

UNIT – 4

1.What is Software Project Management ?

- Software project management is an art and discipline of planning and supervising software projects.
- It is a sub-discipline of software project management in which software projects planned, implemented, monitored and controlled.
- It is a procedure of managing, allocating and timing resources to develop computer software that fulfills requirements.

2. Explain COCOMO 1 Model.

The Constructive Cost Model was first developed by Barry W. Boehm.

- The model is for estimating effort, cost, and schedule for software projects.
- It is also called as Basic COCOMO. This model is used to give an approximate estimate of the various parameters of the project.
- Example of projects based on this model is business system, payroll management system and inventory management systems.

3.Define Earned Value Analysis (EVA)

- **It** is also called “Budget cost of work performed”. It is considered a refinement of the cost-monitoring technique.
- In this analysis, a “value” is assigned to each track or work package based on the expenditure forecast. The value assigned is known as the “**planned value (PV)**”. The work that has not yet begun is given a value known as the “**earned value of zero**”.
- The total value credited to a project is called “**earned value(EV)**”, which is also represented as “money value”.

4. Define RFP .

- A Request for Proposal is a formal document that outlines the requirements, scope, and objectives of a project, inviting qualified vendors or contractors to submit their proposals for consideration.
- RFPs are commonly used when an organization seeks to procure goods, services, or solutions for a project.

- They provide a clear framework for potential vendors to understand the project's needs and deliver tailored solutions.

5. Define Risk Projection

Risk projection, also called risk estimation, attempts to rate each risk in two ways the likelihood or probability that the risk is real and the consequences of the problems associated with the risk, should it occur.

The project planner, along with other managers and technical staff, performs four risk projection activities:

- (1) establish a scale that reflects the perceived likelihood of a risk,
- (2) delineate the consequences of the risk,
- (3) estimate the impact of the risk on the project and the product
- (4) note the overall accuracy of the risk projection so that there will be no misunderstandings.

5 .Explain the types of risk?

There are mainly 3 classes of risks that may affect a computer code project:

1. ProjectRisks:

Project risks concern various sorts of monetary funds, schedules, personnel, resources, and customer-related issues.

2. TechnicalRisks:

Technical risks concern potential style, implementation, interfacing, testing, and maintenance issues.

3. BusinessRisks:

This type of risk embodies the risks of building a superb product that nobody needs, losing monetary funds or personal commitments, etc.

Part-B

1. Define Estimation.

Estimation is the process of finding an estimate, or approximation, which is a value that can be used for some purpose even if input data may be incomplete, uncertain, or unstable. Estimation determines how much money, effort, resources, and time it will take to build a specific system or product. Estimation is based on

- Past Data/Past Experience
- Available Documents/Knowledge
- Assumptions
- Identified Risks

The four basic steps in Software Project Estimation are

- Estimate the size of the development product.
- Estimate the effort in person-months or person-hours.
- Estimate the schedule in calendar months.
- Estimate the project cost in agreed currency.

2. Define LOC

A **line of code (LOC)** is any line of text in a code that is not a comment or blank line, and also header lines, in any case of the number of statements or fragments of statements on the line. LOC clearly consists of all lines containing the declaration of any variable, and executable and non-executable statements. As Lines of Code (LOC) only counts the volume of code, you can only use it to compare or estimate projects that use the same language and are coded using the same coding standards..

Advantages of Lines of Code (LOC):

- **Effort Estimation:** LOC is occasionally used to estimate development efforts and project deadlines at a high level. Although caution is necessary, project planning can begin with this.
- **Comparative Analysis:** High-level productivity comparisons between several projects or development teams can be made using LOC. It might provide an approximate figure of the volume of code generated over a specific time frame.
- **Benchmarking Tool:** When comparing various iterations of the same program, LOC can be used as a benchmarking tool. It may bring information on how modifications affect the codebase's total size.

3 .Explain the types of risk?

- **Project Risks:**
Project risks concern various sorts of monetary funds, schedules, personnel, resources, and customer-related issues. A vital project risk is schedule slippage. Since computer code is intangible, it's tough to observe and manage a computer code project. It's tough to manage one thing that

can not be seen. For any producing project, like producing cars, the project manager will see the merchandise taking form.

- **Technical**

Risks:

Technical risks concern potential style, implementation, interfacing, testing, and maintenance issues. Technical risks conjointly embody ambiguous specifications, incomplete specifications, dynamic specifications, technical uncertainty, and technical degeneration. Most technical risks occur thanks to the event team's lean information concerning the project.

- **Business**

Risks:

This type of risk embodies the risks of building a superb product that nobody needs, losing monetary funds or personal commitments, etc.

4. Define the advantages of the case approach.

Computer-aided software engineering (CASE) is the implementation of computer-facilitated tools and methods in software development. CASE is used to ensure high-quality and defect-free software.

Advantages:

- **Improved Documentation:** Comprehensive documentation creation and maintenance is made easier by CASE tools
- **Reusing Components:** Reusable component encourages a development approach that is modular and component-based, enabling teams to shorten development times and reuse tested solutions.
- **Quicker Cycles of Development:** Development cycles take less time when certain jobs, such testing and code generation, are automated. This may result in software solutions being delivered more quickly, meeting deadlines and keeping up with changing business requirements.
- **Improved Results:** Code generation, documentation, and testing are just a few of the time-consuming, repetitive operations that CASE tools perform. Due to this automation, engineers are able to concentrate on more intricate and imaginative facets of software development, which boosts output.
- **Achieving uniformity and standardization:** Coding conventions, documentation formats and design patterns are just a few of the areas of software development where CASE tools enforce uniformity and standards.

5.Explain detail about FP Based Estimation.

Functional Point Analysis gives a dimensionless number defined in function points which we have found to be an effective relative measure of function value delivered to our customer.

Objectives of Functional Point Analysis:

1. **Encourage Approximation:** FPA helps in the estimation of the work, time and materials needed to develop a software project. Organizations are able to plan and manage projects more accurately when a common measure of functionality is available.
2. **To assist with project management:** Project managers can monitor and manage software development projects with the help of FPA. Managers are able to evaluate productivity, monitor progress, and make well-informed decisions about resource allocation and project timeframes by measuring the software's functional points.
3. **Comparative analysis:** By enabling benchmarking, it gives businesses the ability to assess how their software projects measure up to industry standards or best practices in terms of size and complexity. This can be useful for determining where improvements might be made and for evaluating how well development procedures are working.
4. **Improve Your Cost-Benefit Analysis:** It offers a foundation for assessing the value provided by the program in respect to its size and complexity, which helps with cost-benefit analysis. Making educated judgements about project investments and resource allocations can benefit from having access to this information.
5. **Comply with Business Objectives:** It assists in coordinating software development activities with an organization's business objectives. It guarantees that software development efforts are directed towards providing value to end users by concentrating on user-oriented functionality.

Part-C

1..Explain detail in Make / Buy Decision.

MAKE AND BUY DECISION

Make-or-buy decision is one of the key techniques for management practice. Due to the global outsourcing, make-or-buy decision making has become popular and frequent..When you are supposed to make a make-or-buy decision, there are four numbers you need to be aware.

- The fixed cost of making
- The volume
- Per-unit direct cost when making
- Per-unit cost when buying

Reasons for Making

There are number of reasons a company would consider when it comes to making in-house. Following are a few:

- Cost concerns
- Desire to expand the manufacturing focus
- Need of direct control over the product
- Intellectual property concerns
- Quality control concerns
- Supplier unreliability
- Lack of competent suppliers
- Volume too small to get a supplier attracted
- Reduction of logistic costs (shipping etc.)
- To maintain a backup source
- Political and environment reasons
- Organizational pride

Reasons for Buying

Following are some of the reasons companies may consider when it comes to buying from a supplier:

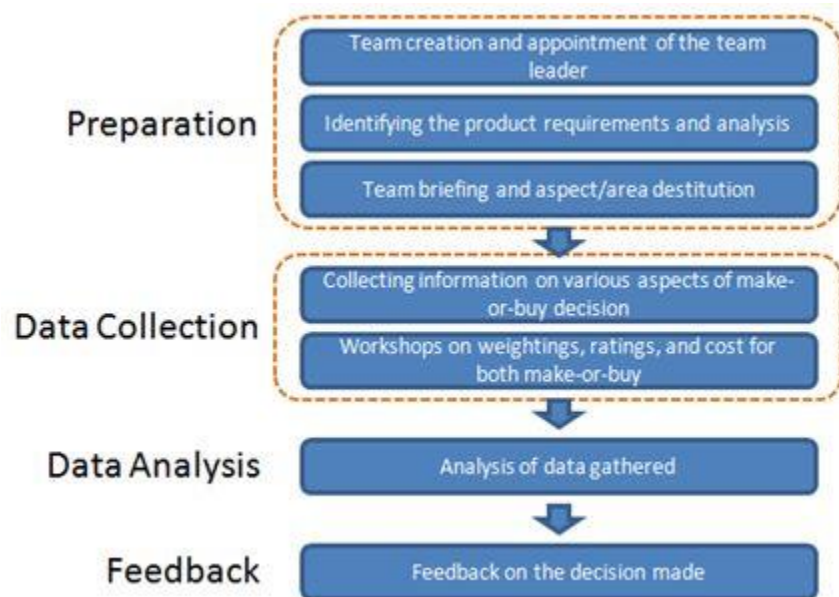
- Lack of technical experience
- Supplier's expertise on the technical areas and the domain
- Cost considerations
- Need of small volume
- Insufficient capacity to produce in-house
- Brand preferences
- Strategic partnerships

The Process

The make or buy decision can be in many scales. If the decision is small in nature and has less impact on the business, then even one person can make the decision.

The person can consider the pros and cons between making and buying and finally arrive at a decision.

When it comes to larger and high impact decisions, usually organizations follow a standard method to arrive at a decision. This method can be divided into four main stages as below.



1. Preparation

- Team creation and appointment of the team leader
- Identifying the product requirements and analysis
- Team briefing and aspect/area destitution

2. Data Collection

- Collecting information on various aspects of make-or-buy decision
- Workshops on weightings, ratings, and cost for both make-or-buy

3. Data Analysis

- Analysis of data gathered

4. Feedback

- Feedback on the decision made

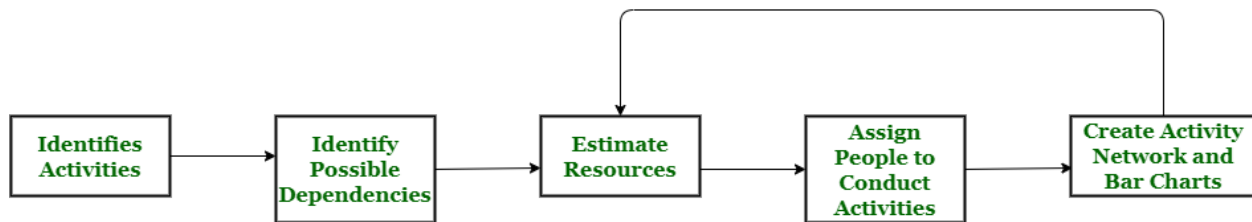
2. Difference between COCOMO 1 and COCOMO 2

COCOMO I	COCOMO II
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COCOMO I	COCOMO II
<p>COCOMO I is useful in the waterfall models of the software development cycle.</p> <p>It provides estimates of effort and schedule.</p>	<p>COCOMO II is useful in non-sequential, rapid development and reuse models of software.</p> <p>It provides estimates that represent one standard deviation around the most likely estimate.</p>
<p>This model is based upon the linear reuse formula.</p>	<p>This model is based upon the non linear reuse formula</p>
<p>This model is also based upon the assumption of reasonably stable requirements.</p> <p>Effort equation's exponent is determined by 3 development modes.</p> <p>Development begins with the requirements assigned to the software.</p>	<p>This model is also based upon reuse model which looks at effort needed to understand and estimate.</p> <p>Effort equation's exponent is determined by 5 scale factors.</p> <p>It follows a spiral type of development.</p>
<p>Number of submodels in COCOMO I is 3 and 15 cost drivers are assigned</p>	<p>In COCOMO II, Number of submodel are 4 and 17 cost drivers are assigned</p>
<p>Size of software stated in terms of Lines of code</p>	<p>Size of software stated in terms of Object points, function points and lines of code</p>

4. Define Project Scheduling:

Project scheduling means a mechanism that is used to communicate and know about that tasks are needed and has to be done or performed and which organizational resources will be given or allocated to these tasks and in what time duration or time frame work is needed to be performed. Effective project scheduling leads to success of project, reduced cost, and increased customer satisfaction. Scheduling in project management means to list out activities, deliverables, and milestones within a project that are delivered. It contains more notes than your average weekly planner notes. The most common and important form of project schedule is Gantt chart.



Project Scheduling Process

Process

The manager needs to estimate time and resources of project while scheduling project. All activities in project must be arranged in a coherent sequence that means activities should be arranged in a logical and well-organized manner for easy to understand. Initial estimates of project can be made optimistically which means estimates can be made when all favorable things will happen and no threats or problems take place.

The total work is separated or divided into various small activities or tasks during project schedule. Then, Project manager will decide time required for each activity or task to get completed. Even some activities are conducted and performed in parallel for efficient performance. The project manager should be aware of fact that each stage of project is not problem-free.

4 .Explain briefly about Steps in Risk Management

1. Risk Identification

Risk identification entails brainstorming. It also entails the creation of a risk list. Brainstorming is a group discussion technique in which the whole project management is present. This technique generates new ideas and encourages

creative thinking. The preparation of a risk list entails identifying risks that have occurred repeatedly in previous software projects.

2. Risk Assessment and Prioritization

It is a procedure within project management that includes the following steps:

- Identifying the issues that are causing risk in projects
- Determining the likelihood of a problem occurring
- Determining the problem's impact
- Assigning probability and impact values ranging from 1 to 10
- Determining the risk exposure factor

The project manager should make a table with all of the values and rank the risks according to the risk exposure factor.

3. Risk Avoidance and Mitigation

. Risk avoidance involves identifying potential risks and then eliminating them as much as possible, or reducing their impact if they cannot be eliminated..

4. Risk transfer

This technique is used in software engineering to reduce the risk of a project. Risk transfer is usually used when the scope of a project is too large for any one team to handle, and there is no way to split up the work so that each team can be responsible for its own piece of it.

5. Risk acceptance

In software engineering risk acceptance is a technique that involves taking on risks in order to complete the system. It can be a good idea if there is a lot of uncertainty about which features will be required and when they'll be needed.

6. Risk Monitoring

The risk should be continuously monitored by reevaluating the risks, the impact of the risk, and the probability of the risk occurring.

5, Define Risk Mitigation, Monitoring, and Management (RMMM) plan.

RMMM Plan :

A risk management technique is usually seen in the software Project plan. This can be divided into Risk Mitigation, Monitoring, and Management Plan (RMMM). In this plan, all works are done as part of risk analysis. As part of the overall project plan project manager generally uses this RMMM plan.

In some software teams, risk is documented with the help of a Risk Information Sheet (RIS). This RIS is controlled by using a database system for easier management of information i.e creation, priority ordering, searching, and other analysis. After documentation of RMMM and start of a project, risk mitigation and monitoring steps will start.

Risk Mitigation :

It is an activity used to avoid problems (Risk Avoidance). Steps for mitigating the risks as follows.

1. Finding out the risk.
2. Removing causes that are the reason for risk creation.
3. Controlling the corresponding documents from time to time.
4. Conducting timely reviews to speed up the work.

Risk Monitoring :

It is an activity used for project tracking. It has the following primary objectives as follows.

1. To check if predicted risks occur or not.
2. To ensure proper application of risk aversion steps defined for risk.
3. To collect data for future risk analysis.
4. To allocate what problems are caused by which risks throughout the project.

Risk Management :

It assumes that the mitigation activity failed and the risk is a reality. This task is done by Project manager when risk becomes reality and causes severe problems. If the project manager effectively uses project mitigation to remove risks successfully then it is easier to manage the risks. This shows that the response that will be taken for each risk by a manager. The main objective of the risk management plan is the risk register. This risk register describes and focuses on the predicted threats to a software project.

