**Estimation**

A tentative evaluation or rough calculations.  
An estimate is a prediction of how long a project will take or how much it will cost.

But estimation on software projects interplays with business targets, commitments, and control.

A target is a description of a desirable business objectives. Commitment is a promise to deliver defined functional at a specific level of quality by a certain date.

Estimation should be treated as an unbiased, analytical process; Planning should be treated as a biased, goal-seeking process.

Estimates form the foundation for the plans, but the plans don’t have to be the same as the estimates.

**Cost**

Cost is something which is incurred on production of any product.

Cost utilization = Cost of the product / no. of days we used the product.

What is cost monitoring and cost controlling?

Basic principles of Cost Management

* Learning Curve Theory
  + States that when many items are produced repetitively, the unit cost of those items decreases in a regular pattern as more units are produced
* Reserves
  + Are rupees included in a cost estimate to mitigate cost risk by allowing for future situations that are difficult to predict
  + **Contingency reserves** allow for future situations that may be partially planned for (sometimes called known unknowns) and are included in the project cost baseline eg: recruiting and training costs for expected personnel turnover during a project.
  + **Management Reserves** allow for future situations that are unpredictable (sometimes called unknown unknowns) eg: Extended absence of a manager supplier goes out of business.

**Cost Budgeting**

* Cost budgeting involves allocating the project cost estimate to individual work items over time
* The WBS is a required input to the cost budgeting process since it defines the work items.
* The important goal is to produce a **cost baseline**
  + A time-phased budget that project managers use to measure and monitor cost performance
  + Estimating costs for each major project activity over time provides management with a foundation for project cost control
  + Cost budgeting also provides info for project funding requirements -at what point(s) in time will the money be needed

**Cost Control**

* Project Cost control includes:
  + Monitoring cost performance
  + Ensuring that only appropriate project changes are included in a revised cost baseline
  + Informing project stakeholders of authorized changes to the project that will affect costs
* Many organizations around the globe have problems with cost control

**Eared Value Formulas and Interpretations**

|  |  |
| --- | --- |
| **TERM** | **FORMULA** |
| Earned Value | EV = PV to date x RP |
| Cost Variance | CV=EV-AC |
| Schedule Variance | SV= EV-PV |
| Cost Performance Index | CPI = EV/AC |
| Schedule Performance Index | SPI = EV/PV |
| Estimate at Completion | EAC = BAC/CPI |
| Estimated Time to Complete | Original Time Extimation / SPI |

**VE numbers** for cost and schedule variance indicate problems in those areas

If **CV is negative** – it means that performing the work cost more than planned

If **SV is negative** – it means that it took longer than planned to perform the work

**CPI** can be used to estimate the projected cost of completing the project based on performance date (**EAC)**

=1: the planned and actual costs are the same;

<1: over budget;

>1: under budget;

**SPI** can be used to estimate the projected time to complete the project

=1: on schedule;

<1 behind schedule;

>1 ahead of schedule;

**Rate of Performance (RP)** is the ratio of actual work completed to the percentage of work planned to have been completed at any given time during the life of the project or activity.

Brenda Taylor, Senior Project Manager in South Africa, suggests this term and approach for estimating earned value.

Planned Value = Cost of resources per activity planned (in MS PROJECT)

THERE IS DEFINITELY GOING TO BE A QUESTION ON THIS, LEARN THIS

<http://edward-designer.com/web/pmp-earned-value-questions-explanined/>

Steps

Calculate the following things:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Req. Analysis | Design | End of Design Phase |
| CPI (EV/AV) | =20,000/22000 | =25000/21250 | (CPIRA + CPID /2) |
| SPI (EV/PV) |  |  | (SPIRA + SPID /2) |
| Estimated Cost @ Completion |  |  |  |
| Estimated Schedule @ completion |  |  |  |
|  |  |  |  |

Q. A software development Project has a duration of 250 functioning days. These days are spread over activities like, Requirement Analysis, Designing, Coding and Testing.

Requirement Analysis Phase require 30% of the functioning days, Design requires 20% of the functioning days, 30% is required for coding and 20% for testing. Till the design phase, requirement analysis had 24 activities to complete, design has 10 activities to complete. Planned value for Req. Analysis and design are 20,000 and 25,000. Actual values are 10% increase in req. analysis, 15% reduction in design.

A:

**<<Learn how to do it>>**

**Project Portfolio Management**

* Many organizations collect and control an entire suite of projects or investments as one set of interrelated activities in a portfolio
* Five Levels for project portfolio management
  + Put all your projects in one database
  + Prioritize the projects in your database
  + Divide your projects into two or three budgets based on type of investment
  + Automate the repository
  + Apply modern portfolio theory, including risk-return tools that map project risk on a curve.

**Estimating Techniques**

<<Watch 3 videos in the folder>>

**Function Points**

Function Count measure functionality from user point of view. The base of the function count is what the user requests and what he receives in return from the sustem.

Quantitative Measure and Industry Data is available as basis for Comparision

5 Key Components:

* External Input
* External Output
* External Inquiries
* Internal Logic Files
* External Interface Files

**What is Risk?**

Uncertain event that has a positive or negative effect

On at least one of the project objectives (Scope, Schedule, budget, Quality)

What is Risk Management?

The Practice of dealing with project Risk.

It includes PLANNING for risk, ASSESSING risk, developing risk, response Strategies, Monitoring risk throughout the project life cycle.

To copy with

* Changing Environment: Internally and Externally
* Effective policy making
* Increased Profitability
* Better Project performance and control
* To win a contract
* Prediction Business needs

**Risk Management Planning**

Definition: The process of deciding how to approach and plan the risk management activities for a project.

**Organizational Risk management Policy:** Predefined approaches to risk analysis and resolution that needs tailoring to a particular project.

The plans describe how risk identification, qualitative and quantitative analysis, resolution planning, monitoring and control will be structured and performed during the project life cycle.

The plan may include:

* Methodology
* Roles and Responsibilities
* Budgeting
* Timing
* Scoring and Interpretation
* Thresholds
* Reporting formats
* Tracking

Major Tasks of Project Closure

1. Evaluate if the project delivered the expected benefits to all stakeholders
   1. Was the project managed well?
   2. Was the customer satisfied?
2. Assess what was done wrong and what contributed to success
3. Identify changes to improve the delivery of future projects.

Google about: 7 M Techniques (introduced by Ishikawa)

Project Monitoring Activities

A review of why the project was selected.

* A **reassessment** of the project’s role in the organization’s priorities.
* A **check** on the organizational culture to ensure it facilitates the type of project being implemented
* An **assessment** in how well the project team is functioning well and if its is appropriately staffed
* A **check** on external factors that might change where the project is heading or its importance.
* A **review** of all factors relevant to the project and to managing future projects.

Project Closure

1. Types of Project Closure
   1. Normal
   2. Premature
   3. Perpetual
   4. Failed Project
   5. Changed Priority
2. Close-out Plan: Questions to be asked
   1. What tasks are required to close the project?
   2. Who will be responsible for these tasks?
   3. When will closure begin and end?
   4. How will the project be delivered?