TEXAS COLLEGE OF MANAGEMENT AND IT

Assignment on

Software Engineering

1) Define Software engineering. Write its advantages in detail.

Software engineering is a detailed study of engineering to design, development and maintenance of software.

The advantages of software engineering are:

a) Cost:

The single greatest driving force is software engineering is cost-reduction. Time to market and development cost are two critical factors of a product's fate. Although initially through trial-and-error, the current accepted method of cost-effective software development is the result of an industry-wide study as to what makes a software project successful.

b) Modularity/ Flexibility:

Decision made during the design phase of a software project can often carry see the hidden costs the project is finished. To reduce this problem, code is increasingly being made modular. By defining a part of program only through its interface it is

relatively easy to replace module or component at a later date without making drastic change to the core of product.

c) Reliability:

The probability of success of time denotes the reliability. Reliable systems take slow and steady route which include trusted implantation techniques. Software engineering is more reliable it includes the failure and further improving reliability.

2) Explain the principles and objectives of software engineering.

The principles of software engineering are:

a) Separation of concern:

Separation of concern is recognition of the need for human beings to work within a limited context. When specifying the behaviour of a data structure component there are often two concerns that needs to be dealt with basic functionality and support for data integrity.

b) Modularity:

The principle of modularity is a specialization of the principle of separation of concerns. Following the principle of modularity

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implies separating software into components according to functionality and responsibility.
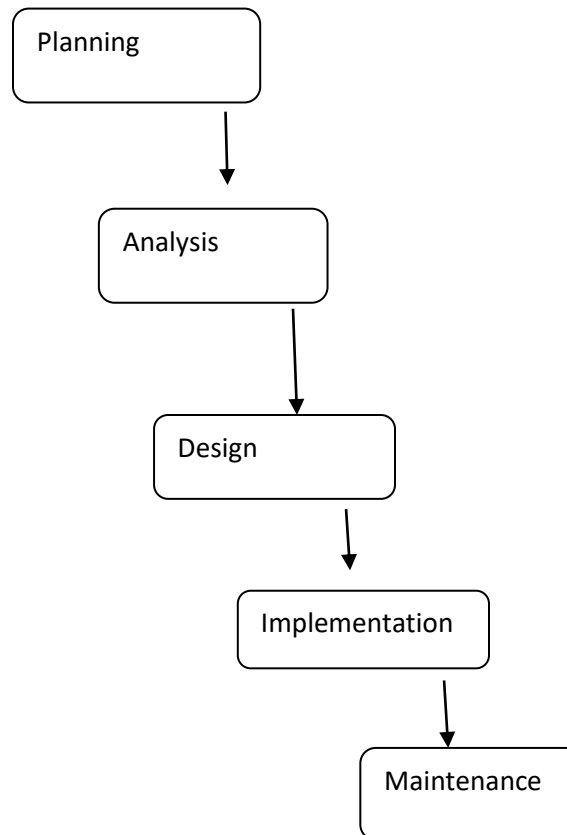
c) Abstraction:

The principle of abstraction is another specialization of the principle of separation of concerns. Following the principle of abstraction implies separation the behavior of software components from their implementation.

d) Incremental Development:

An incremental software development process simplifies verification. If you develop software by adding small increments of functionality, then for verification of the software incremental development helps to reduce the problem.

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3) Explain the phases of Software Development Life Cycle (SDLC) in detail.

Phases of Software Development Life Cycle are:

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┌─────────────────┐
│  Planning       │
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          ▼
    ┌─────────────────┐
    │  Analysis       │
    └─────────────────┘
              │
              ▼
        ┌─────────────────┐
        │  Design         │
        └─────────────────┘
                  │
                  ▼
            ┌─────────────────┐
            │  Implementation │
            └─────────────────┘
                      │
                      ▼
                ┌─────────────────┐
                │  Maintenance    │
                └─────────────────┘
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Planning: It obtains approval for project, initiate, assess feasibility, plans for the project.

Analysis: Understand business needs and processing needs is the role of analysis.

Design: Define solution system based on requirement and analysis decision

Implementation: It construct, test, train users, install new system and implement.

Maintenance: It helps to improve the project and maintain the project.

4) **Discuss about software feasibility studies in details.**
   Feasibility study include following steps:
   a) Information assessment:
      Identifies information about whether the system helps in achieving the objectives of the organization. It also verifies that the system can be implemented using new technology and within the budget and whether the system can be integrated with the existing system.

   b) Information collection:
      Specifies the sources from where information about software can be obtained. This source include user, organization, software development team for the collection of information.

   c) Report writing:
      Uses a feasibility report, which is the conclusion of feasibility study by the software development team. It includes the recommendations whether the software development should continue. This report may also include information about changes in the software scope , budget, schedule suggestions of any requirements in the system.

   d) General information:
      It describes the purpose and scope of feasibility study. It also describes system overview, project references and point to be used. System overview provide description about the name of organization responsible for software development

5) Explain about CMM model with figure.

The Capability Maturity Model (CMM) is a methodology used to develop and refine an organization's software development process. The model describes a five-level evolutionary path of increasingly organized and systematically more mature processes. CMM was developed and is promoted by Software Engineering Institute (SEI) a research and development center sponsored by the US Department of Defense (DoD).
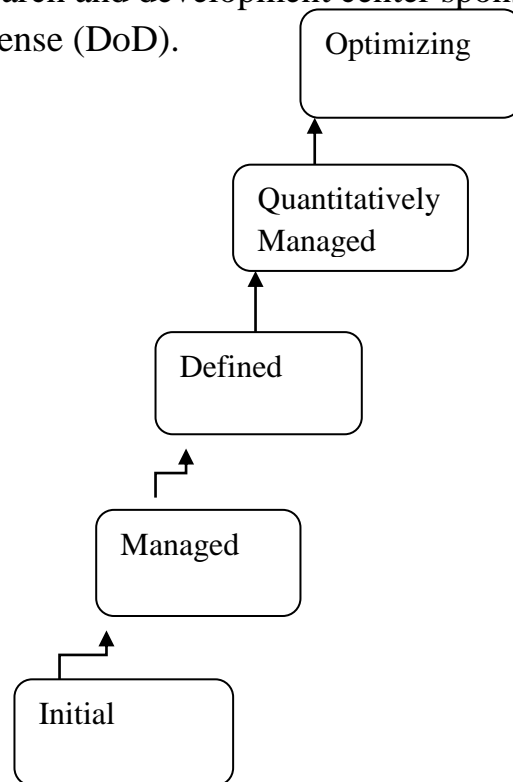
Initial: Process unpredictable, poorly controlled and reactive

Managed: Processes characterized for projects and is often reactive

Defined: Processes characterized for organization and is proactive

Quantitatively managed: Process measured and control

Optimizing: Focus on process improvement

6) Explain about prototyping model in detail.

The Prototyping Model is a systems development method (SDM) in which a prototyping (an early approximation of a final system or product) is built, tested, and then reworked as necessary until an acceptable prototype is finally achieved from which the complete system or product can now be developed. This model works best in scenarios where not all of the project requirements are known in detail ahead of time. It is an iterative, trial-and-error process that takes place between the developers and the users.

There are several steps in prototyping model:

- The new system requirements are defined in as much detail as possible. This usually involves interviewing a number of users representing all the departments or aspects of the existing system.
- A preliminary design is created for the new system.
- A first prototype of the new system is constructed from the preliminary design. This is usually a scaled-down system, and represents an approximation of the characteristics of the final product.
- The users thoroughly evaluate the first prototype, noting its strengths and weaknesses, what needs to be added, and what should to be removed. The developer collects and analyzes the remarks from the users.

Requirement AnalvsIS

Design

Refining prototype

Building and prototyping

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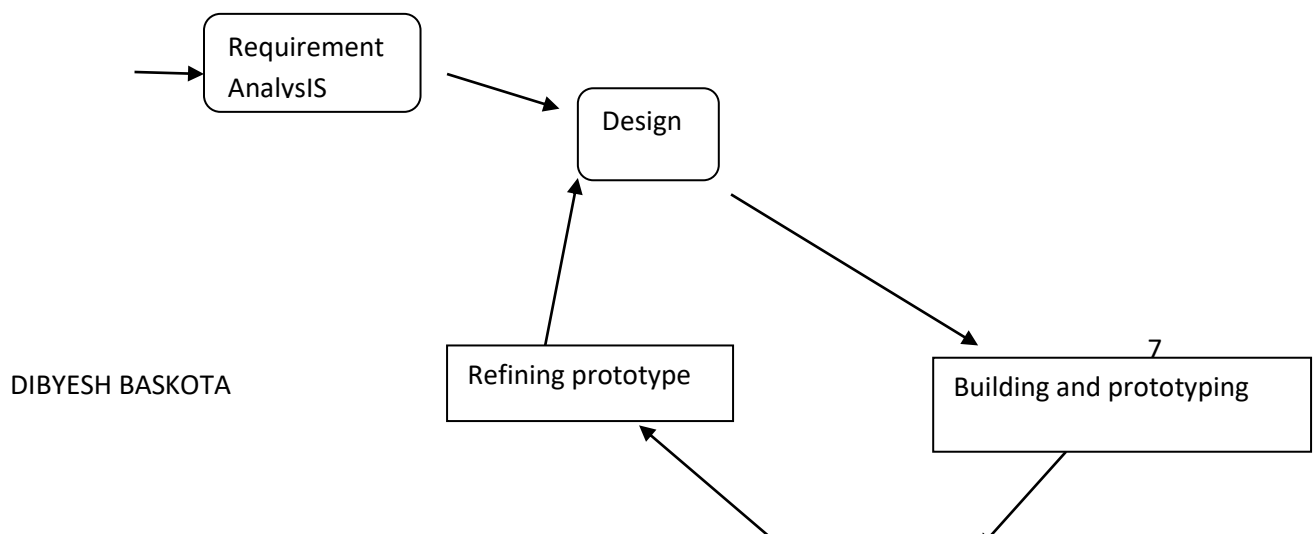
**7) Differentiate between agile and spiral model.**

The difference between agile and spiral model are:

Agile Model:

The main principle of agile model is to achieve agility by removing unnecessary activities that waste time and effort. The agile model focuses on the delivery of an incremental to the customer after each time-box, so customer interaction is more frequent. Agile model is suitable for large projects that are easy to divide into small parts that can be easily developed incrementally over each iteration.

Spiral Model:

The main principle of the spiral model is risk handling. Spiral model   mainly deals with various kinds of unanticipated risks but customer interaction is less. The spiral model is suitable for those projects that are prone to various kinds of risks that are difficult to anticipate at the beginning of the project.
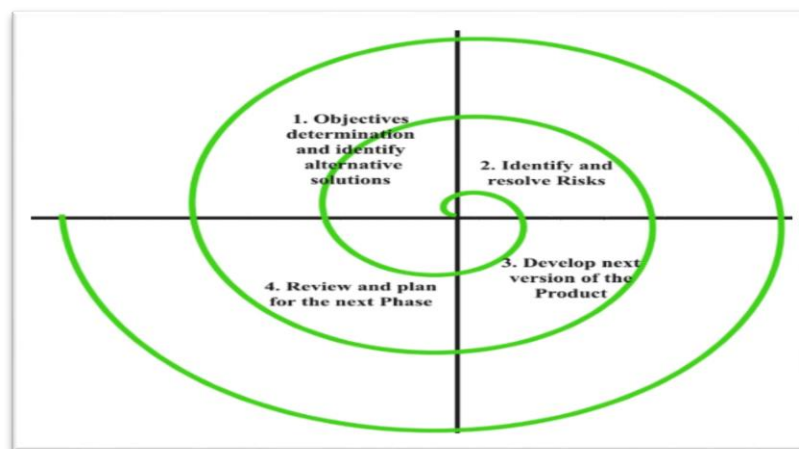
8) Explain the advantage and disadvantages of Object-oriented model.
The advantage of object-oriented model is:

i)   Design is no longer carried out independently of the later implementation because during the design phase we must consider which components are available for the solution of the problem.

ii)   Design and implementation become more closely associated.

iii)   Duration of the implementation phase is reduced.

iv)   A new job title emerges, the class librarian who is responsible for ensuring the efficient usability of the class library.

The disadvantage of object-oriented model is:

i)   It is not widely developed and complete to use it in the database systems. Hence it is not accepted by the users.

ii)   It is an approach for solving the requirement. It is not a technology. Hence it fails to pot it in the database management systems.