Experiment – 7

Understanding COCOMO Drivers

Food Management System

Software Engineering

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INDEX

- **Introduction**
- **Project Overview**
- **COCOMO Model**
- **Calculation Results**
- **Conclusion**
- **Recommendations**

1. Introduction

The **Food Management System (FMS)** is a software solution designed to optimize food inventory, track supply chains, and reduce food waste in restaurants, canteens, and other food service industries. Effective cost estimation is crucial in software development to ensure budget adherence and efficient resource allocation. This report focuses on using the **COCOMO (Constructive Cost Model)** approach to estimate the cost drivers for the FMS project using the **COCOMO calculator** available at COCOMO site.

2. Project Overview

- **Project Name:** Food Management System
- **Project Type:** Web-based Application
- **Team Size:** Organic
- **Development Duration:** 3.75 months
- **Programming Languages & Tools:** HTML, CSS, JavaScript, PHP, MySQL.
- **Project Scope:** Inventory Management, Supplier Management, Order Tracking, and Waste Reduction

3. COCOMO Model for Cost Estimation

The **COCOMO Model** is an empirical estimation technique used for software cost estimation based on the size of the project (measured in **KLOC - Thousands of Lines of Code**). It classifies projects into three categories:

- **Organic:** Small, simple projects with experienced teams.
- **Semi-Detached:** Medium-sized projects with moderate complexity.
- **Embedded:** Complex, large-scale projects with high constraints.

3.1. Estimating Project Complexity

The **FMS** is classified as an **organic** project based on the COCOMO calculator input.

3.2. Key Cost Drivers in COCOMO

Using the **COCOMO calculator**, the cost estimation depends on several factors, including:

- **Size of the project:** Estimated at **1.2 KLOC**
- **Development Team Experience:** Medium (5-7 years)
- **Required Software Reliability:** High (Critical for tracking food inventory and supply chains)
- **Complexity of the Application:** Low to Moderate
- **Development Tools & Language Constraints:** Moderate (Use of standard web frameworks)
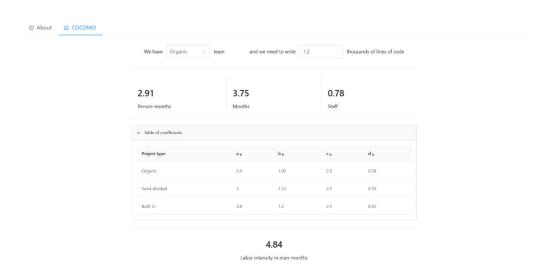
4. COCOMO Calculation Results

Using the **COCOMO calculator**, the following results were obtained:

- **Effort Estimation:** 2.91 Person-Months
- **Time Estimation:** 3.75 Months
- **Staff Required:** 0.78
- **Labor Intensity:** 4.84 Man-Months

5. Conclusion

The **COCOMO model** helps in understanding cost drivers for the **Food Management System** by providing a structured approach to software cost estimation. It highlights key project parameters such as size, team expertise, and complexity, aiding in budget planning and resource allocation. The estimated development effort of **2.91 person-months** ensures that the project remains feasible within financial constraints while meeting industry standards.

6. Recommendations

- **Optimize Team Efficiency:** Leverage automation tools to reduce person-month effort.
- **Use Agile Development:** Regular iterations to refine cost estimation and development progress.
- **Budget Contingencies:** Allocate extra funds for unforeseen development complexities.

This report serves as a foundational document for the cost estimation of the **Food Management System** project using the **COCOMO Model**, ensuring that all stakeholders have clear financial and resource expectations.