**Department of Computer Science and Engineering**
Premier University

# CSE 305: Software Engineering & Information System Design

Title: CT-03 Assignment

**Submitted by**

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**Remarks**

# Cost Analysis

| Cost Category | Amount |
|---|---|
| **Initial Investment** | |
| Software License | $50,000 |
| Hardware Upgrades | $10,000 |
| Implementation Costs | $20,000 |
| Training Costs | $5,000 |
| Utilities Cost (Yearly) | $1,500 ×12 = $18,000 |
| **Marketing Costs** | $40,000 (Approximately) |
| **Other Costs** | |
| Maintenance and Support (Yearly) | $10,000 |
| Data Storage (Yearly) | $2,000 |
| **Total Development Cost** | **$155,000** |

Table 1: Cost Analysis

# Benefit Analysis

### 1. Increased Sales

A 10% increase in annual revenue:

$$\text{Present revenue} = \$1,000,000$$

$$\text{Increase} = 0.10 \times 1,000,000 = 100,000$$

### 2. Customer Satisfaction

50% of new customers become regular customers:

$$\text{New customers contributing} = 0.50 \times \text{new customers} \times 5000$$

### 3. Reduced Labor Costs

Replacing 3 workers, each paid $30/hour: Assuming 40 hours/week, 52 weeks/year:

$$\text{Savings per worker} = 30 \times 40 \times 52 = 62,400$$

$$\text{Total Savings} = 62,400 \times 3 = 187,200$$

### 4. Increased Brand Value

Assuming a 25% increase in brand value will contribute additional revenue. This is difficult to quantify exactly but may contribute to customer loyalty and new customer acquisition.

### 5. Adjust for Dollar Rate Decrease

Each year, the value of the dollar decreases by 15%. This affects both costs and benefits, but we'll assume it's more relevant to the recurring costs.

## Payback Period Calculation

| Cash Flow Description | Year 0 | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|---|
| Cost | $155,000 | $12,000 | $12,000 | $12,000 | $12,000 |
| Benefit | $0 | $780,000 | $780,000 | $780,000 | $780,000 |
| Net Cash Flow | ($155,000) | $768,000 | $768,000 | $768,000 | $768,000 |
| Cumulative Cash Flow | ($155,000) | $613,000 | $1,381,000 | $2,149,000 | $2,917,000 |

Table 2: Payback Period Calculation

## Payback Period Determination

The cumulative cash flow becomes positive after the first year, therefore the payback period is:
   **Payback Period: 1 Year**

## ROI Analysis

The ROI (Return on Investment) can be calculated using the following formula:

$$\text{ROI} = \frac{\text{Total Benefits} - \text{Total Costs}}{\text{Total Costs}} \times 100$$

$$\text{Total Costs} = \$155,000 \ (\text{Initial}) + \$12,000 \ (\text{Ongoing Year 1})$$
$$= \$167,000$$
$$\text{Total Benefits (Year 1)} = \$780,000$$
$$\text{ROI} = \frac{780,000 - 167,000}{167,000} \times 100 \approx 466.47\%$$

**ROI for Year 1: 466.47% and Payback Period: 1 Year**

This analysis shows that the investment in the software system will be fully recovered within 1 year, with a high ROI of 466.47% by the end of the first year.