

Unit 6

Software Project Management

1. Software Project: A software project is a complete procedure of software development from requirement gathering to testing and maintenance, carried out according to demand in a specified period of time to achieve planned software product.

2. Software development process

Software development refers to a set of computer science activities dedicated to the process of creating, designing, deploying and supporting software.

2. (SDLC) Software Development Life Cycle

SDLC is an organized way to develop an information system. It defines a sequence of steps or phases that must be carried out while building a new system. A next phase starts after previous phase is completed. Any SDLC starts with new system recognition, feasibility study, system design, system development, testing, debugging, implementation, maintenance and end with reviews and report. A completion of system ensure satisfaction of requirement by the user.

7. Importance of SDLC

- SDLC possess with distinct phases which ensure satisfaction of requirement by the user.
- SDLC ensure quality of a system or software.
- SDLC ensure validation of a system.
- SDLC ensure flexibility of a system.
- The difficult and complicated functions are easily identified.
- Missing functions are easily identified because of distinct phases.

8. Phases System Development /Phases of Software Development Life Cycle

- a. System Study or Preliminary Investigation or Feasibility Study.
- b. System Analysis
- c. System Design
- d. System Development
- e. System Testing
- f. System Implementation
- g. System Maintenance and Evaluation

a. System Study or Preliminary Investigation or Feasibility Study:

This phase begins with identifying a new system. In this phase, System Analyst studies organization capacity, planning, project scheduling, cost estimation etc. He also test whether the system is meeting user requirement or not. System Analyst Studies Technical feasibility, Economical feasibility, Operational feasibility, Social feasibility, management feasibility, Time feasibility, Legal feasibility.

b. System Analysis:

After Feasibility study, data are collected from various sources by using different tools like interview, observation, questionnaire, sampling, research etc. and documentation is done. Once all the requirements are understood, system analysis is done for the new system or software. System analysis is done whether software design specification and requirements are meeting to the user wants or not.

c. System Design:

This is the most creative and challenging phase of SDLC. In this phase final system is designed. During this phase designer must design all the aspect from input, processing, output and database of the system. It is a documentation which guides while developing system. Many system design tools are used while system design i.e. Data Flow Diagram (DFD), Entity Relationship (E-R) diagram, Flowchart etc.

d. System Development:

After designing a system the documentation turn into physical system. A new system is developed according to organization requirement. It is the process of defining, designing, developing, testing, and implementing a new software application or program. This is the phase where coding is done to development a system.

e. System Testing:

After developing a new system, testing is done according to the schedule. In this phase specification, requirement, features are tested. The system is tested to check either the system is meeting organization goal or not.

f. System Implementation:

This phase carry out developed system into working condition. The system is loaded for work and distributed to the user. Testing , debugging is done in this phase. Training is provided to the users and staffs for a new system. The theoretical project turn into practice in this phase

g. System Maintenance and Evaluation:

Correcting and upgrading system is called system maintenance. Maintenance is necessary to reduce errors during working life. The system may encounter a problem while working. So, this phase change running system into updated new system. This changes is necessary to keep the system running smoothly.

6. System Analyst

System Analyst is a computer specialist or IT professionals, who analyze, design, implement and evaluate Computer Based Information System (CBIS). He also train and motivate other to use system. He support the decision making and operations of an organization.

7. Role and Responsibility, Duties of System Analyst

a. Defining User Requirements :- The most important step for system analysts is to understand user's requirements. He have to interview users and prepare questionnaires, observe the current system, and plan system. This phase is important to understand how the current system functions and what users want from the new systems.

b. Prioritizing Requirements:- Large systems do have various requirements. The information collected from the users may contain various requirement which may not be possible for system analyst to implement all of them at a same time. Therefore, system analysts have to prioritize users' requirements using their social and logical skills.

c. Gathering Data and Facts :- System analysts research and gather various facts and data with the users of the system. They consult users from time to time to obtain necessary information related to the system requirement. This process is important because analysts have to organize and document information into function.

d. Analyzing the Problem:- After gathering data and facts, system analysts analyze various problems, their causes, and effects on business operations. They analyze and identify the requirements. They remove unnecessary data, focus on the important ones, and change or modify the working system to make it more user-friendly.

e. Solving Problems:- System Analyst develop and evaluate a set of possible alternative solutions and then compare and choose the best one to implement. They have to compare the alternative solutions on the basis of cost, benefits, risk factors, etc. and decide the best with management's help.

f. Drawing Specifications:- System analysts are responsible for drawing clear specifications for programmers and managers to understand easily. That includes text, documents, and flow charts for computer programmers. These are presented in a detailed form as they are the foundations for functioning of the system.

g. Designing Systems:- Once specifications accepted, they design and implement the system along with the development team so that the management's goal is achieved. The design must be simple and understandable to the system user.

h. Evaluating Systems:- Once system is designed they are implemented and tested. According to their performance, evaluation is done and apply necessary modifications after that.

8. Characteristics / Quality of System Analyst

a. Knowledge of Organization:

b. Technical Knowledge:

c. Interpersonal Communication Skill:

d. Character and Ethics:

e. Problem Solving Skill:

9. Software Engineer : A software Engineer is a branch of Computer Science which includes the development and building of computer software. He must have programming knowledge, Design architecture, algorithm, debug software etc

10. Difference between System Analyst and Software Engineer

<ul style="list-style-type: none">• More responsible for documenting the project, relaying information.• Not pure technical person• Leadership quality in needed.• Remains as bridge, who fulfills the gap between IT and business.• Discuss, collect data, requirement with related person.	<ul style="list-style-type: none">• Focused on the design, development, maintenance, testing and evaluating of software.• Pure technical person.• Logical, mathematical and creative quality is needed.• Remains as a pillar, who makes software.• Responsible for coding, debugging, implementation, monitoring and maintenance.
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11. SDLC Model

a. Waterfall model

Water fall model is a popular SDLC model for software engineering. It is offered as classic approach of SDLC which describe development method in linear and sequential method. In this model once a phase of development is completed, the development proceeds to the next phase and there is no turning back. It is a traditional SDLC model which is not used now a days.

b. Prototype Model

The prototype model is a systems development method in which a prototype of a software is built, tested and kept ready to be implemented. The users evaluate the first prototype and note its strengths and weaknesses, what needs to be added and what should to be removed. The developer collects and analyzes and re-modify the software and supply to the users. This process repeats until the user is satisfied.

c. Spiral Model/ Agile

This model is combination of waterfall model and prototype model. The phases in this model loops until the requirement of the user is fully satisfied. After planning, analysis, coding and evaluation if the requirement of user is not satisfied, the phases loops again from planning, analysis, coding and evaluation.

12. Requirement Collection Methods

It is a part of project definition process of analysis phase of SDLC. The methods for requirement collection are given below:

One to one Interview: One of the common techniques for gathering requirement where face to face interview is taken by stake holders

Group Interview: It is similar to one to one but, here interview is taken from more than one person.

Questionnaires/Survey: Way of collecting information from many person in short period of time.

Observation:/Field Visit: gathering requirement by observing the organization by a analyst.

Prototype: Giving a prototype of a system to check and collect positive and negative feedback from the stakeholder.

13. System design Concept

The process of defining entire requirements of a system such as architecture, modules, interface etc. is called system design. Some subsets of system design are mentioned below:

Logical Design: It is abstract representation of the data flow, inputs and outputs of the system. Data flow and ER diagram are specially used here.

Physical Design: The actual input output of the system is physical design. It basically includes interface design, process design and data design of the user

14. Software and quality

Software quality refers to the software which is bug and defect free delivered in time within the specified budget according to the requirement of the user. Some qualities of software are given below:

1. **Portability :** It should work in any machine with various operating system environment.
2. **Reusability:** It must have the feature of reusability by which product can be used to develop new product.
3. **Correctness:** The software should be correctly implemented according to the requirement.
4. **Maintainability:** A product should be bug or error free.
5. **Functional suitability:** A product must correctly perform functions that will satisfy the user's need.