SOFTWARE MANAGEMENT

What is Project Management and its activities ? 5m

- PM is an integral part of software development.
- Software Project Management encompasses the knowledge, techniques and tools to develop the software products.
- Activities are part of the project management process are

- COST: Budget allocation, proposal and controlling the budget for the entire project.
- QUALITY: Explicitly
  * stated functional and performances requirement.
  *its documented development standards

  Implicit
  *characteristics that are Expected of all Professionally developed s/w

- SCHEDULING: Time to start and end the project and complete each activity. Calculate this all time requirement.

- RESOURCE/PROJECT: pooling up with human resources and allocation with a suitable job. Designers, analysts, supporting staff etc.. All those who contribute to the project

What is software project management? List number of tasks it consists? 3M

- In SPM the end user and developers need to know the length, duration and cost of the project.
- Its a process of managing, allocating and timing resources to develop computer software that meets the requirement.

List are: problem definition

problem Identification

project planning

project organization

resource allocation

project scheduling

Tracking, Reporting and controlling

Project termination

Explain Project Management Process or PM phases?

Project management uses a systematic and discipline approach to develop software.

Project management process is a complex process involving several activities. They can be grouped under different phases.

- **Project planning**

project management begins with a project plan before starting of any technical activities. Project plan provides a framework or blueprint for project management

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- **Project monitoring and control**

this phases concentrate on monitoring software developing right from the scratch.

- **Project termination**

this phase concludes the software development process. It keeps track of project enhancement for further improvement of the software package.

Project Planning

Project management begins with a project plan before starting of any technical activities. Project plan provides a framework or blueprint for project management

- Project schedule
- Cost estimation
- Milestone determination
- Project output Identification
- Risk plans and reduction of risk
- Project - staffing
- Quality Control Plans
- Monitoring and controlling plans

Project Monitoring, Control And Terminate

- **Project monitoring and Control** phase activities process continues for the entire duration of the project.
- It takes care of project schedule and verifies whether software development process activities are taking place as per project plan.
- **Project Termination** phase concludes the software development process
- It keeps track of project enhancement for further Improvement of the software package.

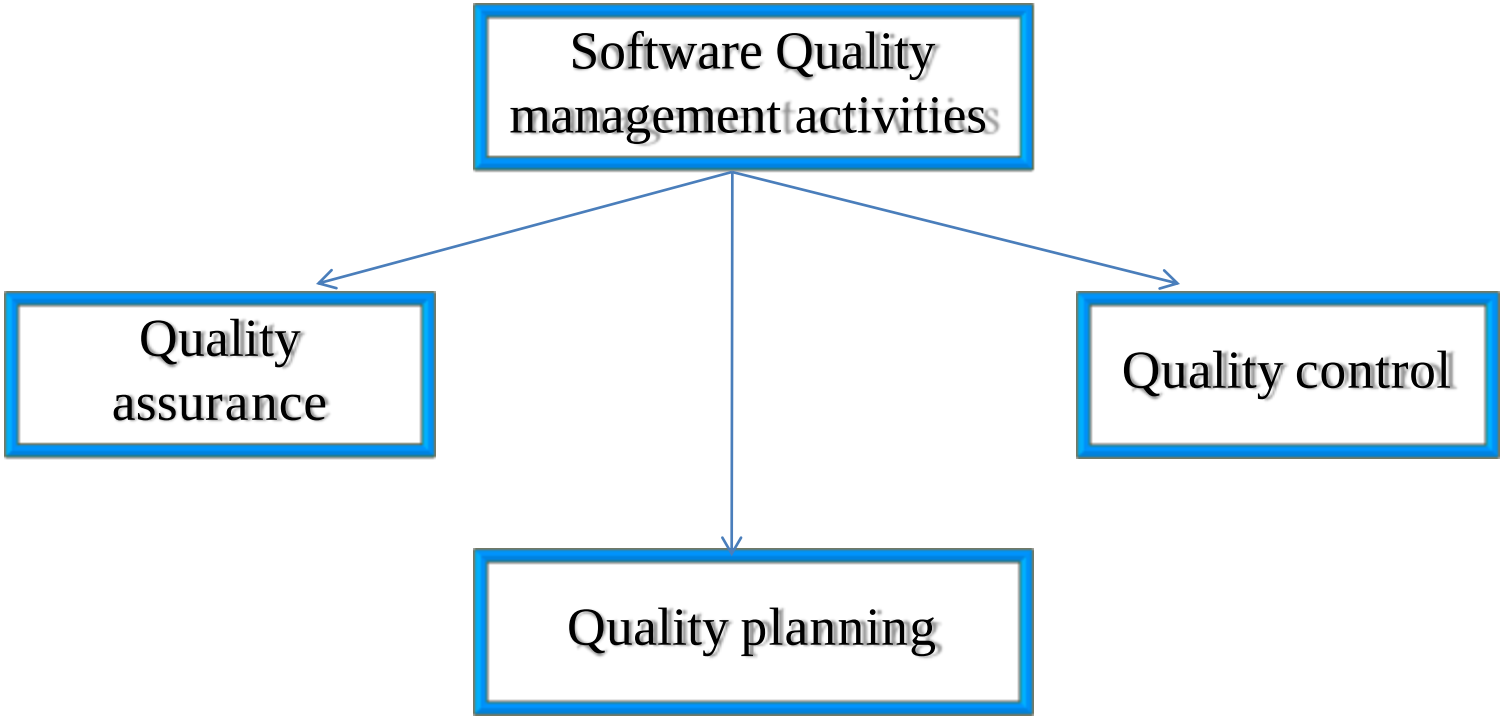
Define Quality Management(QM)?

- QM is concerned with the ensuring that the required level of quality is achieved in a software product.

- Define Quality:-

  Quality, simplistically, means that a product should meet its specification.

Software Quality Management Activities? 10M (each activities 6-7marks)



1. Quality Management Activities

- **Software Quality Assurance is a process for providing adequate assurance that the software products and process in the product life cycle confirm to their specific requirements.**

- **Purpose of SQA is to provide management with appropriate visibility into the process being used by the software project and of the products being built.**

QA measures the quality of process used to create a quality product

- SQA is the process of monitoring and improving all activities associated with software development from Requirement,design,reviews of coding,testing and implementation.
- it involves the entire software development process monitoring and improving all the processes making sure that any agreed upon standards and procedures.
- Testing is a detection process, It aims to ensure quality in the methods and processes and reduce the errors in software.

SQA Activities are:

- Application of technical methods– methods and tools
- Conducting formal technical review
- Testing of software
- Enforcement of software– improve in standards
- Measurement – software quality
- Control of charge
- Records keeping and recording

2. Quality Control (QC)

- QC means testing and it measures the quality of a product.
- The goal of QC is to ensure that the product services of processes provided must specific requirements and dependable satisfactory.
- Quality control involves, examination of a product, service or process for certain minimum levels of quality.

- Quality control not just product, services and processes, but also people. Employees are an important part. Skills training knowledge than quality.
- QA involved in evaluating a product, activity , process or service.

3. Quality Planning (QP)

- It establishes the design of a product, service or process that will meet customer requirements and operational needs to produce the product before its produced.
- Steps are:

1) Identify customer and target markets
2) Discover hidden and unmet customer needs
3) Translate there needs into product or service requirements
4) Develop a service on product that exceeds customers needs.

Algorithmic cost modelling 5m

- Algorithm cost modelling uses a mathematical formula to predict project cots based on estimates of size of project.
- Its primarily used to make estimates of software development costs.
- Its built by analyzing the costs and attributes of completed projects and finding the closest fit formula to actual experiences

Formula :
Effort = A * size^b *m

A --- is a constant factor that depends on local organizational practices and the type of s/w that is developed.

Size--- may be either an assessment of the code size of the software

B--- the value of exponent. B usually btw 1 and 1.5

M--- is a multiplier made by combining process product and development attributes.

- AS the size of the s/w increases, extra costs are incurred bcoz of the communication overhead of large items more complex configuration mgt.
- All algorithmic models suffer from the same fundamental difficulties:

1) Its often difficult to estimate size at an early stage in a project when only specification is available.
2) The estimated of the factors contributing to B and M are subjective

1) The COCOMO model (COnstructive COst Model) 7m

- The COCOMO model is one of the best documented algorithmic cost estimation model.
- It uses a basic regression formula, with parameters that are derived from historical project data and current project.
- It was developed by Boehim in 1981.
- This model is an empirical model derived by collecting data from large number of software projects.
- These data were analyzed to discover formulae that would best fit to the observation.

Bohem's hierarchy of COCOMO model takes 3 forms:-

- Model 1: **the basic cocomo model**

➢ its a simple model and simplest version of cocomo model.

➢ Its a starting point for project estimation.

➢ There are 3 classes of s/w projects:

Organic or simple

Embedded

Semidetached or moderate

- Organic model its small s/w team develop, in-house environment, most people connected with project have extensive experiences in work.
- Embedded mode s/w project is a need to operate within tight constraints. The product must be strongly coupled complex h/w.
- Semidetached it represents an intermediate stage btw the organic and embedded.

- Formula: PM = A * SIZE ^B * M

The value of A and B for 2 different type of projects are

Project complexity	A	B
Simple	2.4	1.05
Moderate	3.0	1.12
Embedded	3.6	1.20

Simple formula : PM = 2.4 *(KLOC)1.05 *M small teams well understood

Moderate formula : PM = 3.0*(kloc)1.12*M more complex project, team member have limited experience

Embedded formula: Pm =3.6*(kloc)1.20*M complex project where software is part of a strongly coupled complex.

Model 2: intermediate COCOMO model

- Intermediate COCOMO makes use of cost drives and their multiples to estimate the cost.
- EX: computer, skilled professional.

Model 3: Complete COCOMO

Basic and intermediately COCOMO considers s/w products as a single homogeneous entity.

Complex systems are made up of sub-system.

Each parameter of a module must be summed up to get complete cost estimation

Software Maintenance and its types? 10m

- Software maintenance is defined as the process of modifying a software system or component after delivery to correct faults, improve performance or other attributes to a changed environment.

Need for maintenance is needed to ensure that the s/w continues to satisfy user requirement.

Maintenance must be performed by:

- Improve the design
- Implement enhancements
- Interface with other systems
- Retire s/w
- Maintaining control over the s/w functions
- Maintaining control over s/w modification
- Perfecting existing functions
- Correct faults.

Categories of maintenance

1)Corrective Maintenance: modification and updations done, to correct or fix error.

2) Adaptive maintenance: modification and updations applied to keep the s/w product up-to-date

3)Perfective Maintenance: modification and updations done in order to keep the s/w usable over long period of time

4)Preventive Maintenance: modification and updations to prevent future problem of the s/w.aim to attend problem.

Cost of maintenance

- Reports suggest that the cost of maintenance is high.
- Cost maintenance found high 67%
- Average is 50% of all SDLC phase
- Others requirement 3%
- Designing 8%
- Implementation 7%
- Testing 15%

Maintainability and maintenance Activities ? 6M

- Maintainability is the ease with which s/w can be maintained, enhanced or corrected to satisfy specified requirements.
- IEEE provides a framework for sequential maintenance process activities with each phase are:

Identification & tracing

Analysis

Design

Implementation

System testing

Acceptance Testing

Delivery

Maintenance Management.