Software Process Management (CSSE-603) - Assignment #02

Student Name: Haseeb Ahmed Khan

Roll Number: EB2210106019

Task 1: Work Breakdown Structure (WBS)

Scenario: A client requires a website and a mobile application. They are not concerned with workflow intricacies but want a clear understanding of the work to be executed. Recommended model: Agile or Iterative.

Deliverables:

1. Website Development

- Requirement Gathering: Understand client needs, define user stories

- UI/UX Design: Create wireframes and mockups

- Front-End Development: HTML/CSS, React.js

- Back-End Development: Node.js, Database Configuration

- Testing: Unit and Integration Testing

- Deployment: Host using AWS or Vercel

2. Mobile App Development

- Requirement Gathering: Choose platform, define features

- UI/UX Design: Design mobile UI in Figma

- Front-End Development: Use React Native or Flutter

- Back-End Development: REST API, Firebase, or Node.js

- Testing: Use emulators and physical devices

- Deployment: Publish to Play Store / App Store

Task 2: Time Estimation from Historical Data

Based on 12 previous projects:

- 3 projects = 30 days

- 4 projects = 60 days

- 5 projects = 80 days

Estimated Duration = $((3\times30) + (4\times60) + (5\times80)) / 12 = 60.83$ approximately 61 days

Task 3: Critical Path Analysis (CPM)

Project Phases & Durations:

1. PM (4d) -> 2. D (12d) -> 3. Dev (15d) -> 4. T (8d) -> 5. PF (2d) -> 6. Dep (2d)

Possible Paths:

- Path A: 1->2->3->4->5->6 = 43 days (Critical Path)

- Path B: 1->2->3->5->6 = 35 days

- Path C: 1->3->4->5->6 = 31 days

Answer: Critical Path is Path A = 43 days

Task 4: Project Management Frameworks

a) Key Elements:

- Integration, Scope, Time, Cost, Quality, Human Resource, Communication, Risk, Procurement Management

- Advantages: Standardized approach, enhanced communication, risk management, progress tracking

b) Framework Examples by Sector:

- IT: Agile, Scrum

- Construction: PRINCE2

- Finance: Waterfall

- Healthcare: Lean

Task 5: COCOMO Estimation - E-Commerce Website

Project: 70,000 lines of code

Model: Basic COCOMO (Semi-Detached)

1. Effort (Person-Months):

Effort = 3.0 × (70)^1.12 approximately 398 PM

2. Development Time (Months):

Time = 2.5 × (398)^0.35 approximately 20 months

3. Required People:

People per Month = 398 / 20 approximately 20

Summary:

- Model Type: Semi-Detached

- Effort Estimate: ~398 Person-Months

- Estimated Time: ~20 Months

- Team Size: ~20 Developers