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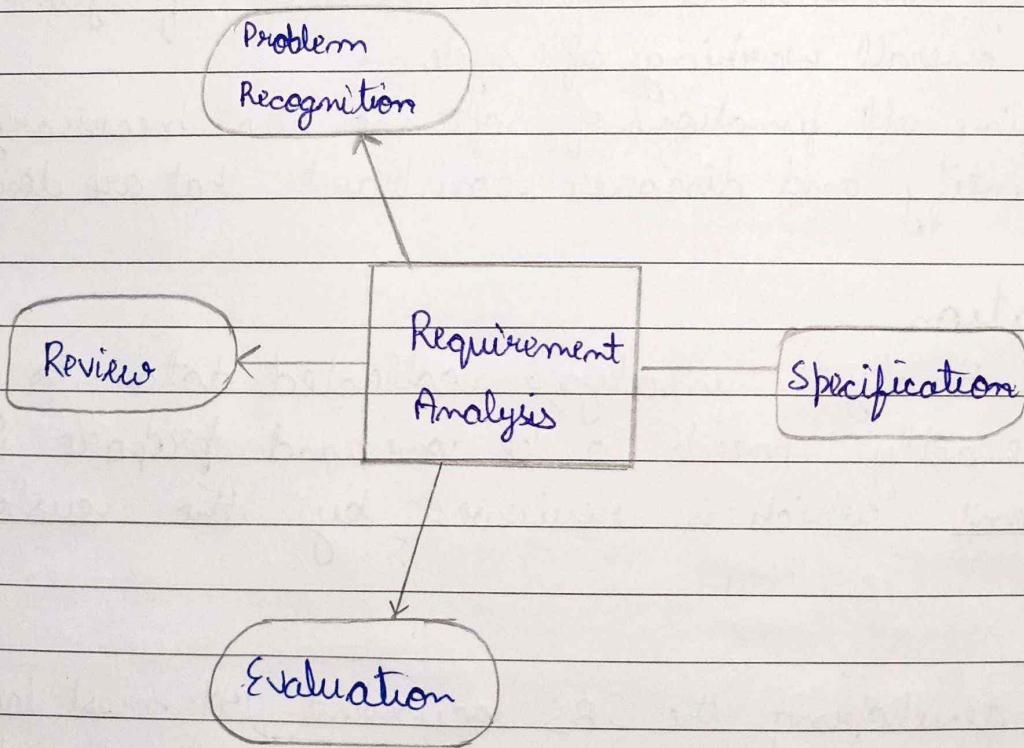
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(Q1)

Ans a) Requirement analysis is the most important and necessary stage of any project.

These requirements are generally a type of expectation of user. Analysis means to examine something in an organized and specific manner.

- There are several activities involved in requirement analysis:
Some of them are:



- Problem Recognition

The main aim of the requirement analysis is to fully understand

main objectives of requirement that includes why it is needed, will it be beneficial, does it increase quality of the project.

All these points are recognized in problem recognition so that requirements that are essential can be fulfilled to solve problems.

- Evaluation

Evaluation means whether the project is worth or not. There are some task which are important in the evaluation of the software requirement:

- ✓ To evaluate that flow of data is worth or not.
- ✓ To fully understand overall behavior of system that means overall working of system.
- ✓ To define all functions of software that necessary.
- ✓ To identify and discover constraints that are designed

- Specification

System Analyst analyze collected data to understand what exactly needs to be done and prepare SRS document which is reviewed by the customer.

- Review

After developing the SRS document, It must be reviewed to check whether it can be improved or not and must be refined to make it better and increase the quality.

- b) • The final outcome of requirement analysis is Software Requirement Specification (SRS). It is prepared by System Analyst who analyze collected data to understand what exactly needs to be done.
- After gathering all the requirements:
- Resolve incompleteness through further discussion.
 - Some parts of the requirement which contradicts other should be removed.
 - Several things about the project should be clearly understood.
- The main aim of SRS document is systematically organize the requirements arrived during requirement analysis.
- The SRS document is useful for various contexts
- i) Statement of user need
 - ii) Contract Document
 - iii) Reference Document
 - iv) Developer can use SRS for their requirement reference.
- SRS document is also known as Black Box specification. It is known as Black box because its internal details are not known. Only its visible external behavior is documented.

- SRS document contain 3 important parts:
 - Functional Requirement
 - Non Functional Requirement
 - Constraints on the System

- Functional Requirement

These are the ~~requirement~~ requirements that the end user specifically demand as basic facilities that the system should offer.

- Non-Functional Requirement

The characteristics of the system which cannot be expressed as functions:

- Maintainability
- Scalability
- Usability
- Reusability

Constraints

It describes things that the system should or should not do.

(82) a)

Ans The basic idea of using a prototype model is when the customer do not know the exact project requirements beforehand.

In this model, a prototype of the end product is first developed, tested and refined as per customer feedback repeatedly till a final acceptable prototype is achieved.

It is an iterative, trial and error method which takes place b/w developer and client.

- Prototype Model has 6 phases:

• Step 1: Requirement gathering and Analysis

This model starts with requirement analysis. During the process, the users of the system are interviewed to know what is their expectation from the system.

• Step 2: Quick Design

The second phase is quick design. In this phase a single design of the system is created. However, it is not a complete design. It helps in developing the prototype.

• Step 3: Build a prototype

In this phase an actual prototype is designed based on the

information gathered from quick design. It is a small model of the required system.

- Step 4 : Initial user Evaluation

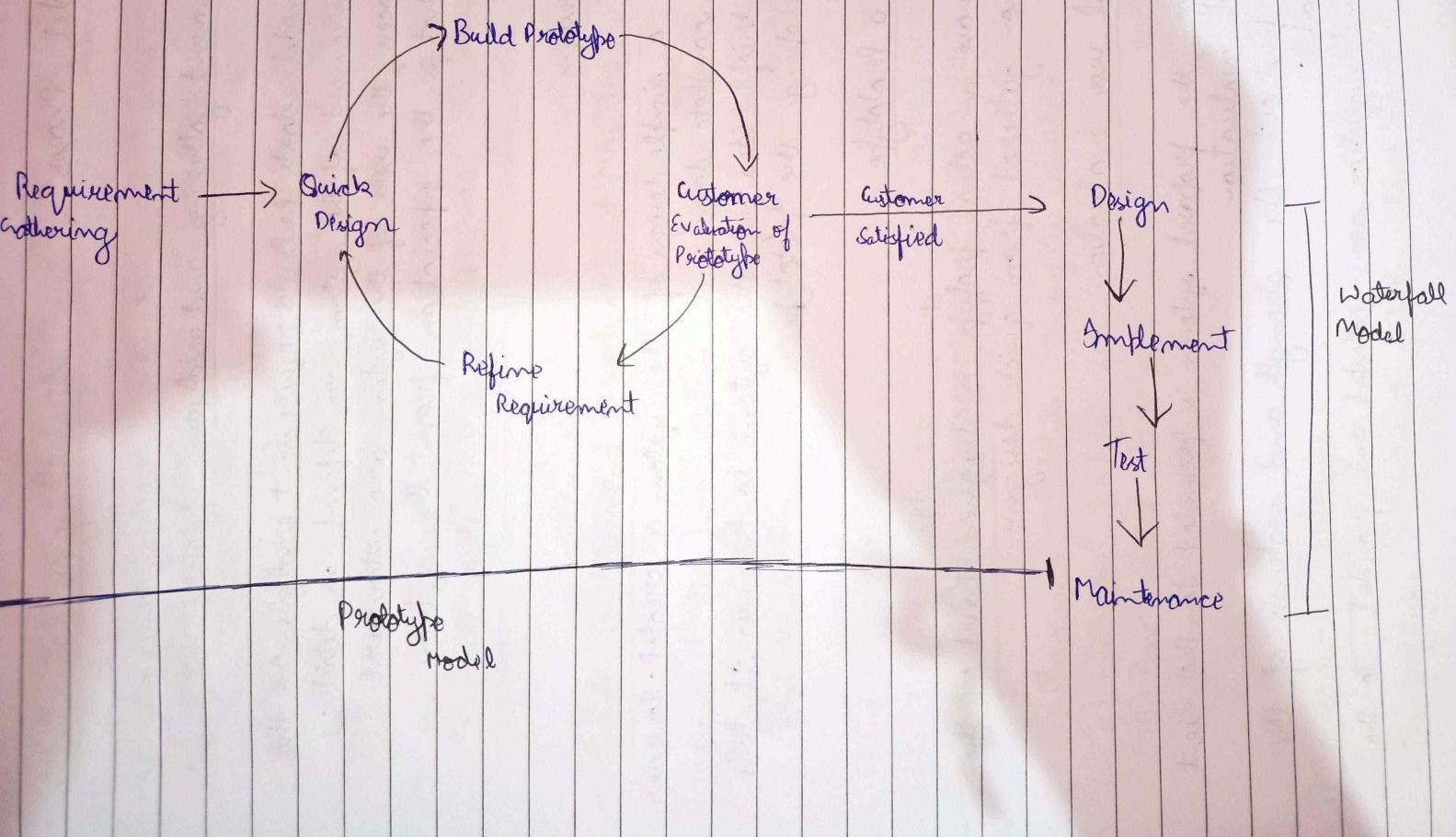
In this stage, the proposed system is presented to the client for an initial evaluation. It helps to find out the strength and weakness of the working model. Then suggestion and comments are collected from the customer and provided to the developer.

- Step 5: Refining Prototype

If the client is not satisfied with current prototype, then the developer need to redefine the prototype according to the user's feedback.

- Step 6: Implement Product and Maintain

Once the final system is developed on the basis of final prototype. It is thoroughly tested and deployed to the production.



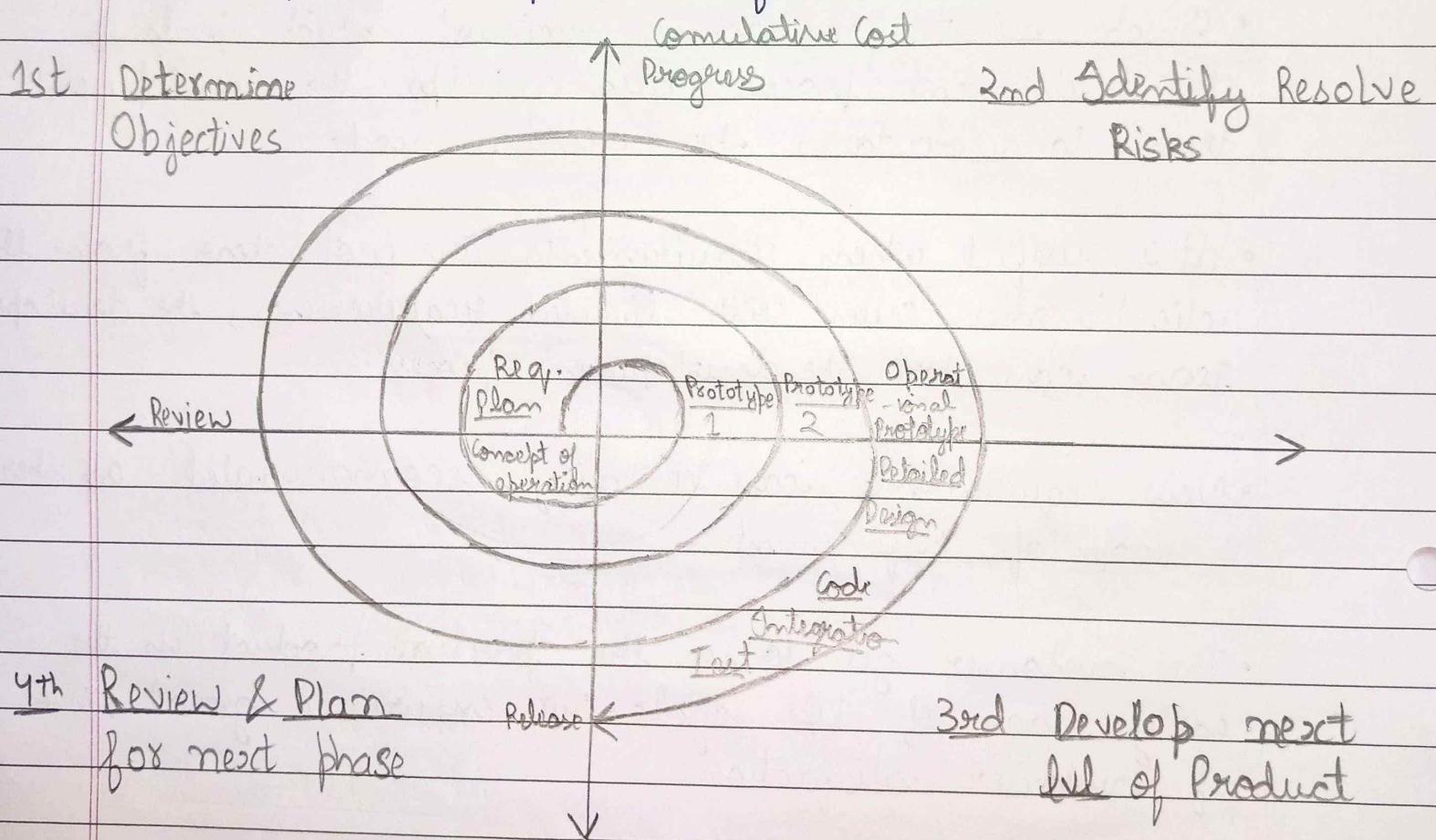
b) Strengths of Prototyping Model:

- Any missing functionality and any error can be detected early.
- Developed prototype can be used later for any similar projects.
- Quick client feedback is received which speeds up the development process. Also it helps the development team to understand the client's need.
- It is useful when requirements are not clear from the client's end, even with limited requirements, the development team can start the development process.
- New requirements can be easily accommodated as there is scope of refinement.
- The customer get to see the partial product in the early stage of life cycle. This ensures a great level of customer satisfaction.
- It involves user in development phase.
- Prototype can be changed and even discarded which reduces the chance of software rejection.

(Q3)

- a) The exact number of loops in the spiral is not fixed. Each loop of the spiral represents a phase of the software process.

For example the innermost loop might be concerned with feasibility study, the next loop with requirement specification, the next one with design and so on. Each phase is split into four sectors.



- 1st Quadrant:

- To identify the objectives of the phase
- Examine the risks associated with the objectives

- Then alternative solutions possible for the phase are proposed in the quadrant.
- 2nd Quadrant:
 - During this phase all possible solutions are evaluated to select the best possible solution.
 - Then ~~the~~ the risk associated with that solution are identified and the risks are resolved using the best possible strategy.
 - At the end of this quad quadrant, the prototype is built for the best possible solution.
- 3rd Quadrant:
 - During the third quadrant, the identified features are developed and verified through testing.
- 4th Quadrant:
 - In ~~the~~ this quad quadrant, the customer evaluate the so far developed version of the software.
 - In the end, planning for next phase is started.

- So on the basis of progress from these quadrants project manager can determine the number of loops.
- b) Spiral model can be preferred over the Prototyping Model because:
 - Spiral Model takes special care about Risk Analysis whereas it is not given importance in Prototype model.
 - In spiral model there is no continuous customer interaction while in prototype model customer interaction is continuous until the prototype is approved.
 - Spiral model is a proto model which means it is already having features of prototype model.
 - Prototype model depend on the customer satisfaction so there is uncertainty when the project will end, this is not the case with Spiral model as it is not taking continuous approvals.
 - Spiral model is good for large project but because of the continuous approvals from customer side prototype model is not preferred for large projects.