

1. Software project management is the art and science of planning and leading software projects. It is a sub-discipline of project management in which software projects are planned, implemented, monitored and controlled.

2. Software quality metrics are subset of software metrics that focus on the quality aspects of the product process and project. In general software quality metrics are closely associated with process and product metrics than project metrics.

3. Scrum is an efficient framework within which you can develop software with teamwork. It is based on agile principles. Scrum supports continuous

collaboration among the customer, team members, and relevant stakeholders.

4. Answering the question

'What do we have to do to have a success?'

Need for a project authority

- * Sets the project scope
- * Allocates/approves costs
- * Could be one person - or a group
- * Project Board
- * Project Management Board
- * Steering committee.

Objectives Informally, the objective of a project can be defined by completing the

statement: The project will be regarded as a success if ... Rather like

post-conditions for the project. Focus on what will be put in place, rather than how activities will be carried out.

5. Monitoring is the systematic process of collecting, analyzing and using information to track a programme's progress toward reaching its objectives and to guide management decisions. Monitoring usually focuses on processes, such as when and where activities occur, who delivers them and how many people or entities they reach.

6. The Monte Carlo method is a numerical method for statistical simulation which utilizes sequences of random numbers to perform the simulation.

7. Once data has been collected about project progress, a manager needs some way of presenting that data to greatest effect. Some of these methods such as Gantt charts provide a static picture, a single snapshot, whereas others such as time line charts try to show how the project has progressed and changed over time.

8. Earned Value Analysis (EVA) is an industry standard method of measuring a project's progress at any given point in time, forecasting its completion date and final cost, and analyzing variances in the schedule and budget as the project proceeds.

9. A virtual team (also known as a geographically dispersed team, distributed team) is a group of individuals who work across time, space and organizational boundaries with links strengthened by webs of communication technology

10. Project software management is a collection of techniques used to develop and deliver various

Types of software products

*Project management is all about getting things done in the most efficient manner possible.)

*It's important to the company's success to invest time into the project

11. b. Risk is an uncertain event or condition that, if it occurs, has an effect on at least one project objective. Risk management focuses on identifying and assessing the risks to the project and managing those risks to minimize the impact on the project.

Risk Management process

Identify Risk

Make list of potential risks continually.

Identify risks facing the company - through consultation with stakeholders

Decide on acceptable risk

Decide on acceptable risk - and the loss of return/extra costs associated with

reduced risks Analyze Risk

Prioritize according to threat/likelihood.

Assess the likelihood of the risk occurring -
management attention obviously on the
higher probability risks

Plan for Risk

Look at how impact of these risks can be
minimized - through consultation with
affected parties. Avoid or make contingency plans
(TARA)

Monitor Risk

Assess risks continually.

Understand the costs involved in the internal
controls set up to manage these
risks - and weighed against the benefits
various paradigms, principles to manage the risks in
project:

The approach to safety risk management is composed of the following steps:

Plan. A case-specific plan for risk analysis and risk assessment should be

predetermined in adequate detail for appropriate review and agreement by the risk

manager prior to commitment of resources. The

plan should additionally describe

criteria for acceptable risk.

Hazard Identification. The specific safety hazard or list of hazards to be

addressed by the safety risk management plan should be explicitly identified to

prevent ambiguity in subsequent analysis and assessment.

Analysis. Both elements of risk (hazard severity and likelihood of occurrence) should be characterized. The inability to quantify and/or lack of historical data on a particular hazard does not exclude the hazard from this requirement. If the seriousness of a hazard can be expected to increase over the effective life of the decision, this should be noted. Additionally, both elements should be estimated for each hazard being analyzed, even if historical and/or quantitative data is not available.

Assessment. The combined impact of the risk elements should be compared to

acceptability criteria and the results provided for decisionmaking.

Decision. The risk management decision should consider the risk assessment results. Risk assessment results may be used to compare and contrast alternative options.

- The process should create value.
- It should be an integral part of the organizational process.
- It should factor into the overall decision making process.
- It must explicitly address uncertainty.
- It should be systematic and structured.
- It should be based on the best available information.

12. a.

Extreme Programming technique is very helpful when there is constantly changing demands or requirements from the customers or when they are not sure about the

functionality of the system. It advocates frequent "releases" of the product in short development cycles, which inherently improves the productivity of the system and also introduces a checkpoint where any customer requirements can be easily

implemented. The XP develops software keeping customer in the target. Phases of extreme

programming: There are 6 phases available in Agile XP method, and those are explained as follows:

Planning

- Identification of stakeholders and sponsors
- Infrastructure Requirements
- Security related information and gathering
- Service Level Agreements and its conditions

Analysis

- Capturing of Stories in Parking lot Prioritize stories in Parking lot -

Scrubbing of stories for estimation - Define Iteration $SPAN(Time)$ -

Resource planning for both Development and QA teams Design - Break down of tasks - Test Scenario preparation for each task - Regression Automation Framework Execution -

Coding

- Execution of Manual test scenarios

- Regression Testing
- Demos and reviews
- Develop new stories based on the need.

Advantages and disadvantages:

The main advantage of Extreme Programming is that this methodology allows software development companies to save costs and time required for project realization. Time savings are available because of the fact that XP focuses on the timely delivery of final products. Extreme Programming teams save lots of money because they don't use too much documentation. They usually solve problems through discussions inside of the team.

* Simplicity is one more advantage of Extreme Programming projects. The developers who prefer to use this methodology create extremely simple code that can be improved at any moment.

* The whole process in XP is visible and accountable. Developers commit what they will accomplish and show progress.

* Constant feedback is also the strong side. It is necessary to listen and make any changes needed in time.

* XP assists to create software faster thanks to the regular testing at the development stage.

* Extreme Programming contributes increasing employee satisfaction and

retention.

Disadvantages

– Some specialists say that Extreme Programming is focused on the code

rather than on design. That may be a problem

because good design is extremely important for software applications. It helps sell them in the

software market. Additionally, in XP projects the defect documentation is

not always good. Lack of defect documentation may lead to the occurrence

of similar bugs in the future.

– One more disadvantage of XP is that this methodology does not

measure code quality assurance. It may cause defects in the initial code.

– XP is not the best option if programmers are separated geographically.

13. a. The critical path method (CPM) is a step-by-step project

management technique for process planning that defines critical and noncritical

tasks with the goal of preventing time-frame problems and process

bottlenecks. The CPM is ideally suited to projects consisting of numerous

activities that interact in a complex manner.

Formulating a network model

– Constructing Precedence network

– Representing lagged activities – Hammock activities

- Labeling conventions
- Adding the time dimension

Forward pass Backward pass

A project usually consists of multiple activities that occur both simultaneously

and sequentially. To determine the flow of these activities, you'll need to create a

Precedence Diagram. After creating the Precedence Diagram, you can identify

the activities that would, if delayed, cause your project to come in late. This is

the Critical Path definition. A delay in any of the critical path activities will

delay the entire project, regardless of whether the other project activities are

completed on or before time. The act of determining the Critical Path is known as the Critical Path Method or the Critical Path Analysis. To determine the Critical Path and conduct Critical Path Analysis, you need to:

- Define the duration of each activity. - Identify all the paths.
- Calculate the duration of each path. - Identify the longest path.
- Identifying the critical path There will be at least one path through the network that defines the duration of the project. This is known as critical path.

Any delay to any activity on this critical path will delay the completion of the

project. Significance of critical path —In managing the project, we must pay particular attention to monitoring activities on the critical path so that the effects of any delay or resource unavailability are detected at the earliest opportunities.

—In planning the project, it is the critical path that we must shorten if we are to reduce the overall duration of the project.

14. a. A project manager is a person who is responsible for leading the project. In other words, project managers are the spearheads of a project.

They ensure that the project is completed within the specified deadline and

gets delivered to the client without any flaws.

Here are three simple steps to help you start monitoring your schedule.

Create a baseline for your project. Click the Project tab, and then click Set

Baseline.

Communicate, communicate, communicate. It is not easy for people to send you work status.

Use Team Planner.

15. b. Ethics relates to the moral obligation to respect the rights and

interests of others - goes beyond strictly legal responsibilities

Three groups of responsibilities:

- * Responsibilities that everyone has
 - * Responsibilities that people in organizations have
 - * Responsibilities relating to your profession or calling
- Organizational ethics

There are some who argue that ethical organizational ethics are limited:

- * Stockholder theory (e.g. Milton Friedman). An employee's duty is to the owners of the business (which often means the stakeholders) above all others - although legal requirements must be met.
- * Competitive relationships between businesses.

Uniform Treatment

One example of organizational ethics is the uniform treatment of all employees. Small business owners should treat all employees with the same respect, regardless of their race, religion, cultures or lifestyles. Everyone should also have equal chances for promotions. One way to promote uniform treatment in organizations is through sensitivity training. Some companies hold one-day seminars on various discrimination issues. They then invite outside experts in to discuss these topics. Similarly, small company managers must also avoid favoring one employee over others. This practice

may also lead to lawsuits from disgruntled employees. It is also counterproductive Social Responsibility

Small companies also have an obligation to protect the community. For

example, the owner of a small chemical company needs to communicate

certain dangers to the community when explosions or other disasters

occur. The owner must also maintain certain safety standards for

protecting nearby residents from leaks that affect the water or air quality.

There are state and federal laws that protect people from unethical

environmental practices. Business owners who violate these laws may face stiff penalties. They may also be shut down.

Financial Ethics

Business owners must run clean operations with respect to finances, investing and expanding their companies. For example, organizations must not bribe state legislators for tax credits or special privileges.

Insider trading is also prohibited. Insider trading is when managers or executives illegally apprise investors or outside parties of privileged information affecting publicly traded stocks, according to the Securities

and Exchange Commission. The information helps some investors achieve greater returns on their investments at the expense of others. Executives in small companies must strive to help all shareholders earn better returns on their money. They must also avoid collusive arrangements with other companies to deliberately harm other competitors.

Considerations

A small company's organizational ethics can also include taking care of employees with mental illnesses or substance abuse problems, such as drug and alcohol dependency. Ethical business owners help their employees

overcome these types of problems when possible. They often put them through employee advisor programs, which involves getting them the treatment they need. Employees may have issues that lead to these types of problems. Therefore, they deserve a chance to explain their situations and get the help they need

Professional ethics

Professionals have knowledge about the technical domain that the general public does not. Ethical duty of the expert to warn lay people of the risks involved in a particular course of action. Many professions, or would be

professions, have codes of conduct for their members.

16. b. A contract is an agreement between two parties that creates an obligation to perform (or not perform) a particular duty.

Types of contract

- Fixed price contracts
- Time and materials contract
- Fixed price per delivered unit contracts

Fixed price contracts

As the name implies, in this situation a price is fixed when the contract is signed. In other words when the contract is to construct a s/w system,

the detailed requirements analysis must already have been carried out.

Advantages

- If there are few subsequent changes to the original requirements,

the customers will have a known outlay

- the supplier has a motivation to manage the delivery of the

system in a cost effective manner

- Disadvantages
- Higher prices to allow for contingency:

- Difficulties in modifying requirements

- Upward pressure on the cost of changes

- Threat to system quality

Time and materials contracts

In type of contract, the

customer is charged at a fixed rate per unit of effort.

Advantages

- Ease of changing requirements
- Changes to requirements are dealt with easily, where a project

has a research orientation

and the direction of the project changes as options are explored, then

this can be an

appropriate method of calculating payment.

- Lack of price pressure
- The lack of price pressure can allow better quality software to

be produced. Disadvantages

- Customer liability

- The customer absorbs all the risks associated with poorly defined or changing requirements.
- Lack of incentives for supplier: the supplier has no incentive to work in a cost effective manner or to control the scope of the system to be delivered. Fixed price per unit delivered
- This is often associated with function point (FP) counting. The size of the system to be delivered is calculated or estimated at the outset of the project.
- The size of the system to be delivered might be estimated in lines

of code.

- A price per unit is also quoted.
- The final price is then the unit price multiplied by the number of

unit sit delivered contracts Advantages

- Customer understanding: the customer can see how the price is

calculated and how it will vary with changed requirements

- Comparability : pricing schedules can be completed

- Emerging functionality: the supplier does not bear the risk of

increasing functionality

- Supplier efficiency:- the supplier still has an incentive to deliver

the required functionality in

a cost-effective manner

- Life-cycle range: - the requirements do not have to be

definitively specified at the outset.

Thus the development contract can cover both the analysis and

design stages of the project.

Disadvantages

- Difficulties with software size measurements -

Changing

requirements Another way to categorize contract

- Open

- Restricted

- Negotiated Open tendering process

- Any supplier can bid to supply the goods and services

— Invitation to tender must be considered and evaluated in the same way as all others

Restricted tendering process

— In this case, there are bids only from suppliers who have been invited by the customer — Reduce the number of suppliers

Negotiated procedure

— — Single supplier might be justified