**Project Management**

**Software project management** is concerned with activities involved in ensuring that **software is delivered on time and on schedule and in accordance with the requirements** of the organizations developing and procuring the software.

**Software project success criteria:**

* Deliver the software to the customer at the agreed time.
* Keep overall costs within budget.
* Deliver software that meets the customer's expectations.
* Maintain a happy and well-functioning development team.

**Difficulties in software engineering project management**

**Software engineering is different** from other types of engineering in a number of ways that make software management particularly challenging. Some of these differences are:

**The product is intangible**

Software cannot be seen or touched. Software project managers cannot see progress by simply looking at the artifact that is being constructed.

**Many software projects are 'one-off' projects**

Large software projects are usually different in some ways from previous projects. Even managers who have lots of previous experience may find it difficult to anticipate problems.

**Software processes are variable and organization specific.**

We still cannot reliably predict when a particular software process is likely to lead to development problems.

**Software project management activities:**

**Project planning**

Project managers are responsible for planning. estimating and scheduling project development and assigning people to tasks.

**Reporting**

Project managers are usually responsible for reporting on the progress of a project to customers and to the managers of the company developing the software.

**Risk management**

Project managers assess the risks that may affect a project, monitor these risks and take action when problems arise.

**People management**

Project managers have to choose people for their team and establish ways of working that leads to effective team performance.

**Proposal writing**

The first stage in a software project may involve writing a proposal to win a contract to carry out an item of work. The proposal describes the objectives of the project and how it will be carried out.

**Risk management**

**(What is Risk Management. Explain the three types of risks)**

Risk management is concerned with **identifying risks** and drawing up **plans to minimize their effect** on a project. A risk is a **probability that some adverse circumstance will occur**:

* **Project risks** affect schedule or resources;
* **Product risks** affect the quality or performance of the software being developed;
* **Business risks** affect the organization developing or procuring the software.



**The Risk management process: (Explain risk management process with a diagram)\*\***



**Risk identification**

Identify project, product and business risks. May be a team activity or based on the individual project manager's experience. A checklist of common risks may be used to identify risks in a project:

* Technology risks
* People risks
* Organizational risks
* Requirements risks
* Estimation risks

**(Explain with example common types of risks (5 Marks)**

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**Risk analysis**

Assess probability and seriousness of each risk. Probability may be very low, low, moderate, high or very high. Risk consequences might be catastrophic, serious, tolerable or insignificant.

**Risk planning**

Consider each risk and develop a strategy to manage that risk.

* **Avoidance** strategies: the probability that the risk will arise is reduced
* **Minimization** strategies: the impact of the risk on the project or product will be reduced
* **Contingency** plans: if the risk arises, contingency plans are plans to deal with that risk

**Risk monitoring**

Assess each identified risk regularly to decide whether or not it is becoming less or more probable. Also assess whether the effects of the risk have changed. Each key risk should be discussed at management progress meetings.

**Managing people**

**Explain four critical factors in people management (5 Marks)**

**People management factors:**

* **Consistency**: team members should all be treated in a comparable way without favorites or discrimination.
* **Respect**: different team members have different skills and these differences should be respected.
* **Inclusion**: involve all team members and make sure that people's views are considered.
* **Honesty**: you should always be honest about what is going well and what is going badly in a project.

**Explain the different personality types Or Bass and Dunteman (1963) classify professionals into three types. (5 Marks)**

Motivation should also take into account different **personality types**:

* **Task-oriented**: the motivation for doing the work is the work itself
* **Self-oriented**: the work is a means to an end which is the achievement of individual goals - e.g. to get rich, to play tennis, to travel etc.;
* **Interaction-oriented**: the principal motivation is the presence and actions of co-workers. People go to work because they like to go to work.

**Explain the factors which effect team work. (5 Marks)**

Three generic **factors that affect team effectiveness**:

**The people in the group**

You need a mix of people in a project group as software development involves diverse activities such as negotiating with clients, programming, testing and documentation.

**The group organization**

A group should be organized so that individuals can contribute to the best of their abilities and tasks can be completed as expected.

**Technical and managerial communications**

Good communications between group members, and between the software engineering team and other project stakeholders, is essential.

**Group communications. (5 Marks)**

The effectiveness and efficiency of communications is influenced by:

* **Group size**: the larger the group, the harder it is for people to communicate with other group members.
* **Group structure**: communication is better in informally structured groups than in hierarchically structured groups.
* **Group composition**: communication is better when there are different personality types in a group and when groups are mixed rather than single sex.
* **The physical work environment**: good workplace organization can help encourage communications.