

Q1 Discuss the prototyping model. What is the effect of designing a prototype on the overall cost of the project?

Prototyping is defined as the process of developing a working replication of a product or system that has to be engineered.

- It offers a small scale facsimile of the end product and is used for obtaining customer feedback.
- Prototype is the act of making the software applications prototypes which is basically an incomplete version of the software program that is being developed.
- It takes place in software development and is comparable to prototyping as known in other fields like that of manufacturing and mechanical engineering. However, it is completely different from that of the final product and stimulates only a few aspects.
- In this process model, the system is partially implemented before or during the analysis phase thereby giving the customers an opportunity to see the product early in the life cycle.
- The process starts by interviewing the customers and developing the incomplete high-level paper model.
- This document is used to build the initial prototype supporting only the basic functionality as desired by the customer.
- Once the customer figures out the problems, the prototype is further refined to eliminate them.
- The process continues until the user approves the prototype and finds the working model to be satisfactory.

Q2 Compare iterative enhancement model and evolutionary process model.

Iterative Enhancement Model: This model has the similar phases as the waterfall model, but with fewer restrictions. In general the phases occur in the same order as in the waterfall model but these may be conducted in several cycles. A utilizable product is released at the end of the each cycle with each release providing additional functionality.

Advantage(Pros) of Iterative Model:

1. Testing and debugging during smaller iteration is easy.
2. A Parallel development can plan.
3. It is easily acceptable to ever-changing needs of the project.
4. Risks are identified and resolved during iteration.
5. Limited time spent on documentation and extra time on designing.

Disadvantage(Cons) of Iterative Model:

1. It is not suitable for smaller projects.
2. More Resources may be required.
3. Design can be changed again and again because of imperfect requirements.
4. Requirement changes can cause over budget.
5. Project completion date not confirmed because of changing requirements.

Evolutionary Development Model: Evolutionary development model bear a resemblance to iterative enhancement model. The similar phases as defined for the waterfall model occur here in a cyclical fashion. This model is different from iterative enhancement model in the sense that this doesn't require a useable product at the end of each cycle. In evolutionary development requirements are implemented by category rather than by priority.

Advantages of the Model:

1. Risk analysis is better.
3. Initial operating time is less.
4. Better suited for large mission-critical projects.
5. During the life cycle software is produced early which facilitates customer evaluation and feedback

Disadvantage of the Model:

- Management complexity is more. Not suitable for smaller projects.
- Can be costly to use. Highly skilled resources are required for risk analysis.

.Q3 As we move outward along with process flow path of the spiral model, what can we say about software

that is being developed or maintained.

- The product advances to a more complete state as work spirals outward, and the level of abstraction at which work is conducted decreases (i.e., implementation specific work accelerates as we move further from the origin).
- One of the most significant models for the Software Development Life Cycle that supports risk handling is the spiral model.
- In diagrammatic form, it resembles a spiral with several loops.
- The spiral's precise number of loops is unclear and varies from project to project. A phase of the software development process is referred to as each spiral loop.
- The project manager might alter the precise number of phases required to build the product depending on the project's risks.
- The project manager plays a crucial role in the spiral model of product development since they dynamically set the number of phases.
- The waterfall model's methodical, managed elements are combined with the idea of iterative development in the spiral model.
- Iterative and sequential linear development models, or the waterfall model, are combined to create the spiral model, which places a strong emphasis on risk analysis.

Q4 Explain the Scrum Agile methodology.

Scrum is an agile development methodology used in the development of Software based on an iterative and incremental processes.

- Scrum is precisely an evolution of Agile Management. Scrum methodology is based on a set of very defined practices and roles that must be involved during the software development process.
- It is a flexible methodology that rewards the application of the 12 agile principles in a context agreed by all the team members of the product.
- Scrum is executed in temporary blocks that are short and periodic, called Sprints, which usually range from 2 to 4 weeks, which is the term for feedback and reflection.
- Each Sprint is an entity in itself, that is, it provides a complete result, a variation of the final product that must be able to be delivered to the client with the least possible effort when requested.
- The process has as a starting point, a list of objectives/ requirements that make up the project plan. It is the client of the project that prioritizes these objectives considering a balance of the value and the cost thereof, that is how the iterations and consequent deliveries are determined.

Q5 Explain the utility of Kanban CFD reports.

The cumulative flow diagram (also known as CFD) is one of the most advanced Kanban and Agile analytics charts.

- The chart tracks the total number of work items in the columns of the "In Progress" section on your Kanban board each day.
- The horizontal axis of the CFD represents the time frame for which the chart is visualizing data. The vertical axis shows the cumulative number of cards in the workflow at various points in time.
- The differently colored bands that divide sections of the upward flow are the different stages of your workflow as they appear on the Kanban board itself. The bands always go up or sideways in accordance with the number of assignments that go through your process.
- The top line of each band on the cumulative flow chart represents the entry point of tasks in the respective stage of your Kanban board, while the bottom one shows when it leaves it. If a line becomes flat, nothing arrives in the corresponding stage, or nothing is leaving it.