**COCOMO Model Report for Game Development Project**

**Project Title:** Dungeons and Wishes – Demo Version

**Model Used:** Basic COCOMO

**Prepared by:** Prabal Gurung

**Date:** 18 April 2025

**1. Introduction**

The purpose of this report is to estimate the effort, time, and cost required to develop a demo version of the game titled *Dungeons and Wishes* using the Basic COCOMO Model. The game is a 2D top-down view role-playing game (RPG) featuring turn-based battles. The COCOMO model is a procedural software cost estimation model developed by Barry W. Boehm and is used to estimate the effort required to develop software projects.

**2. Project Overview**

* **Game Type**: Top-Down 2D RPG with Turn-Based Battles
* **Title**: Dungeons and Wishes (Demo)
* **Team Size**: 1 Developer
* **Duration**: 12 Months
* **Estimated LOC (Lines of Code)**:
  + Number of Scripts: 81
  + Average Lines per Script: 100
  + Total Estimated LOC: 81 × 100 = 8,100 LOC

**3. COCOMO Basic Model**

The Basic COCOMO model uses the formula:

Effort (person-months) = a × (KLOC)^b  
Time (months) = c × (Effort)^d

Where:

* KLOC = Thousands of Lines of Code = 8.1
* The constants (a, b, c, d) depend on the project type.

**Project Type Determination**

Considering it's a solo developer working on a game demo with moderate complexity and small team size, we categorize this as an Organic project.

**Organic Mode Constants:**

* a = 2.4
* b = 1.05
* c = 2.5
* d = 0.38

**4. Calculations**

**Effort Estimation**

Effort

= 2.4×(8.1)1.05

= 2.4×8.797

= 21.11person-months

**Time Estimation**

Time

= 2.5×(21.11)0.38

= 2.5×3.028

= 7.57months

Effort: ~21.11 person-months  
Development Time: ~7.57 months

**5. Actual Time vs Estimated Time**

* Planned Duration: 12 months
* COCOMO Estimated Duration (assuming multiple developers): ~7.57 months
* Effort Required (Person-Months): ~21.11

The COCOMO model estimates approximately 21.11 person-months of work, which implies that effort was distributed among a small team, the project could be completed in approximately 7.57 calendar months.

However, since this project is being developed by a single developer, the actual calendar time required is 21.11 months if working at a standard full-time pace.

To achieve the demo version within the planned 12-month timeline, the developer will need to:

* Work at an increased pace (approximately 1.76 times the standard full-time effort)
* Prioritize and reduce the scope of features for the initial release
* Strategically manage time for polishing, content integration, and testing in the latter phase of development.

This highlights the importance of careful planning and scope management in solo development projects.

**Cost Estimation**

To estimate the total cost, we can use the following formula:

Cost = Effort (person-months) × Cost per Person-Month

We need to assume or define a cost per person-month. This typically includes salary, overhead, and other expenses. For a solo indie developer, a reasonable approximation can range from Rs 22000 - Rs 44000 per month.

Let’s consider Rs 31,000 per person-month as a balanced estimate for an indie developer:

Effort = 21.11 person-months  
Cost per person-month = Rs 31,000

Total Estimated Cost  
= 21.11 × Rs 31,000

= Rs 654,410

**8. Cost Considerations**

The estimated total cost for the demo version of *Dungeons and Wishes* is approximately Rs 654,410, assuming a cost of Rs 31,000 per person-month. This cost can vary depending on:

* Actual monthly expenses
* Use of paid assets, tools, or licenses
* Marketing and publishing efforts

Solo developers often mitigate costs by:

* Using free or open-source tools
* Handling multiple roles (developer, designer, tester, etc.)
* Delaying paid marketing or outsourcing until post-demo or release

**6. Summary and Analysis**

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| Total LOC | 8,100 |
| KLOC | 8.1 |
| Project Type | Organic |
| Estimated Effort | 21.11 person-months |
| Estimated Duration (Team) | 7.57 months |
| Actual Developer Count | 1 |
| Realistic Solo Duration | 21.11 months |
| Planned Duration | 12 months |
| Estimated Cost | Rs 654,410 |

While the COCOMO model suggests that a small team could complete the project in under 8 months, a single developer working full-time would need closer to 21 months to complete the same workload. The planned 12-month timeline is therefore ambitious but potentially achievable with additional effort, reduced feature scope, or extended work hours.

**7. Conclusion**

Based on the Basic COCOMO model, developing the demo version of *Dungeons and Wishes* is expected to require approximately 21.11 person-months of effort and around 7.57 months to complete. Given the 12-month planned timeline, the developer has approximately 4.43 months of additional time which can be used for improvements, polish, content addition, and testing. The estimates suggest the project is feasible and well-scoped for a solo developer, assuming consistent and dedicated development time.