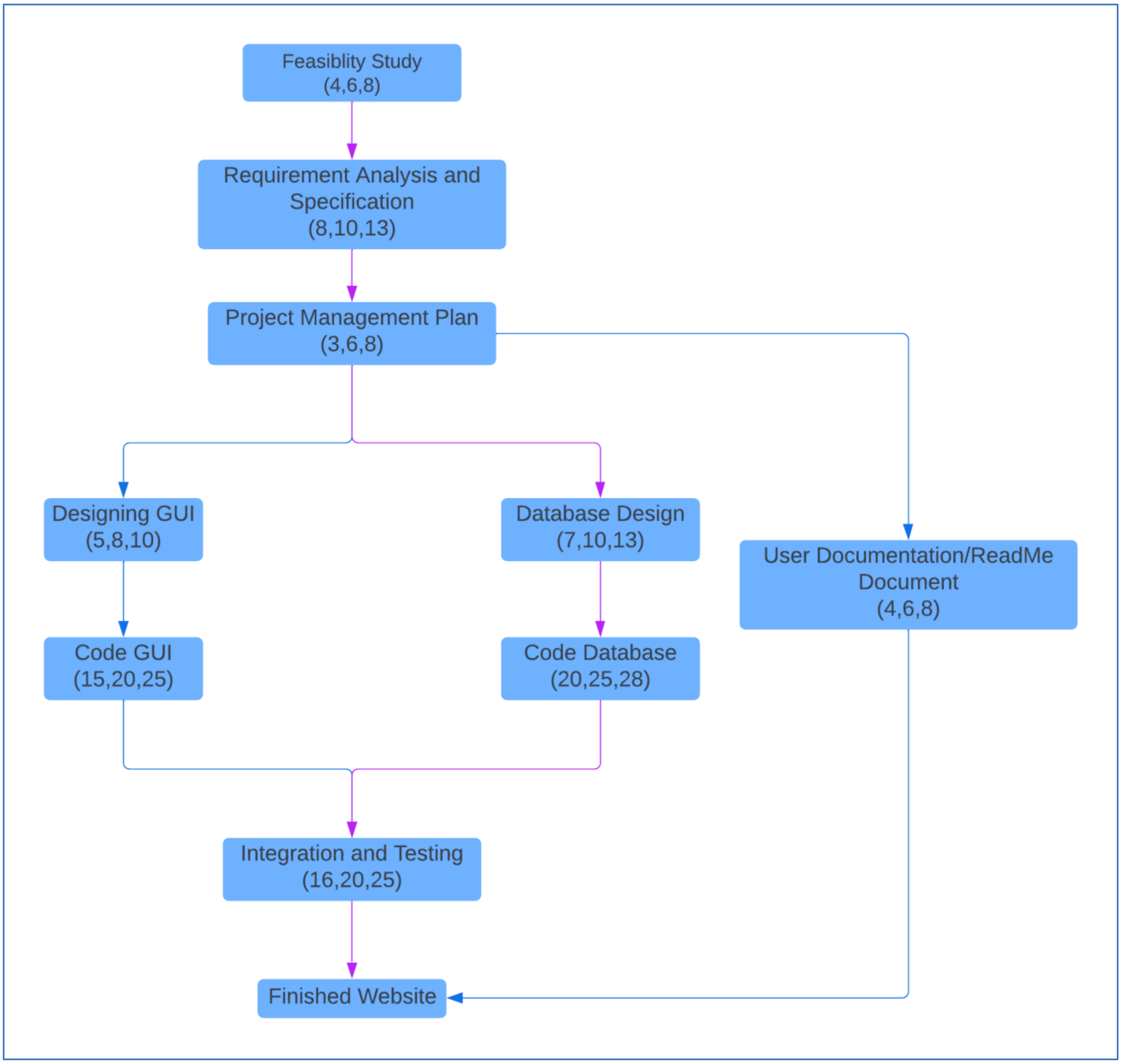
Tasks	ES	EF	LS	LF	ST
Feasibility Study	0	6	0	6	0
Requirement Analysis and Specification	6	16	6	16	0
Project Management Plan	16	22	16	22	0
Designing GUI	22	30	29	37	7
Database Design	22	32	22	32	0
Code GUI	30	50	37	57	7
Code Database	32	57	32	57	0
User Documentation	22	28	71	77	49
Integration and Testing	57	77	57	77	0

3.2 PERT Chart

PERT(Project Evaluation and Review Technique) charts are used to represent the statistical variations in the project estimates assuming these to be a normal distribution.

PERT allows for some randomness in task completion times and therefore provides the capability to determine the probability for achieving project milestones based on the probability of completing each task along the path to that milestone. Each task is annotated with three estimates:

Optimistic (O): The best possible case task completion time.
Most likely estimate (M): Most likely task completion time.
Worst case (W): The worst possible case task completion time.



4 RISK MANAGEMENT PLAN

4.1 Project Risks

Since all the tools and frameworks used in this project are open source so there is no risk related to budgetary. The risk of schedule slippage would be mitigated by constant communication among team members. In case we are not meeting the project deadline, functionality(or functionalities) with low priority will not be implemented and website will be up with limited functionality only.

4.2 Technical Risks

This is a well understood application and all the framework and technologies are open-source. So, there are no technical risks associated with this project.

4.3 Business Risks

There is no risk associated with losing budgetary commitments. Upon completion of the project if the user base is not growing as expected then student-survey will be taken and changes will be made accordingly.