

| **Title:**  **Project Cost Estimation** |
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**Objective:** Acquire skill of cost and efforts estimation techniques.

**Expected Outcome of Experiment:**

| **Course Outcome** | **After successful completion of the course students should be able to** |
| --- | --- |
| CO2 | Evaluate and assess the projects and to estimate the project cost using cost benefit evaluation techniques. |

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**Books/ Journals/ Websites referred:**

1. *Bob Hughes, Mike cotterell, Rajib Mall“Software Project Management”, fifth Edition, Tata McGraw Hill, Special Indian Edition*
2. *Royce, “Software Project Management”, Pearson Education, 1999.*
3. *Project Management Institute: “A Guide to the Project Management Body of Knowledge (PMBOK Guide)” 5th Edition Project Management Institute.*
4. *John Nicholas, Herman Steyn, “Project Management for Business Engineering and Technology” 4th Edition.*

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**Team Members :**

**Nidhi Bhanushali – 1911004**

**Mayank Chopra – 1911006**

**Shubh Gosalia – 1911015**

**Pre Lab/ Prior Concepts:**

Project Scheduling, Interest, Investments etc.

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**New Concepts to be learned:**

* + Cost estimation Techniques
  + Prepare cost estimate and Budget

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| Activity Code | Particulars | Duration in Days | Predecessor(s) | Material cost  ( in 10k) | General and administration  ( in 10k) | Total cost  ( in 10k) |
| --- | --- | --- | --- | --- | --- | --- |
| **A** | **Requirement Gathering** | | | |  |  |
| A1 | Literature Survey | 18 |  | 0 | 2 | 2 |
| A2 | Requirement analysis | 22 |  | 0 | 3 | 3 |
| **B** | **Design Phase** | | | |  |  |
| B1 | System design | 14 | A | 1 | 5 | 6 |
| B2 | Database Design | 14 | B1 | 1 | 5 | 6 |
| B3 | UI Design | 20 | B1 | 2 | 8 | 10 |
| **C** | **Development Phase** | | | |  |  |
| C1 | Frontend Module | 38 | B1,B3 | 5 | 20 | 25 |
| C2 | Database Creation | 17 | B2 | 15 | 15 | 30 |
| C3 | Backend Module | 40 | B1,C2 | 10 | 30 | 40 |
| C4 | Authentication module | 17 | B3,C2 | 5 | 7 | 12 |
| **D** | **Testing Phase** | | | |  |  |
| D1 | Unit testing of C1 | 10 | C1 | 1 | 3 | 4 |
| D2 | Unit testing of C2 | 14 | C2 | 1 | 3 | 4 |
| D3 | Unit testing of C3 | 14 | C3 | 1 | 3 | 4 |
| D4 | Unit testing of C4 | 14 | C4 | 1 | 3 | 4 |
| D5 | Integration testing | 17 | D1,D2,D3,D4 | 5 | 6 | 11 |
| D6 | System testing | 12 | D5 | 3 | 5 | 8 |
| E | User documentation | 8 | C1,C2,C3,C4 | 1 | 1 | 2 |
| F | Deployment | 20 | D6 | 2 | 3 | 5 |
| G | Final Delivery | 1 | E,F | 1 | 1 | 2 |
| Total (in 10k) | | | | 65 | 101 | 166 |

**Total cost = 16,60,000**

**Budget = 17,00,000**

**Post Lab Questions:**

1. What are the different kinds of costs that make up the whole cost of a project?

Ans)

There are five types of costs in a typical project:

1. Fixed
2. Variable
3. Direct
4. Indirect
5. Sunk
6. Fixed Costs

Fixed costs are those that do not change throughout the life-cycle of a project.

For example, if you are constructing a road, the excavators and bulldozers are fixed costs. For software development projects, the physical development space and development computers are fixed costs to the project.

1. Variable Costs

Variable costs, as the name suggests, are costs that change during the project life-cycle. Construction projects usually have a longEuroTunnel duration and can easily span several years.

For example, in 1987, the Channel (Euro) Tunnel project begun. The objective of this project was to construct an undersea high-speed train tunnel that would connect Great Britain to France. The project was completed over a period of 3-4 years and at a cost of about 13 billion U.S. dollars. The project employed over 15,000 people and had mammoth cost overruns.This project required tremendous risk management skills. During the construction of this project there were several variable costs, such as fuel costs and labor rates.

1. Direct Costs

Direct costs are expenses that come out of the project budget directly. For example, if you have outsourced some of your development work, the developers are expected to put in a specific amount of time, which is then billed for. The developer salaries are direct costs.

1. Indirect Costs

Indirect costs are those that are shared across multiple projects. Indirect costs are sometimes also referred to as Oversight costs. For example, in software development projects, it is common for a project manager or an architect to be partially allocated across several projects. Hence, the cost of the project manager or architect will be shared among the projects they are allocated to.

Project managers are usually an indirect cost to the project. This is because their work is to supervise. They don’t actually do the work! The people who do the work, like developers and designers, are Direct Costs to the project.

1. Calculate Payback period, NPV and ROI for following:

|  | Project A | Project B | Project C |
| --- | --- | --- | --- |
| Initial Investment | ($40,000) | ($40,000) | ($200,000) |
|  |  |  |  |
| Projected Cashflow |  |  |  |
| Year 1 | $5,000 | $20,000 | $55,000 |
| Year 2 | $10,000 | $25,000 | $55,000 |
| Year 3 | $15,000 | $15,000 | $55,000 |
| Year 4 | $25,000 | $10,000 | $55,000 |
| Year 5 | $20,000 | $5,000 | $55,000 |
| Payback Period | 3.4 years | 1.8 years | 3.65 years |
| NPV (8%) | $17,098 | $22,613 | $19,599 |
| ROI | 17.5 % | 17.5 % | 7.5 % |

**Post Lab Activities (with reference to your Project):**

|  |  |
| --- | --- |
| Initial Investment | INR 17,00,000 |
|  |  |
| Projected Cashflow |  |
| Year 1 | 6,00,000 INR |
| Year 2 | 8,00,000 INR |
| Year 3 | 6,00,000 INR |
| Year 4 | 5,00,000 INR |
| Year 5 | 3,00,000 INR |
| Total | 28.00,00 INR. |

**PAYBACK PERIOD -**

-17,00,000 + 6,00,000 +8,00,000 +6,00,000> 0

Hence payback period is 2.5 years

|  | Project A | Discount Factor | Discounted Cash Flow |
| --- | --- | --- | --- |
| Initial Investment | INR 17,00,000 | 1.0000 | -1700000 |
|  |  |  |  |
| Projected Cashflow |  |  |  |
| Year 1 | 6,00,000 INR | 0.9091 | 545460 |
| Year 2 | 8,00,000 INR | 0.8264 | 661120 |
| Year 3 | 6,00,000 INR | 0.7513 | 450780 |
| Year 4 | 5,00,000 INR | 0.6830 | 341500 |
| Year 5 | 3,00,000 INR | 0.6209 | 186270 |
| Total | 28,00,000 INR. |  | 485130 |

**NPV (10%)**

Hence NPV IS 485130 INR

**ROI**

|  | Project A |
| --- | --- |
| Initial Investment | INR 17,00,000 |
|  |  |
| Projected Cashflow |  |
| Year 1 | 6,00,000 INR |
| Year 2 | 8,00,000 INR |
| Year 3 | 6,00,000 INR |
| Year 4 | 5,00,000 INR |
| Year 5 | 3,00,000 INR |
| TOTAL PROFIT | 11,00,000 |

AVG annual profit - 1100000/5 =2,20,000 INR

Initial Investment- 17,00,000INR

ROI - avg annual profit/ initial investment \* 100

=2,20,000/17,00,000 \*100

=12.94 %