Importance of Software Engineering

1. Reduces complexity

Big softwares are always complex and difficult to develop. Software engineering has a great solution to decrease the complexity of any project. Software engineering divides big problems into several small problems. And then start solving each small problem one by one. All these small problems are solved independently to each other.

2. To minimize software cost

Software requires a lot of hardwork and software engineers are highly paid professionals. A lots of man force is requires to develop software with millions of codes. But in software engineering, programmers plan everything and reduce all those things that are not required. In turn, cost for software productions becomes less as compared to any software that does not use software engineering approach.

3. To decrease time

Anything that is not made according to the plan always wastes time. And if you are making big software then you may need to run many code to get the ultimate running code. This is a very time consuming process and if it is not well managed then this can take a lot of time. So if you are making your software according to software engineering approach then it will reduce a lot of time.

4. Handling big projects

Big projects are not made in few days and they require lots of patience, planning and management. And to invest six and seven months of any company, it requires lots of planning, direction, testing and maintenance. No one can say that he has given four months of company to the project and the program is still in its first stage. Because company has given many resources to the projects and it should be completed. So to handle big projects without any problem, company has to go for software engineering approach.

5. Reliable software

Software should be reliable, means if you have delivered the software then it should work for at least it's given time span or subscription. And if any bugs come in the software then company is responsible for solving all these bugs. Because in software engineering, testing and maintenance is provided so there is no worry of its reliability.

6. Effeteness

Effectiveness comes if anything has made according to the standards. Software standards are the big focus of companies to make it more effective. So Software becomes more effective in performance with the help of software engineering.

Software Evolution

Software Evolution is a term which refers to the process of developing software initially, then timely updating it for various reasons, i.e., to add new features or to remove obsolete functionalities etc. The evolution process includes fundamental activities of change analysis, release planning, system implementation and releasing a system to customers.

The necessity of Software evolution: Software evaluation is necessary just because of the following reasons:

a) Change in requirement with time: With the passes of time, the organization's needs and modus Operandi of working could substantially be changed so in this frequently changing time the tools(software) that they are using need to change for maximizing the performance.

b) Environment change: As the working environment changes the things(tools) that enable us to work in that environment also changes proportionally same happens in the software world as the working environment changes then, the organizations need reintroduction of old software with updated features and functionality to adapt the new environment.

c) Errors and bugs: As the age of the deployed software within an organization increases their preciseness or impeccability decrease and the efficiency to bear the increasing complexity workload also continually degrades. So, in that case, it becomes necessary to avoid use of obsolete and aged software. All such obsolete Softwares need to undergo the evolution process in order to become robust as per the workload complexity of the current environment.

d) Security risks: Using outdated software within an organization may lead you to at the verge of various software-based cyberattacks and could expose your confidential data illegally associated with the software that is in use. So, it becomes necessary to avoid such security breaches through regular assessment of the security patches/modules are used within the software. If the software isn't robust enough to bear the current occurring Cyber attacks so it must be changed (updated).

e) For having new functionality and features: In order to increase the performance and fast data processing and other functionalities, an organization need to continuously evolute the software throughout its life cycle so that stakeholders & clients of the product could work efficiently.
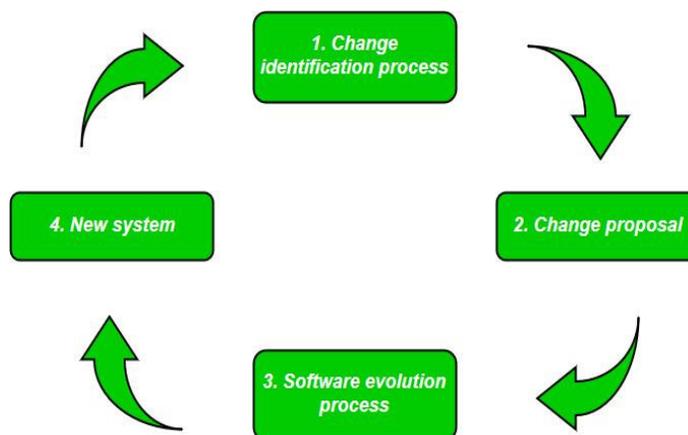
Laws used for Software Evolution:

1. **Law of continuing change:**
   This law states that any software system that represents some real-world reality undergoes continuous change or become progressively less useful in that environment.
2. **Law of increasing complexity:**
   As an evolving program changes, its structure becomes more complex unless effective efforts are made to avoid this phenomenon.
3. **Law of conservation of organization stability:**
   Over the lifetime of a program, the rate of development of that program is approximately constant and independent of the resource devoted to system development.
4. **Law of conservation of familiarity:**
   This law states that during the active lifetime of the program, changes made in the successive release are almost constant.