UNIT – IV

1. Explain with a neat diagram the Agile Project Planning Process in XP (Extreme Programming).

Ans:

Story-based planning

- The system specification in XP is based on user stories that reflect the features that should be included in the system.
- The project team read and discuss the stories and rank them in order of the amount of time they think it will take to implement the story.
- Release planning involves selecting and refining the stories that will reflect the features to be implemented in a release of a system and the order in which the stories should be implemented.
- Stories to be implemented in each iteration are chosen, with the number of stories reflecting the time to deliver an iteration (usually 2 or 3 weeks).

❖ At the start of each iteration, there is more detailed planning stage where the developers break stories down into development tasks which takes 4–16 hours. All the tasks that must be completed to implement all of the stories in that iteration are listed.

2. Briefly explain the Algorithmic Cost Modelling and also draw the graph for Estimate Uncertainty.

Ans:

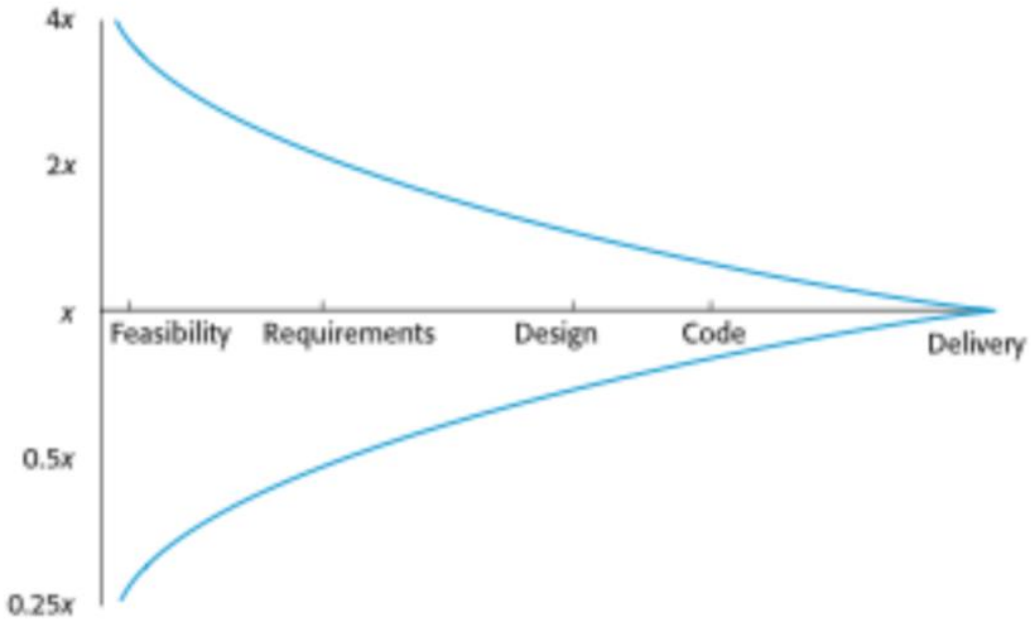
Algorithmic cost modelling

- Cost is estimated as a mathematical function of product, project and process attributes whose values are estimated by project managers:
  - Effort = A X SIZE^B X M
  - According to agile SIZE=Notion points assigned to every story.
  - A is an organisation-dependent constant, B reflects the disproportionate effort for large projects and M is a multiplier reflecting product, process and people attributes.
- The most commonly used product attribute for cost estimation is code size, application points.
- Most models are similar but they use different values for A. B and M.

Estimation accuracy

- The size of a software system can only be known accurately when it is finished.
- Several factors influence the final size
  - Use of COTS and components;
  - Programming language;
  - Distribution of system.
- As the development process progresses then the size estimate becomes more accurate.
- The estimates of the factors contributing to B and M are subjective and vary according to the judgment of the estimator.

Estimate uncertainty



3. List and explain the factors affecting Software price.

Ans:

Factors affecting software pricing

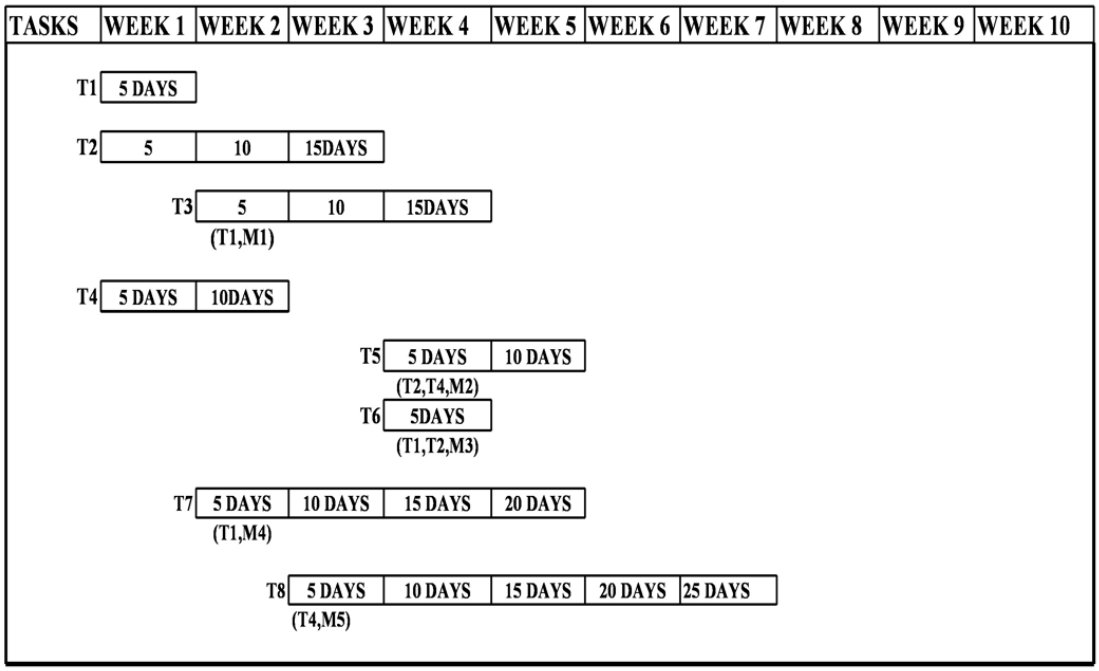
Factor	Description
Market opportunity	A development organization may quote a low price because it wishes to move into a new segment of the software market. Accepting a low profit on one project may give the organization the opportunity to make a greater profit later. The experience gained may also help it develop new products.
Cost estimate uncertainty	If an organization is unsure of its cost estimate, it may increase its price by a contingency over and above its normal profit.
Contractual terms	A customer may be willing to allow the developer to retain ownership of the source code and reuse it in other projects. The price charged may then be less than if the software source code is handed over to the customer.

Factor	Description
Requirements volatility	If the requirements are likely to change, an organization may lower its price to win a contract. After the contract is awarded, high prices can be charged for changes to the requirements.
Financial health	Developers in financial difficulty may lower their price to gain a contract. It is better to make a smaller than normal profit or break even than to go out of business. Cash flow is more important than profit in difficult economic times.

4. For the set of tasks shown below draw the project scheduling using activity bar chart assuming start date of the project as 04/05/2021 (Assume 5 days = 1 week)

Task	Duration	Dependency
T1	05	-
T2	15	-
T3	15	T1(M1)
T4	10	-
T5	10	T1, T2(M3)
T6	05	T2, T4(M2)
T7	20	T1(M1)
T8	25	T4(M4)

Ans:



5. With context to the Plan Driven Software approach
   i. Briefly explain the purpose of each of the section in a software project plan and
   ii. Explain the project plan supplements for the same.

Ans: a.

- Plan sections
  - Introduction :
  - Project organization:
  - Risk analysis:
  - Hardware and software resource requirements:
  - Work breakdown :
  - Project schedule :
  - Monitoring and reporting mechanisms :

1. *Introduction* This briefly describes the objectives of the project and sets out the constraints (e.g., budget, time, etc.) that affect the management of the project.

2. *Project organization* This describes the way in which the development team is organized, the people involved, and their roles in the team.

3. *Risk analysis* This describes possible project risks, the likelihood of these risks arising, and the risk reduction strategies that are proposed. I have covered risk management in Chapter 22.

4. *Hardware and software resource requirements* This specifies the hardware and support software required to carry out the development. If hardware has to be bought, estimates of the prices and the delivery schedule may be included.

5. *Work breakdown* This sets out the breakdown of the project into activities and identifies the milestones and deliverables associated with each activity. Milestones are key stages in the project where progress can be assessed; deliverables are work products that are delivered to the customer.

6. *Project schedule* This shows the dependencies between activities, the estimated time required to reach each milestone, and the allocation of people to activities. The ways in which the schedule may be presented are discussed in the next section of the chapter.

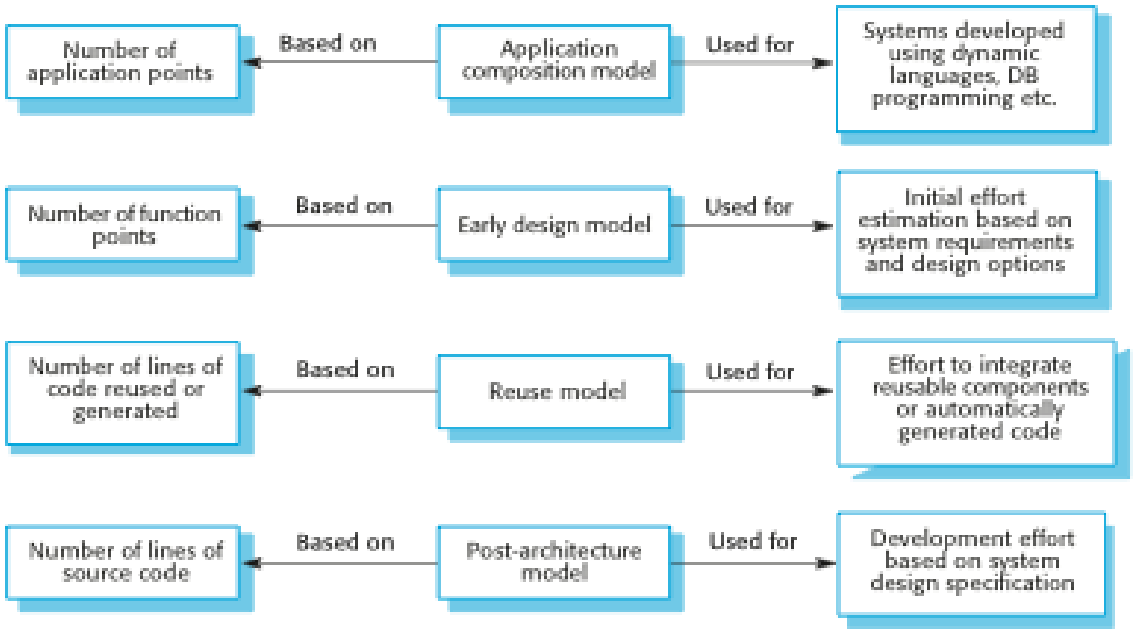
7. *Monitoring and reporting mechanisms* This defines the management reports that should be produced, when these should be produced, and the project monitoring mechanisms to be used.

b.

Plan	Description
Quality plan	Describes the quality procedures and standards that will be used in a project.
Validation plan	Describes the approach, resources, and schedule used for system validation.
Configuration management plan	Describes the configuration management procedures and structures to be used.
Maintenance plan	Predicts the maintenance requirements, costs, and effort.
Staff development plan	Describes how the skills and experience of the project team members will be developed.

6. Explain with a neat diagram COCOMO-II estimation model.

Ans:



COCOMO 2 models

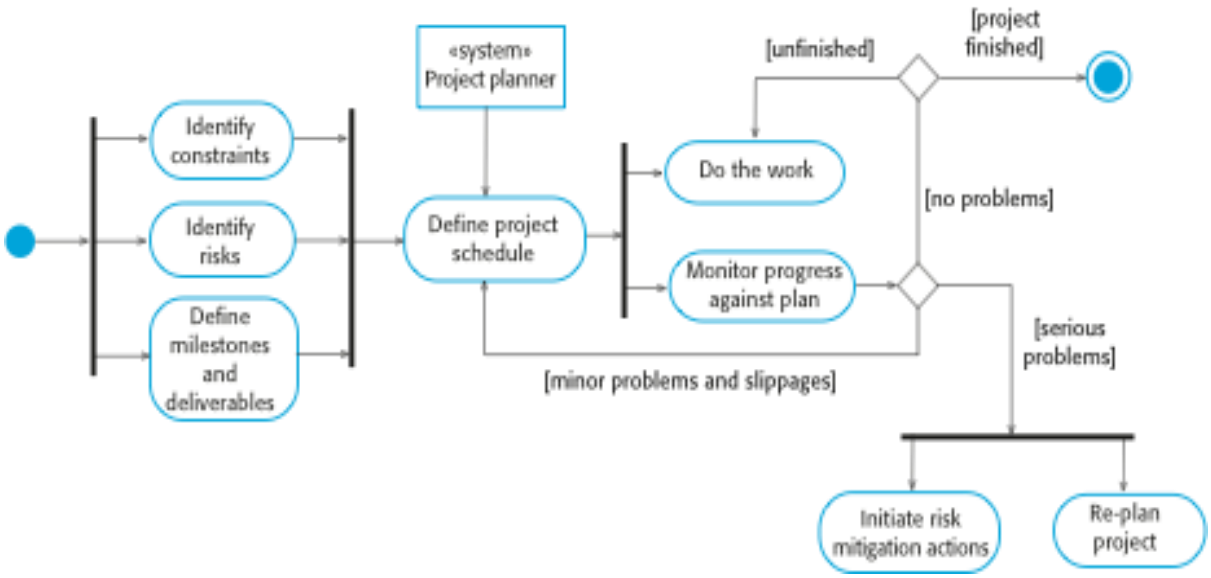
- COCOMO 2 incorporates a range of sub-models that produce increasingly detailed software estimates.
- The sub-models in COCOMO 2 are:
  - Application composition model. Used when software is composed from existing parts.
  - Early design model. Used when requirements are available but design has not yet started.
  - Reuse model. Used to compute the effort of integrating reusable components.
  - Post-architecture model. Used once the system architecture has been designed and more information about the system is available.

Staffing requirements

- Staff required can't be computed by diving the development time by the required schedule.
- The number of people working on a project varies depending on the phase of the project.
- The more people who work on the project, the more total effort is usually required.
- A very rapid build-up of people often correlates with schedule slippage.

7. Draw and explain with activity diagram, for Plan driven project planning process.

Ans:



- Project planning is an iterative process that starts when you create an initial project plan during the project startup phase.
- Plan changes are inevitable.
  - As more information about the system and the project team becomes available during the project, you should regularly revise the plan to reflect requirements, schedule and risk changes.
  - Changing business goals also leads to changes in project plans. As business goals change, this could affect all projects, which may then have to be re-planned.

At the beginning of a planning process, you should assess the constraints affecting the project. These constraints are the required delivery date, staff available, overall budget, available tools, and so on. In conjunction with this, you should also identify the project milestones and deliverables. Milestones are points in the schedule against which you can assess progress, for example, the handover of the system for testing. Deliverables are work products that are delivered to the customer (e.g., a requirements document for the system).

The process then enters a loop. You draw up an estimated schedule for the project and the activities defined in the schedule are initiated or given permission to continue. After some time (usually about two to three weeks), you should review progress and note discrepancies from the planned schedule. Because initial estimates of project parameters are inevitably approximate, minor slippages are normal and you will have to make modifications to the original plan.

It is important to be realistic when you are creating a project plan. Problems of some description nearly always arise during a project, and these can lead to project delays. Your initial assumptions and scheduling should therefore be pessimistic rather than optimistic. There should be sufficient contingency built into your plan so that the project constraints and milestones don't need to be renegotiated every time you go around the planning loop.

If there are serious problems with the development work that are likely to lead to significant delays, you need to initiate risk mitigation actions to reduce the risks of project failure. In conjunction with these actions, you also have to replan the project.

8. What is Project Scheduling? Explain Project Scheduling process with a neat diagram.

Ans:

- Project scheduling is the process of deciding how the work in a project will be organized as separate tasks, and when and how these tasks will be executed.
- You estimate the calendar time needed to complete each task, the effort required and who will work on the tasks that have been identified.
- You also have to estimate the resources needed to complete each task, such as the disk space required on a server, the time required on specialized hardware, such as a simulator, and what the travel budget will be.

Project scheduling activities

- Split project into tasks and estimate time and resources required to complete each task.
- Organize tasks concurrently to make optimal use of workforce.
- Minimize task dependencies to avoid delays caused by one task waiting for another to complete.
- Dependent on project managers intuition and experience.

Schedule representation

- Graphical notations are normally used to illustrate the project schedule.
- These show the project breakdown into tasks. Tasks should not be too small. They should take about a week or two.
- Bar charts are the most commonly used representation for project schedules. They show the schedule as activities or resources against time.

9. Define Milestones and Deliverable's.

Ans:

Milestones and deliverables

- Milestones are points in the schedule against which you can assess progress, for example, the handover of the system for testing. (Represented as M1,M2,M3)

- Deliverables are work products that are delivered to the customer, e.g. a requirements document for the system.

10. For the given values A=2, size=12, M=2, B=1.2. Find out effort cost by using Algorithmic cost modelling technique.

Ans: Effort = A*Size^B*M

= 2*12^1.2*2

Effort = 78.90

11. Compare and contrast between Experience based techniques and Algorithmic cost modelling technique.

Ans:

Experience based technique	Algorithm cost modelling
1. Experience-based techniques rely on judgments based on experience of past projects and the effort expended in these projects on software development activities.	a. Cost is estimated as a mathematical function of product, project and process attribute whose values are estimated by project managers:
2. It is knowledge based.	b. It is formulary approach.
3. It is manual	c. It is automated.
4. Its accuracy is less	d. Its accuracy is more
5. Human involvement is more.	e. No human involvement.