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Unit-II

Software Cost Estimation

* software cost estimation is a critical aspects of software engineering using various technologies. and, various methods used to predict the results, time factor for the development of the software. The project consists of planning, Budget & environment to the software development life cycle.

The software cost estimation gives effective of the development & involves analysing the project requirement analysis, different technologies, complexity of the project, team experience. & all other aspects are also required.

① Cost Estimation Factor :-
Software Cost factors:-

Software cost factors can be very depending on the project, the scope of the project & the environment. in which of the development of a software. here some of the common factors for software cost factors.

1. Project Size & complexity.

2. Requirements

3. Technology

4. Skill & development of development team

5. Project Management.

6. Software development methodology

7. Quality assuring & Testing.
 8. Infrastructure & Environment.
 9. Support & Maintenance.
1. Project size & Complexity:-
A project consists of two different sectors large projects & small projects. The larger project has more complexity projects, typically it requires more resources to development of the project.

2. Requirements:-

The software cost factor changes the requirement during the development of the software process can increase the cost due to rework & adjustment of the project.

3. Technologies:-

The choice of the programming language have of languages like webpage development, frameworks and tools can develop the time & cost of the project.

4. Skill & experience of development team:-

Highly skilled programming and experience developers may highly demand their salaries, but they can also more efficiently, potential working process to the development team.

5. Project Management:-

The project management has efficient it can help the development process & control the cost estimation.

6. Software development methodologies:-

The development of the software can generate

the result in more flexibility & responsibility they can also require more frequent iteration to development of a Software like extra software to the project.

7. Quality assurance & Testing:-

In the Software testing is essential for ensure the software quality and also add to development of cost management system so that quality of the software as well as testing process can be improved.

8. Infrastructure & Environment:-

In the software cost factors are associated with hardware, Software icons and to development of different tools and it should be maintain overall project budget or cost estimation of the project.

9. Support & Maintenance:-

In the Software development cost for the organising support and maintenance as updated should be maintained in the existing budget.

② Software Cost:-

Software cost refers to the total expenditure required to development, deploy & maintenance of the Software application or System. The wide range of the activities & resources through out the Software development life cycles. The primary Components of Software Cost as follows.

Components of Software Cost:-

1. Development of Cost

- Project management cost.
- Quality assurance & Testing.
- Deployment Cost
- Maintenance & Support
- License of the Software.
- Development of costs - to plan total cost of project from beginning and end.

The development of cost has three different sectors.

- 1.1 personal cost
- 1.2 Tools and Technologies
- 1.3 Infrastructure

1.1 Personal cost

In the first development of the cost that is number one the personal cost is used for the purpose of Salaries to the employees and benefits for development, design, project managers & other team members involved in the software development process.

1.2 Tools and Technologies:-

For software development tools, integrated development environment (IDE's), various control systems and other necessary softwares.

1.3 Infrastructure:-

In the software cost associated with hardware, software, services, cloud services, & other infrastructure need to develop the software.

Q. Project Management Cost :-

In the project management which is having two different criterias they are:-

1. planning & co-ordination

2. Risk Management

3. 1.1 Planning & Co-ordination

In the software the user must plan and co-ordinate with the team members for the development of software. Project planning, scheduling & coordination.

1.2 Risk Management :-

In risk management cost is associated with identifying, analysing and maintaining project risks.

3. Quality Assurance & Testing :-

In quality of the software having three different testing techniques they are:-

1. Manual testing.

2. Automated testing.

3. Bug fixing testing.

1.1 Manual Testing :-

In manual testing cost for the manual testing the functionality and performance of the software.

1.2 Automated Testing :-

Investing cost in automated testing

tools & the creation of automated testing, that is Standard programming in the software.

1.3

Bug Fixing Testing:

In bug fixing identify the fixed errors during the post development testing.

4. Deployment Cost:-

In deployment cost consists of two different functions

1. Release management

2. Training management.

1.1 Release Management

The effort required to develop the development process including project environment & transportation

1.2 Training management:

In training users and administrators are involved at the time of new software system

5. Maintenance & Support:-

In the maintenance support having the three different criterias :-

1. ~~on~~ on-going maintenance

2. Customer support

3. Technical support

1. Ongoing maintenance :-

Regular updates, bug fixing & enhancement

Software development

2. Customer Support

Providing the support to user to resolve the issues & answer the questions

3. Technical Support :-

In technical support cost is associated with addressing techniques for the development of the software technology.

6. License of the software :-

In the license of the software has only one criteria that this software license the purpose of this license for the usage of third-party customers, laboratories, frameworks & ^{other} tools are used in the development of the software.

③ Estimation Technique

Software engineering estimation techniques are essential for planning and managing the Software development of the project. Here some of the common techniques used for various aspects of the software project. The common techniques are

1. Expert Judgement

4. Top-down-Estimation

2. Analogous Estimation

5. Three-point Estimation

3. Bottom-up-Estimation

6. Function point Analysis (FPA)

1. Expert Judgment :-

In this techniques expanded innovation or team proactivity (providing) to the judgment of the software based on their experience and knowledge of the similar projects. They can be quickly and effectively they can estimate especially for a high level planning.

2. Analogous Estimation :-

This method involves using "historical" data from smaller project as a estimating the "current project". It assumes that the effort and the duration of new project will be similar to previous projects with comparable of new project.

3. Bottom-up Estimation :-

This technique involves breaking down the project into smaller, more tasks and more components it is easy to estimate each individuality. The estimation is combine together that is overall project estimation.

4. Top-down Estimation

unlike bottom-up-estimation, Top-down-estimation start with an overall estimation for the entire project and then breaks down into smaller components. This method is used for high level planning when detail information is not available.

5. Three-point-Estimation (PERT)

PERT is a probabilistic Estimation technique that consider three estimation for each task. An optimistic technique is used in the project. these estimation combine to calculate average estimation.

to statistical methods.

6. Function point analysis :-

Function point analysis is a method used to measure the "size and complexity" of software. It assigns the value to each function based on the complexity of the project used to estimation effort, duration and overall cost of the project.