

26/7/24 Unit 1: Introduction to Software Engineering

Definition

A software Engineering is defined as an application of engineering principles to design, Development, Maintenance and implementation of software.

1. Software Engineering provides a standard procedure to design and development
2. The term SEngineer, is the product of two words that is Software & Engineering.
3. The software is a collection of integrated (one after one)
4. Software engineering is the application of developing different softwares. and maintain a process.

Software process:-

The term Software specifies the set of programmes and associated with documentation.

A software process is the set of activities like Constructions, Developments to proceed the Software Development.

The common Software processes are...

1. Software Specification
2. Software Development
3. Software Validation
4. Software Evolution

Software Development life cycle:-

(SDLC) Software Development life cycle are also called as process model. A life cycle model represents all the methods required to make a software product in SDLC. The stages of SDLC are as follows....

1. Communication and Requirement analysis.
2. ~~Anab~~ Feasibility study and system analysis
3. Designing the software
4. Developing the software (or) project
5. Testing
6. Deployment
7. Maintenance.

1. Communication and Requirement Analysis:-

- Communication is the user request for a software development by meeting several times
- requirement analysis is the most important and necessary stages in SDLC.
- In communication and requirement analysis the business and an organisation can be developed in various stages
- The requirement analysis ones the customer is understand then the SRS (Software requirement specification)

2. Feasibility Study and System Analysis:-

- In Feasibility study plan of the software design or map of the software using algorithm models.

3. Designing the Software :-

The Designing the software the next stage of Feasibility study after the knowing analysis documentation and Feasibility study. The face of product of the input and output through the customers then only we can design any kind of software development.

4. Software Developing the Software (or) project:-

In this pale the development of SDLC programming by enhancing of designing by writing the code. development has to follow the coding and decoding. called as programming.

5. Testing :-

After the completion of programming language or after the completion of developing the software we have to test our application. During the stage we have to test unit testing, integration testing, system testing can be done in testing software development.

6. Deployment :-

Once the software is certified through the developer the software may be released in different format application.

7. Maintenance :-

Once the client started using the developing the system then the real issues (problems) comes up and requirement to be solved from time to time. This process is taken from the Development product is known as Software maintenance.

Software Engineering principles:-

1. Abstraction - focusing on factors and hiding complexity.
2. modularity - Breakdown the system into smaller, that is independent
3. reusability - Designing the software to be reusable in other context
4. Scalability - Building the software to development
5. reliability - Encouraging the software works.
6. security - protecting the software & Data.

Software Engineering Benefits (Advantages) :-

There are few benefits or advantages of SE

1. Improving quality.
2. Increase productivity.
3. Better management
4. Enhanced customer satisfaction

1. Improving Quality :-

In SE improving the quality of software which should have more reliability, Efficient & maintenance of the software then only software will be improved as a quality factor.

2. Increase productivity :-

To increase the productivity in the software Development process and reduce the errors which is occurred in the software, so that productivity of software can be developed

3. Better Management :-

In this software management should think more efficient planning & coding of the co-ordination of the team members and control of the software.

4. Enhanced Customer Satisfaction :-

If the customer the software that is used by the user & developed than the customer will be satisfied then only the software as giving proper that result will satisfy the customer satisfaction.

Software Engineering Disadvantages :-

In SE there are few challenges can be accepted by the software.

1. complexity

2. Change management

3. Team collaboration

4. Time & Budget to the Software

5. Complexity:-

In the software we have to manage interact with the software system then only software can be work as properly

6. Change Management :-

In the software adapting to changing the requirement and changing the various technology like planning and maintaining of the software.

3. Team collaboration:-

when we are developing a software co-ordinating various devices and various team members to develop the software.

4. Time & Budget to the Software:-

In this software meetings and dead lines of the software at the same time we have to think software development budget limitation that is Cost of the Software.

Conclusion :-

In this SE principles and techniques development can be highly qualified software system the user need to be used efficient, reliable and maintenance.

Quality & productivity Factors :-

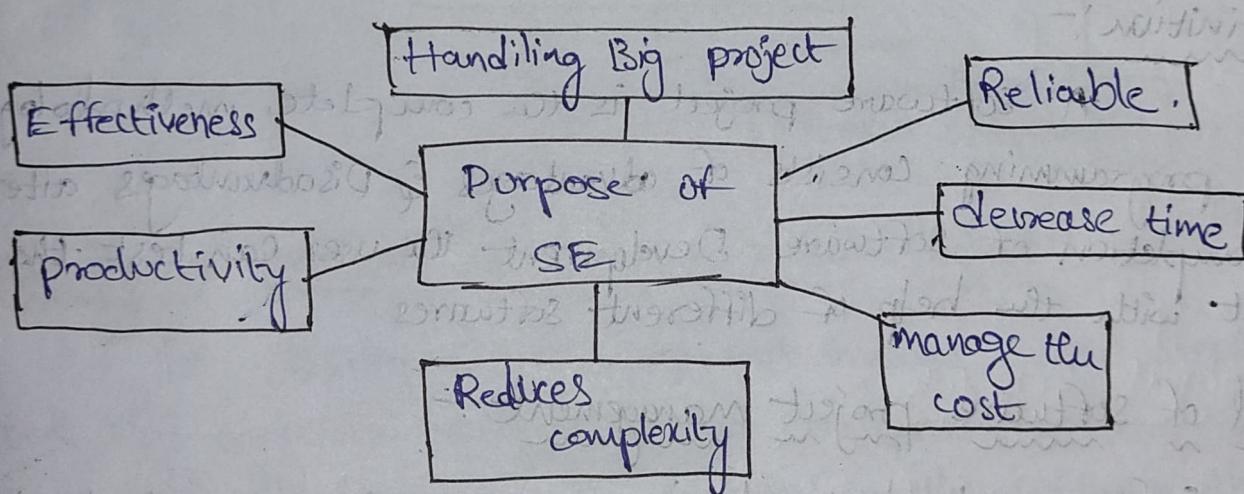
Quality and productivity are a curriculum factors in SE. As they directly impact the success of the software project and the satisfaction of end users. Here some of the key quality factors and productivity factors, they are...

Quality Factors :-

1. Reliability
2. Maintainability
3. Usability
4. Performance of the software.
5. Security of the software.
6. Flexibility.
7. Scalability.
8. Documentation

- Productivity Factors:
1. Development
 2. Effectiveness
 3. Efficient
 4. Team collaboration in software
 5. Tools & Automations
 6. Requirement management
 7. Continuous Integration & Delivery
 8. Code quality (programming)
 9. Learning & Improvement

By using this Quality & productivity factors SE teams can be divided and deliver high quality software products efficiently and effectively maintaining the end users.



Managerial issues:-

In the SE managerial issues can be happened after the completion of developing of the software improving the principle tools, techniques and process development are shown in the management principles. The SE principles can be acceptable in our organisation.

1. Method of planning, organising, Execution, monitoring, controlling and cost of the project ^(estimation)
2. Method of cost estimating technique

3. method for resource allocation policy.
4. Management for Budget control to develop the software.
5. Method to set up and maintain the continuous evolution & project scheduling.
6. Method for effective communication between team members and customers.
7. Methods to develop efficient control agreements with customer. So that legal and document can be maintained.

Planning a Software project

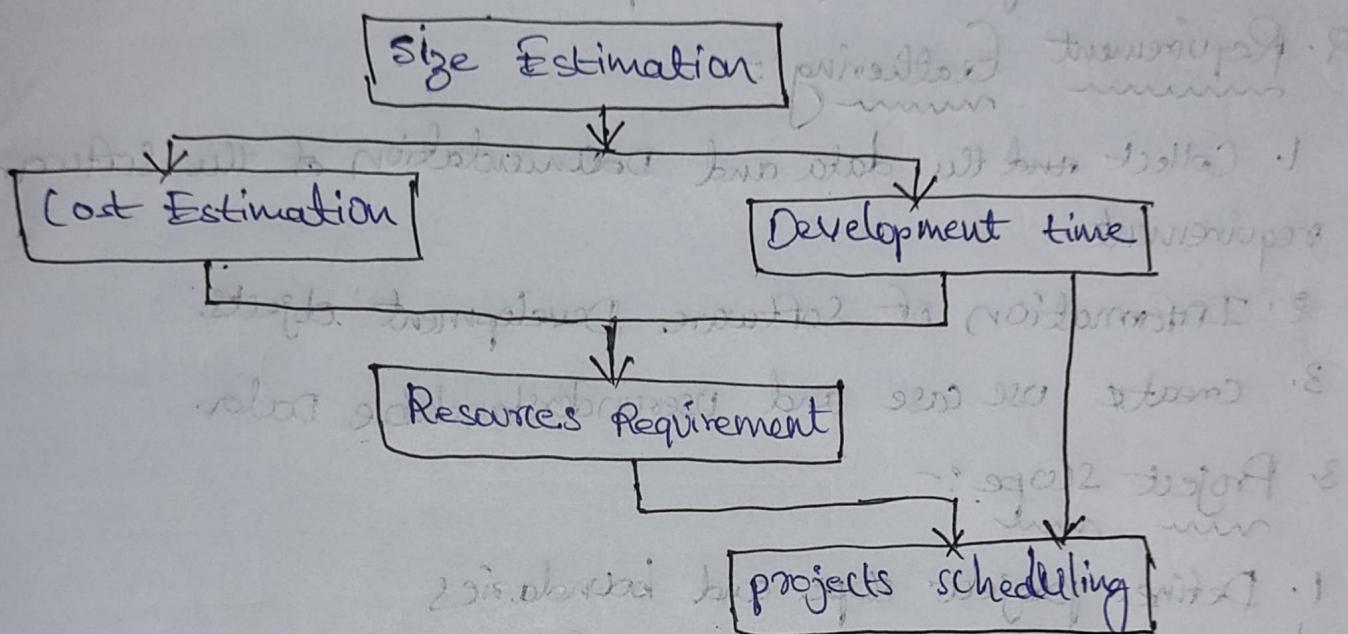
Definition:-

A software project is the complete methodology of a programming. Consists of advantages & Disadvantages after the completion of software. Development the user can test the project with the help of different softwares.

Need of software project management :-

Software development is a part of all new technologies for development of business. The most significant technology can be changed for a different business software Project management. The Software project management represent planning & scheduling the project development it's consists of Project monitoring Project testing, project validation of the Software. There are successful software project for developing a with big software development.

1. scope of work to be completed.
2. Risk analysis
3. Resources mandatory
4. The project to be accomplished



Defining the problem Developing a solution Stages:

- planning a software project involves several steps to ensure the successful execution, and development. Here some of the problems and developing the solution for the software they are
1. project initialization
 2. Requirement gathering
 3. project scope
 4. project schedule
 5. Resource planning
 6. Cost management
 7. Quality Management
 8. Communication of planning
 9. project monitoring & control

1. Project initialization:-
 1. defining project scope and objectives
 2. Identify the Role of the software.
 3. Identify the system Requirement for communication.
2. Requirement Gathering:-

1. Collect and flu data and Documentation of the Software requirement.
2. Information of Software Development objects.
3. Create use case and userunderstandable Data.

3. Project scope:-

1. Define project scope and boundaries
2. Identify exception of the software.
3. Develop a scope of management plan.
4. Project Schedule:-

 1. Develop a project schedule with the "deadline".
 2. create a chart of the software development (blue print)
 3. Identify the critical path activities.

5. Resource planning:-

1. Resource planning identify and allocate project resources like team members, employees, to the software development.

2. Develop a resources of different plans.

3. Resource planning creates various necessary of the planning system.

6. Cost management:-

1. Estimate the project budget that is financial issues.

2. Identify the individual cost management.

3. To Develop a cost management plans of the software.

7. Quality Management

1. In the software we have to maintain a quality software, quality objects and its standards.

2. develop a quality assurance plans

3. Identify the quality material & Bench market.

8. Communication of a planning:-

1. Develop a communication between developer & customer. (user).

2. Identify where the communication is required between user & System.

3. Create a communication ^{with} ~~use~~ different technologies.

9. Project monitoring & controlling:-

1. Develop a project monitoring & control plans of the software

2. Create a change Management plans of the project control

3. Identify the project monitoring programme for a Software development.

By this planning of software project involves easy communication & comparison of a project plan of the software which is successfully developed by the user.

Planning & Development process:-

In the software planning and development process is a general outline for planning & development process in Software Engineering. There are few things to develop a Software according to the user requirement. The requirement of the software can be specified by user or customer, then only the developer of the software can easily analyse what are the requirements of user. They are ..

1. Requirement gathering
2. Designing
3. Implementation
4. Testing.
5. Development
6. Maintenance
7. Project management.

1. Requirement Gathering:-

1. Collect the data & document software requirement.
2. Identify the need of the customer.
3. Define the project scope for developing a project.

2. Designing:-

1. Create a software as a blue print of designing the Software.

2. Develop a system architecture which is related to System.
3. Design user interface and user experience.
4. plan data "Storage" & "Managing" the Software.

3. Implementation :-

1. Write clean model structure of coding to develop a Software.

2. Use "Various control systems"

3. In implementation use unit testing & integration testing
- etc...

4. Testing :-

1. In software plan the testing ~~stratgey~~ strategy according to the developer.
2. In testing conduct "System Testing & acceptance testing".
3. Performe reconnection testing & expority testing.

5. Development :-

1. In the software plan development strategy.
2. In this software conduct development testing also.
3. In this software the role out the software to protect the development of the software. (product)

6. Maintenance :-

1. The user should plan maintenance activities should follow according to the software.
2. Conduct bug fixing and rectification of the problem.
3. Perform updates of the software and enhancement of the development of a software.

- ## 7. Project Management :-
1. plan the project according to the user's dead lines which is given by the project time.
 2. Manage resources & budget of a software.
 3. Co-ordinate the team activities & communication of the team members.

Some of the popular development process of a software they are

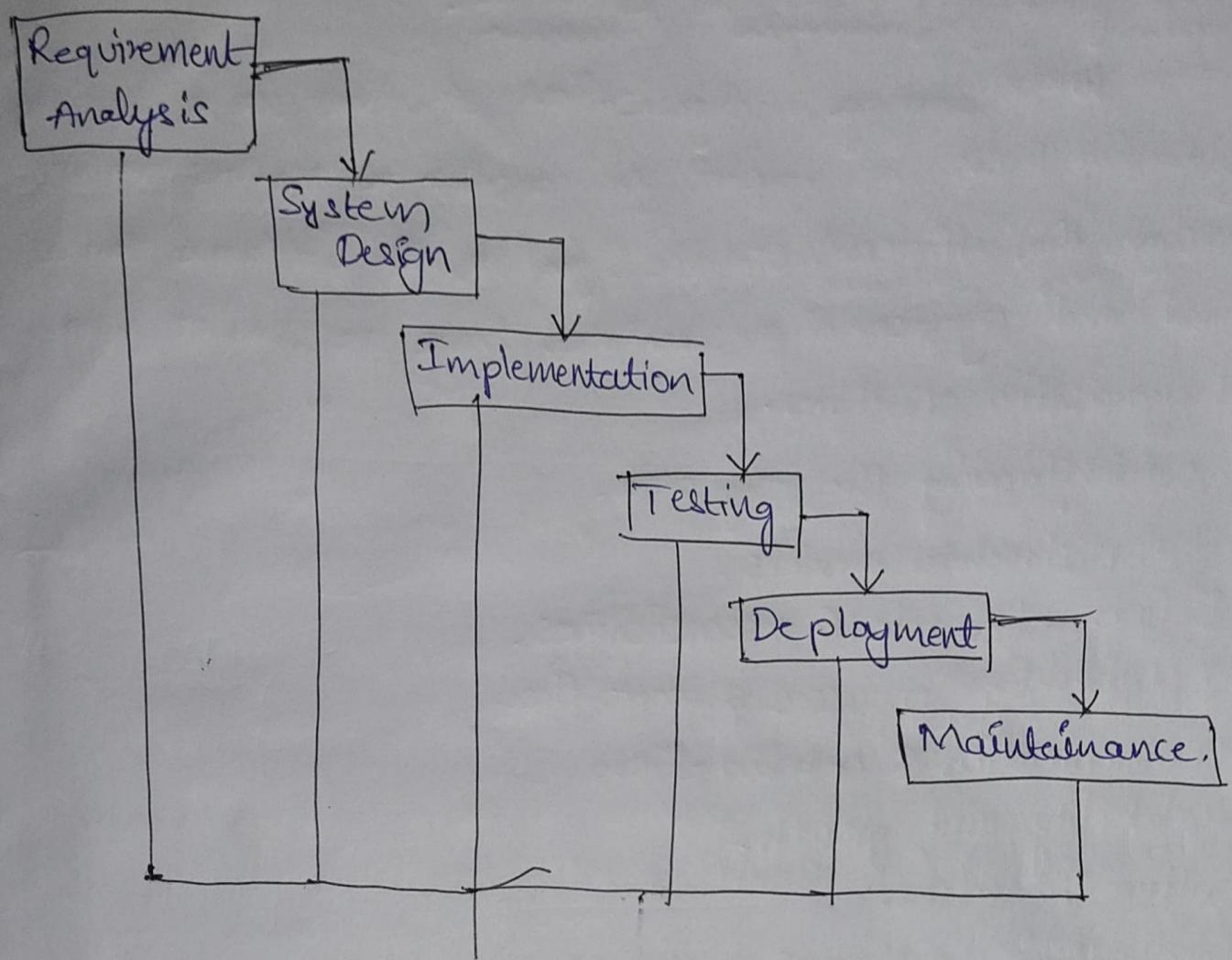
1. Waterfall Model
2. Spiral Model
3. Prototype model
4. Rad. model.

1. Waterfall Model :-

The waterfall model was the first process model to be introduced it is also referred as a "linear sequential life cycle model". It is very simple to understand and use in the waterfall model. Each phase must be completed before the next phase can begin, and then we have to move to the next level of the ^(begin) phase. The waterfall model is the approach in the development of software like SDLC.

Waterfall approaches are the first SDLC model to be used widely in the software engineering to ensure success of the project in the waterfall model.

will take longer time.



Leave 2 road

Planning & Organisation Structure:-

When planning a organisation structure for a software engineering team its impact to consider a various factors to ensure the "efficient, scalable & goal of the Software can be planned and organise of a structure. there are sum of planning and organisation structures.

1. Understanding the key role.
2. Team structure models.
3. Define clear role & responsibilities.
4. Establishing processes & work flow
5. Communication & collaboration
6. Scalability and growth.
7. Culture & Values.
8. Feedback & Continuous improvement.

1. Understanding the key role:-

first understand the key role required in your software engineering team the common role note includes

1. Product Management (PM)
2. Engineering Management
3. Architecture.
4. Software Engineering
5. Quality assurance.

2. Team structure models:-

Decide the team structure models that first you organised. They are....

1. Functional team (working)
2. Mixed structure
3. Future team members
4. cross functional team members.

3. Define clear role & responsibility:-

Ensure that each role has a clear responsibility to help the drawbacks of the system, and provides over loop & gaps of the software development some of has to take clear structure with responsibilities that is

1. Product manager
2. Engineering Managers
3. Responsibility Leader
4. Software Engineer
5. Architecture.

4. Establishing process & work flow:-

* Define and document the process work flow of your team members, common process includes daily structure plan.

2. Splitting the planning structure both documentation.

work documentation.

3. focusing on daily report.

5. Communication & collaboration.

In collaboration & communication choose the proper tools for facilitating for the communication the major components for developing a software there are project

1. Project management

2. Documentation

3. Communication

4. Development

6 Scalability & Growth :-

In SE plan for scalability such as

1. Hiring employees properly.

2. Training and development to the employees.

3. Scalable architecture.

4. Distribution growth.

7. Cultural & Values :-

The fastest positive culture and define a value to the particular development of a software that is

1. Collaboration

2. Innovation

3. Quality

4. Accountability.

8. Feedback & continuous improvement :-

to improve the feedback of the software in regular intervals. to develop the software and maintain properly. Such as

1. performance review

2. customer feedback

3. Team review (week, month)