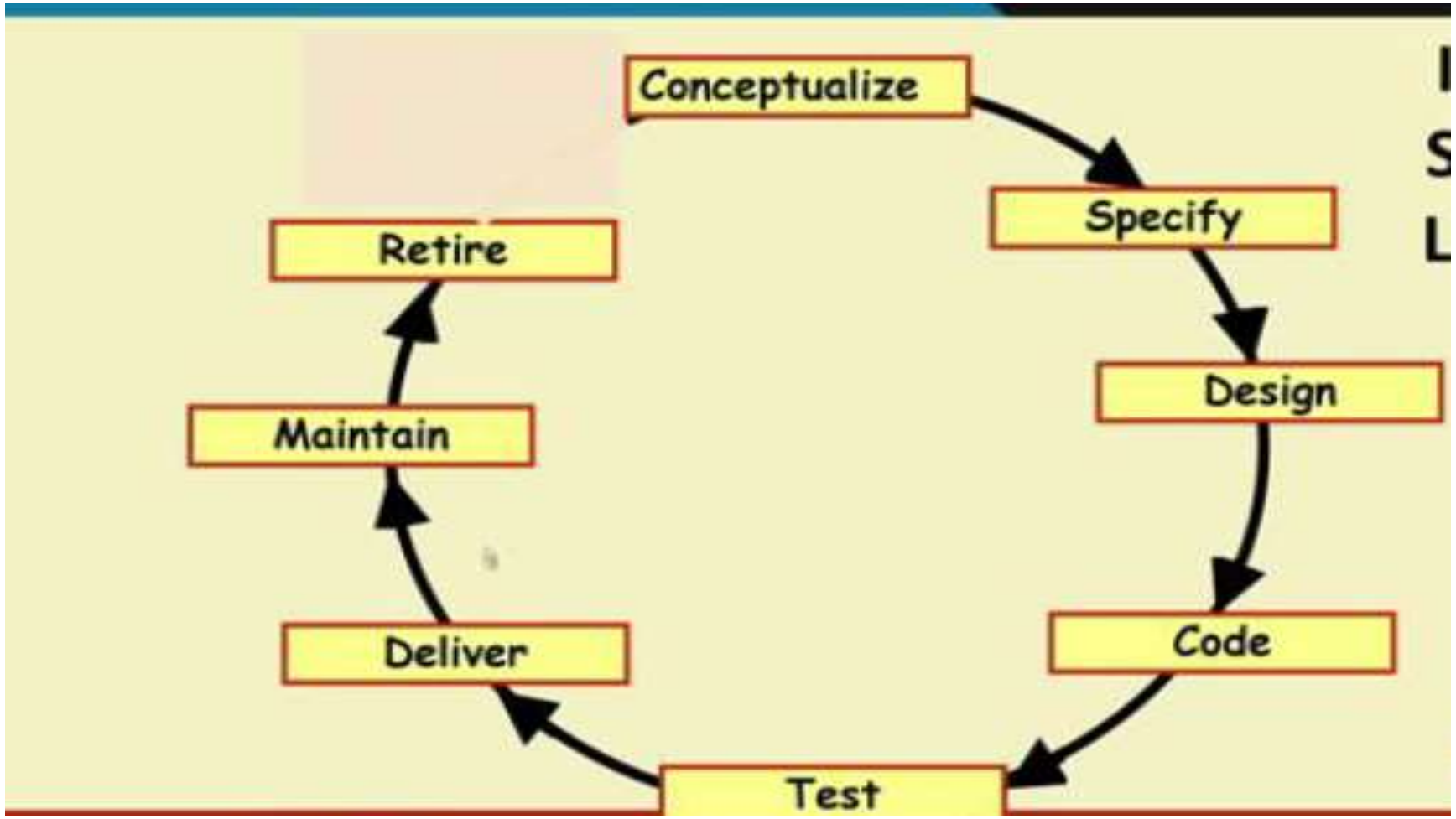
# Life cycle Models

- Now let us look at the life cycle models, because the project manager executes the the project management processes to direct the project team to carry out the development work.
- At different stages the project team carries of different activities and therefore, as a project manager we must be clear about the various
- life cycle models, what are the stages through which the development proceeds, the stage boundaries and so on.

# Software Life cycle



Intuitively a software life cycle consists of

1. Conceptualisation first somebody thinks of the project the need for the software
2. Specification : the project is specified,
3. Design it is designed,
4. Coded it is coded,
5. Testing  it is tested,
6. finally, delivered and once it is delivered and used it needs maintenance and it undergoes  maintenance for number of years as the software gets used over many years maintenance activities proceed and finally, once the software is not used anymore it is retired.

***Based on this conceptual model of the software life cycle various life cycle models have been proposed where these activities the sequencing of these activities vary***.

- Waterfall model
- V model
- Evolutionary model
- Prototyping model

- The project lifecycle is very important for the project manager because based on the lifecycle the project manager can track the progress of the project.

- Because, there are various milestones in the lifecycle and as the milestones are met the project manager can tell how much progress has been achieved or at which stage the project is.

- Without a lifecycle model the project manager is handicapped. It becomes very difficult for the project manager to monitor and control the project does not know that how much work is remaining and therefore, the project gets delayed. The cost rises
- So for every non-trivial project the project manager uses a suitable lifecycle model and the development team follows it. Without a lifecycle model usually a problem it is known as the 99 percent complete syndrome occurs. Here the project manager has no way of finding out the progress of the project other than asking the team members that how are you doing, how much you have completed.

# 99 percent complete syndrome

- Typically the development team is very enthusiastic and they optimistically answer that we have almost done only small thing is there and each time you ask them they say that see we are nearly done.

- So, the project manager thinks that the project is about to complete, but is far from true. It takes many more months or years even when he the project manager hears the term that the work is almost done and that is known as the 99 percent complete syndrome.
- It occurs when the project manager has no other way to track the progress of the project other than asking for the opinion of the team members that how far they have progressed.

- As the project progresses various deliverables are produced. It is a myth if we say that the working program is the deliverable of a project.

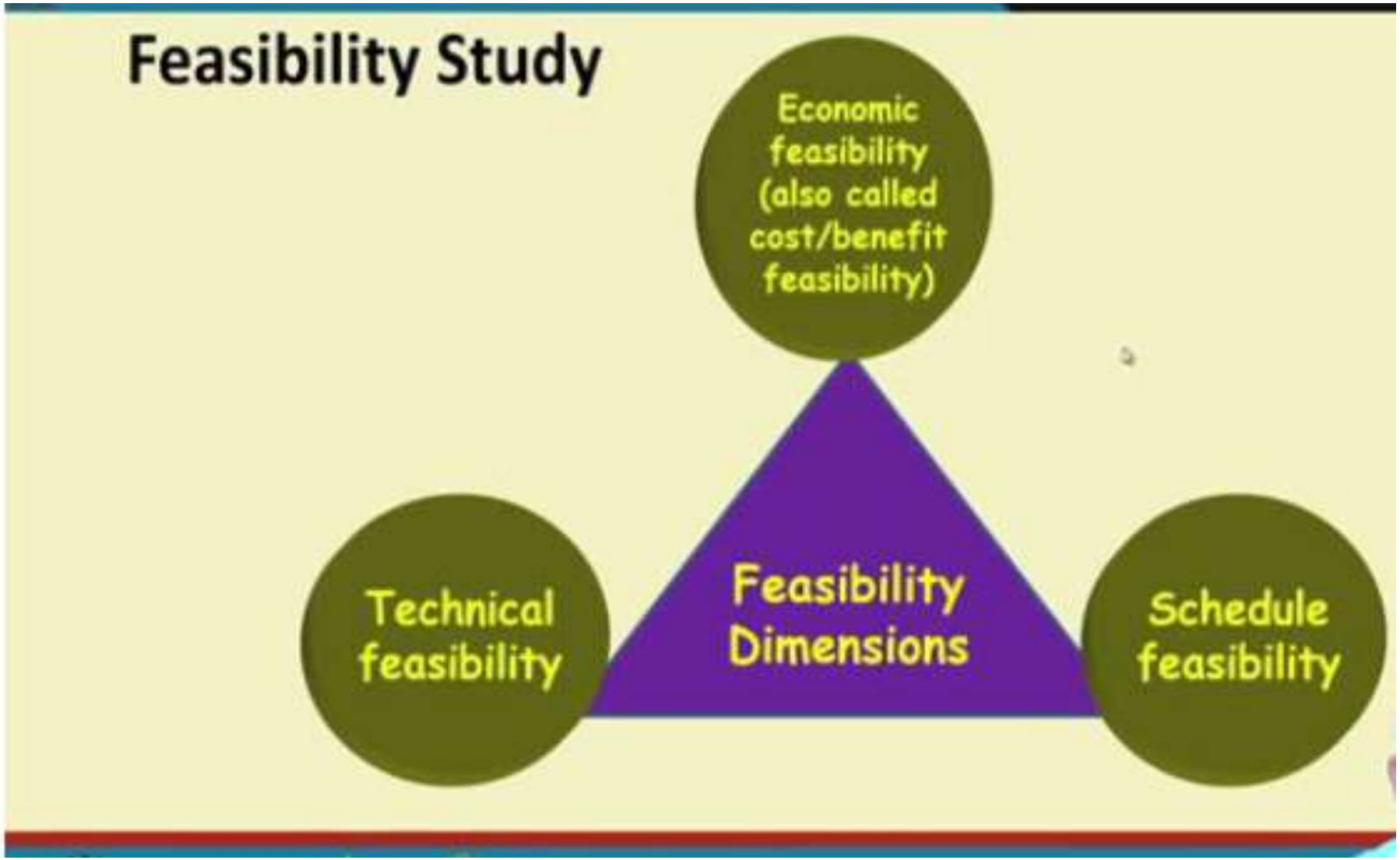
- There are a large number of deliverables that are produced as the project progresses and these are the documentation of all aspects of development for example, specification design etcetera.

# Software Life cycle

- Software life cycle (or software process):
  - Series of identifiable stages that a software product undergoes during its life time:
    - Feasibility study
    - Requirements analysis and specification,
    - Design,
    - Coding,
    - Testing
    - Maintenance.

# Classical Waterfall Model

- Classical waterfall model divides life cycle into following phases:
  - Feasibility study,
  - Requirements analysis and specification,
  - Design,
  - Coding and unit testing,
  - Integration and system testing,
  - Maintenance.


Feasibility Study
Economic feasibility (also called cost/benefit feasibility)
Technical feasibility
Feasibility Dimensions
Schedule feasibility

# Feasibility Study

- The first activity in the waterfall model is the feasibility study. Here the project manager is responsible to carry out the feasibility study.

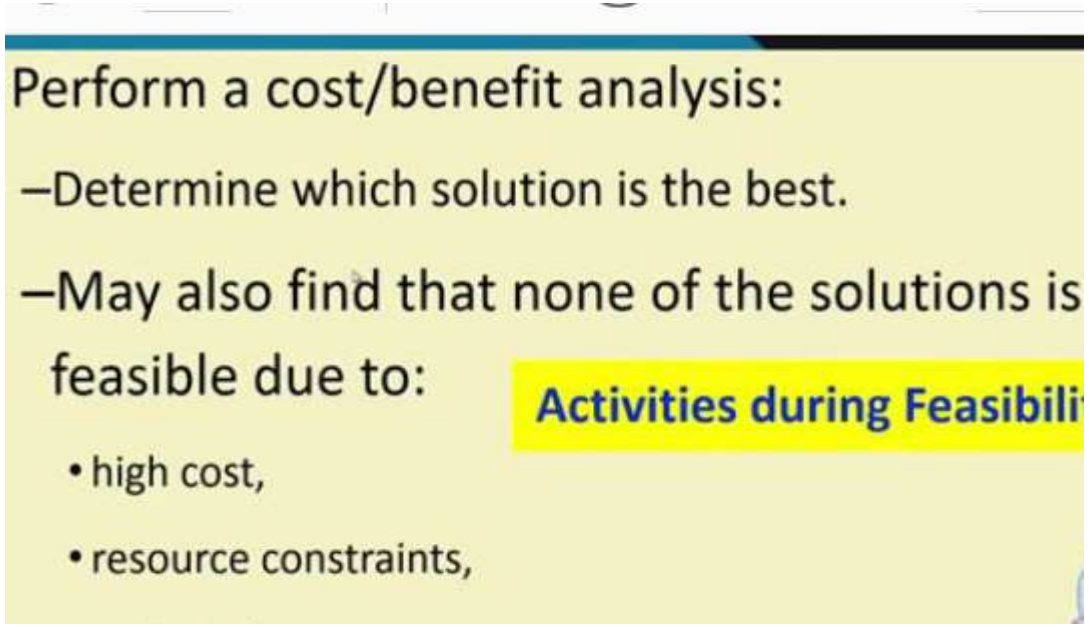
- The project manager needs to identify  whether the project is feasible. So that, it can be undertaken by the development team

- There are 3 types of feasibility that the project manager is concerned.

## Activities During Feasibility Study

- Work out an overall understanding of the pr
- Formulate different solution strategies.
- Examine alternate solution strategies in term
  - resources required,
  - cost of development, and
  - development time.

- So during the feasibility study  the project manager first develops an overall understanding of the problem, formulates the different solution strategies and examines the alternate solutions in terms of the resource required, the cost of development and development time.



- And forms a cost benefit analysis and based on this the project manager finds that it is feasible to carry out the project or find that it is infeasible due to
- high cost,
- resource constraints,
- technical reasons or
- schedule reason.

# Cost benefit analysis

- The cost benefit analysis is a important activity during the feasibility study here the project manager needs to identify all costs.

- The cost can be development costs,
- the setup cost,
- operational cost and
- also identify all the benefits that would accrue. For example, the benefit may not only be the financial budget that it provides the company gets, but also the experience that it builds reusable software.

- At the end of the cost benefit analysis the project manager needs to check whether the benefits are greater than the costs for the project to proceed.

- Another important activity of the project manager is write to write the business case.

- The feasibility study once it is undertaken helps the manager to write the business case.

- Here the project manager provides a justification for starting the project and shows that the benefit of the project exceeds the cost and also identifies the business risks.

# Writing an Effective Business Case

1. **Executive summary**
2. **Project background:**
   - The focus must be on what, exactly, the project is undertaking, and should not be confused with what might be a bigger picture.
3. **Business opportunity**
   - What difference will it make?
   - What if we don't do it?
4. **Costs**
   - Should include the cost of development, implementation, training, change management, and operations.
5. **Benefits**
   - Benefits usually presented in terms of revenue generation and cost reductions.
6. **Risks**
   - Identify risks.
   - Explain how these will be managed.

- The business case is a very important document and writing a business case is a important project management process initiating process

- almost anybody aspiring to become a project manager needs to write a business case sometime or other.

- Here for writing a business case need to have an executive summary of what is required, the project background, the business opportunities that is what are the benefits that the project will bring, what we will lose if we do not do the project, what are various costs that will be incurred as the project progresses, the benefits and what are the risks and how these risks will be managed.
- The business case is submitted to the top management. This gives them an overview of what is involved in the project. How it will help the company and what are the costs and benefits and what will be the risks here and what are the plans of risk management.

- This forms an important project initiation process.