

**Department of Master of Computer Science**

**Advance Software Engineer**

**Assignment 2**

**Submitted By: Submitted To:**

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**1.Explain in detail Project management attributes**

 Effective project management entails having the following attributes that are essential in becoming an effective project manager:

1. Effective communication skills.

One of the qualities of a good manager is being a good [communicator](https://www.nutcache.com/blog/the-importance-of-collaboration-in-the-workplace/) so that he can connect with people at all levels. The project manager must clearly explain the project goals as well as each member’s tasks, responsibilities, expectations and feedback.

2. Strong leadership skills.

Effective project management means having strong leadership qualities such as being able to motivate his team and drive them to maximum performance so that they can achieve their goals.

3. Good decision maker.

An effective project manager needs to have decision-making skills because there will always be decisions that need to be acted on.

4. Technical expertise.

Since project management software and other related programs are essential in accomplishing the project goals, an effective project manager needs to have sound technical knowledge to understand the issues that are related to the technical aspect. Knowledge of theory as well as the technical side can greatly help the manager in taking strategic initiatives when needed.

5. Inspires a shared vision.

An effective project manager can articulate the vision to his team members very well. A visionary person can lead his people to the right direction as well as easily adapt to the changes that come in the way. They are good at empowering people to experience the vision on their own.

[6. Team-building skills](https://www.nutcache.com/blog/team-management-tools-and-techniques-to-improve-your-team-management-skills/).

It is necessary that a team works in unison otherwise the project will undergo various relationship challenges that might hinder its success. Project managers need to know how to give each of them the importance they need by focusing on their positive traits. He has to be fair and just in the way he treats them.

7. Cool under pressure.

As the project goes on, certain incidents could take a toll on the project’s momentum and test the project manager’s patience. It is essential that a project manager keeps his calm at all times and be consistently grounded so as not to lose himself and adversely affect his relationship with the team.

8. Good negotiation skills.

One of the qualities needed for effective project management is the ability to negotiate. In times that conflict arise due to differences in opinion, project managers need sheer negotiating skills to settle the issue and maintain harmony in the team.

9. Empathetic.

Understanding and caring for people as well as being grateful for their help are a few of the things that an empathetic leader shows to his members.  It includes understanding the needs of the project and its stakeholders.

10. Competence.

A good manager knows what he is doing, can initiate new projects as well as face the challenges that come with them.

It is necessary for an effective [project manager](https://www.nutcache.com/blog/be-better-than-the-rest-read-these-7-traits-a-great-project-manager-should-possess/) to possess most of these attributes for him to succeed in managing the project

**2.Explain in detail project scheduling**

Project scheduling is a mechanism to communicate what tasks need to get done and which organizational resources will be allocated to complete those tasks in what timeframe. A project schedule is a document collecting all the work needed to deliver the project on time.

But when it comes to creating a project schedule, well, that’s something few have deep experience with. What and who is being scheduled, and for what purposes, and where is this scheduling taking place, anyway?

A project is made up of many tasks, and each task is given a start and end (or due date), so it can be completed on time. Likewise, people have different schedules, and their availability and vacation or leave dates need to be documented in order to successfully plan those tasks.

It’s quite a lot to manage. If you don’t want your project to quickly fall off the rails, you’ll want to understand and practice proper project scheduling. Whereas people in the past might have printed calendars on a shared wall in the water-cooler room, or shared spreadsheets via email, today most teams use [online project scheduling tools](https://www.projectmanager.com/software/scheduling). Typically, project scheduling is just one feature within a larger project management software solution.

ProjectManager.com, for example, has online Gantt charts for scheduling tasks and resources, but also team management features and reporting tools for a comprehensive project management platform. [Sign up for a free trial today](https://www.projectmanager.com/pricing) to make a project schedule quickly and easily, without sacrificing other robust project management functions.

**How to Make a Project Schedule**

Project scheduling occurs during the [planning](https://www.projectmanager.com/project-planning) phase of the project. When beginning to put together a schedule for your project, you should ask yourself four things to start:

* What needs to be done?
* When will it be done?
* Who will do it?
* Where will it be done?

The answers to these four questions will greatly inform your project schedule moving forward, as you’ll use this information to plan dates, link activities, set the duration, create milestones and manage resources.

Follow these steps to create a project schedule of your own!

**1. Create the Project Scope**

The [project scope](https://www.projectmanager.com/blog/project-scope) is created during the initial planning. It’s a document that contains the specific goals, deliverables, features, budget, etc of your project. All of the tasks needed to complete the project successfully are listed here (which requires understanding the stakeholder’s requirements.)

Be thorough when putting a task list together, you don’t want to leave anything out. By using a [Work Breakdown Structure](https://www.projectmanager.com/templates/work-breakdown-structure-template) (WBS) you can organize these activities and lay them out in order of completion.

**2. Establish the Sequence of Tasks**

Tasks are the small jobs that lead to the final deliverable, and it’s fairly crucial to map out the sequence of those tasks before diving into them. Oftentimes a task will be [dependent on another](https://www.projectmanager.com/blog/manage-task-dependencies) to start or finish. You don’t want to get halfway through a task before you realize you can’t complete it due to hanging objectives.

**3. Group Tasks**

Once you’ve collected your tasks and have them in proper order, you should take the opportunity to divide your tasks by importance. You need to know which is critical to the project and must be done first and those less important that can be done if there’s time.

Then, break your tasks down with [milestones](https://www.projectmanager.com/blog/milestones-project-management) that relate to the five project phases—initiation, planning, execution, monitoring and close. Organizing your tasks with milestones makes it easier to track progress, and gives your teams a sense of accomplishment that boosts morale and productivity.

**4. Link Task Dependencies**

Some tasks can be done simultaneously, but some tasks are dependent on others to start or finish before they can start or finish. These task dependencies must be mapped out in your schedule to keep you aware of them, or you risk bottlenecks and blocking your team.

**5. Find the Critical Path**

The [critical path is a method](https://www.projectmanager.com/critical-path-method) for scheduling tasks in a project to find those which are critical to the success of the project. This allows you to make smart choices about tasks that can be ignored if time and costs become constrained.

**6. Assign Resources**

Every task on your schedule should have the related resources and costs associated with completing it. Tasks aren’t done on their own, and without mapping the proper resources to each task you’re in danger of going wildly over budget. With resources attached to tasks, you can more accurately plan your team’s time and keep their workload balanced.

**3. Explain in detail cocomo model.**

Cocomo (Constructive Cost Model) is a regression model based on LOC, i.e **number of Lines of Code**. It is a procedural cost estimate model for software projects and often used as a process of reliably predicting the various parameters associated with making a project such as size, effort, cost, time and quality. It was proposed by Barry Boehm in 1970 and is based on the study of 63 projects, which make it one of the best-documented models.

The key parameters which define the quality of any software products, which are also an outcome of the Cocomo are primarily Effort & Schedule:

* **Effort:** Amount of labor that will be required to complete a task. It is measured in person-months units.
* **Schedule:** Simply means the amount of time required for the completion of the job, which is, of course, proportional to the effort put. It is measured in the units of time such as weeks, months.

Different models of Cocomo have been proposed to predict the cost estimation at different levels, based on the amount of accuracy and correctness required. All of these models can be applied to a variety of projects, whose characteristics determine the value of constant to be used in subsequent calculations. These characteristics pertaining to different system types are mentioned below.

Boehm’s definition of organic, semidetached, and embedded systems:

* **Organic –** A software project is said to be an organic type if the team size required is adequately small, the problem is well understood and has been solved in the past and also the team members have a nominal experience regarding the problem.
* **Semi-detached –** A software project is said to be a Semi-detached type if the vital characteristics such as team-size, experience, knowledge of the various programming environment lie in between that of organic and Embedded. The projects classified as Semi-Detached are comparatively less familiar and difficult to develop compared to the organic ones and require more experience and better guidance and creativity. Eg: Compilers or different Embedded Systems can be considered of Semi-Detached type.
* **Embedded –** A software project with requiring the highest level of complexity, creativity, and experience requirement fall under this category. Such software requires a larger team size than the other two models and also the developers need to be sufficiently experienced and creative to develop such complex models.
* All the above system types utilize different values of the constants used in Effort Calculations.

**Types of Models:** COCOMO consists of a hierarchy of three increasingly detailed and accurate forms. Any of the three forms can be adopted according to our requirements. These are types of COCOMO model:

* Basic COCOMO Model
* Intermediate COCOMO Model
* Detailed COCOMO Model
* The first level, **Basic COCOMO** can be used for quick and slightly rough calculations of Software Costs. Its accuracy is somewhat restricted due to the absence of sufficient factor considerations.
* **Intermediate COCOMO**takes these Cost Drivers into account and **Detailed COCOMO** additionally accounts for the influence of individual project phases, i.e in case of Detailed it accounts for both these cost drivers and also calculations are performed phase wise henceforth producing a more accurate result. These two models are further discussed below.

* **Explain in detail risk management**

Risk management is the process of [identifying, assessing and controlling threats](https://whatis.techtarget.com/feature/How-to-assess-and-prioritize-insider-threat-risk) to an organization's capital and earnings. These threats, or risks, could stem from a wide variety of sources, including financial uncertainty, legal liabilities, strategic management errors, accidents and natural disasters. [IT](https://searchdatacenter.techtarget.com/definition/IT) security threats and data-related risks, and the risk management strategies to alleviate them, have become a top priority for [digitized](https://whatis.techtarget.com/definition/digitization) companies. As a result, a risk management plan increasingly includes companies' processes for identifying and controlling threats to its digital assets, including proprietary corporate data, a customer's personally identifiable information (PII) and intellectual property.

Every business and organization faces the risk of unexpected, harmful events that can cost the company money or cause it to permanently close. Risk management allows organizations to attempt to prepare for the unexpected by minimizing risks and extra costs before they happen.

**Importance**

By implementing a risk management plan and considering the various potential risks or events before they occur, an organization can save money and protect their future. This is because a robust risk management plan will help a company establish procedures to avoid potential threats, minimize their impact should they occur and cope with the results. This ability to understand and control risk enables organizations to be more confident in their business decisions. Furthermore, strong corporate governance principles that focus specifically on risk management can help a company reach their goals.

Other important benefits of risk management include:

* Creates a safe and secure work environment for all staff and customers.
* Increases the stability of business operations while also decreasing legal liability.
* Provides protection from events that are detrimental to both the company and the environment.
* Protects all involved people and assets from potential harm.
* Helps establish the organization's insurance needs in order to save on unnecessary premiums.

The importance of combining risk management with patient safety has also been revealed. In most hospitals and organizations, the risk management and patient safety departments are separated; they incorporate different leadership, goals and scope. However, some hospitals are recognizing that the ability to provide safe, high-quality patient care is necessary to the protection of financial assets and, as a result, should be incorporated with risk management.

In 2006, the Virginia Mason Medical Center in Seattle, Washington integrated their risk management functions into their patient safety department, ultimately creating the Virginia Mason Production System (VMPS) management methods. VMPS focuses on continuously improving the patient safety system by increasing transparency in risk mitigation, disclosure and reporting. Since implementing this new system, Virginia Mason has experienced a significant reduction in hospital professional premiums and a large increase in the reporting culture.

**Risk management strategies and processes**

All risk management plans follow the same steps that combine to make up the overall risk management process:

* **Establish context.**Understand the circumstances in which the rest of the process will take place. The criteria that will be used to evaluate risk should also be established and the structure of the analysis should be defined.
* **Risk identification.** The company identifies and defines potential risks that may negatively influence a specific company process or project.
* **Risk analysis.** Once specific types of risk are identified, the company then determines the odds of them occurring, as well as their consequences. The goal of [risk analysis](https://searchsecurity.techtarget.com/definition/risk-analysis) is to further understand each specific instance of risk, and how it could influence the company's projects and objectives.
* **Risk assessment and evaluation.** The risk is then further evaluated after determining the risk's overall likelihood of occurrence combined with its overall consequence. The company can then make decisions on whether the risk is acceptable and whether the company is willing to take it on based on its [risk appetite](https://searchcompliance.techtarget.com/definition/risk-appetite).
* **Risk mitigation***.*During this step, companies assess their highest-ranked risks and develop a plan to alleviate them using specific risk controls. These plans include risk mitigation processes, risk prevention tactics and contingency plans in the event the risk comes to fruition.
* **Risk monitoring***.*Part of the mitigation plan includes following up on both the risks and the overall plan to continuously monitor and track new and existing risks. The overall risk management process should also be reviewed and updated accordingly.
* **Communicate and consult.**Internal and external shareholders should be included in communication and consultation at each appropriate step of the risk management process and in regards to the process as a whole.

**Risk management approaches**

After the company's specific risks are identified and the risk management process has been implemented, there are several different strategies companies can take in regard to different types of risk:

* [**Risk avoidance**](https://searchcompliance.techtarget.com/definition/risk-avoidance)*.*While the complete elimination of all risk is rarely possible, a risk avoidance strategy is designed to deflect as many threats as possible in order to avoid the costly and disruptive consequences of a damaging event.
* **Risk reduction**. Companies are sometimes able to reduce the amount of damage certain risks can have on company processes. This is achieved by adjusting certain aspects of an overall project plan or company process, or by reducing its scope.
* **Risk sharing.** Sometimes, the consequences of a risk are shared, or distributed among several of the project's participants or business departments. The risk could also be shared with a third party, such as a vendor or business partner.
* **Risk retaining.** Sometimes, companies decide a risk is worth it from a business standpoint, and decide to keep the risk and deal with any potential fallout. Companies will often retain a certain level of risk if a project's anticipated profit is greater than the costs of its potential risk.

ther limitations include:

* **A false sense of stability.**Value-at-risk measures focus on the past instead of the future. Therefore, the longer things go smoothly, the better the situation looks. Unfortunately, this makes a downturn more likely.
* **The illusion of control.** Risk models can give organizations the false belief that they can quantify and regulate every potential risk. This may cause an organization to neglect the possibility of novel or unexpected risks. Furthermore, there is no historical data for new products, so there's no experience to base models on.
* **Failure to see the big picture.** It's difficult to see and understand the complete picture of cumulative risk.
* **Risk management is immature.** An organization's risk management policies are underdeveloped and lack the history to make accurate evaluations.
* he ISO recommends the following target areas, or principles, should be part of the overall risk management process:
* The process should create value for the organization.
* It should be an integral part of the overall organizational process.
* It should factor into the company's overall decision-making process.
* It must explicitly address any uncertainty.
* It should be systematic and structured.
* It should be based on the best available information.
* It should be tailored to the project.
* It must take into account human factors, including potential errors.
* It should be transparent and all-inclusive.
* It should be adaptable to change.
* It should be continuously monitored and improved upon.