

S/E Engg.

- * It is the systematic, disciplined, cost effective techniques for sw development.
- * Engineering approach to develop a sw
 - ↳ the whole approach. e.g. idea, Requirement Analysis, Feasibility Study, planning, implementation, ~~dev~~ designing, maintainence, delivery. All ~~steps~~ approaches are combined to develop a sw . That approaches called Engineering approach.
 - Step by Step systematic approach to develop a sw .

Evaluation:

1945 - 65 (Origin)

1965 - 85 → crisis (If sw are developed at that time only 2% sw are delivered or actually used e.g. OS/360 is a Failure approach)

1990 - 2000 → Internet (PC OS e.g. windows)

2000 - 2010 - light weight (mobile OS)

2010 - Till → AI, ML, DL

Spw crises

Problem with Spw?

The major problem with current scenarios on Spw industry is, Spw usually overruns their development cost, they exceed their development duration limits, are usually poor quality.

characteristics

- Correctness :- The ability of a Spw to perform its intended tasks effectively and meet user requirements.
- Usability :- The ease with which user can learn, operate and navigate the Spw
- Reliability :- The software's consistency in producing accurate results & maintaining performance over time.
- Efficiency :- The optimal use of system resource, such as memory & processing power to achieve desired outcomes.
- Maintainability :- The ease of updating, modifying and fixing the Spw to accommodate changing requirements or fix issues.

- Portability :- The ability of the S/W to operate on different platform or environments without modifications.
- Scalability :- The S/W's capacity to handle increased workloads or user demands without compromising performance.
- Security :- The S/W's ability to protect against unauthorized access, data breaches and other potential threats.
- Modularity :- The degree to which the S/W's component are organized into separate, manageable units that can be independently developed or updated.
- Reusability :- The S/W components to be used in other applications or context reducing the development time & cost.

Major problem in S/W Development

- 1) Inadequate Requirement Gathering :-
 - Ambiguous or incomplete Requirement
 - lack of communication between Stakeholders
- 2) Poor project Management
 - Inadequate planning, monitoring & control
 - Lack of Risk assessment
 - multiplicity of S/W development lifecycle
 - selection of wrong technology.

3) Insufficient time & Budget :-

→ Unrealistic budget deadlines & Budget resource constraints

→ Insufficient resource allocation & prioritization.

4) Lack of skilled personal :-

→ Inadequate expertise in the development team:

→ High turnover rates & loss of experienced staff.

5) Resistance to change :-

→ Difficult in adapting to new technology or processes

6) Wrong motivation technique :-

Software Process

4) A) S/W process (also known as methodology) is a set of related activities that leads to the production of the S/W. These activities may involve the development of the S/W from the scratch or, modifying an existing system.

1) Feasibility Study :-

4) Abstract definition of the problem

*) checking the financial & technical feasibility

*) Analysis of cost & benefits

* checking the availability of infra infrastructure & human resource.

2) Requirement Analysis & Specification :-

- * Understand the exact & complete requirement of the customer & document them properly.
- * Try to collect & analyse all data related to projects.
- * A document will be written in the natural language which will describe what the system will do without describing it how. Called SRS (Software Requirement Specification).

3) Designing

- * We transform the requirements into a structure i.e. suitable for implementation of the code in a specific programming language.
- * We prepare a document called SDD (Software Development Description).

4) Coding

- * Translate the design of the system into a code of programming language.
- * It affects both testing & maintenance.

5) Testing

Executing a program with the intention of finding bugs or faults in the code.

6) Implementation

SW is installed on the user site & training of the user & the server event check is done.

7) Maintenance

Any change made in SW after its official release is called maintenance. It could be because of various reasons.

— Adaptive

— Corrective

— Perfective

SW could have a defect in it (not working properly).