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

1. Prototyping may have some initial costs of developing, but it
2. reduces the overall budget by helping your product to be free of
3. the errors or glitches that could have occurred if the idea was
4. made from scratch without any prior user testing. Furthermore,
5. prototyping also helps to understand the intrinsic flaws,
6. shortcomings and drawbacks that can be improved during the
7. product development process. If the prototyping process is
8. ignored completely, it might result in the restructuring and
9. redesigning of the entire product after spending all your resources
10. on its development. So, the effect of designing a prototype on the
11. overall cost of a software project is to actually reduce the
12. additional costs of restructuring and reframing it after its full-
13. fledged development- which might cost a fortune.
14. Prototyping may have some initial costs of developing, but it
15. reduces the overall budget by helping your product to be free of
16. the errors or glitches that could have occurred if the idea was
17. made from scratch without any prior user testing. Furthermore,
18. prototyping also helps to understand the intrinsic flaws,
19. shortcomings and drawbacks that can be improved during the
20. product development process. If the prototyping process is
21. ignored completely, it might result in the restructuring and
22. redesigning of the entire product after spending all your resources
23. on its development. So, the effect of designing a prototype on the
24. overall cost of a software project is to actually reduce the
25. additional costs of restructuring and reframing it after its full-
26. fledged development- which might cost a fortune.
27. Prototyping may have some initial costs of developing, but it
28. reduces the overall budget by helping your product to be free of
29. the errors or glitches that could have occurred if the idea was
30. made from scratch without any prior user testing. Furthermore,
31. prototyping also helps to understand the intrinsic flaws,
32. shortcomings and drawbacks that can be improved during the
33. product development process. If the prototyping process is
34. ignored completely, it might result in the restructuring and
35. redesigning of the entire product after spending all your resources
36. on its development. So, the effect of designing a prototype on the
37. overall cost of a software project is to actually reduce the
38. additional costs of restructuring and reframing it after its full-
39. fledged development- which might cost a fortune.
40. Prototyping may have some initial costs of developing, but it
41. reduces the overall budget by helping your product to be free of
42. the errors or glitches that could have occurred if the idea was
43. made from scratch without any prior user testing. Furthermore,
44. prototyping also helps to understand the intrinsic flaws,
45. shortcomings and drawbacks that can be improved during the
46. product development process. If the prototyping process is
47. ignored completely, it might result in the restructuring and
48. redesigning of the entire product after spending all your resources
49. on its development. So, the effect of designing a prototype on the
50. overall cost of a software project is to actually reduce the
51. additional costs of restructuring and reframing it after its full-
52. fledged development- which might cost a fortune.
53. Prototyping may have some initial costs of developing, but it
54. reduces the overall budget by helping your product to be free of
55. the errors or glitches that could have occurred if the idea was
56. made from scratch without any prior user testing. Furthermore,
57. prototyping also helps to understand the intrinsic flaws,
58. shortcomings and drawbacks that can be improved during the
59. product development process. If the prototyping process is
60. ignored completely, it might result in the restructuring and
61. redesigning of the entire product after spending all your resources
62. on its development. So, the effect of designing a prototype on the
63. overall cost of a software project is to actually reduce the
64. additional costs of restructuring and reframing it after its full-
65. fledged development- which might cost a fortune.
66. Prototyping may have some initial costs of developing, but it
67. reduces the overall budget by helping your product to be free of
68. the errors or glitches that could have occurred if the idea was
69. made from scratch without any prior user testing. Furthermore,
70. prototyping also helps to understand the intrinsic flaws,
71. shortcomings and drawbacks that can be improved during the
72. product development process. If the prototyping process is
73. ignored completely, it might result in the restructuring and
74. redesigning of the entire product after spending all your resources
75. on its development. So, the effect of designing a prototype on the
76. overall cost of a software project is to actually reduce the
77. additional costs of restructuring and reframing it after its full-
78. fledged development- which might cost a fortune.
79. Prototyping may have some initial costs of developing, but it
80. reduces the overall budget by helping your product to be free of
81. the errors or glitches that could have occurred if the idea was
82. made from scratch without any prior user testing. Furthermore,
83. prototyping also helps to understand the intrinsic flaws,
84. shortcomings and drawbacks that can be improved during the
85. product development process. If the prototyping process is
86. ignored completely, it might result in the restructuring and
87. redesigning of the entire product after spending all your resources
88. on its development. So, the effect of designing a prototype on the
89. overall cost of a software project is to actually reduce the
90. additional costs of restructuring and reframing it after its full-
91. fledged development- which might cost a fortune.
92. Prototyping may have some initial costs of developing, but it
93. reduces the overall budget by helping your product to be free of
94. the errors or glitches that could have occurred if the idea was
95. made from scratch without any prior user testing. Furthermore,
96. prototyping also helps to understand the intrinsic flaws,
97. shortcomings and drawbacks that can be improved during the
98. product development process. If the prototyping process is
99. ignored completely, it might result in the restructuring and
100. redesigning of the entire product after spending all your resources
101. on its development. So, the effect of designing a prototype on the
102. overall cost of a software project is to actually reduce the
103. additional costs of restructuring and reframing it after its full-
104. fledged development- which might cost a fortune.
105. Prototyping may have some initial costs of developing, but it
106. reduces the overall budget by helping your product to be free of
107. the errors or glitches that could have occurred if the idea was
108. made from scratch without any prior user testing. Furthermore,
109. prototyping also helps to understand the intrinsic flaws,
110. shortcomings and drawbacks that can be improved during the
111. product development process. If the prototyping process is
112. ignored completely, it might result in the restructuring and
113. redesigning of the entire product after spending all your resources
114. on its development. So, the effect of designing a prototype on the
115. overall cost of a software project is to actually reduce the
116. additional costs of restructuring and reframing it after its full-
117. fledged development- which might cost a fortune.
118. Prototyping may have some initial costs of developing, but it
119. reduces the overall budget by helping your product to be free of
120. the errors or glitches that could have occurred if the idea was
121. made from scratch without any prior user testing. Furthermore,
122. prototyping also helps to understand the intrinsic flaws,
123. shortcomings and drawbacks that can be improved during the
124. product development process. If the prototyping process is
125. ignored completely, it might result in the restructuring and
126. redesigning of the entire product after spending all your resources
127. on its development. So, the effect of designing a prototype on the
128. overall cost of a software project is to actually reduce the
129. additional costs of restructuring and reframing it after its full-
130. fledged development- which might cost a fortune.
131. Prototyping may have some initial costs of developing, but it
132. reduces the overall budget by helping your product to be free of
133. the errors or glitches that could have occurred if the idea was
134. made from scratch without any prior user testing. Furthermore,
135. prototyping also helps to understand the intrinsic flaws,
136. shortcomings and drawbacks that can be improved during the
137. product development process. If the prototyping process is
138. ignored completely, it might result in the restructuring and
139. redesigning of the entire product after spending all your resources
140. on its development. So, the effect of designing a prototype on the
141. overall cost of a software project is to actually reduce the
142. additional costs of restructuring and reframing it after its full-
143. fledged development- which might cost a fortune.
144. Prototyping may have some initial costs of developing, but it
145. reduces the overall budget by helping your product to be free of
146. the errors or glitches that could have occurred if the idea was
147. made from scratch without any prior user testing. Furthermore,
148. prototyping also helps to understand the intrinsic flaws,
149. shortcomings and drawbacks that can be improved during the
150. product development process. If the prototyping process is
151. ignored completely, it might result in the restructuring and
152. redesigning of the entire product after spending all your resources
153. on its development. So, the effect of designing a prototype on the
154. overall cost of a software project is to actually reduce the
155. additional costs of restructuring and reframing it after its full-
156. fledged development- which might cost a fortune.

=>The prototyping model is a systems development method in which a prototype is built, tested and then reworked as necessary until an acceptable outcome is achieved from which the complete system or product can be developed. 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.

**Types of prototype models**

* Rapid throwaway- This method involves exploring ideas by quickly developing a prototype based on preliminary requirements that is then revised through customer feedback. The name rapid throwaway refers to the fact that each prototype is completely discarded and may not be a part of the final product.
* Evolutionary- This approach uses a continuous, working prototype that is refined after each iteration of customer feedback. Because each prototype is not started from scratch, this method saves time and effort.
* Incremental- This technique breaks the concept for the final product into smaller pieces, and prototypes are created for each one. In the end, these prototypes are merged into the final product.

1. I believe prototyping usually begins with sketching. It's the most intuitive thing to do.
2. It is for the client or business executives, decision makers who need to approve the design, layout, content and functionality before coding and implementation
3. Developers and coders who need to clearly understand, to the finest detail possible, what to build before they jump into coding.
4. This affect to app development cost directly or indirectly in terms of stockholders or developers.

Developing a prototype will not only help to give a grasp of how the website or app will look like, but also help to learn about the features to expect and match all the set of specifications prior to the full-scale development process being launched.

Q2. Compare iterative enhancement model and

evolutionary process model.

=> Iterative and evolutionary development is a foundation not only of modern software methods, but as the history section of the "Evidence" chapter shows of methods used as far back as the 1960s. Agile methods are a subset of iterative and evolutionary methods. This chapter summarizes key practices:

### The various phases of Iterative model are as follows:

**1. Requirement gathering & analysis:** In this phase, requirements are gathered from customers and check by an analyst whether requirements will fulfil or not. Analyst checks that need will achieve within budget or not. After all of this, the software team skips to the next phase.

**2. Design:** In the design phase, team design the software by the different diagrams like Data Flow diagram, activity diagram, class diagram, state transition diagram, etc.

**3. Implementation:** In the implementation, requirements are written in the coding language and transformed into computer which are called Software.

**4. Testing:** After completing the coding phase, software testing starts using different test methods. There are many test methods, but the most common are white box, black box, and grey box test methods.

**5. Deployment:** After completing all the phases, software is deployed to its work environment.

## **Evolutionary Process Models**

* Evolutionary models are iterative type models.
* They allow to develop more complete versions of the software.

**Following are the evolutionary process models.**  
  
The prototyping model  
The spiral model

## **The Prototyping model**

* Prototype is defined as first or preliminary form using which other forms are copied or derived.
* Prototype model is a set of general objectives for software.
* It is software working model of limited functionality.
* In this model, working programs are quickly produced.

## **The Spiral model**

* Spiral model is a risk driven process model.
* It is used for generating the software projects.
* In spiral model, an alternate solution is provided if the risk is found in the risk analysis, then alternate solutions are suggested and implemented.

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.

=> As work moves outward on the spiral, the product moves toward a more complete state and the level of abstraction at which work is performed is reduced. **Spiral model** is one of the most important Software Development Life Cycle models, which provides support for **Risk Handling.** In its diagrammatic representation, it looks like a spiral with many loops.

The exact number of loops of the spiral is unknown and can vary from project to project. Each loop of the spiral is called a **Phase of the software development process.** The exact number of phases needed to develop the product can be varied by the project manager depending upon the project risks. As the project manager dynamically determines the number of phases, so the project manager has an important role to develop a product using the spiral model.

The Spiral Model is a risk-driven model, meaning that the focus is on managing risk through multiple iterations of the software development process. It consists of the following phases:

1. Planning: The first phase of the Spiral Model is the planning phase, where the scope of the project is determined and a plan is created for the next iteration of the spiral.
2. Risk Analysis: In the risk analysis phase, the risks associated with the project are identified and evaluated.
3. Engineering: In the engineering phase, the software is developed based on the requirements gathered in the previous iteration.

Q4. Explain the Scrum Agile methodology.

=> Agile scrum methodology is a project management system that relies on incremental development. Each iteration consists of two- to four-week sprints, where the goal of each sprint is to build the most important features first and come out with a Potentially Shippable Product. Scrum is a framework of rules, roles, events, and artifacts used to implement Agile projects. It is an iterative approach, consisting of sprints that typically only last one to four weeks, with the objective of continuously improving a product.

* Agile and scrum are two similar project management systems with a few key differences.
* Agile is more flexible and promotes leadership teams, while scrum is more rigid and promotes cross-functional teams.
* Agile lets teams develop projects in small increments called “sprints” and allows for more effective collaborations among teams working on complex projects.
* This article is for business owners and project managers who want to learn more about agile scrum methodology and how to implement it as a management process.

Agile scrum methodology is used by companies of all sizes for its ability to provide high-end collaboration and efficiency for project-based work. Agile and scrum are two different methods and can be used separately; however, their combined benefits make the agile scrum methodology the most popular use of agile. Here’s the complete guide to agile scrum methodology.

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. It provides a concise visualization of the three most [important metrics of your Agile flow](https://kanbanize.com/agile/project-management/agile-metrics):

Cycle time

Throughput

Work in progress

Its main purpose is to show you how stable your flow is and help you understand where you need to focus on making your process more predictable. It gives you quantitative and qualitative insight into past and existing problems and can visualize massive amounts of data.

The fundamental purpose of the cumulative flow diagram is to demonstrate the stability of your workflow. Analysis of the CFD should tell you what areas need your focus, in order to maintain continuous process improvement. It enables you to improve your overall productivity and efficiency.

CFD charts are a powerful tool that Kanban teams can use to measure flow and analyze trends about a team's performance. Think of a CFD chart as a storyteller. It paints a picture of how workflows through your Kanban system within a period. Kanban Reports, such as Cumulative Flow Diagram (CFD), Throughput Run report, Cycle Time scatterplot, Cycle Time Variation, Aging work in progress, Processing Time per State, and Process Control chart, are calculated for your Kanban system as a whole.

2. Compare iterative enhancement model and

evolutionary process model. 2. Compare iterative enhancement model and

evolutionary process model. 2. Compare iterative enhancement model and

evolutionary process model. Prototyping may have some initial costs of developing, but it

reduces the overall budget by helping your product to be free of

the errors or glitches that could have occurred if the idea was

made from scratch without any prior user testing. Furthermore,

prototyping also helps to understand the intrinsic flaws,

shortcomings and drawbacks that can be improved during the

product development process. If the prototyping process is

ignored completely, it might result in the restructuring and

redesigning of the entire product after spending all your resources

on its development. So, the effect of designing a prototype on the

overall cost of a software project is to actually reduce the

additional costs of restructuring and reframing it after its full-

fledged development- which might cost a fortune.

Prototyping may have some initial costs of developing, but it

reduces the overall budget by helping your product to be free of

the errors or glitches that could have occurred if the idea was

made from scratch without any prior user testing. Furthermore,

prototyping also helps to understand the intrinsic flaws,

shortcomings and drawbacks that can be improved during the

product development process. If the prototyping process is

ignored completely, it might result in the restructuring and

redesigning of the entire product after spending all your resources

on its development. So, the effect of designing a prototype on the

overall cost of a software project is to actually reduce the

additional costs of restructuring and reframing it after its full-

fledged development- which might cost a fortune.

Prototyping may have some initial costs of developing, but it

reduces the overall budget by helping your product to be free of

the errors or glitches that could have occurred if the idea was

made from scratch without any prior user testing. Furthermore,

prototyping also helps to understand the intrinsic flaws,

shortcomings and drawbacks that can be improved during the

product development process. If the prototyping process is

ignored completely, it might result in the restructuring and

redesigning of the entire product after spending all your resources

on its development. So, the effect of designing a prototype on the

overall cost of a software project is to actually reduce the

additional costs of restructuring and reframing it after its full-

fledged development- which might cost a fortune.

Prototyping may have some initial costs of developing, but it

reduces the overall budget by helping your product to be free of

the errors or glitches that could have occurred if the idea was

made from scratch without any prior user testing. Furthermore,

prototyping also helps to understand the intrinsic flaws,

shortcomings and drawbacks that can be improved during the

product development process. If the prototyping process is

ignored completely, it might result in the restructuring and

redesigning of the entire product after spending all your resources

on its development. So, the effect of designing a prototype on the

overall cost of a software project is to actually reduce the

additional costs of restructuring and reframing it after its full-

fledged development- which might cost a fortune.

Prototyping may have some initial costs of developing, but it

reduces the overall budget by helping your product to be free of

the errors or glitches that could have occurred if the idea was

made from scratch without any prior user testing. Furthermore,

prototyping also helps to understand the intrinsic flaws,

shortcomings and drawbacks that can be improved during the

product development process. If the prototyping process is

ignored completely, it might result in the restructuring and

redesigning of the entire product after spending all your resources

on its development. So, the effect of designing a prototype on the

overall cost of a software project is to actually reduce the

additional costs of restructuring and reframing it after its full-

fledged development- which might cost a fortune.

Prototyping may have some initial costs of developing, but it

reduces the overall budget by helping your product to be free of

the errors or glitches that could have occurred if the idea was

made from scratch without any prior user testing. Furthermore,

prototyping also helps to understand the intrinsic flaws,

shortcomings and drawbacks that can be improved during the

product development process. If the prototyping process is

ignored completely, it might result in the restructuring and

redesigning of the entire product after spending all your resources

on its development. So, the effect of designing a prototype on the

overall cost of a software project is to actually reduce the

additional costs of restructuring and reframing it after its full-

fledged development- which might cost a fortune