Unified Modeling Language

BASICS

Model:

- Definition: It is an abstraction of something for the purpose of understanding it before building it.
- Engineers, artists, craftsman, architects have builts models thousands of years to try out designs before executing them.
- E.g. Hardware and software development.
- Complex systems representation in small models
- Other examples include: aircraft models, pencil sketches, blueprints for machine parts, storyboards for advertisements, outlines of books
- Usefulness: 1. Testing a physical entity before building it, communication with customers, visualization, and reduction of complexity

Abstraction:

- Focus on the aspects which are very important, and suppress those aspects that are unimportant.
- A good model captures the crucial aspects of any system/problem and omits the other aspects.
- Modeling allows all individuals involved in a project to maintain a common understanding of the product being developed.
- Modeling is at the heart of analysis and design allowing us to “describe the structure and behavior both of real-world phenomena and of the abstractions to be built in a software product”
- E.g. CAR- XC60, Ford Ecosports are in the list of unreliable models due to their modeling.
- Extraneous details may divert from the real issues.

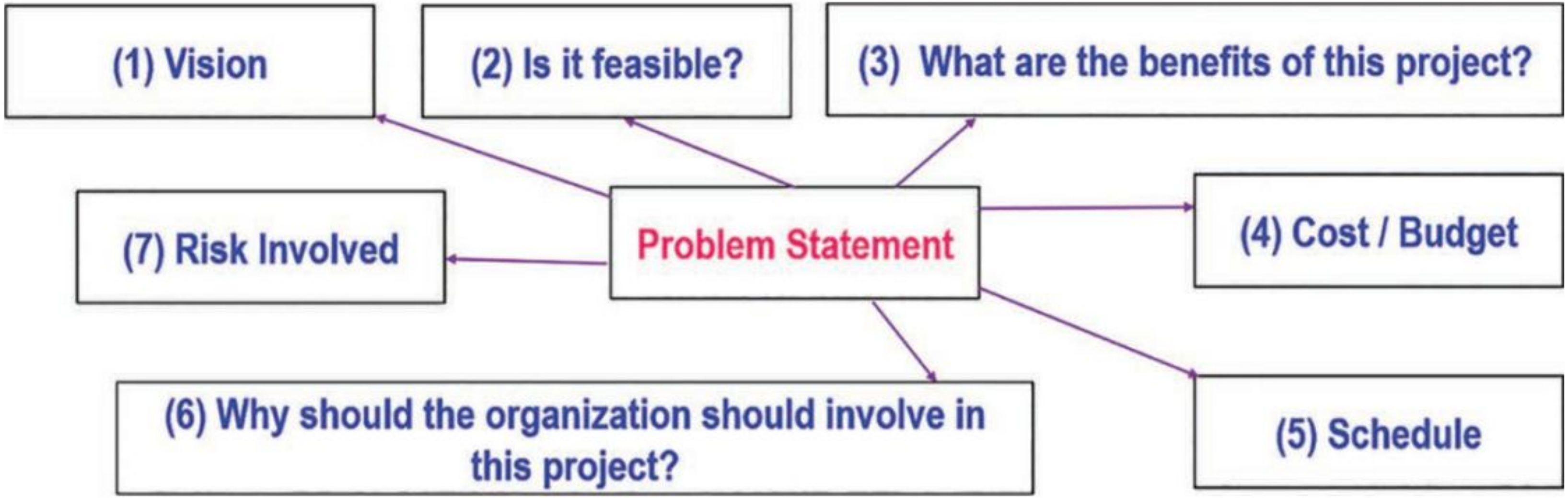
The Unified process:

- According to Craig Larman,

  “The unified process combines the commonly accepted practices into a well documented and cohesive process or description.”

- Four phases of unified process:
  - Inception: Feasibility study
  - Elaboration: Core architectural modeling
  - Construction: Coding, testing and feedback
  - Transition: Beta testing

Inception Phase:



(1) Vision

(2) Is it feasible?

(3) What are the benefits of this project?

(7) Risk Involved

Problem Statement

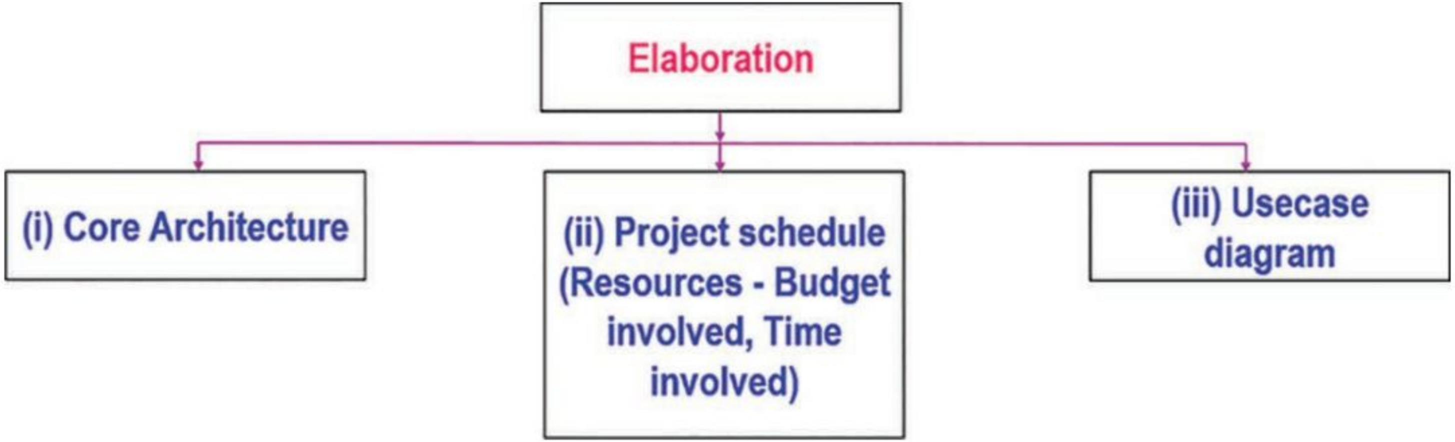
(4) Cost / Budget

(6) Why should the organization should involve in this project?

(5) Schedule

- Asking questions to trace the answers for feasibility study.

Elaboration phase:



Elaboration

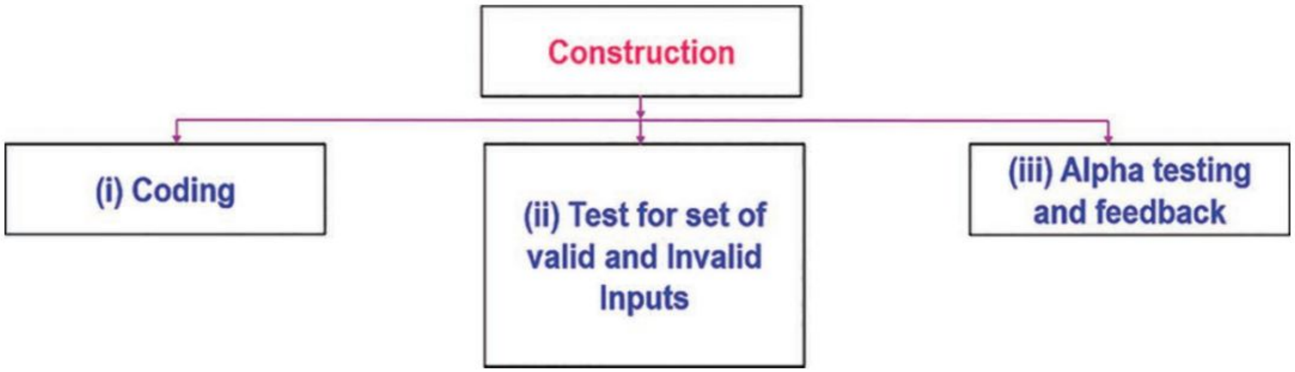
(i) Core Architecture

(ii) Project schedule (Resources - Budget involved, Time involved)

(iii) Usecase diagram

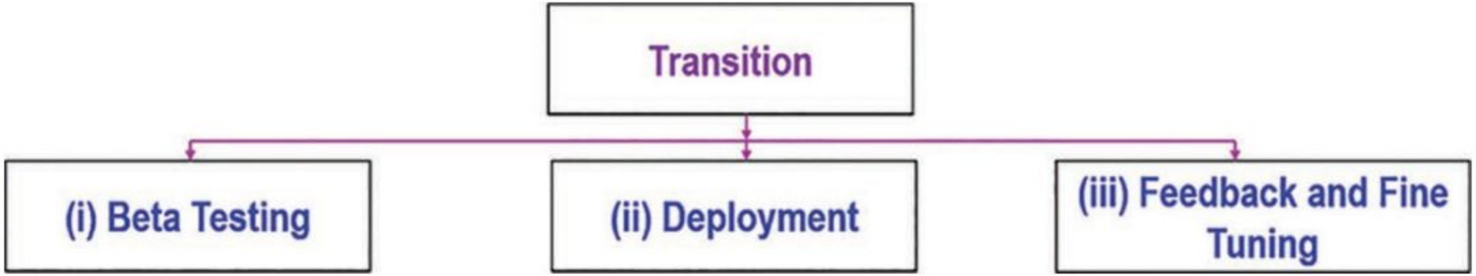
- It takes feasibility report from Inception phase as input and do:
    - Develop core architecture.
    - Develop project schedule
    - Sketch UML use case diagram.

Construction phase:


Construction
(i) Coding
(ii) Test for set of valid and Invalid Inputs
(iii) Alpha testing and feedback

- It involves three main tasks:
  - Coding
  - Testing: Alpha testing i.e., testing a software at developer’s side.
  - Feedback

Transition phase:



Transition

(i) Beta Testing

(ii) Deployment

(iii) Feedback and Fine Tuning

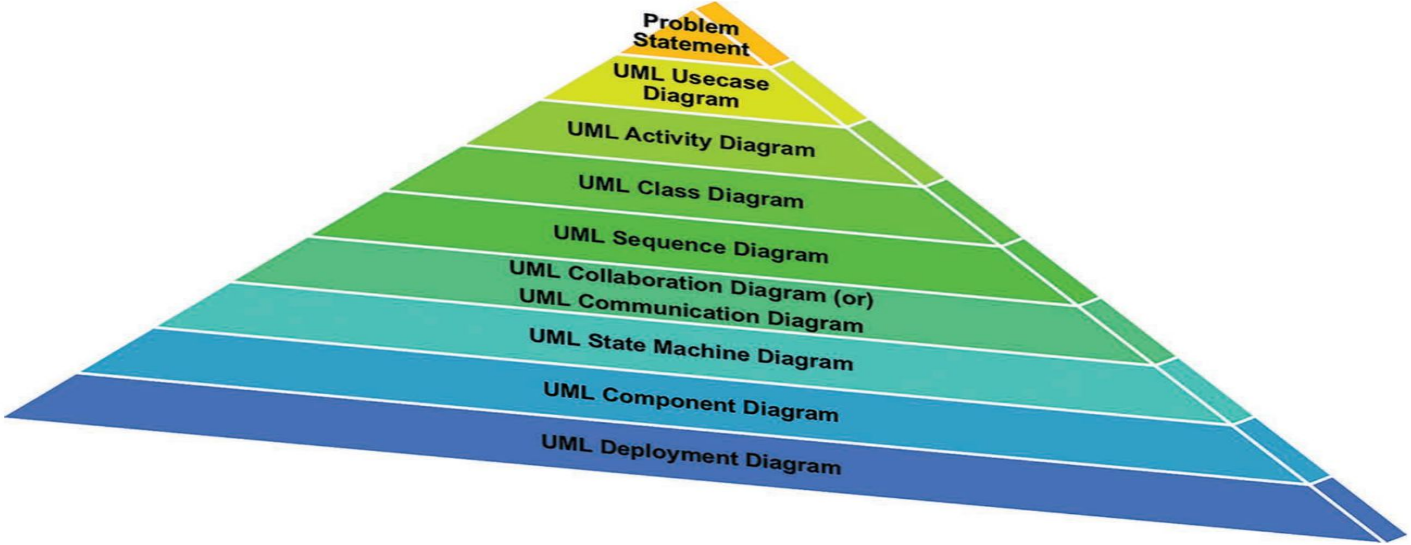
- It involves three main tasks:
    - Beta testing: testing a software at client side without the support of developer.
    - Deployment.
    - Fine tuning after feedback from client.

Modeling with UML (Unified Modeling Language):

- Booch and Rumbaugh laid the foundations of UML in the mid-1990s.
- UML is at the forefront of popular modeling systems.
- UML provides a way for anyone involved in the software project, including programmers, business analysts, and clients to share a common understanding and vocabulary when discussing the details of the software project.
- A System has
    - The class model: static, structural, data aspects of the system
    - The state model: temporal, behavioral, control aspect of the system
    - The interaction model: collaboration of different object, interaction of objects.

UML (continued)

- It is a graphical language for specifying, visualizing, constructing and documenting the artefacts of software systems.
- It helps in better understanding of the software or system or product to be developed.



UML (continued)

- The current version of UML is 2.5.1.
- It includes different types of diagrams divided into two groups:

Structure Diagrams:	**Behavior Diagrams:**
a. Class	a. Use case
b. Object	b. Activity
c. Package	c. State Machine and
d. Composite structure	d. Interaction
e. Component	
f. Deployment and	
g. Profile	