



SE Project

BrainStack - Estimation Report

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REFERENCES

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INTRODUCTION

OVERVIEW OF THE PROJECT

Brainstack is a web-based communication platform that enables users to create and participate in multiple user-hosted custom rooms, join video channels, share content through file uploads, and customize their user profiles. It aims to provide a seamless and intuitive communication experience for individuals, teams, and communities.

OBJECTIVES OF THE PROJECT

- Develop a platform that allows users to create and join custom rooms for various purposes.
- Enable real-time video communication through video channels.
- Facilitate easy sharing of content, such as documents and images, through file uploads.
- Allow users to personalize their experience with customized user profiles.

SCOPE OF THE PROJECT

- Primary Users: Individuals, teams, communities, and organizations looking for a customizable communication platform.
- Key Features: Custom user-hosted rooms, video channels, content sharing through file uploads, and customizable user profiles.
- Technology Stack: Web programming technologies (HTML, CSS, JavaScript), Agora SDK for real-time video communication, and cloud hosting services for scalability.

SIZE ESTIMATION (FUNCTION POINT METRICS):

STEP 1: ESTIMATING THE VARIABLES AND CALCULATING UFP

- Inputs: 4
 - User Authentication (Simple)
 - Message Sending (Simple)
 - Channel Creation (Simple)
 - Server Creation (Simple)
- Outputs: 3
 - Message Display (Simple)
 - Channel List (Simple)
 - Server List (Simple)
- Inquiries: 3
 - Search Users (Simple)
 - Search Channels (Simple)
 - Search Servers (Simple)
- Files: 4
 - User Information (Simple)
 - Message History (Simple)
 - Channel Information (Simple)
 - Server Information (Simple)
- Interfaces: 1
 - Real-time Messaging API (Complex)
- UFP Calculation:
$$UFP = (4 * 4) + (3 * 4) + (3 * 4) + (4 * 7) + (1 * 10) = 90$$

STEP 2: CALCULATING THE REFINED UFP BASED ON THE COMPLEXITIES

- Refined UFP Calculation:
- Refined UFP = $(4 * 3) + (3 * 4) + (3 * 3) + (4 * 7) + (1 * 10) = 73$

STEP 3: CALCULATING DI, TCF, AND FP

- Average DI: $14 * 3 = 42$
- TCF Calculation:
- $TCF = 0.65 + (0.01 * DI) = 0.65 + (0.01 * 42) = 1.07$
- FP Calculation:
- $FP = UFP * TCF = 73 * 1.07 = 78.11$

EFFORT AND DEVELOPMENT TIME ESTIMATION (COCOMO MODEL):

LOC ESTIMATION:

- Based on the size estimation using Function Points (FP), we can convert the FP to Lines of Code (LOC) using a language-specific conversion factor. Assuming we're using a language like JavaScript for the web application, a common conversion factor is 50 LOC per FP.
- $\text{LOC} = \text{FP} * \text{Conversion Factor} = 78.11 * 50 = 3905.5 \approx 3906 \text{ LOC}$
- $\text{KLOC (Kilo Lines of Code)} = \text{LOC} / 1000 = 3.906$

EFFORT ESTIMATION:

- Using the Basic COCOMO model, the effort in Person-Months (PM) can be estimated using the formula:
- $\text{Effort} = a * (\text{KLOC}^b) \text{ PM}$
- For the Organic mode (suitable for small, simple projects), $a = 2.4$ and $b = 1.05$.
- $\text{Effort} = 2.4 * (3.906^{1.05}) \text{ PM} \approx 10.16 \text{ PM}$

DEVELOPMENT TIME ESTIMATION:

- The development time in months can be estimated using the formula:
- $\text{Tdev} = c * (\text{Effort}^d) \text{ Months}$
- For the Organic mode, $c = 2.5$ and $d = 0.38$.
- $\text{Tdev} = 2.5 * (10.16^{0.38}) \text{ Months} \approx 6.28 \text{ Months}$



SUMMARY:

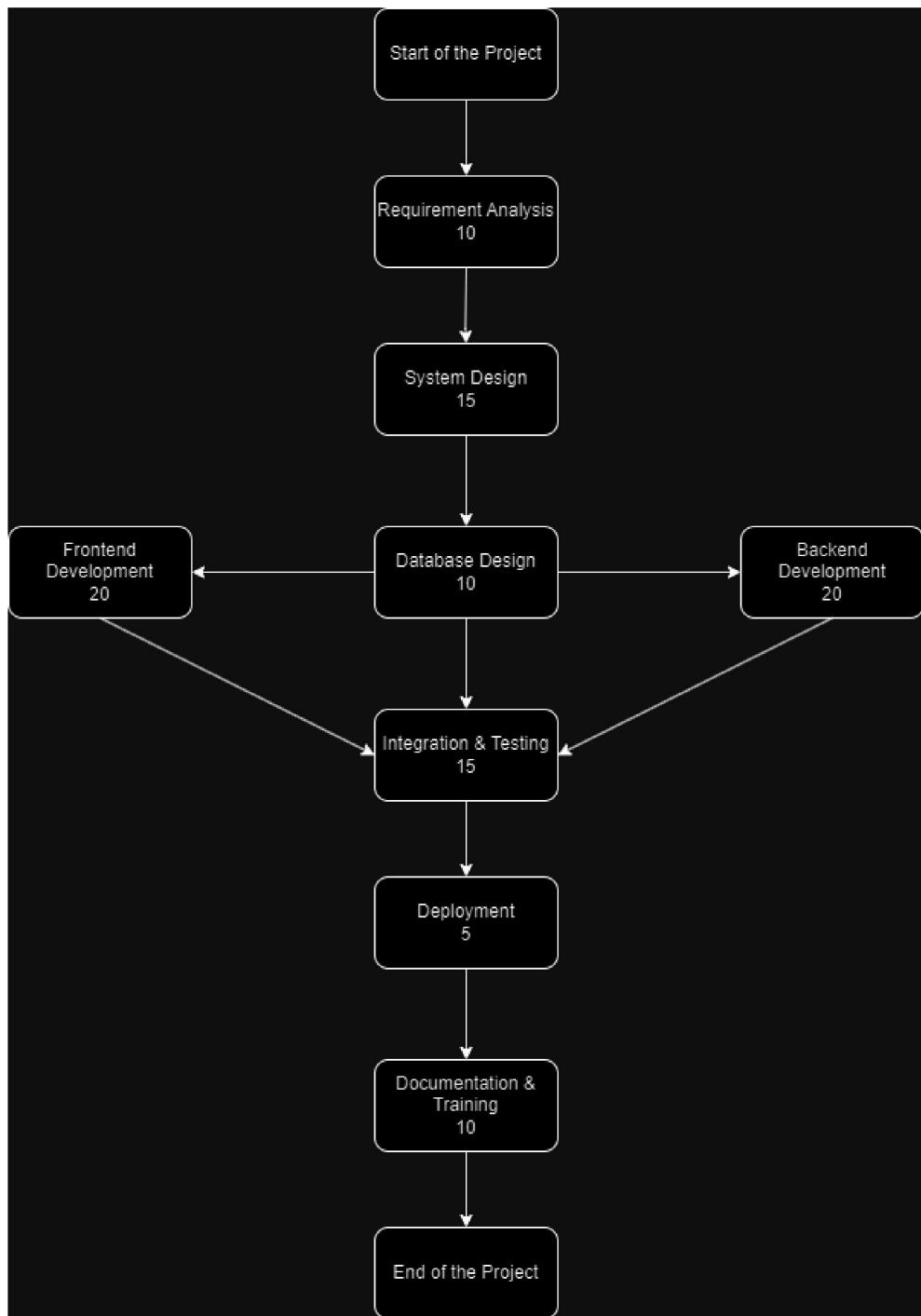
- Estimated Effort: 10.16 Person-Months
- Estimated Development Time: 6.28 Months

PROJECT SCHEDULE BREAKDOWN:

ACTIVITY NETWORK REPRESENTATION:

Task Number	Task Description	Duration (Days)	Dependencies
T1	Requirement Analysis	10	-
T2	System Design	15	T1
T3	Database Design	10	T2
T4	Frontend Development	20	T2
T5	Backend Development	20	T2
T6	Integration and Testing	15	T3, T4, T5
T7	Deployment	5	T6
T8	Documentation and Training	10	T7

THE ACTIVITY NETWORK:

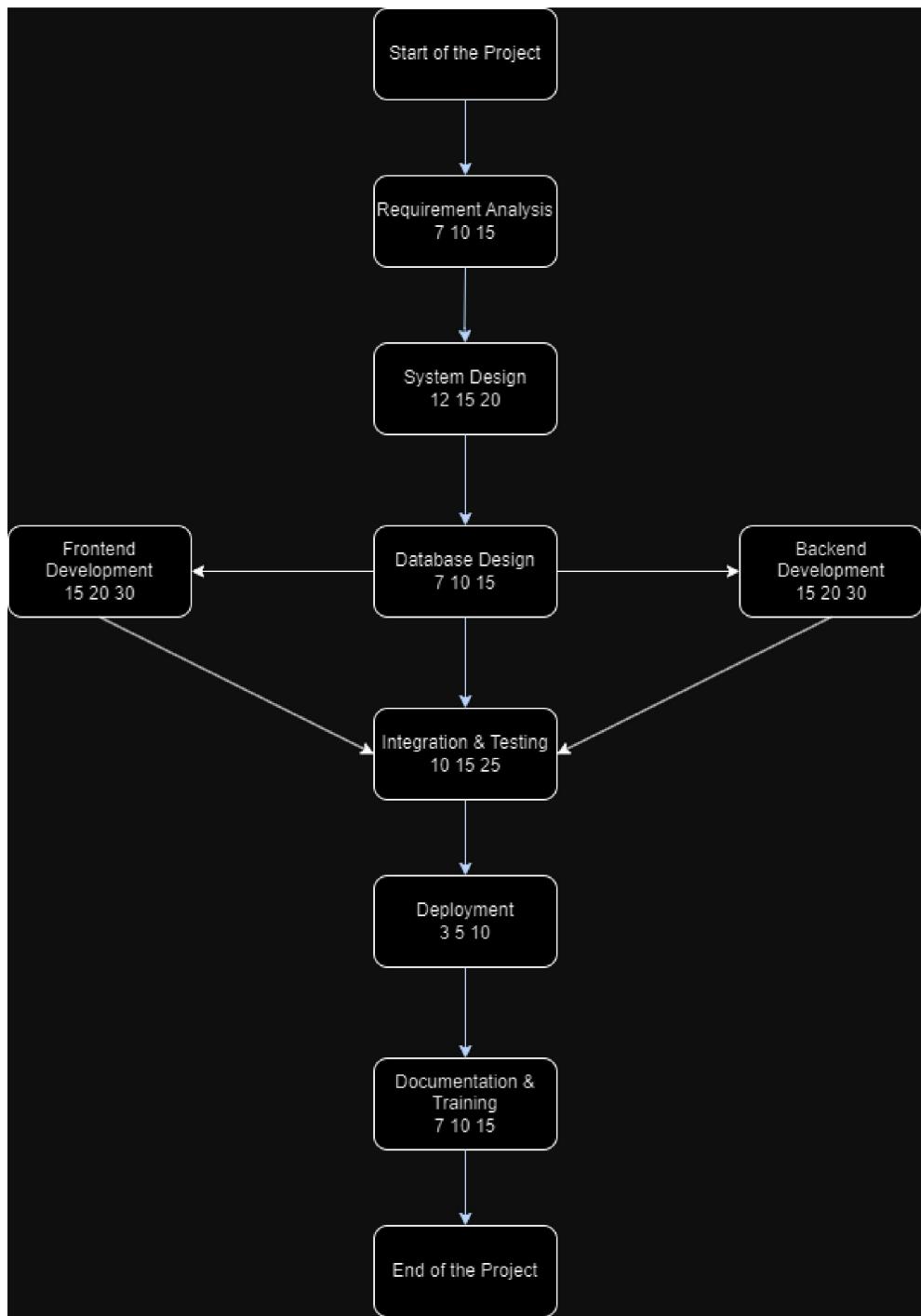




PROJECTED PARAMETERS COMPUTED FROM ACTIVITY NETWORK

Task Description	ES	EF	LS	LF	Slack Time
Requirement Analysis	0	10	0	10	0
System Design	10	25	10	25	0
Database Design	25	35	25	35	0
Frontend Development	25	45	25	45	0
Backend Development	25	45	25	45	0
Integration and Testing	45	60	45	60	0
Deployment	60	65	60	65	0
Documentation and Training	65	75	65	75	0

THE PERT CHART:





CRITICAL PATH:

- The critical path is the sequence of tasks that determines the minimum time needed to complete the project. In this case, the critical path is:
- Requirement Analysis -> System Design -> Database Design -> Integration and Testing -> Deployment -> Documentation and Training

PROJECT DURATION:

The total project duration is the EF of the last task in the critical path, which is 75 days.