Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

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Participant Handbook

Sector
Electronics

Sub-Sector
Generic

Occupation
Generic – Planning & Management

Reference ID: **ELE/Q9801 Version-1.0**
NSQF Level: 7

Project Manager-Electronics

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Shri Narendra Modi
Prime Minister of India

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ELECTRONICS SECTOR SKILL COUNCIL OF INDIA

for

SKILLING CONTENT - PARTICIPANT HANDBOOK

Complying to National Occupational Standards of
Job Role/Qualification Pack: **Project Manager-Electronics** QP **NSQF ELE/Q9801 Level 7**

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**Valid up to the next review date of the Qualification Pack or the 'Valid up to' date mentioned above (whichever is earlier)*

Authorised Signatory
(Skilling India In Electronics)

Acknowledgements

This participant's handbook meant for Project Manager-Electronics is a sincere attempt to ensure the availability of all the relevant information to the existing and prospective job holders in this job role. We have compiled the content with inputs from the relevant Subject Matter Experts (SMEs) and industry members to ensure it is the latest and authentic. We express our sincere gratitude to all the SMEs and industry members who have made invaluable contributions to the completion of this participant's handbook.

I would like to thank the team of Feedback Advisory for their support to develop the content, the SME and the team at the ESSCI along with the industry partners for the tireless effort in bringing the handbook in the current format.

This handbook will help deliver skill-based training in the field of drone service and maintenance. We hope that it will benefit all the stakeholders, such as participants, trainers, and evaluators. We have made all efforts to ensure the publication meets the current quality standards for the successful delivery of QP/NOS-based training programs. We welcome and appreciate any suggestions for future improvements to this handbook.

About this Book

This participant handbook has been designed to serve as a guide for participants who aim to obtain the required knowledge and skills to undertake various activities as a Project Manager-Electronics . Its content has been aligned with the latest Qualification Pack (QP) prepared for the job role. With a qualified trainer's guidance, the participants will be equipped with the following for working efficiently in the job role:

- Knowledge and Understanding: The relevant operational knowledge and understanding to perform the required tasks.
- Performance Criteria: The essential skills through hands-on training to perform the required operations to the applicable quality standards.
- Professional Skills: The Ability to make appropriate operational decisions about the field of work.

The handbook details the relevant activities to be carried out by a Project Manager-Electronics. After studying this handbook, job holders will be adequately skilled to carry out their duties efficiently according to the applicable quality standards, with minimum supervision.

The handbook has been divided into an appropriate number of units and sub-units based on the content of the relevant QP. We hope it will facilitate easy and structured learning for the participants. We sincerely hope that participants will obtain enhanced knowledge and skills after studying this handbook and make career progress in the relevant and senior job roles.

The Participant Handbook is designed based on the National Skill Qualification Framework (NSQF) aligned Qualification Pack (QP) and it comprises of the following National Occupation Standrads (NOS)/ topics:

1. ELE/N9801 Carry out project initiation and planning
2. ELE/N9802 Carry out execution, monitoring, control and closure of the Project
3. ELE/N9905 Work effectively at the workplace
4. ELE/N1002 Apply health and safety practices at the workplace

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1. Introduction to the Role of a Project Manager

Unit 1.1 Roles and Responsibilities of a Project Manager

Bridge Module

Key Learning Outcomes

At the end of this module, the trainee will be able to:

1. Discuss the job role of a Project Manager

UNIT 1.1: Roles and Responsibilities of an In-Project Manager

Unit Objectives

At the end of this unit, the trainee will be able to:

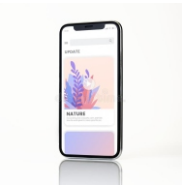
1. Describe the size and scope of the Electronics industry and its sub-sectors
2. Discuss the role and responsibilities of a Project Manager
3. Describe various employment opportunities for a Project Manager

1.1.1 Introduction to Electronic Industry

The electronics industry is the economic sector that manufactures electronic devices. It is one of the world's largest and fastest-growing industries. Today's society is totally dependent on a plethora of electronic devices manufactured in industrially run automated or semi-automated factories. Electronic products have a huge impact on our lifestyle. With the world more connected than ever before, and the digital push induced by the COVID-19 pandemic, demand for electronic devices has risen steadily and remained a significant economic driver around the world. The global electronics industry is rapidly expanding. In 2020, the global electronics industry is projected to be worth $2.9 trillion. In comparison, the global value of the electronics industry is nearly equal to India's current GDP of US$ 2.9 trillion. Asian countries such as China, Taiwan, Singapore, and South Korea dominate the electronic market. The industry is distinguished by rapid innovation and speed to market, a short product life cycle, highly automated manufacturing, and high volume production, all of which result in consistent quality at a low cost and profit accrual through volume.

The Government of India's National Policy for Electronics, 2019 ('NPE') recognizes the electronics industry's growth potential and strategic importance. NPE was founded with the goal of positioning India as a global hub for Electronics System Design and Manufacturing (ESDM), among other things, by creating an enabling environment for the industry to compete globally. Furthermore, the ESDM industry has been identified as one of the 25 priority sectors in the government's Make in India initiative and serves as a significant pillar in contributing to India's economic growth.

The Indian electronics industry is segmented into several sub-sectors:



Communications and Broadcasting Electronics

- Mobile Phones, Tablets, Wired, and Wireless Connections

Consumer Electronics

- Home Appliances, viz., Refrigerators, Washing Machines, Air Conditioners & Microwaves,Televisions, Music Systems, and Home Theatres, Direct-to-home and Set Top Boxes

Industrial Electronics

- UPS, Supervisory Control and Data Acquisition (SCADA), Programmable Logic Controller (PLC), AC Drive Systems

Fig. 1.1 Sub-Sectors of Electronic Industry

Consumer electronics is the most crucial segment of the Indian electronics hardware industry. The segment accounts for approximately 28 percent of the country's electronic industry production. In 2009, the estimated turnover for this segment was 260 billion. Around half of the workforce is employed in the consumer electronics sector's production function. The current consumer electronics employment pattern is around 0.9 million approx. Electronic components accounted for the lion's share of exports in 2008, accounting for 45 percent of total exports. According to the report "Human Resource and Skill Requirements in the Electronics & IT Hardware Sector (2022)," the electronics industry's output is expected to rise from $844 billion in 2008 to $7,520 billion by 2022. This is a good sign because it would increase overall employment from 0.9 million to over 4 million by 2022

1.1.2 Roles and Responsibilities of a Project Manager

A project manager is a professional who organizes, plans, and manages projects while adhering to constraints such as budgets and timelines. Project managers are in charge of leading teams, setting goals, communicating with stakeholders, and completing projects. This includes collaborating with project stakeholders and third-party vendors to ensure projects are delivered on time and successfully. They are responsible for managing multiple projects according to the size of the organisation. The following figure explain the roles and responsibilities of Project Manager in electronic industry.

Fig. 1.2 Roles and Responsibilities of Project Manager

Since project managers have a wide range of responsibilities, a diverse set of skills is beneficial in propelling them through the process. Let's look at the required skills or key competencies of a Project Manager in the electronic industry.

Fig. 1.3 Key Competencies of Project Manager

1.1.3 Various Employment Opportunities for Project Manager

India has one of the world's fastest-growing GDPs, making it a haven for investors from all over the world. The scope of project management is massive. According to a Project Management Institute (PMI) report, India is the fastest-growing market for Project Management-related employment. As per estimates, India will require more than 70 lakh project managers over the next ten years to look after the growing industry needs in the nation. Every organization desires a skilled project manager to oversee and manage the project development process. Organizations typically run multiple programs at the same time and require a project manager who will be in charge of more than one project. As a result, companies in India are not shy about offering higher project manager salaries. A simple LinkedIn search will yield over 7000 job opportunities for Project Managers in India, many of which are from reputable companies such as Bajaj Electronics, Philips Electronics India, Kirloskar Electric Company Limited, etc. Salary packages for project managers can vary depending on the organization, candidate's skillset, and experience. The average annual salary for people with 1-4 years of experience ranges from 6 lakhs to 14 lakhs per year. A candidate with good years of experience and skills, on the other hand, can command three times the salary of a novice.

Summary

- The electronics industry is the economic sector that manufactures electronic devices. It is one of the world's largest and fastest-growing industries.
- In 2020, the global electronics industry is projected to be worth $2.9 trillion. In comparison, the global value of the electronics industry is nearly equal to India's current GDP of US$ 2.9 trillion.
- The industry is distinguished by rapid innovation and speed to market, a short product life cycle, highly automated manufacturing, and high volume production, all of which result in consistent quality at a low cost and profit accrual through volume.
- The Government of India's National Policy for Electronics, 2019 ('NPE') recognizes the electronics industry's growth potential and strategic importance.
- The Indian electronics industry is segmented into seven sub-sectors - communications and broadcasting electronics, consumer electronics, industrial electronics, electronic components, strategic electronics, computer hardware and LED.
- Consumer electronics is the most crucial segment of the Indian electronics hardware industry. The segment accounts for approximately 28 percent of the country's electronic industry production.
- A project manager is a professional who organizes, plans, and manages projects while adhering to constraints such as budgets and timelines.
- The project managers are responsible for managing multiple projects according to the size of the organisation.
- Project managers have a wide range of responsibilities, a diverse set of skills is beneficial in propelling them through the process such as strong technical skills in electronics, a keen eye for detail combined with the ability to see the big picture, capability to manage risks, good leadership and managing skills, excellent organizing and communication skills etc.
- According to a Project Management Institute (PMI) report, India is the fastest-growing market for Project Management-related employment. As per estimates, India will require more than 70 lakh project managers over the next ten years to look after the growing industry needs in the nation.
- The average annual salary of project manager with 1-4 years of experience ranges from 6 lakhs to 14 lakhs per year. A candidate with good years of experience and skills, on the other hand, can command three times the salary of a novice.

Notes

Notes

QR Code

Scan the QR Code to watch the related video

youtu.be/B7MZ5_kQ75w
1.1.1 Introduction to Electronic Industry

youtu.be/KG5cltHpbYs
1.1.2 Roles and Responsibilities of a Project Manager

youtu.be/CSoubY-WM5s
1.1.3 Various Employment Opportunities for Project Manager

Exercise

Answer the following questions:

1. Explain electronic industry and its sub-sectors.

_____
_____
_____

2. List the roles and responsibilities of Project Manager.

_____
_____
_____

3. Write a short note on employment opportunities for Project Manager.

_____
_____
_____

4. List any three key competencies of Project Manager.

_____
_____
_____

Choose the correct answers:

1. Asian countries such as _____, _____, and South Korea dominate the electronic market.
   a. Thailand, Japan b. China, Singapore

2. The average annual salary of project manager with 1-4 years of experience_____ per year.
   a. 6 Lacs – 14 Lacs b. 2 Lacs – 4 Lacs

3. Electronic Sectors consist of _____.
   a. Computers b. Radio

4. Project Managers are responsible for_____.
   a. Planning and Developing Ideas
   b. Dealing with customers

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2. Process of Carrying out Project Initiation and Planning

Unit 2.1 Carry out Project Initiation

Unit 2.2 Carry out Project Planning

Unit 2.3 Participate in Resource Planning and Procurement

Unit 2.4 Obtain the Necessary Approvals

ELE/N9801

Key Learning Outcomes

At the end of this module, the trainee will be able to:

1. Describe the process of carrying out project initiation and project planning
2. Explain the importance of participating in resource planning and procurement
3. Describe the process of obtaining the necessary approvals

Unit 2.1 Carry out Project Initiation

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Elaborate how to create a business case
2. Explain the importance of ensuring the business case is easy to understand, logical and relevant
3. Elaborate how to define the scope of the project and determine the deliverables
4. Explain the importance of creating the project scope statement detailing a comprehensive description of the project deliverables and limitations
5. Describe the process of conducting a feasibility study
6. Explain the importance of identifying the possible project risks and documenting the proposed solutions
7. Elaborate how to create the project charter and the appropriate details to include
8. Explain the importance of creating a project team defining the role and responsibilities of team members

2.1.1 Creating Business Case

A **business case** is a document that explains the value or benefits that the company will receive if an individual pursues a major business investment or initiative. This initiative could be anything from messaging for a new product or feature launch, a proposal to increase spending on a current initiative, or a significant investment with a new agency or contractor, to name a few examples. A compelling business case will outline the anticipated benefits of this large investment decision. The business case provides key stakeholders to decide whether or not to proceed with an initiative.

A **business plan**, on the other hand, is a blueprint for a completely new venture. Typically, a draft outlining the business strategy, mission and vision statements, and how you intend to get there. There may be a case when developing a business plan for an existing business, but only when trying to take the business in a significantly new direction.

Generally, the **project manager** develops the business case, which is then presented to key stakeholders for evaluation. As needed, the project is approved, rejected, deferred, or revised. A well-rounded business case clearly explains the project's value. It assesses both the projected benefits and the cost or risk, providing a clear justification for proceeding.

A business case is frequently used by decision-makers, stakeholders, and the general public as a management tool for making evidence-based and transparent decisions. It is a framework for the subsequent policy, strategy, or project delivery and performance monitoring.

The exact scope of a business case is determined by the nature of the project. A business case checklist is an important step in starting a business case. The following is a general framework for developing the business case.

Executive Summary

- The executive summary is a condensed version of each section of the business case. It provides stakeholders with a high-level overview of the project

Project Definition

- This section is intended to provide general information about the projects, such as the project's business objectives and project plan outline.

Vision, Goals and Objectives

- It defines the project vision, goals, and objectives, which assist the project manager in shaping the project scope and identifying project deliverables.

Project Scope

- The project scope defines all of the tasks and deliverables that will be completed in the project to meet the business objectives.

Background Information

- It provides context for the project by explaining the problem it is meant to solve and how it aligns with the organization's vision and strategic plan.

Success Criteria and Stakeholder Requirements

- Success criteria are the standards/levels used to determine whether an objective/goal/target/outcome has been achieved/successful. These are linked to desired outcomes and targets, such as those action plans and strategic plans. Stakeholder requirements define business decisions about needs, goals, and objectives from the standpoint of the stakeholders and their role in the business. The business requirements are expected to be decomposed by stakeholder requirements. The quality requirements vary by project type, but they are critical to the project's success. Once the data has been gathered, evaluate what determines whether or not it has met them and report on the findings.

Project Plan

- The project plan provides a breakdown structure of each task that must be accomplished in order to complete the project. When all of the tasks are collected, it estimates how long it will take to complete each one.

Project Budget

- A budget is an estimate of everything in the project plan and how much it will cost to complete the project within the time frame specified.

Project Schedule

- It creates a project timeline by estimating how long each task will take to complete. Gantt charts are very effective for creating a more impactful project schedule. This adds a flourish of data visualization and skill that Excel sheets lack.

Project's Roles and Responsibilities

- Project governance corresponds to all of the project management policies and procedures that apply to the project. It describes, for example, the roles and responsibilities of project team members as well as the decision-making framework.

Communication Plan

- A communication plan is a policy-driven approach to informing stakeholders. The plan specifies who should receive specific information, when that information should be delivered, and which communication channels will be used to deliver the information. It also establishes milestones for check-ins and status updates, as well as how stakeholders will be kept informed of project progress throughout the project life cycle.

Progress Reports

- A progress report is a report that updates information about a project. The project manager and clients use the progress reports to stay informed about a project and change or adjust assignments, schedules, and budgets. It monitors and tracks project progress to compare planned to actual progress. There are task tracking tools available to assist in tracking progress and performance.

Financial Appraisals

- A financial appraisal is a method for determining the viability of a proposed project by calculating the value of net cash flows generated by its implementation. The scope of the investigation, the range of impacts examined, and the methodology used distinguish financial appraisals from economic appraisals. This is a critical section of the business case because it describes how the financial benefits outweigh the costs. Examine the project's financial costs and benefits. It can accomplish this by conducting sensitivity and cost-benefit analyses.

Market Assessment

- A market assessment is an in-depth examination of the company's competitors, customers, and other industry stakeholders. A market assessment, which is an important part of the company documentation, allows the company to understand the market's need and demand for its business offerings. Investigate the market, competitors, and industry to identify opportunities and threats.

Competitor Analysis

- A competitive analysis is a strategy that entails researching major competitors to gain knowledge of their products, sales, and marketing strategies. A competitive market analysis can help the project manager implement stronger business strategies, defend against competitors, and gain market share.

SWOT Analysis

- A SWOT analysis can assist to identify the company's strengths, weaknesses, opportunities, and threats. Internal strengths and weaknesses, while external opportunities and threats.

Marketing Strategy

- A marketing strategy is a company's overall game plan for reaching out to prospective customers and converting them into customers of their products or services. It includes the value proposition of the company, key brand messaging, data on target customer demographics, and other high-level elements.

Risk Assessment

- A risk assessment is a procedure for identifying potential hazards and analyzing what might happen if one occurs.
- A business impact analysis (BIA) is the process of determining the potential consequences of interrupting time-sensitive or critical business operations. Numerous risk categories can have an impact on a project. The first step toward mitigation is identifying and assessing the risks associated with the project activities.

Fig 2.1 Key Elements of Business Case

Notes

Please Note: - A **Gantt chart** is a bar chart that shows how project tasks are scheduled overtime. A Gantt chart is used in project planning to show what work is scheduled to be done on specific days. It also allows project managers and team members to see the start, end, and milestone dates of a project schedule in a single stacked bar chart.

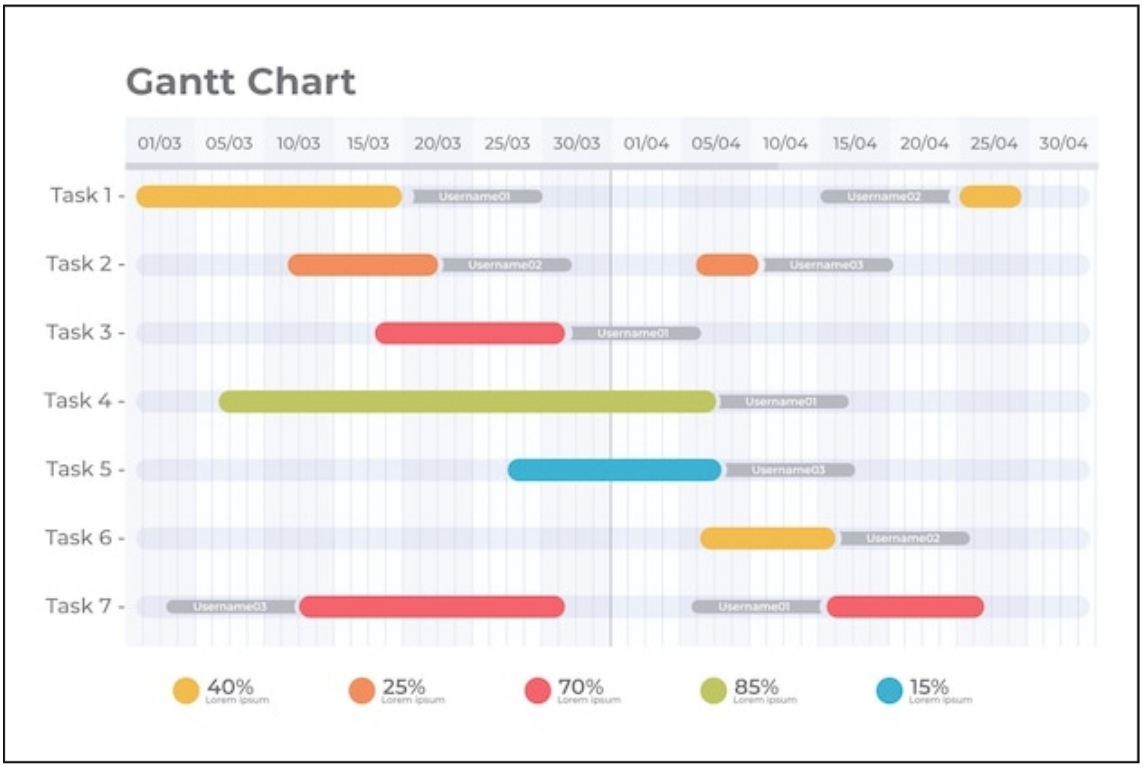


Fig 2.2 Sample of Gantt Chart

The following figure explains the process of creating a business case:

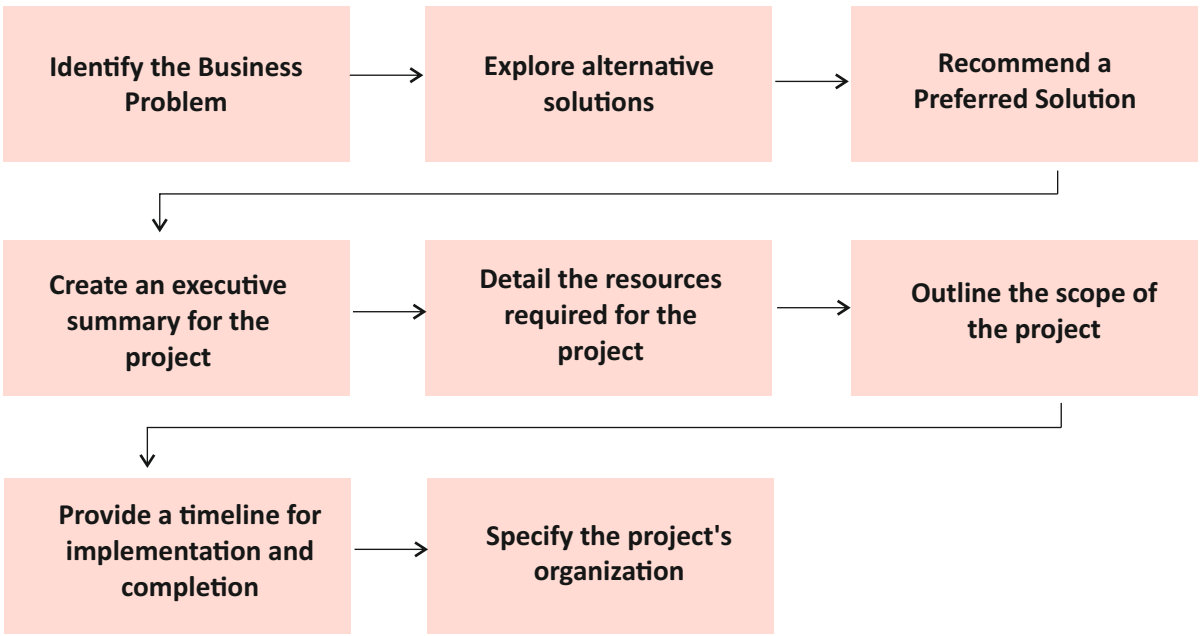


Fig 2.3 Process of Creating Business Case

A business case must guide the reader through the problem, consider various solutions, and ultimately decide on the best option. As a result, it requires a clear structure with plenty of headings and subheadings to guide the reader. A good business case will explain the problem, identify all possible solutions, and allow decision-makers to choose the best course of action for the organization. It will also allow any changes to the project's scope or timetable to be evaluated against the original purpose.

A business case is frequently written for people who do not have in-depth knowledge of the subject. The following are key points to consider when writing the business case and ensuring that it is understandable, logical, and relevant.

1. Keep the language as simple as possible and free of jargon.
2. Use short sentences and plenty of subheadings to break up the text.
3. Paragraphs should be no more than four to five lines long, with a line between paragraphs. Shorter is preferable instead of lengthy.
4. The project manager should also try to instill a sense of urgency.
5. Make it clear when a decision is required and why that date is critical.

Notes

2.1.2 Project Scope Statement and Determining the Deliverables

When working with new clients, project managers frequently face the challenge of defining the project's scope at a fairly granular level. Organizations frequently know what they want in terms of high-level project deliverables but have not gotten down to the essential details.

Project scope is the part of project planning that involves determining and documenting several specific set objectives, deliverables, attributes, functions, activities, timelines, and, eventually, costs. In other words, it is what must be accomplished and the work that must be done to complete a project. It is essential to determine the scope of a project early in its life cycle because it can have a significant impact on the project's schedule or cost (or both) later on. The following is an overview of some of the key processes to follow to correctly define the scope.

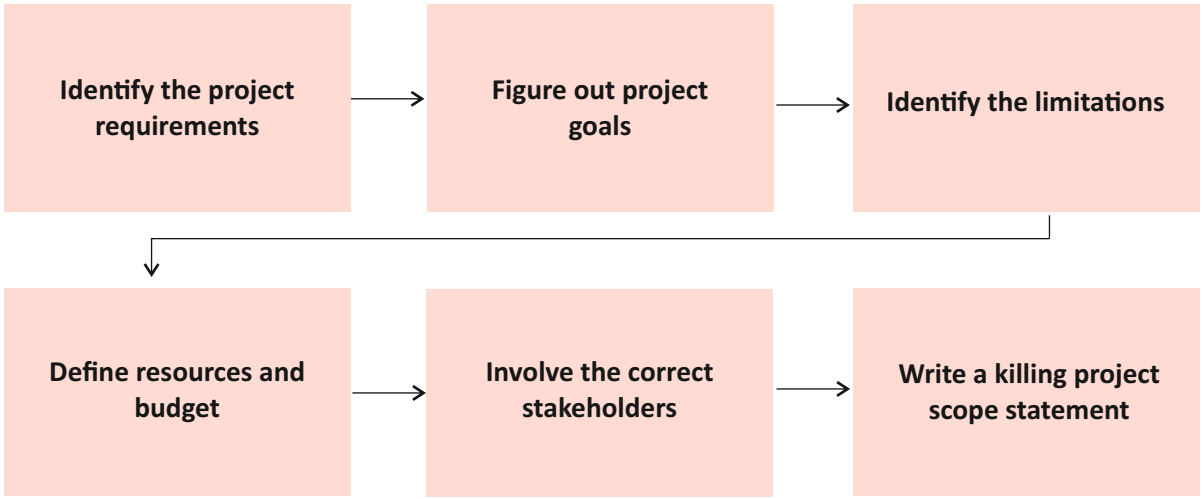


Fig 2.4 Process of Defining Project Scope

A **project scope statement** is a document that defines all of the project's scope elements, as well as assumptions, project requirements, and acceptance criteria. It serves as the primary tool that stakeholders and teammates can refer to and use as a guideline to accurately measure project success.

Project scope is a moving target that project managers want to nail down before mapping out the project management plan. It acts as a boundary within which an entire project exists. However, the scope of a project is more than just work management. To define it, one must first comprehend the **project's objectives, work breakdown structure, and requirements, among other things.**

The project manager can create the scope statement once the project scope has been defined. It is done after reviewing the project start-up document (or project charter) prepared by the project sponsor. In this document, the project manager is responsible for defining the scope of the project and providing measurable goals.

The scope statement ensures that all parties involved have a common and clear understanding of the project and helps to manage scope creep. In other words, it describes what is included in the project and what is not, and thus serves as the foundation for the project plan. The following figure explains each of the components of a project scope statement.

Project Goals & Objectives
- Define the purpose of a project

Project Requirements
- Include expected quality, risk, benefits and cost etc.

Project Scope Description
- Includes work breakdown structure
- List out what is within the scope of your project, and what is out of scope

Project Exclusions
- Define the boundaries around what the project includes from the outset

Project constraints
- Manage time, money and scope,risk, resources, processes, customers and more

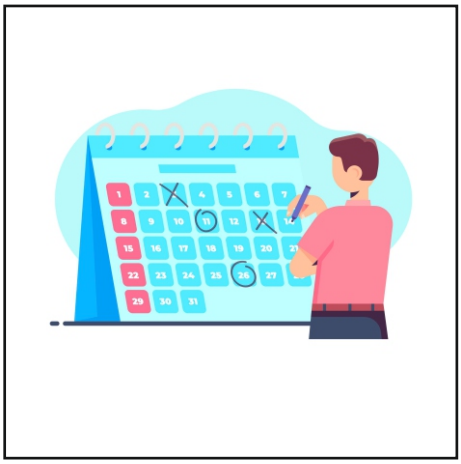
Project Assumptions
- Revolve around the very things that end up being constraints, including time, money and scope
- Quick insight as to where the biggest risk factors lie

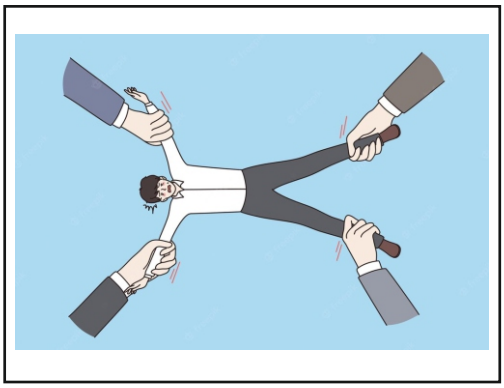
Project Deliverables
- List of the deliverables that team members must create in order to satisfy business goals
- Include the product itself, instruction and installation manuals, marketing materials, press releases, advertising campaigns and more

Fig 2.5 Components of Project Scope Statement

2.1.3 Significance of Identifying Project Risks and its Solutions

A project risk is an unforeseeable event that may or may not occur during the course of a project. Contrary to popular belief, a project risk can have either a negative or positive impact on progress toward project objectives. Project risk is the possibility that a project will fail.
Project risks are classified into following categories:

	**Cost:** The cost can be either financial or time-based. A risk could be that the budget is too limited or that the project takes too long to complete. **Solution:** To reduce cost risk, accurately estimate each component of your project and stick to your budget. The best way to stay within your budget is to create a project plan template that includes deliverables, scope, and a timeline. Consider scheduling regular check-ins to review your budget and how to pace the project when it is in development.
	**Schedule:** The schedule is an important factor that influences the success of the project. A risk could be caused by a lack of resources, a lack of quality work, or even miscommunication between project participants. **Solution:** A good rule of thumb for combating schedule risk is to overestimate the time required to complete tasks during the planning phase and build in time contingency. This gives the project manager wiggle room for scheduling later on. A project manager can also use a Timeline or Gantt chart to create a project schedule. Clarity about work, dependencies between tasks, and any delays can assist project managers in dynamically adapting to time risk as it arises. Understanding the lifecycle of the project can also help us determine how long each task will take.
	**Performance:** Performance issues are what prevent projects from being successful. It includes everything from how fast and accurate it is to how well it is received by its target audience. **Solution:** Anticipating potential performance risks early in the planning process can assist the project manager in better preparing. Using project management software allows us to track the processes in real-time, thoroughly plan the project, and encourage open communication among team members.

	**Scope creep:** When the initial project objectives are not well-defined, scope risk, also known as scope creep, occurs. It is critical to communicate the project roadmap with stakeholders from the start and to stick to those parameters. If the project manager fails to effectively communicate the project scope, stakeholders may attempt to change requirements mid-project. **Solution:** Defining clear project parameters from the start will help to strengthen the scope of the project. Agreeing on the project scope and communicating that vision with stakeholders from the start will reduce scope creep. Regular progress check-ins can also help to ensure that the project stays within its original scope.
	**Stretched resources:** When an organization does not have enough resources to complete a project, it faces resource risk. Time, skills, money, and tools are all examples of resources. As project managers, they are in charge of acquiring resources for their team and communicating the status of those resources to the team. Depending on the size of the project, resource allocation should occur early in the project planning process, typically 1-2 months before the project execution. **Solution:** Creating a resource allocation plan is the best way to mitigate resource risk. A resource allocation plan maximizes resource impact while supporting team goals by making the best use of team resources. When project managers know what resources are required from the start, they reduce the likelihood of running out of resources later.
	**Performance:** Performance issues are what prevent projects from being successful. It includes everything from how fast and accurate it is to how well it is received by its target audience. **Solution:** Anticipating potential performance risks early in the planning process can assist the project manager in better preparing. Using project management software allows us to track the processes in real-time, thoroughly plan the project, and encourage open communication among team members.

	**Lack of clarity:** Lack of clarity can manifest as miscommunication from stakeholders, ambiguous project scopes, or missed deadlines. As a result of siloed work, there may be a lack of visibility, budget overruns, missed project deadlines, changing project requirements, having to pivot project direction, or disappointing project outcomes. **Solution:** Check and recheck the requirements when planning the project to ensure that everything is in place. Is everyone in the process on the same page? Are developers ready for the next step? Is the scope defined clearly? It is also critical to ensure that project information is accessible to all. By centralizing information, project managers can ensure that everyone is kept up to date as the project progresses.

Table 2.1 Project Risks and their Solutions

Every project involves risks. If a potential project risk is not identified early on, the project will be at a high risk of failing to complete on time, within budget, and with the expected quality. One of the current challenges for a new project manager is the lack of a sample or general risk list to refer to when identifying project risks.

Risk management entails determining which risk categories are most likely to impact the project and devising a strategy to mitigate those risks. The observations below provide a sample and general project list that a new project manager can refer to at the start of their project to identify potential risks.

1. **Risk Identification -** The first step in the risk analysis process is to identify potential risks to the project. Other project risks could include contractor failure, unexpected life events, data transfer issues, shifting priorities, legal risk, market risk, and project deferral, in addition to the seven most common risk events mentioned above. To begin the risk identification process, ask the following questions:

   a. What is the probability of this risk event occurring?

   b. What are the consequences and severity of the risk?

   c. What is our risk management strategy?

   d. What is the priority level given the likelihood and impact?

   e. Who is responsible for this risk?

   Once you've answered these questions, move on to the risk management process, which will include risk prioritization, actionable solutions, and regular monitoring.

2. **Determine the likelihood and impact -** The project manager can sort through the risks and determine which ones are most likely to occur. Placing the risks in order of likelihood will help them to prioritize which risks to address as you develop a plan of action.

   When prioritizing risks, it is important to consider not only the likelihood of occurrence but also the business impact of each risk. The project manager should plan more carefully for risks that have the potential to have a significant impact on a business.

3. **Find solutions for each risk -** When conducting risk assessments, the goal is to develop a game plan for how the team will deal with each risk. Sorting risks by likelihood and business impact will provide a starting point for problem-solving. Conducting a risk assessment will help the projects succeed by preventing risk along the way. The Project Manager can meet with project stakeholders to proactively identify reasonable solutions to project risks that are on their minds. Examine lessons learned from previous projects to see how risks were handled.
4. **Monitor risk assessment regularly -** Once the risk assessment has been developed by the project manager, it is critical to monitor it on a regular basis because circumstances can change. The likelihood of risk changes, as does the business impact. It is also possible that new risks will emerge, or that previously possible risks will become less likely. Regularly monitoring your risk assessment can help you feel the most prepared for uncertain events.

2.1.4 Process for Conducting Feasibility Study

A feasibility study is an analysis that considers all relevant factors for a project, including economic, technical, legal, and scheduling considerations, to determine the likelihood of the project is completed successfully. It is an evaluation of the feasibility of a proposed project or plan. A feasibility study is a component of any project's or plan's initial design stage. It is carried out in order to objectively identify the strengths and weaknesses. Furthermore, a description of a proposed project or an existing business. The significance of a feasibility study stems from the organization's desire to "get it right" before committing to business resources, time, and money. A feasibility study may uncover new ideas that completely alter the scope of a project. A feasibility study is not something that should be undertaken lightly. The following figure explains the process of conducting a feasibility study for a project.

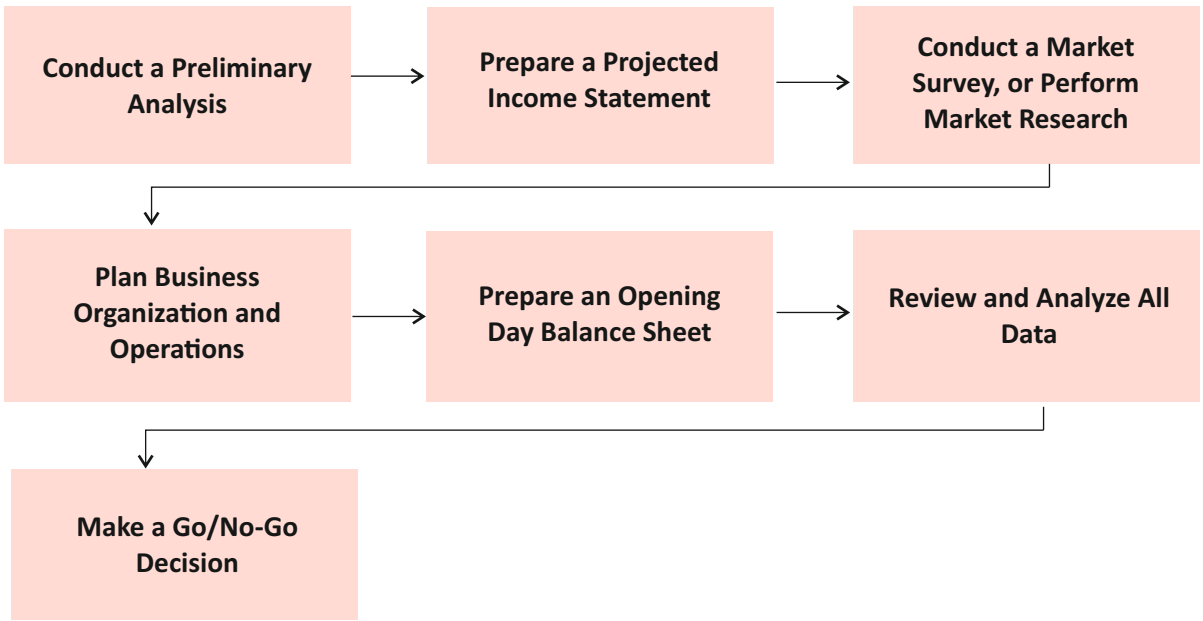


Fig 2.6 Process for Conducting Feasibility Study

2.1.5 Creating Project Charter

In order to gain approval from key project stakeholders, a **project charter** is an elevator pitch of your project objectives, scope, and responsibilities. Before getting started, the project manager should provide a short, succinct explanation of the main elements of the project in the charter. All of that information is used in this formal document to authorize the project. As a result, the charter authorizes the project manager to use both internal and external resources to complete the project.

The following are the project charter components:

1. Problem statement
2. Business case
3. Goal statement
4. Timeline
5. Scope
6. Team members

The following figure explains the steps for creating project charter.

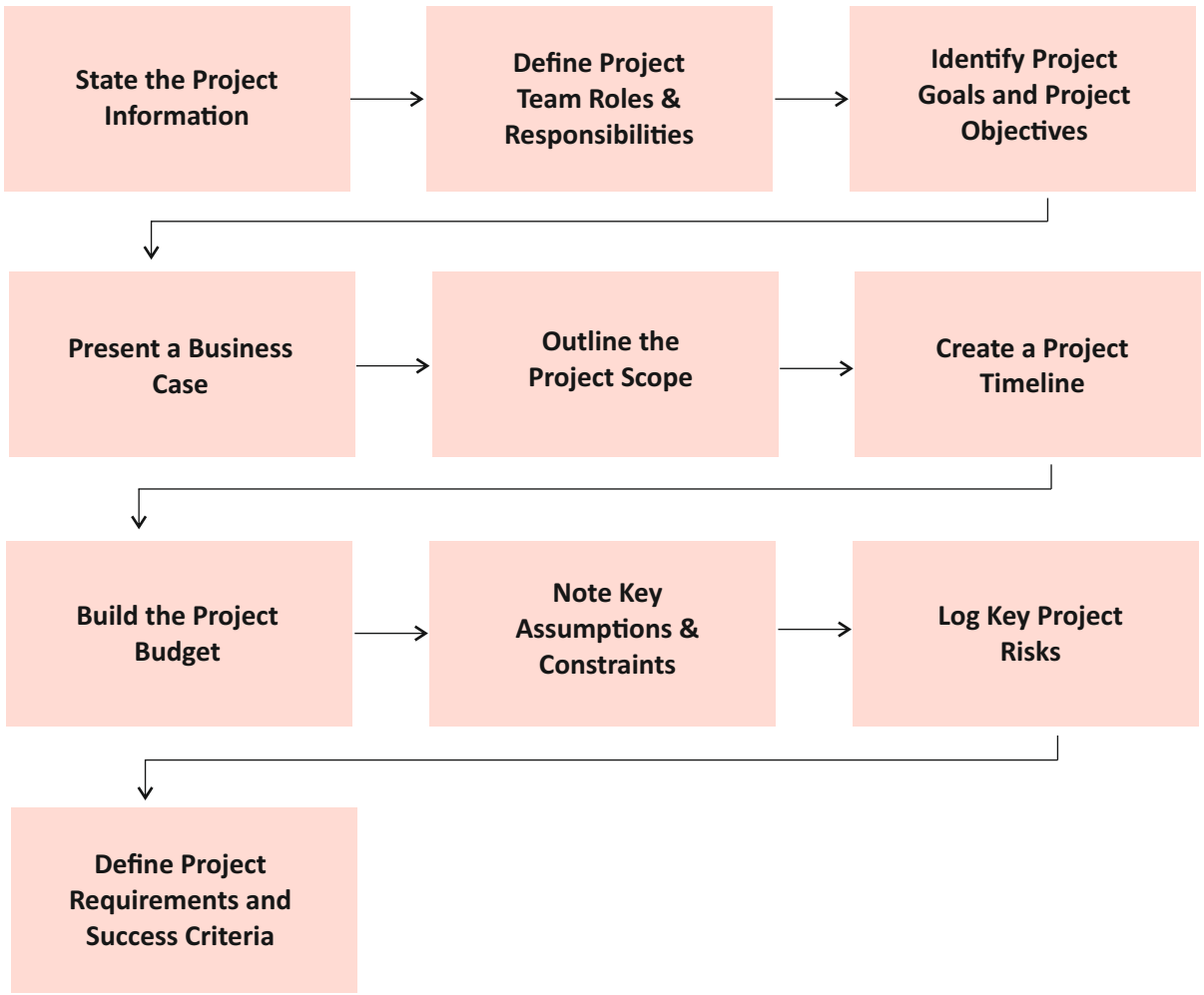


Fig 2.7 Steps for Creating Project Charter

2.1.6 Importance of Project Team

The project team is the group of people who are in charge of carrying out the tasks and producing the deliverables specified in the project plan and schedule, as directed by the project manager, at whatever level of effort or participation is stipulated.

Projects that are successful are usually the result of careful planning as well as the talent and collaboration of a project team. Projects cannot proceed without the participation of all key team members, but it is not always clear who those members are or what roles they play. Let us examine five key project team roles and their respective responsibilities: **project manager, project team member, project sponsor, executive sponsor, and business analyst.**

1. **Project Manager -** The project manager is primarily responsible for the project's successful completion. The project manager's role is to ensure that the project is completed within the specified time frame and budget while meeting its objectives. While managing relationships with contributors and stakeholders, project managers ensure that projects are given adequate resources.

Fig 2.8 Key Responsibilities of Project Manager

2. **Project Team Member -** Project team members are people who actively work on one or more phases of the project. They could be in-house employees or outside consultants who work on the project full-time or part-time. The roles of project team members can differ depending on the project. Responsibilities of project team members often include:
    a. Contributing to the overall set objectives
    b. Completing individual deliverables
    c. Providing knowledge
    d. Working with users to identify and meet business requirements
    e. Documenting the procedure

3. **Project Sponsor -** The project sponsor is the project's driver and internal champion. They are usually members of senior management who have a vested interest in the project's success. The project sponsor collaborates closely with the project manager. They validate the project's goals and take part in high-level project planning. They also frequently assist in resolving conflicts and removing obstacles that arise throughout the project life cycle, as well as signing off on approvals required to advance each project phase.

Fig 2.9 Key Responsibilities of Project Sponsor

4. **Executive Sponsor -** The executive sponsor should ideally be a senior member of management. He or she is the project's visible champion among the management team and the final decision-maker, with final approval on all phases, deliverables, and project scope changes. The executive sponsor is typically responsible for:
    a. Approving all changes to the project scope
    b. Providing additional funds for scope changes
    c. Approving project deliverables
    d. Carrying ultimate responsibility for the project
5. **Business Analyst -** The business analyst defines a company's needs and makes recommendations to improve the organization. They ensure that the project's objectives solve existing business problems or improve performance and add value to the organization when they work on a project team. They can also assist in increasing the value of project deliverables. The business analyst's responsibilities on a project team include the following:
    a. Assisting in the project's definition
    b. Obtaining requirements from various business units or users
    c. Technical and business requirements documentation
    d. Ensuring that project deliverables meet the specifications
    e. Validation of objectives through testing solutions

Notes

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youtu.be/UQP5MmCAQ3Y
2.1.1 Creating Business Case

youtu.be/QDLk2QIuJkg
2.1.2 Project Scope Statement and Determining the Deliverables

youtu.be/Crzo6HnGPO4
2.1.3 Significance of Identifying Project Risks and its Solutions

youtu.be/I4JsU42IO6g
2.1.5 Creating Project Charter

Exercise

Answer the following questions:

1. What is project charter?

_____
_____
_____

2. How business case is different from business plan?

_____
_____
_____

3. Explain the process of defining project scope.

_____
_____
_____

4. What is Gantt chart?

_____
_____
_____

5. Write a short note on Project team.

_____
_____
_____

6. Discuss the significance of identifying project risks along with solutions.

_____
_____
_____

Unit 2.2 Carry out Project Planning

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Explain the advantage of creating a work breakdown structure and sequencing the project activities
2. Elaborate how to estimate the activity duration, costs, and resource requirement for the project
3. Explain the importance of documenting the project plan detailing as the scope, schedule and cost of the project
4. Explain the importance of developing user manuals, training materials, and other documents for the successful implementation of the project
5. Explain the importance and process of creating a contingency plan to deal with internal and external risks to the project
6. Elaborate how to create a performance measurement baseline to measure and manage performance
7. Explain the use of the relevant planning software tools for time-bound scheduling and impl ementation of all critical tasks

2.2.1 Work Breakdown Structure

A work breakdown structure, or WBS, is a project management tool that uses a step-by-step approach to finish large projects with many moving parts. A work breakdown structure (WBS) can integrate scope, cost, and deliverables into a single tool by breaking down the project into smaller components. WBS project management terminology includes the following terms:

Acceptance Criteria: Standards to be met to meet the needs of customers or other stakeholders.

1. **Acceptance Criteria:** Standards to be met to meet the needs of customers or other stakeholders.
2. **Budget:** Project expenses, which can be broken down by deliverables or phases.
3. **Deliverables:** The products, services, or outcomes produced at various stages of the project. A deliverable-based WBS, for example, would be structured around deliverables such as URL, layout, and written content in a website design project.
4. **Milestones:** Critical stages of the project are identified in the work breakdown structure.
5. **Phases:** The various stages of a project are referred to as phases. A phase-based WBS, for example, would be structured around things like discovery, design, and launch in a website design project, rather than specific deliverables.

Although it is frequently overlooked during the planning process, a work breakdown structure or dictionary is a valuable tool for completing projects efficiently and on time. Here are some of the advantages and disadvantages of creating a work breakdown structure:

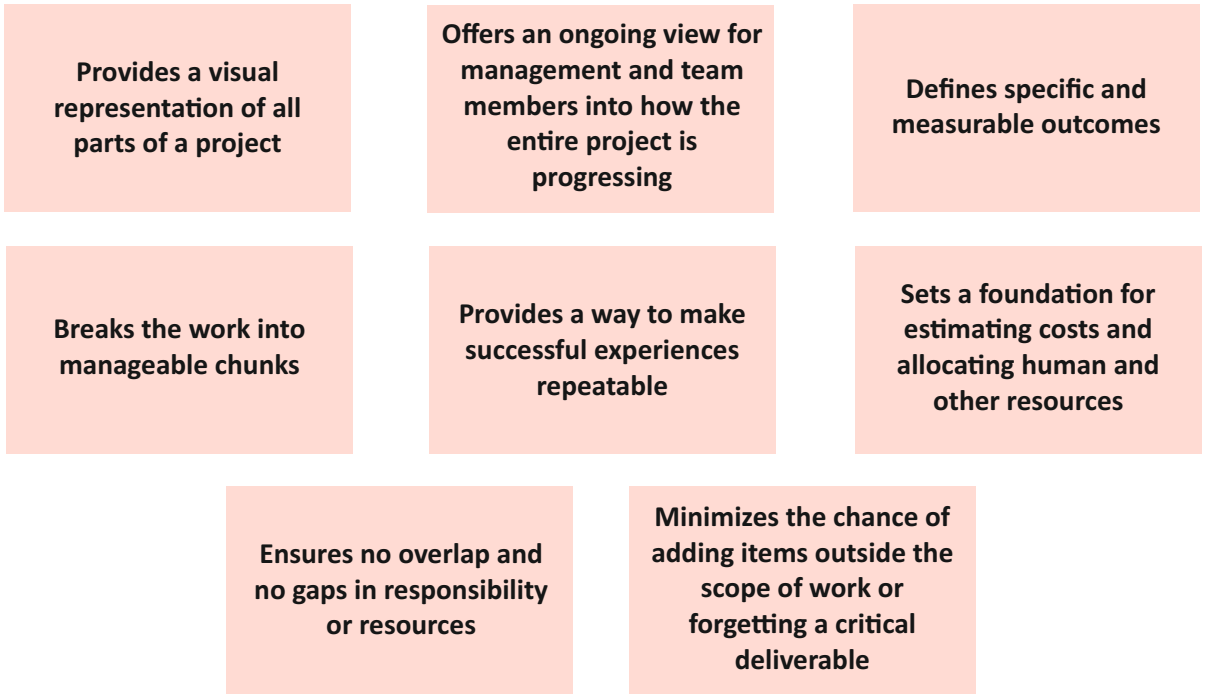

Fig 2.10 Advantages of Work Breakdown Structure

As project manager, it is crucial to make certain that all critical input and deliverables are collected and transparently prioritized. To demonstrate the hierarchical outline of importance and connectivity between the tasks required to complete the project, below are some examples of work breakdown structures that project manager can use any of these to create an outline for their project.

1. **WBS spreadsheet:** It can efficiently structure the WBS in a spreadsheet, noting the various phases, tasks, or deliverables in the columns and rows.
2. **WBS flowchart:** it can structure the work breakdown structure in a diagrammatic workflow. The majority of WBS examples and templates available are flowcharts.
3. **WBS list:** The WBS can be structured as a simple list of tasks, deliverables, and subtasks. This is the simplest way to create a work breakdown structure.
4. **Work breakdown structure Gantt chart:** It can format the WBS as a Gantt chart, which is a combination of a spreadsheet and a timeline. A Gantt chart-structured WBS allows you to link task dependencies and display project milestones.

2.2.2 Estimating Duration, Cost & Resources for Project

Estimating activity resource is a process that assists the project team in determining the type and quantity of material, human resources, tools, or supplies needed for the project. One advantage of this process is that it identifies the type, quality, and attributes of the resources required to complete a specific activity. This will also allow for more accurate cost and duration estimation. This process is carried out on an as-needed basis throughout the project lifecycle. Resources are one of the project's most important tools, and selecting the resource prerequisites leads to successful project management. The process of estimating activity resources is a critical component of project development. The below illustration shows the flow diagram of Estimating the Activity Resources:

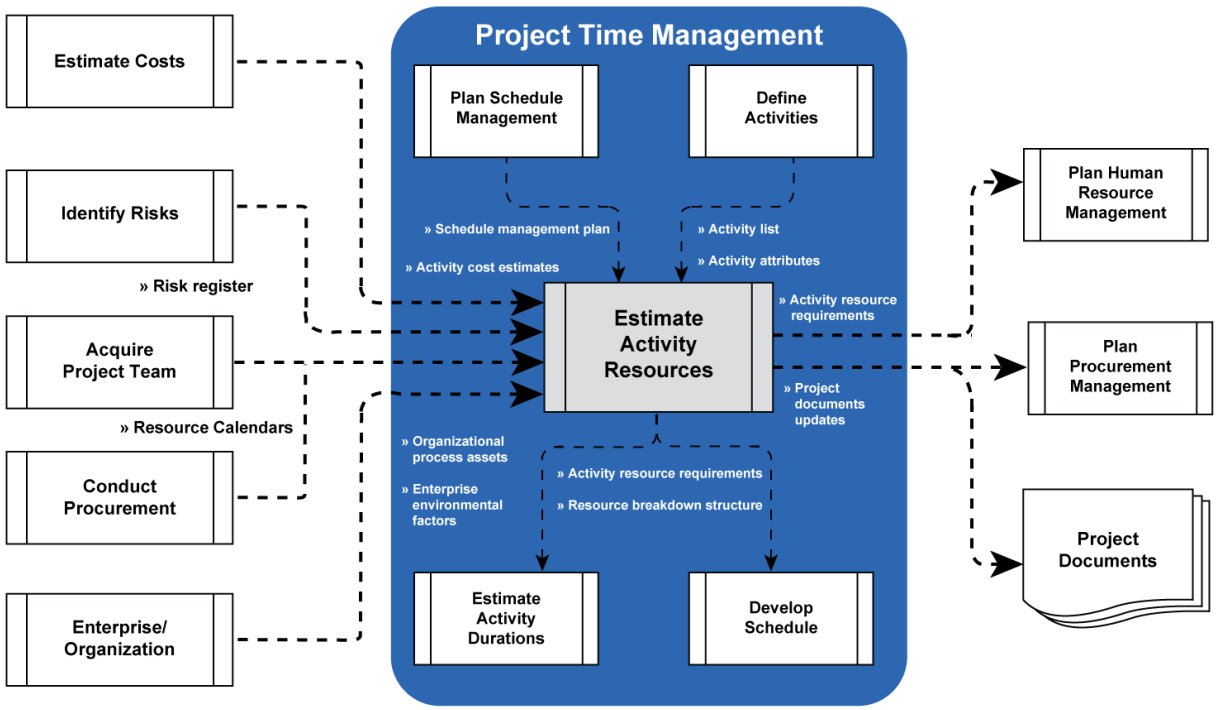

Fig 2.11 Flow-diagram of Estimating Activity Resources

(Source: https://www.invensislearning.com/blog/estimate-activity-resources/)

Notes

The following are the steps involved in the Estimate Activity Resources process:

Fig 2.12 Steps for Estimating Activity Resources

Notes

It is a difficult task for many Project Management teams to analyze or predict how long it will take to complete a project. Missing deadlines and exceeding budgets result in inaccurate estimates in large and complex projects. Project teams use a refined estimation to predict the future at the point of delivery. Estimating the project duration is not an easy task. As a result, Project Managers should consider learning some theories as well as applying some approved procedures and strategies.

Estimating activity duration is a technique for determining the number of work periods needed to complete individual tasks with estimated resources. The main advantage of this procedure is that it estimates how long each task will take to complete, which is an important input into the development schedule process.

Fortunately, including a skilled estimator on a Project Management team is vital, as it aids in the creation of schedules, budgets, resource management, and the overall success of the team and business. Using the right software for the project would be beneficial, but knowing the methods and learning how to apply them is how one becomes a great estimator.

The tools and techniques for estimating activities that work for all types of projects are listed below.

1. **Expert Judgment -** It is the most common technique for extracting an estimate. The Project Management team must include experts with the most hands-on experience in recognizing how to use the project requirements. It is also critical to ensure that everyone is aware of what needs to be delivered. Look for experts who will be working on the project as well.

2. **Analogous Estimation -** It is a method that allows a Project Management team to refer to similar and existing projects that can be used to evaluate the current project's activity durations. A similar estimation method can assist a project manager in estimating the time required to complete the project. Ensure the success of previous projects that are similar to the current task. When there is limited information about the project, an analogous method of estimating can be used to calculate the estimate the fastest.

3. **The PERT Method -** It is an example that could be statistically analyzed to evaluate the ERP project implementation and determine the project duration. This method, however, may not provide a precise prediction. When a couple of data points prevent carrying out a specific analysis, this technique employs an expert's knowledge and experience to present an important date. The ability to validate the estimated project duration period in terms of its likelihood of meeting planned value justifies project managers' use of the PERT technique. The strategy is extremely simple and can be useful for complex projects. Its flaw, regrettably, is that any precision of the strategy's parameters expectation will be dependent on the accuracy of thoughts taken regarding single individual tasks run-time.

4. **Three-Point Estimates -** The PERT (Program Evaluation and Review Technique) is the most widely used statistical tool to determine the time duration of a project under the three-point estimates procedures. In project management, the PERT technique is the best way to estimate project activity durations. It makes use of three-time estimates to calculate a rough period for the estimated activity durations.

5. **Parametric Estimating -** Parametric estimation, like the analogous estimation method, analyses the estimated duration of a project using historical data and various parameters. Actual connections between recorded data and variables are also used in metric estimation. It is more precise than the comparable technique.

6. **Alternative Analysis -** It allows you to experiment with different approaches to resource allocation by changing the number of resources and deciding on the best one.

7. **Published Estimating Data -** A technique for estimating activity resources. Articles, books, journals, and periodicals from various businesses that have demonstrated information on similar projects are included in this technique. The Project Managers can make a rough estimate of the number of assets needed for the project using the published estimating data.
8. **Vendor Bid Analysis -** This strategy is used by the project team when they are assigned to work on a project with external vendors or contractors to complete the project activities. This strategy assists project managers in determining the project cost based on vendor bids and estimating the value of deliverables.

The process for estimating the total duration required for your project is as follows:

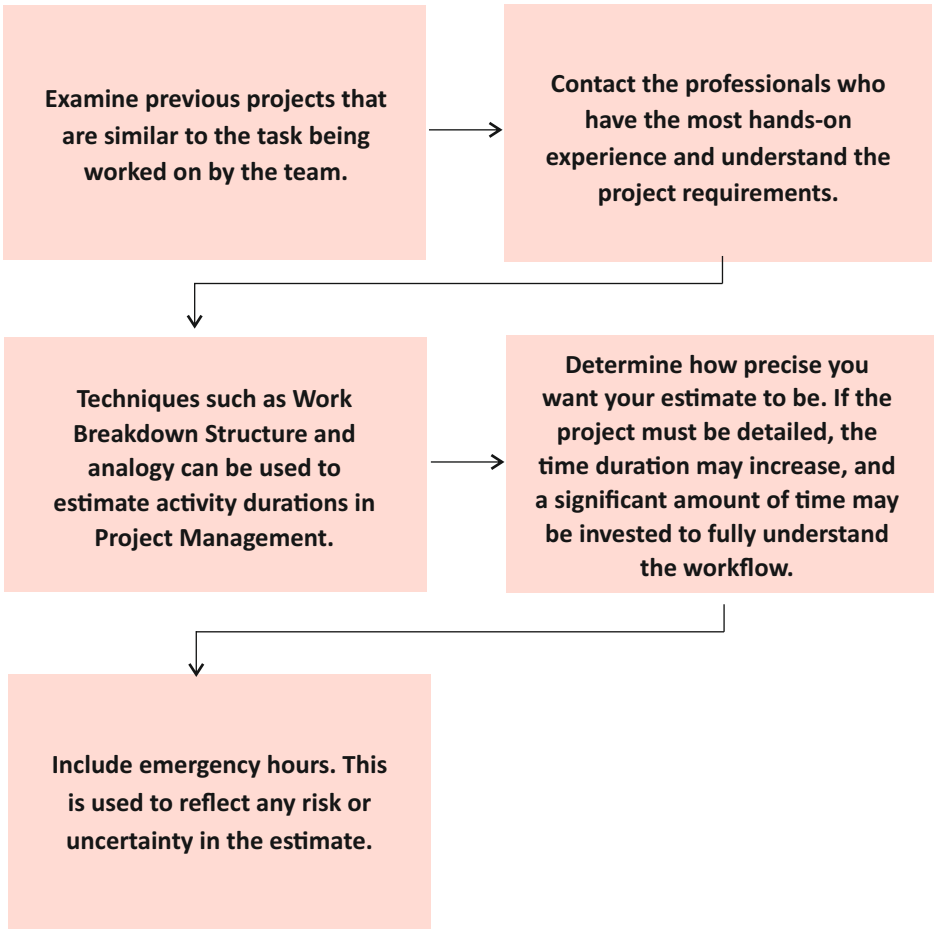

Fig 2.13 Steps for Estimating Activity Duration

An activity list is used for estimating activity costs. This means that all relevant activities associated with a specific task or project are listed so that the cost of each activity can be calculated. In project management, activity cost estimation employs a variety of techniques, but what is important throughout the process is that documents about the required activities are gathered to generate estimates and arrive at a basic value.

Changes to the activities may occur during the activity cost estimation process, affecting the overall cost estimate. To address this issue, a cost management plan is required to generate estimates for changing tasks as well as manage the changes. It is difficult for projects to even begin without it.

2.2.3 Project Documentation

In every field, it is critical to reducing risk as much as possible. Documentation is an excellent tool for avoiding lawsuits and complaints. Documentation helps to ensure that consent and expectations are met. It is beneficial to tell the story of decisions made and how you or the client responded to various situations.

Without a doubt, **project documentation** is an essential component of project management training. It is substantiated by the essential two functions of documentation: ensuring that project requirements are met and establishing traceability regarding what has been done, who has done it, and when it has been done.

Experienced project managers excel at developing and adhering to standard templates for project documents. They repurpose successful project plans, business cases, requirement sheets, and project status reports to allow them to focus on their core competency of project management rather than juggling unmanageable paperwork.

Project management is typically divided into five stages: **Initiation, Planning, Execution, Control, and Closure**. The following table exhibits the list of documents in each phase.

Stage	Initiation	Planning	Execution	Control	Closure
List of Document	Feasibility Report	Requirement Specification	Traceability Matrix	Change Management Document	Technical Document
	Project Charter	Design Document	Issue Tracker		Functional Document
		Work Plan/Estimate			User Manual
					Transition/Rollout Plan
					Handover Document
					Contract Closure
					Lesson Learned

Table 2.2 List of Documents in Project Management

2.2.4 Importance and Process of Creating a Contingency Plan

A contingency plan is a plan of action designed to assist an organization in effectively responding to a significant future event or situation that may or may not occur. A contingency plan is also known as "Plan B" because it can be used as an alternative course of action if expected results do not materialize.

The goal of any contingency plan is to allow an organization to resume normal operations as soon as possible after an unexpected event. The contingency plan safeguards resources reduce customer inconvenience, and identifies key personnel, assigning specific responsibilities in the context of recovery.

Check out the following four guidelines when creating a contingency plan:

1. Determine what specific event or events must occur in order for the plan to be implemented.
2. In each step of your plan, cover the five bases: who will be involved, what they need to do, when it needs to happen, where the plan will take place, and how it will be executed.
3. Have clear reporting and communication guidelines in place during the plan's implementation.
   a. What methods will be used to notify internal and external stakeholders?
   b. Who will write and send the notice, and how soon will it be made public after the incident?
   c. How frequently will updates be made available?
4. Check the plan on a regular basis to ensure it is up to date.

The four most common challenges that project managers face with contingency planning are as follows:

- Contingency planning is viewed as a low priority: Because the plan may never be needed, there is a tendency to put it off. However, failing to plan for a contingency can lead to project failure.
- Team members may be overconfident or overly invested in Plan A: Making it difficult for them to create a detailed, actionable Plan B.
- Lack of enterprise-wide plan awareness and buy-in can hinder implementation: Projects do not happen in a vacuum. If all stakeholders in the organization are not aware of and invested in the plan, it may take longer to implement.
- Inadequate time spent identifying all risks: It is impossible to prepare a viable contingency plan if a risk has not been properly identified.

Fig 2.14 Common Challenges in Contingency Planning

The steps in a contingency planning process are as follows.

Step 1: Brainstorm and list the major risks

Step 2: Prioritize your risks

Step 3: Identify and collect resources

Step 4: Begin developing contingency plans for each event

Step 5: Present the plan to your team

Step 6: Revisit the Plan again

2.2.5 Creating Performance Measurement Baseline

The Performance Measurement Baseline (PMB) is an important tool in earned value management that is used in the Technical Assessment Process to evaluate the technical progress of a programme. The main reason for creating a performance baseline is to allow project managers to quantify the relationship between changes in performance and changes in the load or application. The most difficult aspect of creating a baseline is determining which operations are critical to the system's effectiveness.

A performance measurement baseline is a tool used by project managers to define project parameters – the cost, scope, and timeline of the project. When the estimates are approved and fixed, the PMB becomes a reference point for measuring project success, earned value, and deviations from the original plan. A PMB is primarily required to compare the project plan and actuals to an initial approved budget. It's a yardstick you'll use whenever stakeholders approach you for updates.

Fig 2.15 Benefits of Performance Measurement Baseline

The steps for developing a Performance Measurement Baseline are as follows.

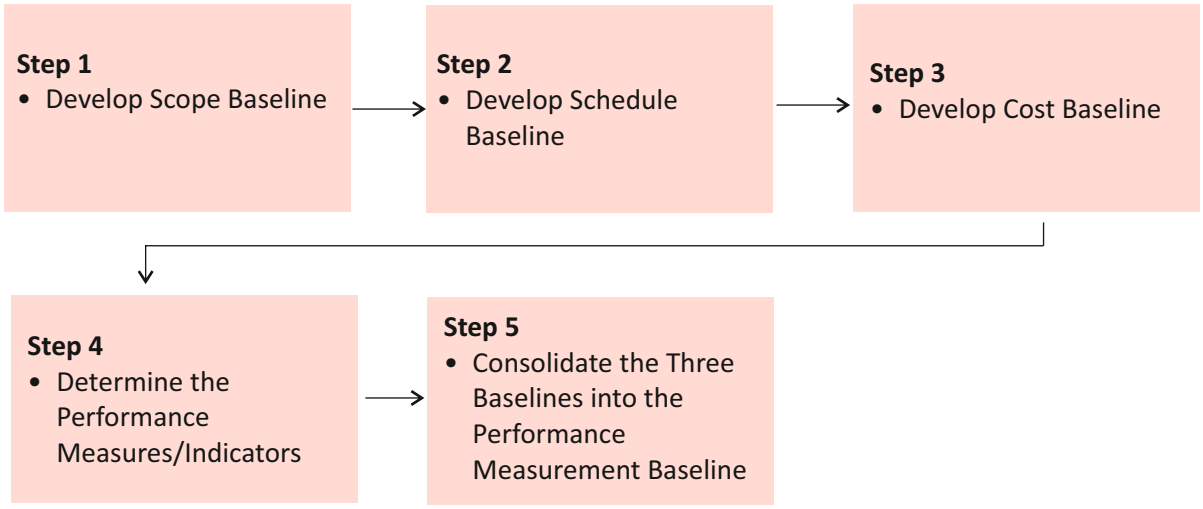

Fig 2.16 Process for Creating Performance Measurement Baseline

2.2.6 Planning software Tools for Time-Bound Scheduling and Critical Tasks

A scheduling tool aids in prioritization by allowing project managers to see the big picture and track progress on all projects at the same time. This enables them to prioritize projects based on their business requirements. Following are the list of software tools used for time-bound scheduling and critical tasks

1. **Forecast App —** end-to-end project scheduling software
2. **Runn —** advanced solution with reporting and financial forecasting
3. **Mavenlink —** a great tool for automated workflows
4. **Adobe Workfront —** all-in-one project management tool
5. **Paymo —** free Gantt chart scheduling

Notes

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youtu.be/WjUZik9CGDY

2.2.1 Work Breakdown Structure

youtu.be/rN0FrDpQNUk

2.2.2 Estimating Duration, Cost & Resources for Project

youtu.be/w2kOqmaSJj8

2.2.4 Importance and Process of Creating a Contingency Plan

youtu.be/WNWSQOynrl0

2.2.6 Planning software Tools for Time-Bound Scheduling and Critical Tasks

Exercise

Answer the following questions:

1. Explain various techniques used for estimating duration in project.

_____
_____
_____

2. List any five documents used in project management.

_____
_____
_____

3. Explain the significance of creating contingency plan.

_____
_____
_____

4. What is Performance Measurement Baseline?

_____
_____
_____

5. What is risk identification?

_____
_____
_____

6. What is PERT Method?

_____
_____
_____

Unit 2.3 Participate in Resource Planning and Procurement

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Describe the process of planning and procuring resources for the project
2. Elaborate how to carry out negotiations with the third-party suppliers and contractors

2.3.1 Process of Planning and Procuring Project Resources

Project procurement management is the establishment of relationships with outside vendors and suppliers for the goods and services required to complete a project. External materials and resources are required for projects in a variety of industries to achieve their goals. Project procurement management is the selection, coordination, and maintenance of these products and services, and it is a critical component of completing a successful project. Understanding the processes, benefits, and applications of project procurement management can help you achieve the project objectives more effectively.

1. **Planning procurement -** Planning procurement entails a series of steps that aid in determining which resources an organization requires for project completion as well as the scope of its budget. When planning for procurement, project procurement managers frequently consider the following factors:

Materials and resources required to complete the project	**Materials and resources they already have and which need to be outsourced**	**Contract requirements for outside purchases**
Delivery date requirements	**Key project milestones and their deadlines**	**Legal terms and conditions**
Industry safety standards of materials and resources	**Researching providers and vendors**	**Criteria for partnerships**

Fig 2.17 Factors for Planning Procurement Process

2. **Conducting procurement -** Following procurement planning, project procurement managers evaluate vendor bids and select partnerships based on project requirements. During this phase of procurement, vendor negotiations are common, and all parties involved sign the agreed-upon contracts. At this time, project procurement managers may also make payments for products and services.

3. **Controlling procurement -** Once contracts are active, procurement control and management are critical components of maintaining vendor partnerships and ensuring that services and products function as intended throughout the project. Controlling procurement frequently entails:

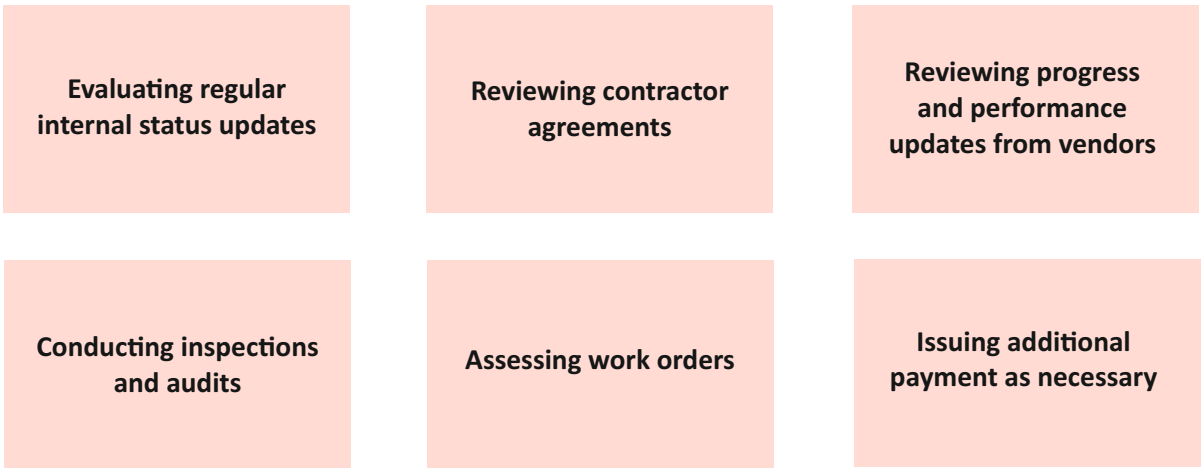

Fig 2.18 Features of Controlling Procurement Process

4. **Closing procurement -** Closing procurement entails all steps required to terminate a partnership or contract. This frequently entails a review of the completed work or services, renegotiation of any changes to the original contract terms, and confirmation of payments issued and received. Organizations may also file a formal release of liability after the procurement is completed. This contract confirms that the vendor has fulfilled the terms of the original contract and is no longer obligated to participate in the project in any way.

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youtu.be/akj4R1xZHzA

2.3.1 Process of Planning and Procuring Project Resources

2.3.2 Carry Out Negotiations with Third-Party Suppliers and Contractors

Negotiation is a process that involves two or more people who hold opposing viewpoints. These individuals try to reach an agreement by changing their original positions. Typically, reaching an acceptable agreement requires bargaining. There are several reasons for bargaining:

1. **Costs -** To reduce acquisition costs by achieving a lower price.
2. **Value –** Adding value, such as shorter lead or cycle times.
3. **Performance –** Increasing performance through KPIs and SLAs.
4. **Conflict -** To resolve a conflict by reaching an understanding.
5. **Problem -** To solve a problem through open discussion.
6. **Quality –** Achieving maximum quality by reducing defects.
7. **Agreement –** To reach a mutual agreement in a collaborative manner that is satisfactory to all parties.

The negotiation process is divided into seven major stages.

1. **Preparation -** This is arguably the most important step. Without thorough preparation, which includes research, understanding the objectives, understanding the concessions, the negotiation is unlikely to yield the best results.
2. **Opening -** In this section, both parties explain what they hope to gain from the negotiation.
3. **Testing -** During this stage, parties attempt to understand what is truly important to each other and where concessions may be made. Effective communication is critical at this stage, as is using good listening skills to gather as much information as possible and reading body language from the other parties.
4. **Proposing -** After listening to the opening stage and participating in the testing, each party puts forward their proposals for what they would like to achieve.
5. **Bargaining –** This occurs when each party offers to give up something in exchange for something else, such as tradeable. A concession occurs when one party must give something up but receives nothing in return.
6. **Agreement -** Once bargaining is finished, it is expected that an agreement can be reached. To be legally binding, an agreement must be accepted by both parties.
7. **Closure -** This is the final stage. This stage includes the documentation of what has been agreed upon, whether it is a contract or meeting minutes. The closure is an important stage because the agreement is open to interpretation without it.

Exercise

Answer the following questions:

1. Explain the seven stages of negotiation process.

_____
_____
_____

2. What is closing procurement process?

_____
_____
_____

3. List out the factors related to planning procurement process.

_____
_____
_____

4. List any 3 reasons for bargaining.

_____
_____
_____

Unit 2.4 Obtain Necessary Approvals

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Describe the process of obtaining the necessary approvals for a variety of projects and the relevant authorities to approach for the purpose

2.4.1 Process of Obtaining Necessary Approvals

The sequencing of tasks for the compliant request and approval of projects, including the application of consistent, value-based approval criteria and automated routing for project requests that impact an organization financially and strategically, is referred to as project approval workflow. Managing project requests via email, spreadsheets (even the most recent online spreadsheet software), or software incapable of handling project approvals, scoring, and routing is inefficient and risky. Project requests can be improperly approved, fail to provide critical details, become lost, and so on. Using workflow automation software to automate the process of project approval and rejection has numerous advantages:

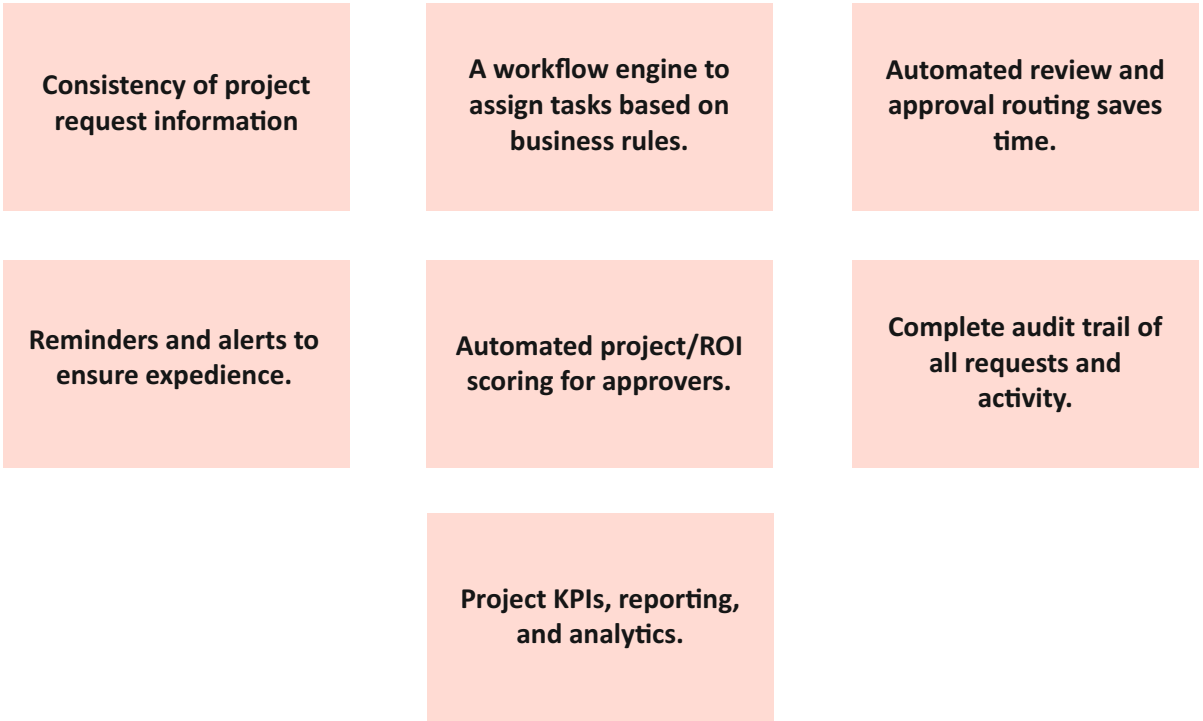


Fig 2.19 Benefits of using Software for Project Approvals

There are three Alternatives for Approval of Change Requests

1. **Sponsor of the project -** The project sponsor is typically a senior leader in an organization with project decision-making authority. The sponsor works with the team to ensure its success. The sponsor sees how the project fits into and supports the organization's mission, goals, and strategy.
2. **Manager of a project -** A project manager's most important role is to integrate all aspects of the project, including subject matter, project processes, and project knowledge areas. The project manager's intimate knowledge of the project and project management is an advantage.
3. **Change Control Board -** Another possibility is to establish a Change Control Board (CCB). This group frequently includes key stakeholders such as the project sponsor and other senior management members. Some organizations have a Change Control Board that reviews all project change requests. Individual projects and programs may have their Change Control Boards in other organizations.

Summary

- A business case is a document that explains the value or benefits that the company will receive if an individual pursues a major business investment or initiative.
- A business plan, on the other hand, is a blueprint for a completely new venture.
- A business case is frequently used by decision-makers, stakeholders, and the general public as a management tool for making evidence-based and transparent decisions. It is a framework for the subsequent policy, strategy, or project delivery and performance monitoring.
- Success criteria are the standards/levels used to determine whether an objective / goal / target/outcome has been achieved/successful.
- A Gantt chart is a bar chart that shows how project tasks are scheduled overtime. A Gantt chart is used in project planning to show what work is scheduled to be done on specific days.
- A business case must guide the reader through the problem, consider various solutions, and ultimately decide on the best option. As a result, it requires a clear structure with plenty of headings and subheadings to guide the reader.
- Project scope is a moving target that project managers want to nail down before mapping out the project management plan. It acts as a boundary within which an entire project exists. However, the scope of a project is more than just work management.
- A project risk is an unforeseeable event that may or may not occur during the course of a project. Contrary to popular belief, a project risk can have either a negative or positive impact on progress toward project objectives. Project risk is the possibility that a project will fail.
- When prioritizing risks, it is important to consider not only the likelihood of occurrence but also the business impact of each risk. The project manager should plan more carefully for risks that have the potential to have a significant impact on a business.
- A feasibility study is an analysis that considers all relevant factors for a project, including economic, technical, legal, and scheduling considerations, to determine the likelihood of the project is completed successfully.

- In order to gain approval from key project stakeholders, a project charter is an elevator pitch of your project objectives, scope, and responsibilities.
- The project team is the group of people who are in charge of carrying out the tasks and producing the deliverables specified in the project plan and schedule, as directed by the project manager, at whatever level of effort or participation is stipulated.
- A work breakdown structure, or WBS, is a project management tool that uses a step-by-step approach to finish large projects with many moving parts. A work breakdown structure (WBS) can integrate scope, cost, and deliverables into a single tool by breaking down the project into smaller components.
- Estimating activity resource is a process that assists the project team in determining the type and quantity of material, human resources, tools, or supplies needed for the project.
- Estimating activity duration is a technique for determining the number of work periods needed to complete individual tasks with estimated resources. The main advantage of this procedure is that it estimates how long each task will take to complete, which is an important input into the development schedule process.
- A contingency plan is a plan of action designed to assist an organization in effectively responding to a significant future event or situation that may or may not occur. A contingency plan is also known as "Plan B" because it can be used as an alternative course of action if expected results do not materialize.
- The Performance Measurement Baseline (PMB) is an important tool in earned value management that is used in the Technical Assessment Process to evaluate the technical progress of a programme.
- A scheduling tool aids in prioritization by allowing project managers to see the big picture and track progress on all projects at the same time. This enables them to prioritize projects based on their business requirements.

QR Code

Scan the QR Code to watch the related video

youtu.be/Do8iykQKMfU

2.4.1 Process of Obtaining Necessary Approvals

Exercise

Answer the following questions:

1. List the benefits of using software for project approvals.

_____

_____

_____

2. Write a short note on the process of obtaining approvals.

_____

_____

_____

3. Explain any two alternatives authorities for approval of change requests.

_____

_____

_____

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

3. Process of Carrying out Execution, Monitoring, Control and Closure of the Project

ESSCI
Skilling India in Electronics

Unit 3.1 Manage Project Execution

Unit 3.2 Monitor and Control Project

Unit 3.3 Carry Out Project Closure

ELE/N9802

Key Learning Outcomes

At the end of this module, the trainee will be able to:

1. Explain how to manage the project execution
2. Demonstrate the process of monitoring and controlling the project
3. Illustrate the process of carrying out project closure

Unit 3.1 Manage Project Execution

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Explain the importance of conducting the kick-off meeting with all the stakeholders to apprise them of the project timelines, deliverables, scope and budgets
2. Describe the process of assigning tasks and responsibilities to the team members, setting deadlines and ensuring the availability of necessary resources
3. Explain the importance of coordinating the internal resources and third parties/ vendors for the flawless execution of the project
4. Explain the importance of maintaining an effective relationship, open and regular communication with the project stakeholders
5. Describe the process of collecting the project's progress data and preparing the status report
6. Explain the importance and process of analysing the data and reports to identify the relevant course-corrective
7. Elaborate the use of the appropriate verification techniques to manage changes in the project scope, schedule and costs
8. Elaborate how to identify risks to project execution and dealing with them as per the risk management plan
9. Explain the importance of adhering to the approved budget and timelines
10. Explain the importance of following the applicable health, safety and environment protection practices
11. State the applicable practices for effective site, logistics and infrastructure management
12. Explain the importance of ensuring positive cash flows for the uninterrupted progress of the project
13. Describe the process of re-allocating the project funds

3.1.1 Importance of Conducting the Kick-Off Meeting

The project kickoff meeting is the first gathering of stakeholders, including the **project manager, the client, and the team.** The kickoff meeting informs the team about the project's goals and the needs of the clients. Typically, the meeting is hosted by the project manager. In project management, it occurs as soon as the contracts are signed and the statement of work, budget, and timelines are agreed upon. It happens immediately after the start of a smaller project. It also takes place at the beginning of a new phase in projects with multiple phases.

Fig. 3.1 Kick-off Meeting

Pre-planning Project Kick-off Meeting

Starting a project without a kick-off meeting is akin to embarking on a journey without a map. A successful and smooth project collaboration begins with a good project kick-off meeting. The project kick-off is the best time to set expectations and foster strong team morale because it is the first meeting between project team members and possibly the client or sponsor. The kick-off usually happens after the statement of work or project poster has been finalized and all parties are ready to go.

Projects do not always follow a logical sequence of planning and execution. Without a proper project plan, ill-prepared teams rush into the execution phase, and as a result, stakeholders have varying levels of understanding of the project's purpose and vision. This is precisely what the kick-off meeting aims to avoid.

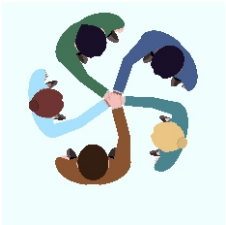
Structuring the Meeting

A kick-off meeting's purpose is to formally notify all project stakeholders that the project has begun. It introduces the team and assists them in:

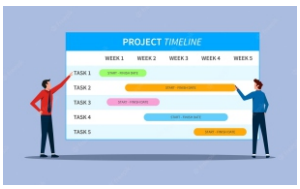
Establishes realistic expectations and project milestones while recognizing potential surprises that team may face

Understanding the project's requirements, background, and individual responsibilities

Decide how to set common project goals and check-ins



Provide an opportunity to get everyone on the same page and establish ground rules for effective collaboration



What the timeline is, and what could slow down the project and how to avoid it

Demonstrates do every stakeholders what success looks like and what steps must be taken to achieve it

Fig. 3.2 Importance of Project Kick-off Meeting

A great kick-off meeting does not happen by accident. It is the result of meticulous planning and preparation. The meeting agenda should be structured according to the project, but key elements should include the 5 W's: **who, what, where, when, why, and how**. The following checklists must be completed before sending out the invitation to the kick-off meeting:

- ✓ Why are you doing it?
- ✓ When is the right time to host the meeting?
- ✓ Where should it be held?
- ✓ What documents should you print?
- ✓ How long should the meeting be?
- ✓ Who should attend?
- ✓ What is the project scope?
- ✓ What should be discussed?
- ✓ What's the action plan?
- ✓ Who's doing what?
- ✓ How are you going to work together?
- ✓ What does success look like?

It is possible that the project about to begin is internal, such as the rollout of a new document management system or the development of a new design feature, or that it is an external project for a client or customer. The initial kick-off meeting serves the same basic purpose in both cases: it is a meeting to set the tone, style, and vision for the project as a whole, as well as to establish common goals, tasks, and timelines with the project team.

The project kick-off meeting for client work will include:

a. Introducing the project team

b. Walking the client through the project stages

c. Agreeing on how to effectively collaborate to successfully deliver the project

It's an opportunity for the team to gain a better contextual understanding of the project, demonstrate their understanding and enthusiasm for the project, and lay the groundwork for a positive working relationship with the client. Also, the project manager must ensure to cover the agenda for the kick-off meeting with the team, as well as any questions or issues that haven't been addressed. The agenda for the kick-off meeting can be used effectively to instil confidence in the client that the team is capable of completing the project successfully. The project manager can acquaint the team with one another and with the client. Later, the following elements must be discussed:

- Covers all of the ideas that were hatched during previous meetings with the client

Project Background

- Includes a detailed description of project deliverables and the work required to achieve them

Project Scope

- Submitted to the client describes the work project team will deliver and when they will deliver it

Project Work Statement

- Limitations and risks associated with a specific endeavor

Project Constraints

- Covers methodology and collaboration to communicate and coordinate work for both internal teams and external vendors, and to handle change requests

Project Management Methodologies

- Overview of what is expected to be delivered and when, and as detailed as required for the project

Project Timeline

- Actual items that the project team will send to the customer or client, as noted on the timeline

Project Deliverables

Fig. 3.3 Elements of Project Kick-off Meeting

An effective kick-off meeting fosters trust and transparency among participants. It brings everyone on board with the project's vision and adds perspective for both team members and clients. The following are some best practices on how to kick off a meeting:

1. Before the Meeting

- Pre-kickoff meeting with internal team to discuss client's background, their stakeholders, their problems, and the proposed solution
- Prepare everything to avoid the resulting awkwardness in front of the clients
- Share the complete agenda–the list of things to be covered during the meeting with all the attendees

2. During the Meeting

- Don't get too involved in the details
- Keep it brief
- Don't broadcast information
- Ask for inputs from the attendees
- Assign a meeting note-taker or record the meeting if possible and with permission

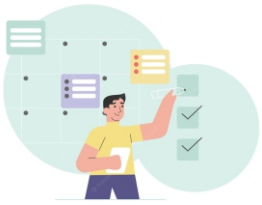
3. After the Meeting

- Send out meeting minutes to all attendees
- Send out an email to connect back for any queries or concern

Fig. 3.4 Best Practices for Conducting an Effective Project Kick-off Meeting

3.1.2 Assigning Tasks, Setting Deadlines and Availability of Necessary Resources

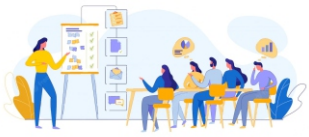
It is crucial to assign tasks for the team to function properly and productively. It is the project manager's responsibility to assign tasks to each member of the team. This necessitates making decisions about who is capable of performing specific tasks for the task to be completed successfully. Work is assigned based on the following criteria:



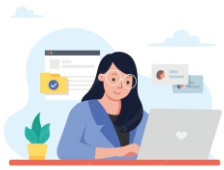
Task Priority

Skill-Sets

Resource Availibility



Employee Development



Personal Interest

Fig.3.5 Criteria for the Work Allocation

Notes

The following figure explains the standard procedure of work allocation:

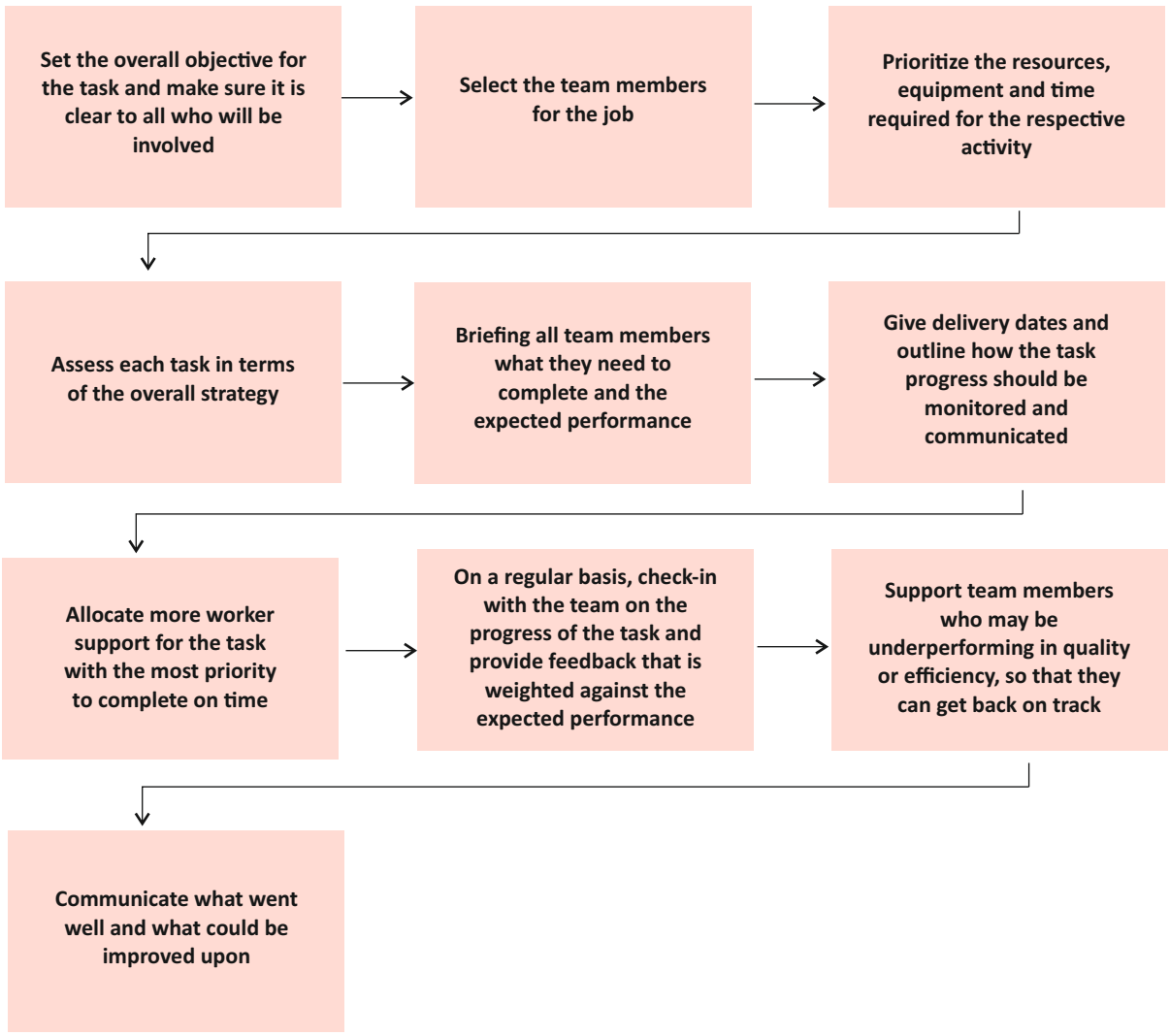


Fig.3.6 Standard Procedure for Work Allocation

3.1.3 Significance of Coordinating with Internal Resources and Vendors

Coordination is the foundation of any successful organization. It is essentially a mechanism or strategy that allows different entities to collaborate. Coordination assists in maintaining and improving efficiency while working toward a common goal or target. As a result, team management and coordination are critical for work integration.

Project coordination entails managing a project's day-to-day operations, ensuring that resources are aware of deadlines and tasks for which they are responsible, managing meeting minutes, and so on. The goal of project coordination is to streamline the workflow of the tasks. A project manager informs it team members about who is in charge of each section of a project and when the deadlines are. A project

coordinator collaborates closely with a project manager and is aware of the project's objectives. It enables the project manager to better monitor and controls each stage of the project to ensure that it progresses in accordance with the timeline. The project manager collaborates with the team to manage risks and the relevance of tasks to the current scope of the project. Effective project coordination can boost the team's productivity at work. The following figure summarize the importance of effective coordination in the project with the team and third parties/vendors.

Fig.3.7 Importance of Project Coordination

Effective coordination with the team members:

1. Improves relationships among team members
2. Get to know each other better
3. Reduces the likelihood of unnecessary conflicts between them Supports their fellow teammate
4. Strengthen their bonds with one another
5. Ensures that team members do not engage in cross-purpose work by bringing together the organization's human and material resources
6. Less resource waste, allows the organization to make better use of its resources

It is crucial to establish and maintain strong vendor relationships for customer service, cost-efficiency, quality, and market development. Vendors, as key stakeholders, can make or break a project's success or failure. Effective vendor coordination ensures that all vendors meet expectations, follow security protocols, and resolve problems as soon as possible. **Effective vendor coordination** focuses on increasing overall project efficiencies. Vendor coordination is necessary for obtaining all of the products and services required to complete the project.

3.1.4 Maintaining Effective Relationship and Communication with Stakeholders

Stakeholders are individuals or organizations whose attitudes and actions have an impact on the project's success. Employees, labour unions, suppliers, customers, business partners, investors and shareholders, the local community, government authorities, and regulators are all stakeholders. Stakeholders have varying interests, attitudes, and priorities. Effective communication ensures that they receive pertinent information and fosters positive attitudes toward the company or project. The advantages of stakeholder communication are obvious, with some of the most important reasons listed below:

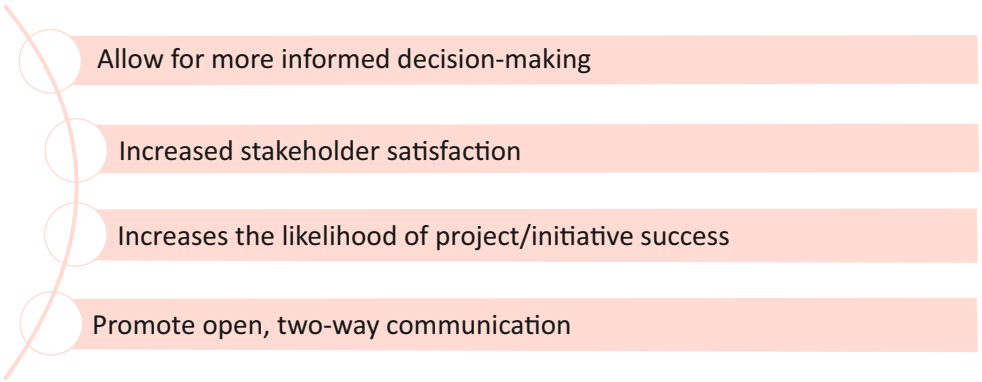


Fig.3.8 Importance of Maintaining Effective Relationship and Communication with Stakeholders

The following are some tips for maintaining communication with stakeholders:

1. Engage stakeholders on a personal level
2. Establish communication goals
3. Speak their language
4. Don't vanish from the map
5. Learn to pay attention
6. Be open and honest

3.1.5 Process of Collecting Progress Data and Preparing Status Report

The purpose of the **project progress report** is to provide a summary of the project status to the Project Board (and possibly other stakeholders) at regular intervals. The report compiles a variety of financial and substantive data to compare project accomplishments to project plans. Whereas, a **status report** is a set of information about a project's current status. Project status reports are used to communicate the current status of a project to the project team and stakeholders.

Data collection is the systematic process of gathering and measuring information on variables of interest to answer stated research questions, test hypotheses, and evaluate outcomes. The process of collecting data consists of the following five steps.

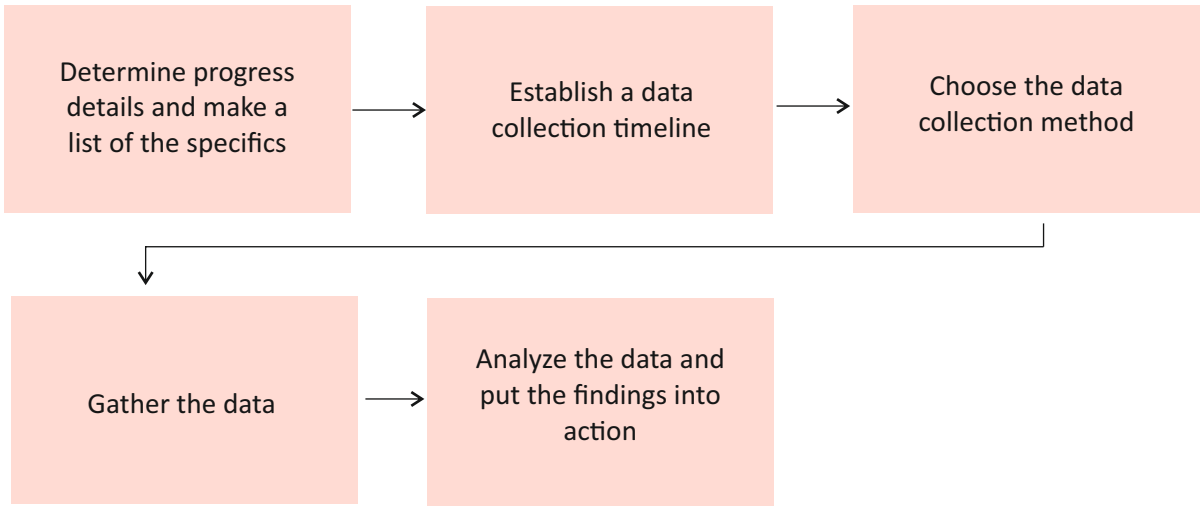


Fig.3.9 Process of Collecting Data

The most effective project status reports foster accountability and ownership among the team members. They identify problems, mitigate risks, and, most importantly, keep the team on track to meet the project objectives. Project status reports are also useful to clients. It describes a project's progress over a specific time and compares it to the project plan. Status reports are used by project managers to keep stakeholders informed of progress and to monitor costs, risks, time, and work.

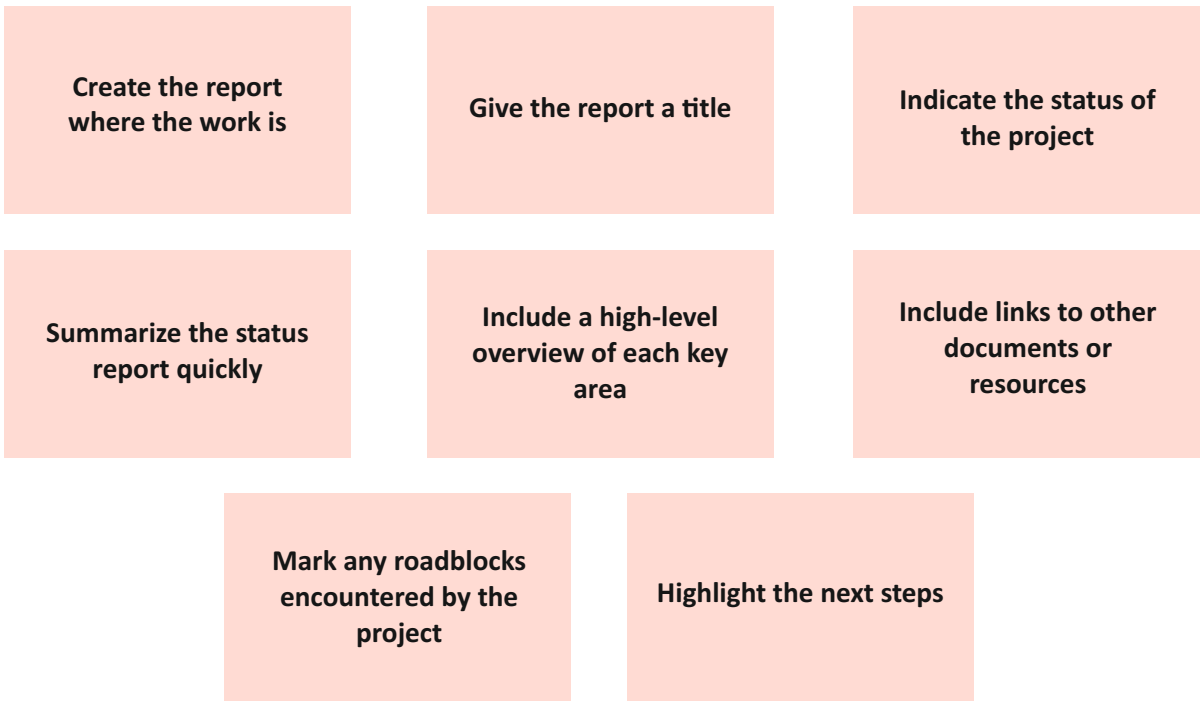


Fig.3.10 Steps for Preparing Progress Status Report

3.1.6 Process of Analysing Data and Reports

Data analysis is the process of inspecting, cleansing, transforming, and modelling data to discover useful information, informing conclusions, and aid decision-making. The basic steps for data analysis are to evaluate, clean, and summarise. The following figure explains the process of analysing data and reports.

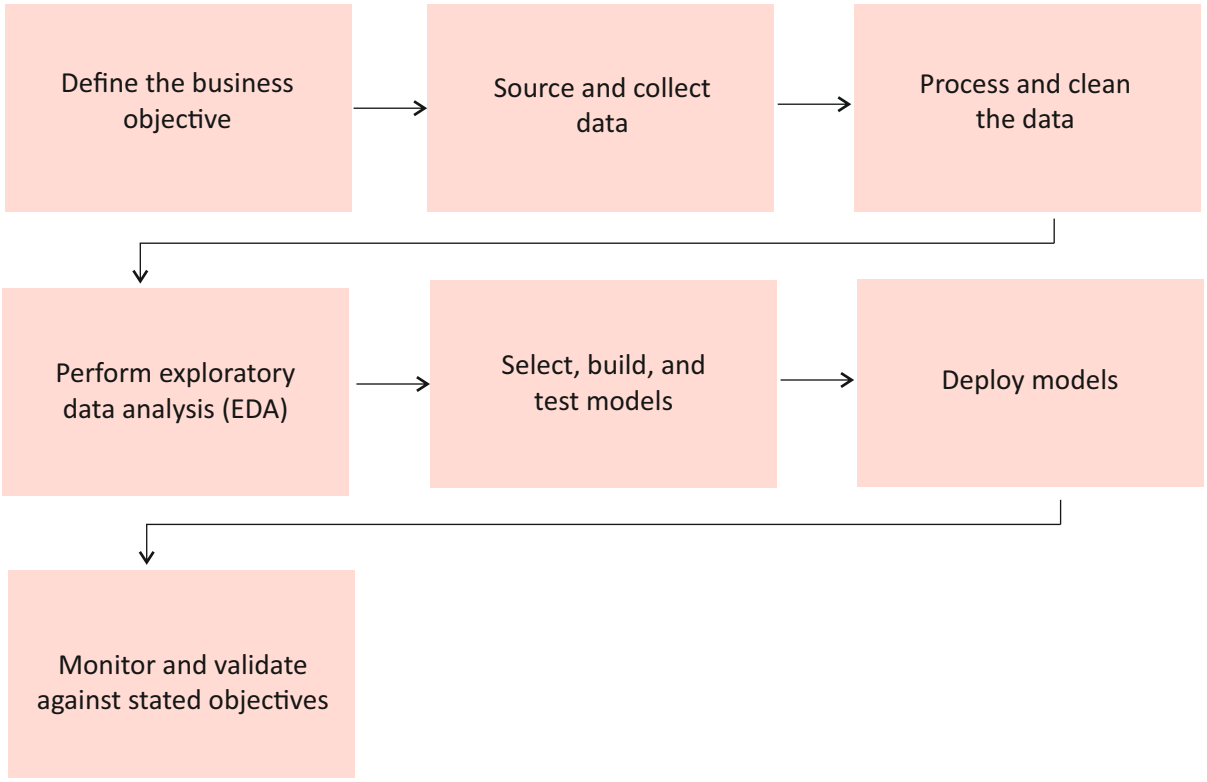


Fig.3.11 Process for Analyzing Data and Reports

3.1.7 Appropriate Verification Techniques for Managing Changes in Scope, Schedule and Costs

Changes in scope can have an impact on the project's cost, schedule, risk, and even quality. Scope changes can be initiated by the client, the project sponsor, or other stakeholders. The scope of work is defined very early in the project planning and estimation phases. In project management, unanticipated changes are unavoidable. However, implementing proper change management processes can significantly reduce their impact.

Changes that are poorly managed or uncontrolled can severely harm your project, resulting in missed deadlines, budget overruns, and even project failure. The verify scope process ensures that the completed project deliverables have received formal acceptance from the customer, end-user, or requesting party. To receive formal acceptance of the deliverables, it is necessary to review the deliverables with the customer to ensure that they are completed satisfactorily. The two important

tools for completing the project scope management plan include **Statement of Scope (SOS) and Work Breakdown Structure (WBS) templates**. The techniques for managing changes in project management are as follows.

1. Recognize and communicate the reason for the change
2. Make a note of the change
3. Evaluate the change and comprehend its implications for scope, schedule, and budget
4. Consider the consequences and get any changes approved
5. Implementation and communication with the team

The process of formalizing acceptance of completed project deliverables is known as **validating scope**. By validating each deliverable, this process adds objectivity to the acceptance process and increases the likelihood of the final product, service, or result acceptance. The following figure depicts the process's inputs, tools and techniques, and outputs.

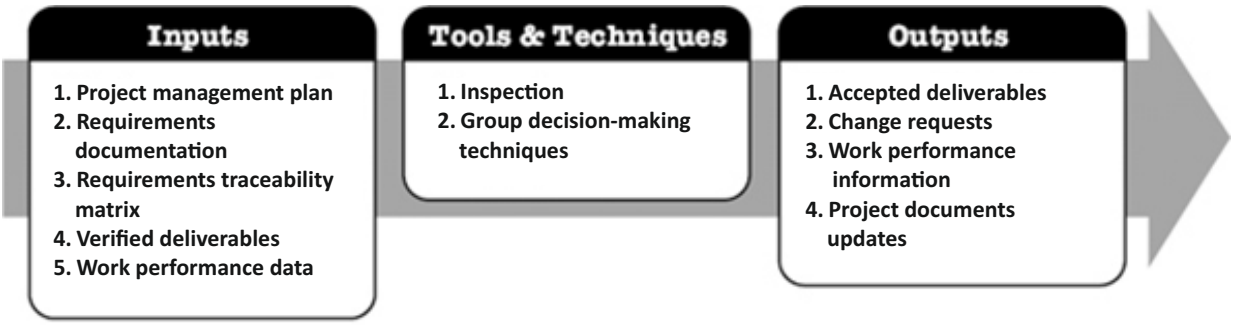


Fig.3.12Validate Scope: Inputs, Tools & Techniques and Outputs

(Source: https://www.oreilly.com/library/view/a-guide-to/9781935589679/sub6.4.xhtml)

3.1.8 Risk Management Plan

In the previous module, we have already discussed risk management. Let us quickly sum it up. A **risk management plan** is a document that outlines how to approach risk management in project management, including how to best understand and manage project risks, the responsibilities of team members and stakeholders in managing those risks, and the steps that will be taken if those risks are not managed properly.

The **risk management plan** should be created long before the project begins, and it should be constantly referenced throughout the project lifecycle to ensure that the risk management process is working and that risks are being addressed.

Project risk management encompasses all aspects of risk management planning, identification and analysis of project risks, response planning, and implementation, and risk monitoring on a project. As shown in the figure below, there are seven project risk management steps.

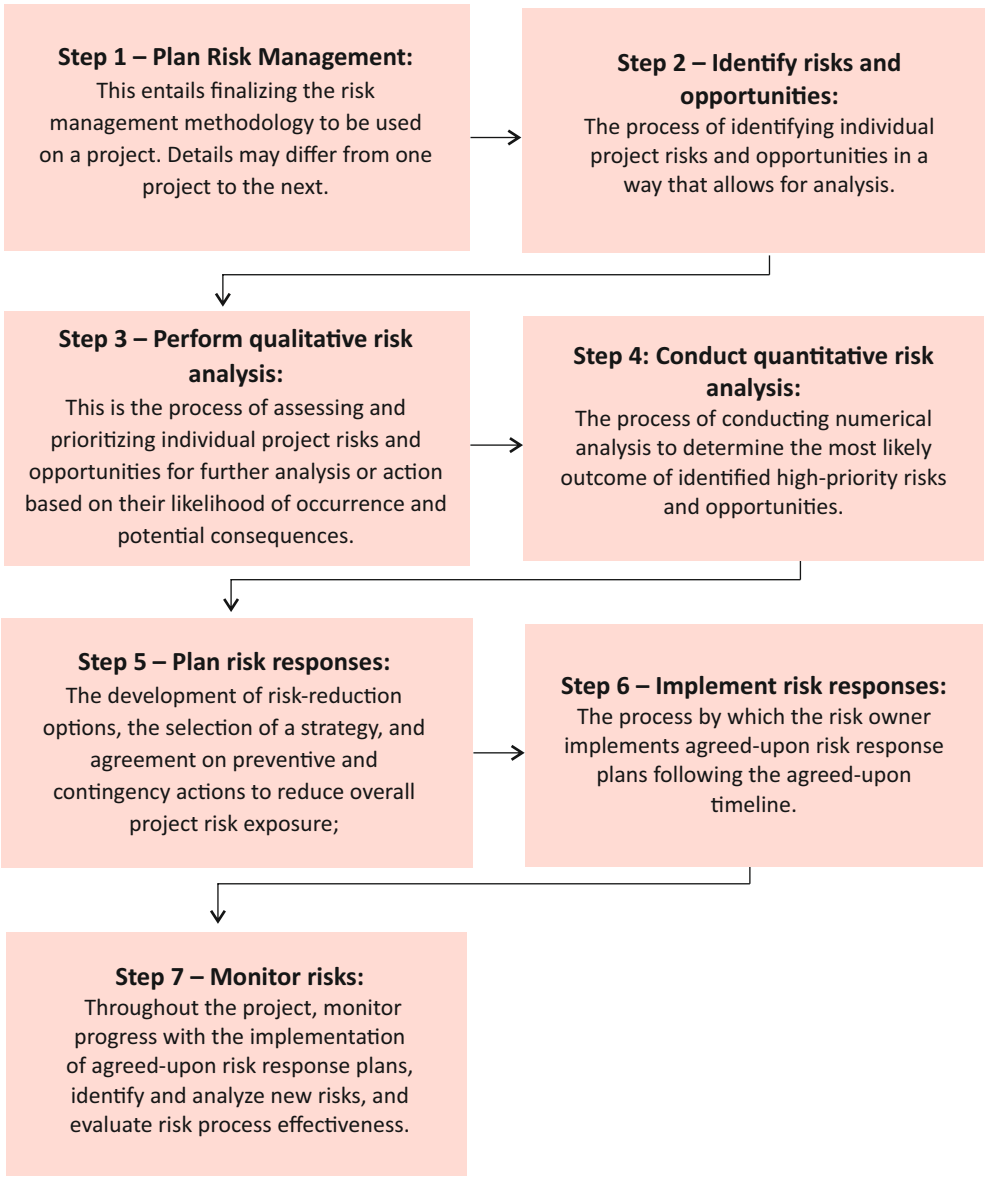


Fig.3.13 Steps for Risk Management Plan

3.1.9 Importance of Adhering to Approved Budget and Timelines

Any organization's financial roadmap is its project budget. A project budget is the total estimated cost of completing each project activity throughout the project's phases. It is critical in getting project approval, ensuring funds are ready on time, and measuring performance because it helps set expenditure expectations. A project budget:

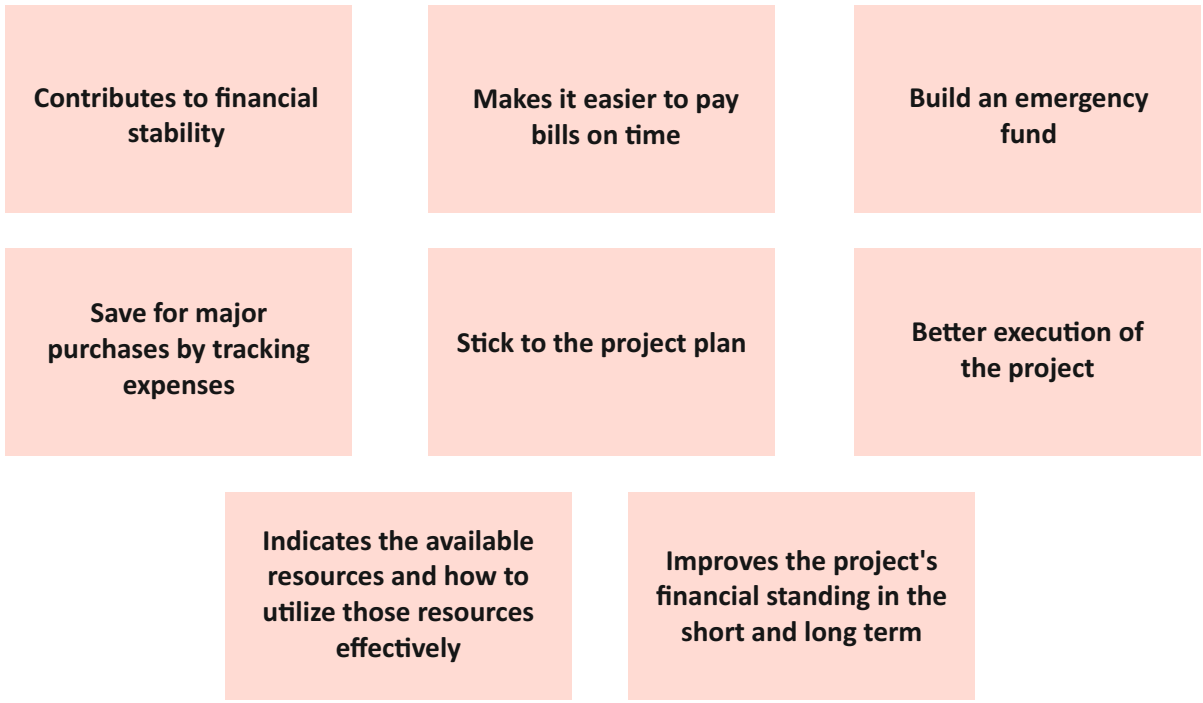


Fig.3.14 Importance of Adhering to Approved Budget

Similarly, timelines are also crucial to any project. They are not only useful for organizing tasks, but they also hold everyone accountable for completing them. They describe what the project will achieve and aid in the establishment of clear objectives and priorities. The development of a project execution plan is a difficult task. Schedule Adherence provides project managers with additional early warning information, allowing for better decision-making and increasing the likelihood of project success.

Fig.3.15 Importance of Adhering to Project Timelines

3.1.10 Importance of Health, Safety and Environment Protection Practices

Environment, Health, and Safety, or EHS, is a system that includes laws governing professionals, programs, and workplace behaviours that protect workers' health and safety. Today, many people spend the majority of their time in an environment that lacks health and safety protocols, which increases the risk of an on-the-job injury significantly. EHS systems can be thought of as additional efforts to protect employees, the environment, and the general public from hazards. What makes an occupational safety and health system function is slightly more complicated than following a safety system, but EH&S is ultimately everyone's responsibility.

There are numerous advantages to implementing EHS workplace practices, not only for the company but also for the employees. These practices primarily prevent accidents, illnesses, and injuries while reducing environmental toxins and spillage. There are historical examples of workplace accidents that occurred as a result of inadequate EHS efforts. The Triangle Shirtwaist Fire, the BP Deepwater Horizon oil spill and fire in 2010, and the collapse of the Savar building in Bangladesh in 2013 are all well-known examples.

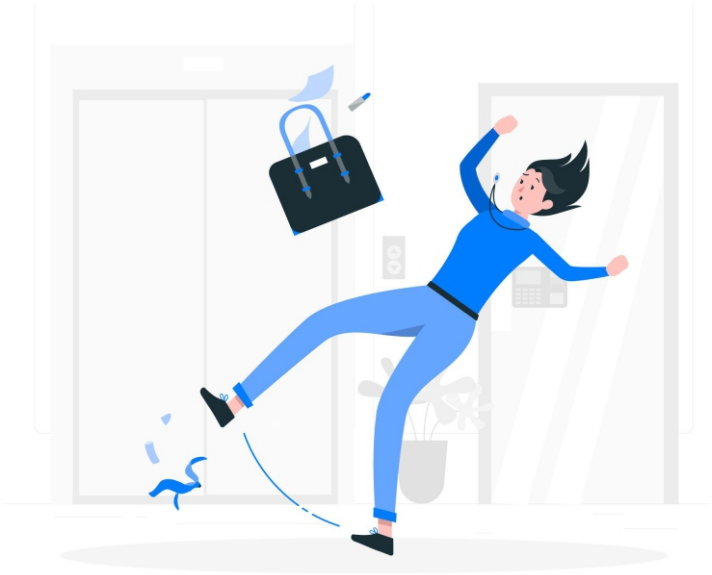


Fig.3.15 Slip, Trip & Fall mishap at Workplace

There have been some serious workplace accidents, **such as slip and falls, or incidents** involving employees who worked in an environment with a poor EHS system. If look carefully, we can probably find something at the workplace that could have caused an accident or something even more dangerous. Many hazards lurk in and around the workplace. Some people in offices are exposed to less severe workplace hazards than outdoor workers, but everyone is exposed to some level of risk in the workplace. The following are the advantages of adhering to **Health, Safety, and Environmental Protection Practices**.

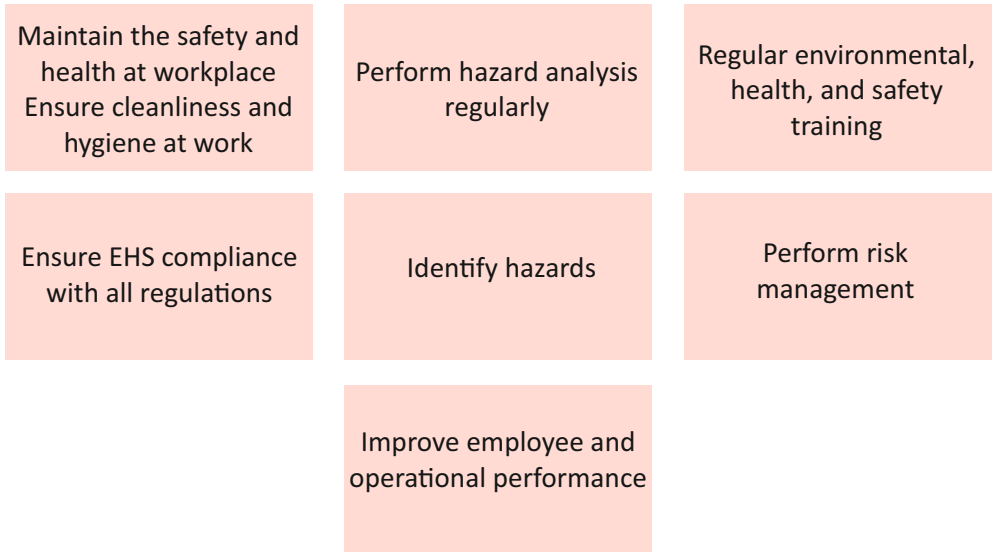


Fig.3.17 Importance of Adhering to EHS Practices at Workplace

3.1.11 Importance of Adhering to Approved Budget and Timelines

Everyone must follow standard practices for effective site, logistics and infrastructure management to prevent damage to the property or serious mishaps at the workplace.

Managing a site and its infrastructure can be a demanding role that involves taking on multifaceted and increasingly complex projects. **Infrastructure management** is the management of both technical and operational components for business effectiveness, including hardware, software, policies, processes, data, facilities, and equipment.

Fig.3.18 Standard Practices for Effective Site & Infrastructure Management

Logistics management is the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption to meet customer requirements. It entails planning, implementing, and supervising the efficient storage and transportation of goods from point of origin to the final destination (the point of consumption). Logistics, in other words, manage both forward and reverse merchandise flows. The five logistics components include:

1. Storage, warehousing and materials handling
2. Packaging and unitisation
3. Inventory
4. Transport
5. Information and control

Effective logistics management can increase efficiency and productivity while lowering costs and saving time. Good logistics management, for example, ensures that the workforce can carry out required activities without being delayed by materials being delivered to the site.

Many activities are integrated into logistics management, including:

1. Resource assessment
2. Lead time assessment
3. Supply and demand planning
4. Sourcing and procurement
5. Production planning and scheduling
6. Packaging and assembly
7. Inventory management and order fulfilment
8. Inbound and outbound transport management
9. Warehousing
10. Materials handling
11. On site management
12. Customer services
13. Waste management

A well-planned timeline of project stages, as well as a complete inventory of materials and tools required, is an important aspect of logistics management. Because of the process's complexity and the interaction of multiple supply streams, dedicated simulation software can be used to model, analyze, visualize, and optimize logistics. Aside from keeping the construction schedule on track, other benefits of good logistics management include:

1. Cost savings and waste reduction as productivity increases
2. On-site logistical planning allows materials to be stored correctly, increasing efficiency and lowering the risk of damage
3. Sites can be kept secure, clean, and easy to navigate

4. Deliveries can be received and processed quickly

Here are some key best practices for logistics management:

1. Determine and evaluate the best logistics operating model
2. Develop strategic relationships with logistics service providers and achieve agreement on performance metrics.
3. Implement processes and systems for visibility and exception management.
4. Improve the flow of goods by using intelligent routing and consolidation.
5. Implement an ongoing process for logistics network design and scenario analysis.

3.1.12 Process of Re-Allocating Project Funds

The most important aspect of any business is cash flow management. A healthy cash flow ensures that the company can pay its employees on time and has funds for growth and expansion. There are also resources available for paying vendor bills and taxes on time. Positive cash flow:

1. Indicates an increase in a company's liquid assets
2. Allows it to pay off debts, reinvest in the business, return money to shareholders, cover expenses
3. Provide a buffer against future financial challenges
4. Prevent negative cash flow which indicates a decrease in a company's liquid assets

Tracking cash flow can help in organizing and prioritizing where the money is and when it's going to leave the company. Late payments, as well as early incentive payments, can both harm and benefit a project. Cash flow management is critical because it can unlock value for the company and increase the reward for owners. It aids in risk mitigation, investment planning, and collection from accounts for which you have rendered services. It can provide insights into the company and aid in strategic decision-making.

The process of allocating funds is known as financial intermediation. This procedure aids in the transfer of funds from borrowers to lenders. Financial intermediation reduces transaction costs in general.

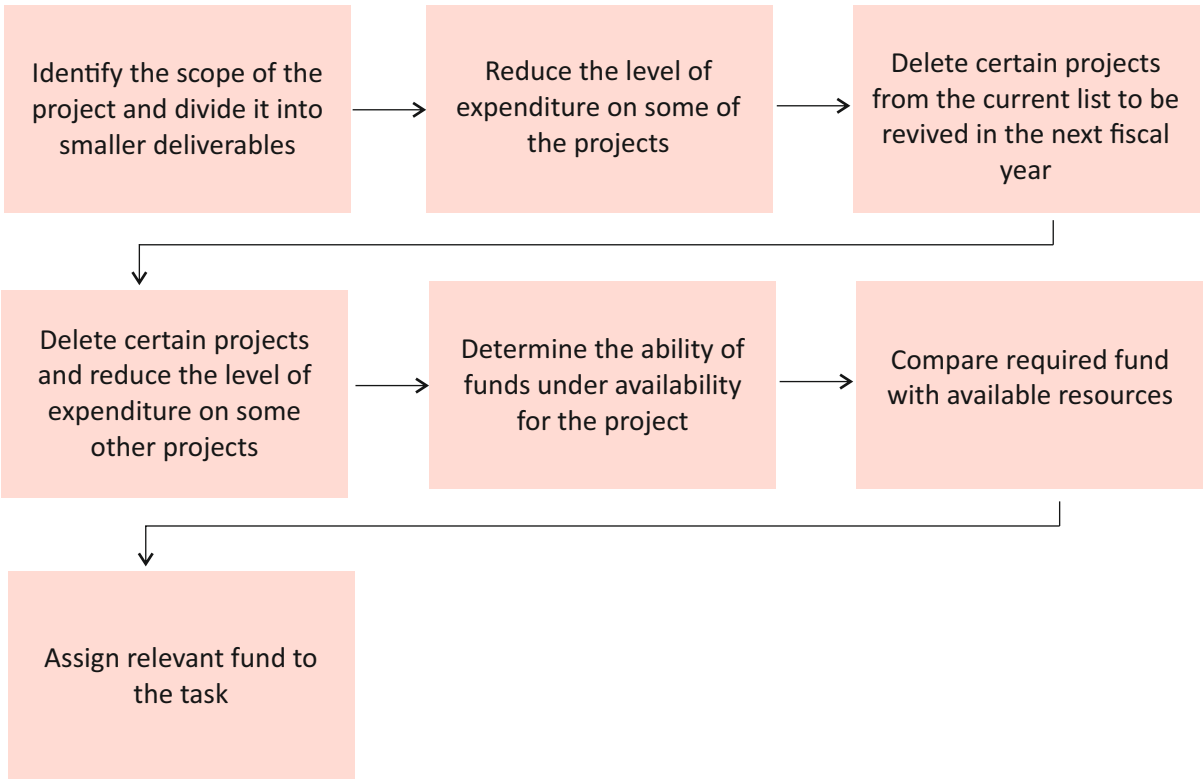


Fig.3.19 Process of Re-Allocating Project Funds

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youtu.be/LOCkV-mENq8

3.1.1 Importance of Conducting the Kick-Off Meeting

youtu.be/zPtI8q9gvX8

3.1.2 Assigning Tasks, Setting Deadlines and Availability of Necessary Resources

youtu.be/2CggVQfEek8

3.1.4 Maintaining Effective Relationship and Communication with Stakeholders

youtu.be/lV1s5NQWN_A

3.1.6 Process of Analysing Data and Reports

youtu.be/D7Jx1ob1sPg

3.1.7 Appropriate Verification Techniques for Managing Changes in Scope, Schedule and Costs

youtu.be/LwnLNMTOQFk

3.1.9 Importance of Adhering to Approved Budget and Timelines

youtu.be/4-QU7WiVxh8

3.1.11 Standard Practices for Effective Site, Logistics and Infrastructure Management

Exercise

Answer the following questions:

1. What is cash flow management?

2. List down the components of logistics management.

3. Discuss the importance of adhering to EHS practices at workplace.

4. Write a short note on:
   a. Importance of adhering to approved budget and timelines
   b. Risk Management Plan
   c. Process for analysing data and reports
   d. Progress Status Report
   e. Effective relationship and communication with stakeholders
   f. Project coordination

5. Explain the standard procedure for work allocation.

6. Explain the importance of project kick-off meeting.

Unit 3.2 Monitor and Control Project

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Explain the importance of monitoring the project planning parameters such as the schedule, timeline, effort, costing, defects etc.
2. Elaborate the use of the appropriate project management software to monitor project schedule, slippages and their impact
3. Describe the process of tracking the commitments and involvement of all the stakeholders through meetings, status reporting, progress and milestones reviews, etc.
4. Explain the importance and process of reviewing and reassigning the roles and responsibilities of the team members
5. State applicable quality control management practices and the importance of ensuring that appropriate follow-up actions are taken based on quality reviews
6. Explain the importance of monitoring various risks such as internal, client and vendor risks, tools and technology risks, etc.
7. Explain the importance of ensuring adequate data protection measures and allowing access to critical data only that only to the authorised personnel

3.2.1 Project Planning Parameters

Project parameters are information containers that you define and then add to multiple categories of project elements. Project parameters are project-specific and cannot be shared with other projects. The project parameters can then be used in multi-category or single-category schedules.
Project management parameters includes:

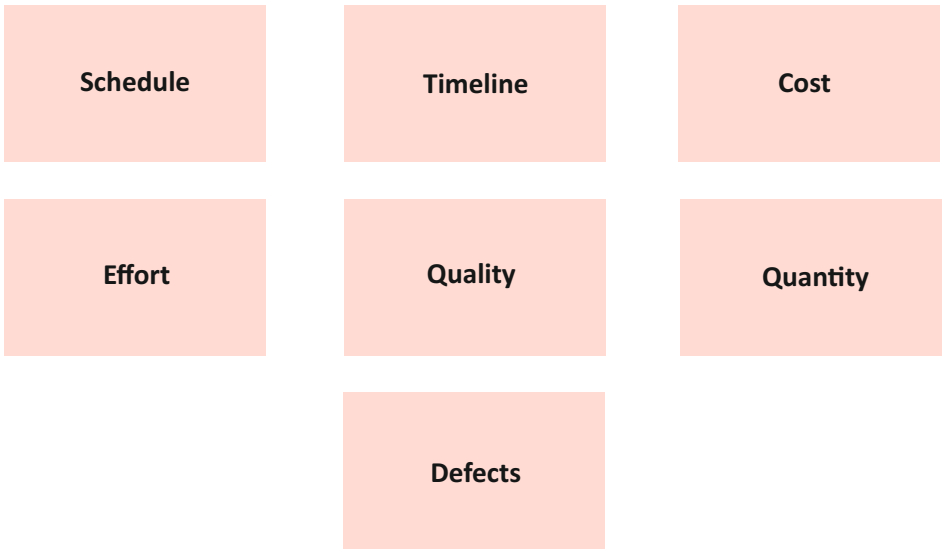

Fig.3.20 Project Planning Parameters

It is critical to try to define how each of these will affect your project from the start. A project's progress is measured using project monitoring and evaluation. It's essential because it allows you to keep track of a project and identify potential issues. Monitoring typically entails measuring the actual values of project planning parameters, comparing the actual values to the plan's estimates, and identifying significant deviations. Actual values of project planning parameters are recorded along with associated contextual information to help understand measures.

3.2.2 Appropriate Project Management Software

The top project management tools to monitor project schedule, slippages and their impact includes:

Gantt Chart Software
- Most effective project management tools
- Depicts the timeline of the project as well as the dependencies between various work items

Work Breakdown Structure
- First and most important tool in project planning
- Breakdown of the project goal into actionable work items

Project Baseline
- Encompasses the scope baseline, cost baseline, and schedule baseline
- Track real-time progress
- Avoid scope creep by keeping the unplanned work in check

Fig.3.21 Project Management Software

Notes

A scheduling tool aids in prioritization by allowing project managers to see the big picture and track progress on all projects at the same time. This enables them to prioritize projects based on their business requirements. Following are the list of software tools used for time-bound scheduling and critical tasks:

1. **Forecast App —** End-to-end project scheduling software
2. **Runn —** Advanced solution with reporting and financial forecasting
3. **Mavenlink —** A great tool for automated workflows
4. **Adobe Workfront —** All-in-one project management tool
5. **Paymo —** Free Gantt chart scheduling

3.2.3 Process of Tracking Commitments and Stakeholders Involvement

In any project or business, commitment is essential. It is the value that unites disparate entities so that they can collaborate unilaterally and seamlessly. Without it, there is no bond and no common purpose. A commitment is a promise made to people who will be impacted directly or indirectly by the project. It entails an organization deciding whether or not to do something important for stakeholders. Commitments can be associated with regulatory or environmental compliance.

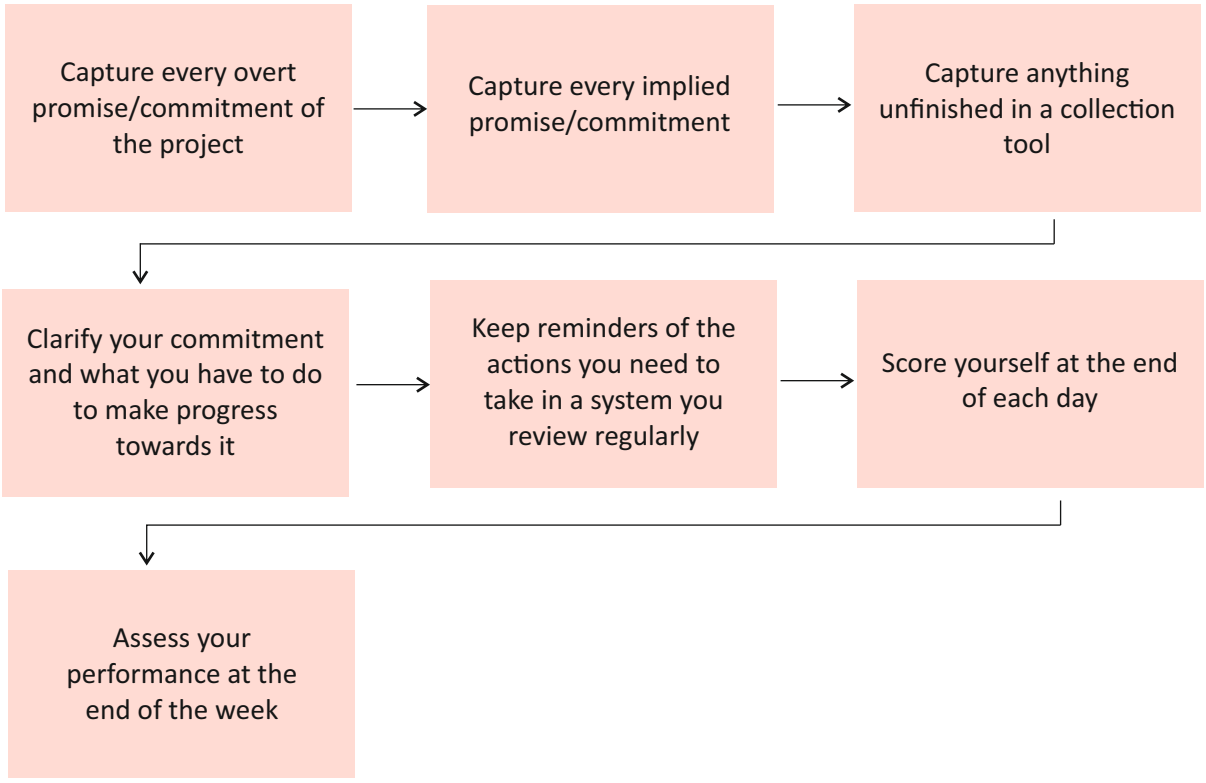

Fig.3.22 Project Commitment Tracking Process

Stakeholder engagement is the process by which organizations communicate with and learn about their stakeholders. Companies can better understand what they want when they want it, how engaged they are, and how the companies' plans and actions will affect their goals by getting to know them. Furthermore, by improving communication and rethinking their strategies and operations, they can reap long-term benefits such as brand reputation and first-mover advantage.

Stakeholder engagement is essential because:

1. it provides companies with the social license to operate, expand, and innovate
2. It strengthens the bond between businesses and their stakeholders
3. It gives businesses a positive public image and boosts their reputation.
4. It saves money on litigation and boycotts.
5. It enables businesses to identify emerging trends, take a proactive approach to them, and gain a competitive advantage by acting first

Stakeholder engagement and stakeholder management are arguably the most important ingredients for successful project delivery, but they are frequently viewed as supplementary activities or ones that can be outsourced to business-as-usual functions. People respond to the outputs and benefits that project managers deliver. People will respond only if they are interested.

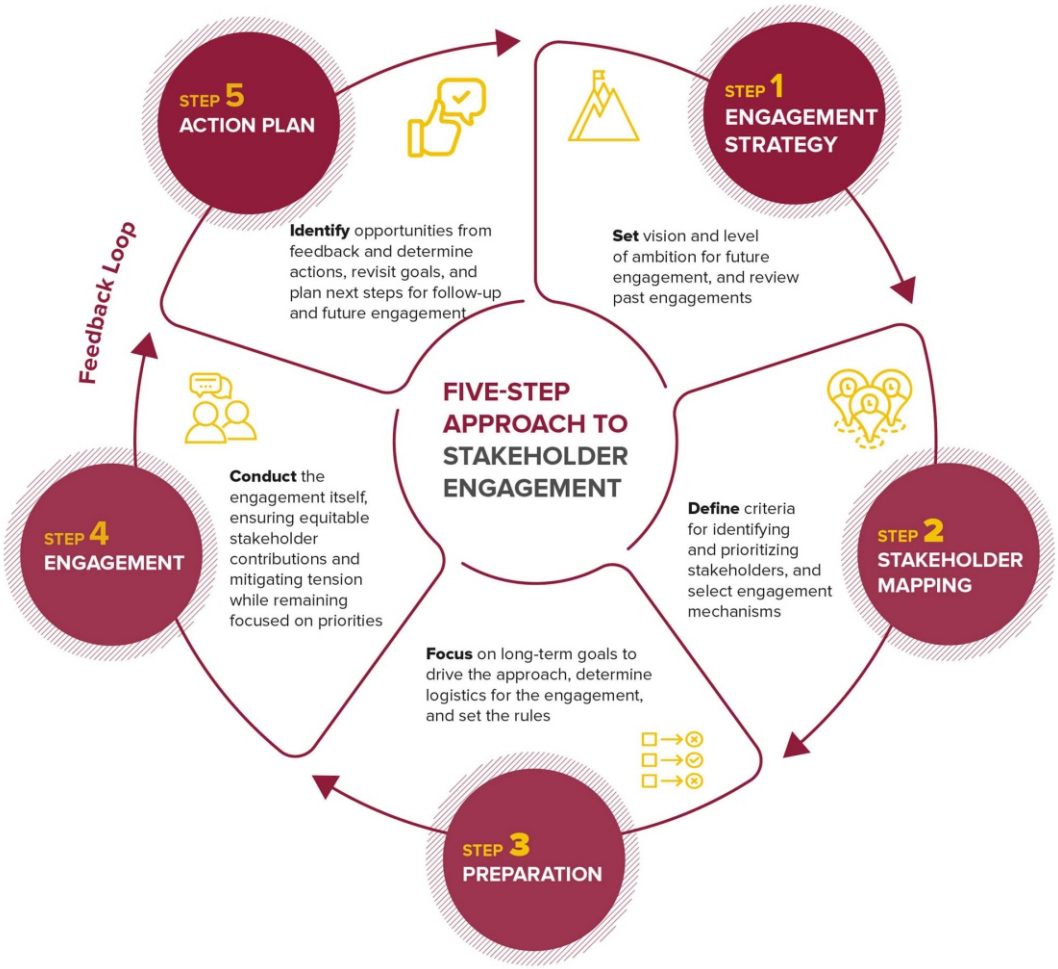

Fig.3.23 Five-Step Approach to Stakeholder involvement/Engagement

(Source: https://www.bsr.org/en/our-insights/report-view/stakeholder-engagement-five-step-approach-toolkit)

3.2.4 Reviewing and Reassigning Roles and Responsibilities of Team Members

Every company should strive to foster alignment between the best roles for team members as they relate to the company's objectives and vision. It all starts with taking some steps toward a more organic approach to people management. The team member's responsibilities include completing all tasks assigned by the team leader or manager, collaborating with other team members, adhering to company regulations, and acting as a good brand ambassador at all times.

The review process allows for valuable conversations with employees, providing regular feedback and encouragement, drawing attention to what's important, and ensuring they have all of the tools, skills, and knowledge they need to do their job well. The following figure explains the importance of reviewing and reassigning roles and responsibilities of team members in a project.

Fig.3.24 Importance of Reviewing and Reassigning Roles and Responsibilities of Team Members

3.2.5 Quality Control Management Practices

Quality is defined as doing what was agreed upon rather than being perfect or exceeding expectations.

Quality management is divided into three processes:

1. Quality Planning (QP).
2. Quality Assurance (QA).
3. Quality Control (QC).

The method of determining what is most important to the project is known as **quality planning(QP)**.

This occurs during the planning stage when the critical factors for a successful project are determined.

This includes the resources required to complete the project, the steps to take, and the specifications that must be met. Quality planning is concerned with taking all of the information available at the start of the project and determining how you will measure quality and prevent defects. The company should have a quality policy that specifies how quality is measured throughout the organization.

Any systematic process of determining whether a product or service meets specified requirements is referred to as **quality assurance (QA)**. QA creates and maintains standards for developing or manufacturing reliable products.

Quality control (QC) management practice is a process by which a company seeks to maintain or improve product quality. Quality control entails testing units to see if they meet the specifications for the final product.

The six steps to developing a quality control process in a project are as follows:

1. Establish the quality standards.
2. Determine which quality standards to prioritize. Develop operational processes to deliver quality.
3. Examine the results
4. Gather feedback and reviews
5. Make improvements and updating

ISO 9001 is defined as the international standard that specifies requirements for a quality management system (QMS). A quality management system (QMS) is a formalized system for documenting processes, procedures, and responsibilities for meeting quality policies and objectives.

Notes

Fig.3.25 ISO Quality Management Principles

Frequent reviews and follow-ups ensure that all team members continue to learn. Even a brief review of their quality performance helps the organization distinguish itself as an employer who is transparent and communicates openly.

Notes

3.2.6 Importance of Monitoring Various Risks

Risk monitoring is important because it reveals whether or not strategies are effective. Risk monitoring can have an impact on organizational risk management because it can lead to the identification of new risks. The overarching goal of risk monitoring and control is to mitigate and eliminate risks that could derail a project or negatively impact a company, and there are some more specific goals within these broader goals:

Ensure that the appropriate risk responses have been developed and are being implemented as planned.

When evaluating third-party vendors, be aware of the six different types of internal/client/vendor risk listed below.

1. **Cybersecurity risk -** With the sophistication and speed of cyber threats increasing, it is more important than ever to monitor vendors' cybersecurity posture. To quantify vendor cybersecurity risk, first determine the organization's risk tolerance. After defining acceptable risk levels, begin assessing third-party security performance and making adjustments as needed.
2. **Compliance risk -** The risk of non-compliance arises from violations of laws, regulations, and internal processes that organizations must follow to conduct business. The laws that apply to each organization will differ depending on the sector; however, some common regulations apply to all industries. Non-compliance with these regulations typically results in significant fines, so it is critical to ensure that cybersecurity compliance efforts are aligned with regulatory requirements.
3. **Reputational risk -** The public perception of the company is the focus of reputational risk. Third-party vendors can harm the reputation in a variety of ways, including:
   a. Interactions that do not adhere to company standards.
   b. Customer information loss or disclosure as a result of carelessness or a data breach.
   c. Infractions of laws and regulations
4. **Financial Risk -** Third-party financial risk arises when vendors fail to meet the organization's fiscal performance requirements. Vendors face two types of financial risk: excessive costs and lost revenue. Excessive costs, if not addressed, can thwart company growth and lead to excessive debt. To keep costs under control, the project manager should conduct periodic audits to ensure that vendor spending is in accordance with the terms of the contract. Managing lost revenue begins with determining which vendors have a direct impact on your organization's revenue-generating activities. A third-party system that tracks and records sales activity for your company is an example of this. Any issues with these vendors and systems can result in lost or delayed revenue, so it is critical to have systems in place to monitor their risk.
5. **Operational risk -** When vendor processes are shut down, operational risk occurs. Third-party operations are inextricably linked to organizational operations, so when vendors fail to deliver on their promises, organizations frequently fail to carry out their daily operations. To reduce operational risk, the organization should develop a business continuity plan so that it can continue to operate in the event of a vendor shutdown.

6. **Strategic risk -** Strategic risks arise when vendors make business decisions that do not align with the strategic objectives of the organization. Strategic risk can have an impact on compliance and reputational risk, and it is frequently a determining factor in a company's overall worth. Key performance indicators (KRIs) enable organizations to effectively monitor strategic risk by providing valuable insight into vendor operations and processes.

A 5-step approach to risk monitoring and management is recommended:

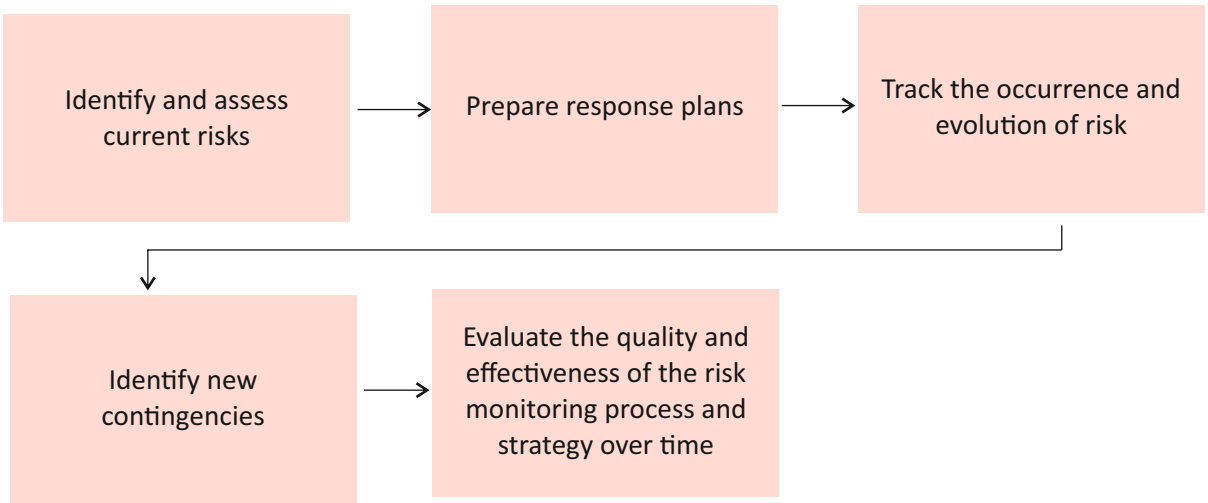

Fig.3.26 5-Step Approach to Risk Monitoring and Management

3.2.7 Data Protection Measures

A data breach occurs when information is stolen or taken from a system without the owner's knowledge or authorization. A data breach can occur in either a small or large organization. Hence, it is important to take preventive steps to avoid such occurrences. The organization must install good security to protect its valuable and confidential data. The following figure explains 6 Essential Data Protection Methods:

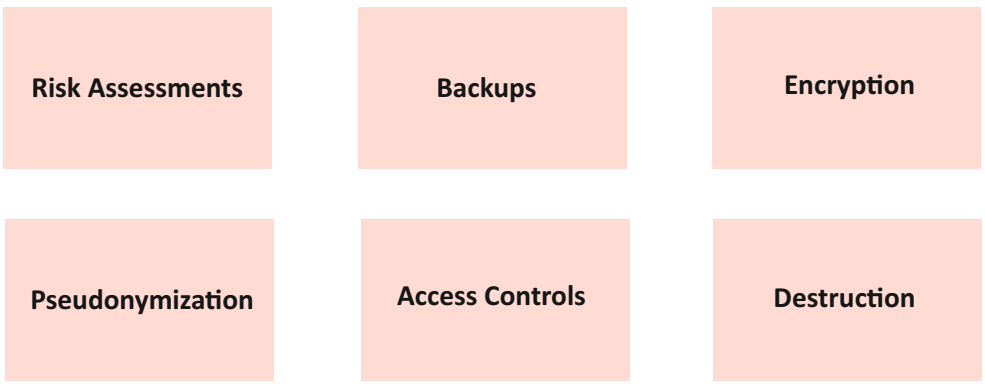

Fig.3.27 Six Essential Data Protection Methods

The following are some valuable tips for data protection.

Back up your data	Use strong passwords	Take care when working remotely
Be wary of suspicious emails	Install anti-virus and malware protection	Don't leave paperwork or laptops unattended
Make sure your Wi-Fi is secure	Encrypt your data.	Make your old computers' hard drives unreadable
	Automate your software updates	

Fig.3.28 Tips for Data Protection Measures

Notes

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youtu.be/HWeUb1VMgJg
3.2.1 Project Planning Parameters

youtu.be/3ltc-h-S9mQ
3.2.2 Appropriate Project Management Software

youtu.be/RS4djBoGSRA
3.2.3 Process of Tracking Commitments and Stakeholders Involvement

youtu.be/18cN8MZvJRA
3.2.5 Quality Control Management Practices

youtu.be/SuNtmCgIhiM
3.2.7 Data Protection Measures

Exercise

Answer the following questions:

1. List down the project planning parameters.

2. Name any two software for project management.

3. Explain the process of tracking commitments and stakeholder's involvement in a project.

4. Discuss the importance of reviewing and re-assigning roles and responsibilities of team members.

5. Write a short note on quality management practices.

6. Explain the significance of monitoring risks in project.

7. List few tips for data protection in project management.

Unit 3.3 Carry Out Project Closure

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Explain the importance of delivering the project as per the agreed timelines and budget
2. Explain the importance of ensuring all deliverables are fully completed and handed off at the project closure stage
3. Describe the process of finalising and transferring the project deliverables to the client
4. Explain the importance and process of reviewing all contracts and documentation
5. Describe the process of invoicing the client
6. Explain the importance and process of releasing various project resources such as suppliers, contractors, team members, and any other partners
7. Explain the importance of notifying all the stakeholders of the end of the project and ensuring final payments and obligations are completed
8. Explain the importance and process of conducting project performance review and documenting the successes, failures, and challenges of the project
9. Explain the importance of taking feedback from the project management team and identifying the scope of improvement
10. Describe the process of reviewing, finalising and archiving the project-related documents

3.3.1 Importance of Delivering Project on Time

Effective time management leads to increased productivity and effectiveness. One of the most important aspects of effective task management is time management. It is critical to assign time to tasks to complete the project on time. This entails breaking the project down into different tasks. Every project, large or small, necessitates the hiring of a professional project manager to oversee the entire process and ensure that it is completed in a cost- and time-efficient manner. Every project manager's primary goal is to complete the project on time and within budget.

As a project manager, taking a reactive approach virtually guarantees that the project will be late, over budget, and diverted from its original goal. To ensure success, a proactive project manager, fluid communication, and some essential preparation are required. The following suggestions can help the project stay on track and finish on time and within budget.

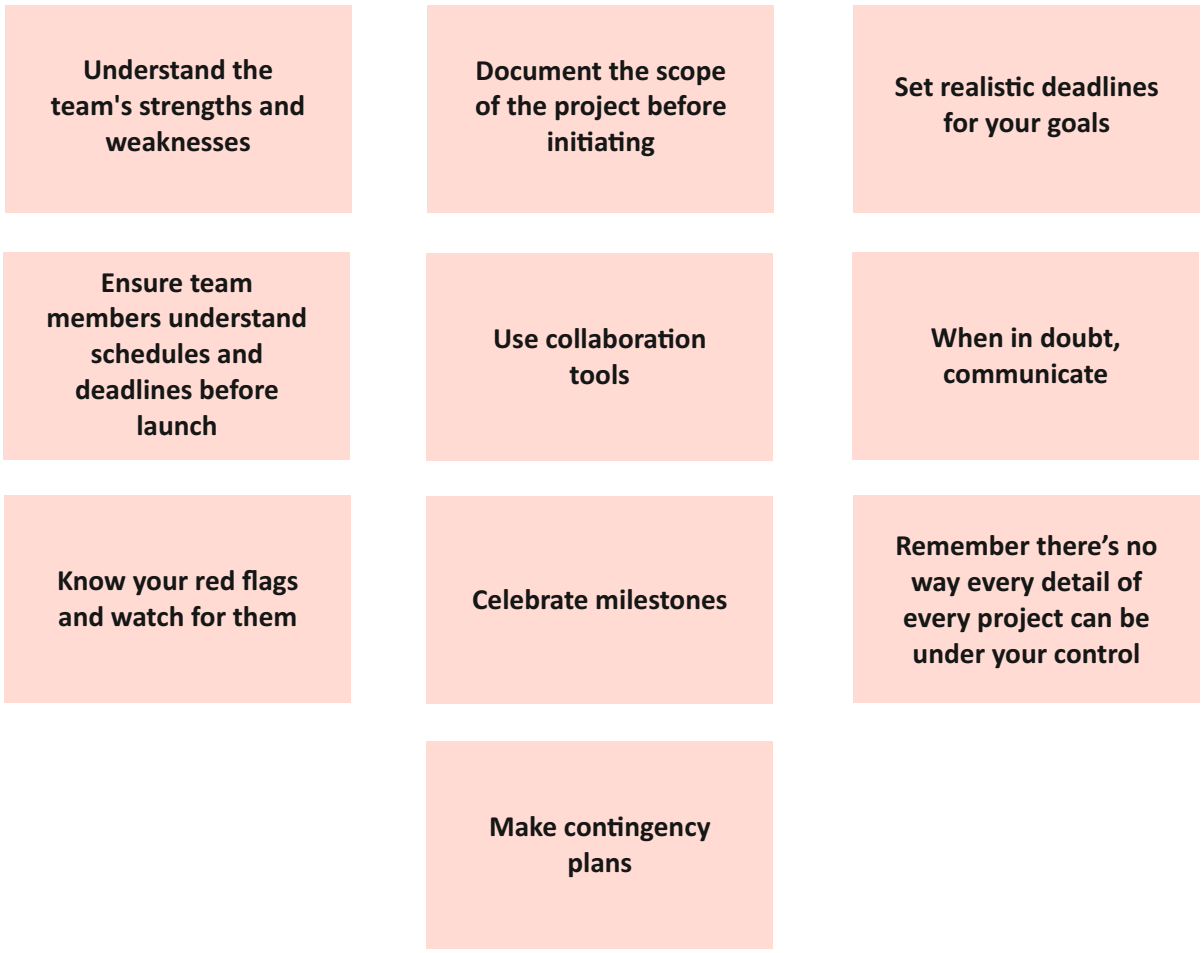

Fig.3.29 Tips for Delivering Project on Time

As a project management professional, the primary focus should be on resolving critical project delivery management issues to ensure successful and timely delivery. These issues can range from procrastination to communication breakdowns to risk mitigation. The figure below depicts the process of finalising and transferring the project deliverables to the client.

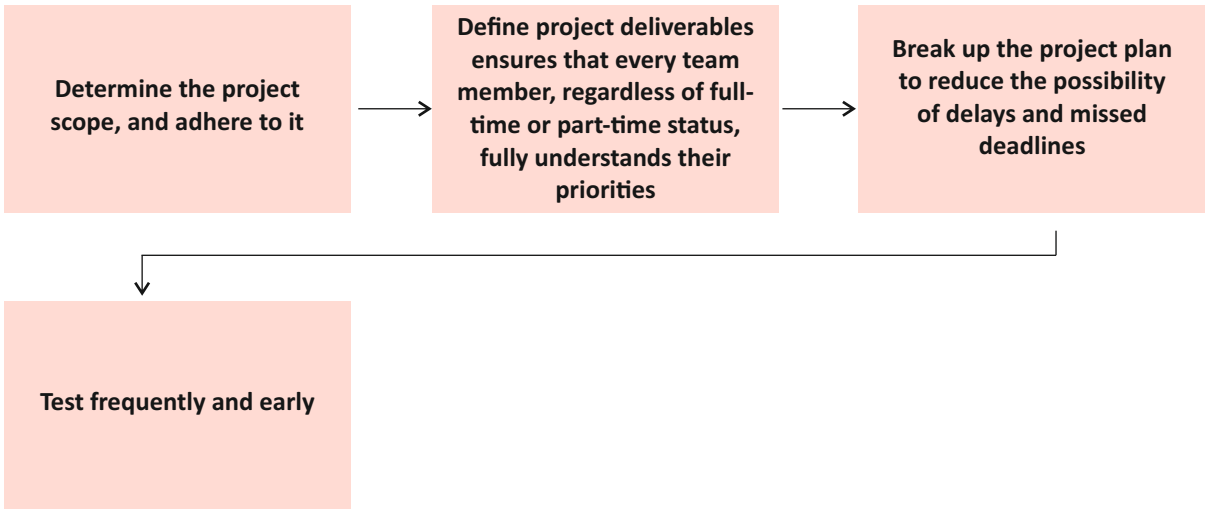

Fig 3.30 Standard Practices for Project Delivery on Time

3.3.2 Project Closure

When it comes to project management, finishing a project is more than just completing deliverables. Even though the process may appear tedious or overly administrative, a formal closure phase ensures that all loose ends are tied up, documentation is signed and approved, contractors are paid, and everyone is on the same page.

The closing phase of the project management lifecycle's purpose is to confirm the completion of project deliverables to the satisfaction of the project sponsor, as well as to communicate the final project disposition and status to all participants and stakeholders. The closing phase also helps to review and evaluate the project's success (or failure), which is critical for future project planning and execution. The diagram below depicts how to navigate the project management closure process.

Fig.3.31 Project Management Process

At first glance, it may appear that completing the first four phases of the project lifecycle is all that is required to wrap up your project and call it a day. However, without a formal closing process, you risk losing important details, which can lead to confusion, a never-ending project, dissatisfied clients, and even liability issues. Project completion assists in avoiding:

a. Making the same mistakes on future projects and goals

b. Having finished products or deliverables in the absence of dedicated support and resources

c. Failure to identify the team or individuals who will own and maintain the solution after its completion.

d. Creating liability issues as a result of late payments, contracts, or deliverables

Several steps are involved in the project management closing phase. To ensure the success of a project, go through the following steps.

Step 1: Formally transfer all deliverables

- Finalize and transfer project deliverables to the client
- Examine the project plan to identify all deliverables
- Ensure that they have been completed and handed off

Step 2: Confirm project completion

- Obtain approvals for project deliverables i.e., all stakeholders must agree that they have delivered on all parts of the project plan
- Official sign-offs from project stakeholders
- Ensure to document all the step so you have proof that the project was officially closed

Step 3: Review all contracts and documentation

- Receive approvals from the clients
- Intiate the process of closing out thecontracts
- Review all the project documentation to ensure all parties have been paid for the work and there are no outstanding invoices

Step 4: Release resources

- Release resources from the project, including suppliers, contractors, team members, and any other partners
- Notify them of the end of the project
- Confirm any final payments or obligations
- officially release them so they are free to work on other projects

Step 5: Conduct a Project Review

- Review the successes, failures, and challenges of the project
- Identify opportunities for improvement going forward
- Calculate the project's performance in terms of cost, schedule, and quality
- Conduct a survey or hold a meeting with the project management team to get feedback on how the project went
- Identify lessons learned and opportunities for the future
- Document your project review with the performance measurement, feedback, and improvement plan

Step 6: Archive documentation

- Finalize all documentation (contracts, project plans, scope outline, costs, schedule, etc.) and index them in the company archives for later reference

Step 7: Celebrate

- Acknowledge your team's hard work and increase morale
- Kick back and take time to celebrate the successful project closure together

Fig.3.32 Project Closure Process

The project lifecycle concludes with the closing phase of project management. In this phase, all deliverables are finalized and formally transferred at this point, and all documentation is signed off, approved, and archived. The project closure process summarizes the following key points:

1. All project management procedures have been carried out
2. Determine whether or not this project was completed on time and within budget
3. Perform due diligence for processes that are required
4. Examine the project's strengths and weaknesses
5. Received final approval and sign-off from all parties
6. Allows the team to review and evaluate the project's performance to ensure the success of future projects
7. Identify key teammates and present awards

3.3.4 Process of Invoicing the Client

Invoice Processing entails the processing of incoming invoices from receipt to payment. An on-account setup, also known as a billing schedule, is used for project invoicing. Fixed-price projects can be invoiced on a per-project or per-contract basis. The invoice amount is determined by the transaction lines entered on projects.

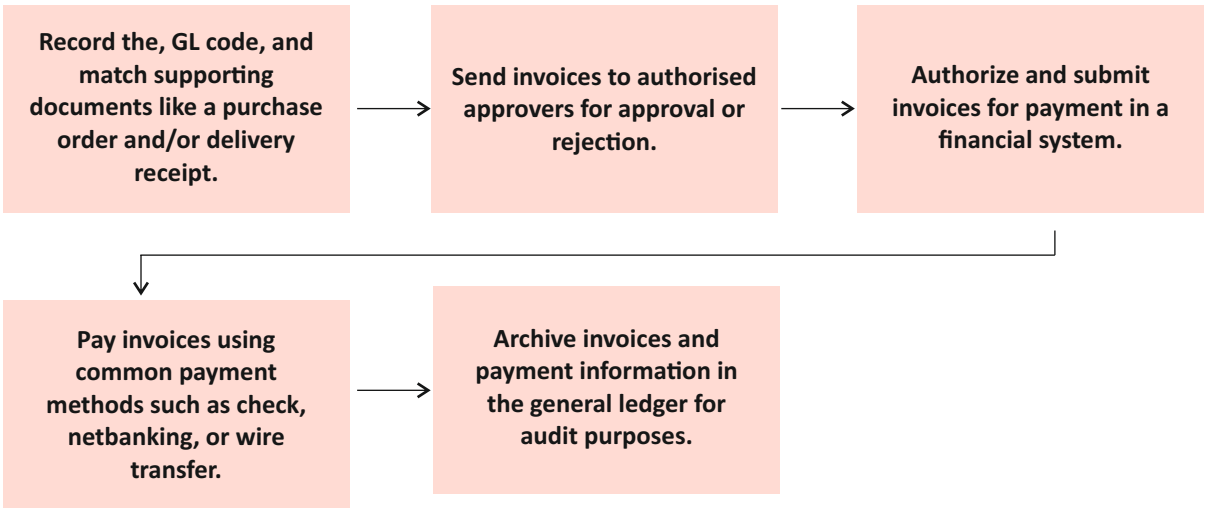

Fig.3.33 Process of Invoicing the Client

3.3.5 Project Performance Review, Feedback and Scope of Improvement

Invoice Processing entails the processing of incoming invoices from receipt to payment. An on-account setup, also known as a billing schedule, is used for project invoicing. Fixed-price projects can be invoiced on a per-project or per-contract basis. Project performance reviews, which are held regularly throughout the life of a project, are the primary means of achieving continuous improvement. Positive accomplishments and valued parts of the process are acknowledged and revealed in project performance reviews, and so are the flaws in our performance and processes. The performance evaluation process aims to promote communication and provide useful feedback about job performance, facilitate better working relationships, provide a historical record of performance, and contribute to professional development. Conducting post-project reviews is a good way to capture and transfer valuable lessons learned. Post-project reviews entail assessing project success and failure, learning from mistakes, and sharing knowledge to improve project success. The following are standard performance review practices:

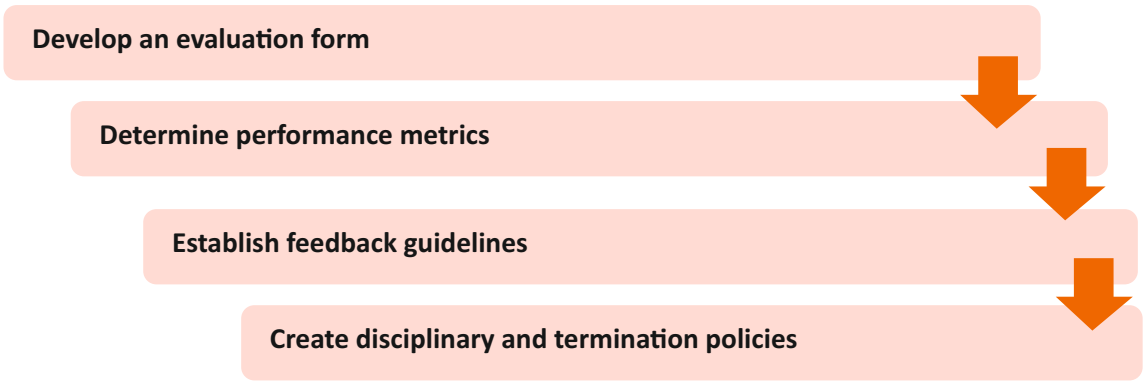

Fig.3.34 Process of Performance Review

Feedback is a critical component of any organization's skill set. Constructive feedback is an effective tool for fostering a positive work environment, increasing productivity and engagement, and achieving better results. Furthermore, it has a positive impact on communication, team member interaction, and teamwork outcomes. Following are the steps to correct and minimize errors based on feedback:

Fig. 3.35 Steps for Rectifying and Minimizing Mistakes at Work

3.3.6 Archiving the Project-Related Documents

Records and documents are essential components of any project. Document archiving is the safe storage of information (both digital and paper) that is no longer in use. It is significant because:

Fig.3.36 Importance of Project Documentation

All documents are vulnerable to being destroyed or corrupted (if digital) whether maliciously, accidentally, or as a result of a natural disaster such as a flood or fire.

Electronic documents can be tainted by:

1. Security risks
2. Failure of software or hardware
3. A power outage
4. Computer failures

Paper documents can be lost due to theft, human error, or an act of God. Correctly archiving documents prevents all of this, giving you peace of mind and ensuring that your data is not affected if the worst happens.

Summary

- The project kick-off meeting is the first gathering of stakeholders, including the project manager, the client, and the team.
- Starting a project without a kick-off meeting is akin to embarking on a journey without a map. A successful and smooth project collaboration begins with a good project kick-off meeting.
- A kick-off meeting's purpose is to formally notify all project stakeholders that the project has begun.
- It's an opportunity for the team to gain a better contextual understanding of the project, demonstrate their understanding and enthusiasm for the project, and lay the groundwork for a positive working relationship with the client.

- It is crucial to assign tasks for the team to function properly and productively. It is the project manager's responsibility to assign tasks to each member of the team. This necessitates making decisions about who is capable of performing specific tasks for the task to be completed successfully.
- Project coordination entails managing a project's day-to-day operations, ensuring that resources are aware of deadlines and tasks for which they are responsible, managing meeting minutes, and so on. The goal of project coordination is to streamline the workflow of the tasks.
- Stakeholders have varying interests, attitudes, and priorities. Effective communication ensures that they receive pertinent information and fosters positive attitudes toward the company or project.
- The most effective project status reports foster accountability and ownership among the team members. They identify problems, mitigate risks, and, most importantly, keep the team on track to meet the project objectives.
- Data analysis is the process of inspecting, cleansing, transforming, and modelling data to discover useful information, informing conclusions, and aid decision-making.
- The process of formalizing acceptance of completed project deliverables is known as validating scope. By validating each deliverable, this process adds objectivity to the acceptance process and increases the likelihood of the final product, service, or result acceptance.
- The risk management plan should be created long before the project begins, and it should be constantly referenced throughout the project lifecycle to ensure that the risk management process is working and that risks are being addressed.
- A project budget is the total estimated cost of completing each project activity throughout the project's phases. It is critical in getting project approval, ensuring funds are ready on time, and measuring performance because it helps set expenditure expectations.
- EHS systems can be thought of as additional efforts to protect employees, the environment, and the general public from hazards. What makes an occupational safety and health system function is slightly more complicated than following a safety system, but EH&S is ultimately everyone's responsibility.
- Everyone must follow standard practices for effective site, logistics and infrastructure management to prevent damage to the property or serious mishaps at the workplace.
- Logistics management is the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption to meet customer requirements.
- A well-planned timeline of project stages, as well as a complete inventory of materials and tools required, is an important aspect of logistics management. Because of the process's complexity and the interaction of multiple supply streams, dedicated simulation software can be used to model, analyse, visualize, and optimize logistics.
- Tracking cash flow can help in organizing and prioritizing where the money is and when it's going to leave the company. Late payments, as well as early incentive payments, can both harm and benefit a project. Cash flow management is critical because it can unlock value for the company and increase the reward for owners. It aids in risk mitigation, investment planning, and collection from accounts for which you have rendered services. It can provide insights into the company and aid in strategic decision-making.
- Project parameters are information containers that you define and then add to multiple categories of project elements.

- A scheduling tool aids in prioritization by allowing project managers to see the big picture and track progress on all projects at the same time. This enables them to prioritize projects based on their business requirements.
- A commitment is a promise made to people who will be impacted directly or indirectly by the project. It entails an organization deciding whether or not to do something important for stakeholders. Commitments can be associated with regulatory or environmental compliance.
- Stakeholder engagement and stakeholder management are arguably the most important ingredients for successful project delivery, but they are frequently viewed as supplementary activities or ones that can be outsourced to business-as-usual functions.
- The review process allows for valuable conversations with employees, providing regular feedback and encouragement, drawing attention to what's important, and ensuring they have all of the tools, skills, and knowledge they need to do their job well.
- Quality control (QC) management practice is a process by which a company seeks to maintain or improve product quality. Quality control entails testing units to see if they meet the specifications for the final product.
- Risk monitoring is important because it reveals whether or not strategies are effective. Risk monitoring can have an impact on organizational risk management because it can lead to the identification of new risks.
- A data breach occurs when information is stolen or taken from a system without the owner's knowledge or authorization. A data breach can occur in either a small or large organization. Hence, it is important to take preventive steps to avoid such occurrences. The organization must install good security to protect its valuable and confidential data.
- Effective time management leads to increased productivity and effectiveness. One of the most important aspects of effective task management is time management. It is critical to assign time to tasks to complete the project on time.
- The closing phase of the project management lifecycle's purpose is to confirm the completion of project deliverables to the satisfaction of the project sponsor, as well as to communicate the final project disposition and status to all participants and stakeholders.
- The project lifecycle concludes with the closing phase of project management. In this phase, all deliverables are finalized and formally transferred at this point, and all documentation is signed off, approved, and archived.
- Invoice Processing entails the processing of incoming invoices from receipt to payment. An on-account setup, also known as a billing schedule, is used for project invoicing. Fixed-price projects can be invoiced on a per-project or per-contract basis.
- Feedback is a critical component of any organization's skill set. Constructive feedback is an effective tool for fostering a positive work environment, increasing productivity and engagement, and achieving better results.
- Records and documents are essential components of any project. Document archiving is the safe storage of information (both digital and paper) that is no longer in use.

Exercise

Answer the following questions:

1. Explain the importance of delivering the project on time.

_____
_____
_____

2. Discuss Project closure in detail.

_____
_____
_____

3. What is the process of invoicing client?

_____
_____
_____

4. Explain the process of performance review.

_____
_____
_____

5. Write a short note on feedback and steps for improvement.

_____
_____
_____

6. Discuss the importance of archiving the project documents.

_____
_____
_____

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youtu.be/C0p5fSNLW8Q

3.3.1 Importance of Delivering Project on Time

youtu.be/iBpv0qHBJ4A

3.3.2 Project Closure

Skill India
कौशल भारत-कुशल भारत

सत्यमेव जयते
GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT
& ENTREPRENEURSHIP

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

ESSCI
Skilling India in Electronics

4. Soft Skills and Work Ethics

Unit 4.1 Work and Communicate effectively at workplace

Unit 4.2 Work in a disciplined and ethical manner

Unit 4.3 Uphold social diversity at the workplace

ELE/N9905

Key Learning Outcomes

At the end of this module, the trainee will be able to:

1. Work effectively at the workplace
2. Implement the practices related to gender and PwD sensitization

Unit 4.1 Work and Communicate Effectively at Workplace

Unit Objectives

At the end of this unit, the trainee will be able to:

1. State the importance of effective communication and interpersonal skills
2. Explain the importance of conveying information/instructions as per defined protocols to the authorized persons/team members
3. Discuss ways of dealing with heightened emotions of self and others
4. Explain the importance of working as per the workflow of the organisation to receive instructions and report problems

4.1.1 Significance of Effective Communication & Interpersonal Skills

Effective communication is required for all employees in the organization to perform basic management functions and carry out their jobs and responsibilities. The ability to communicate effectively at work is essential regardless of industry. Effective communication entails more than just exchanging information; it also encompasses the emotion and intentions behind the facts and conveying a message. Therefore, communicating more clearly and effectively requires learning some essential skills. Learning these skills can assist employees in developing stronger bonds, gaining more trust and respect, improving teamwork, problem-solving, and overall social and emotional health. As a result, we can state that "effective communication is a foundational component of successful organizations."

Fig. 4.1 Importance of Effective Communication and Interpersonal Skills

It is extremely difficult for **project managers** to manage their teams and coordinate efforts for successfully completion of a project without strong interpersonal communication skills. A project cannot be successful if there is no communication. Without effective communication skills, dealing with all of the intricate details, dependencies, decisions, and approvals that a project entails would be impossible. The project manager must possess following interpersonal communication skills.

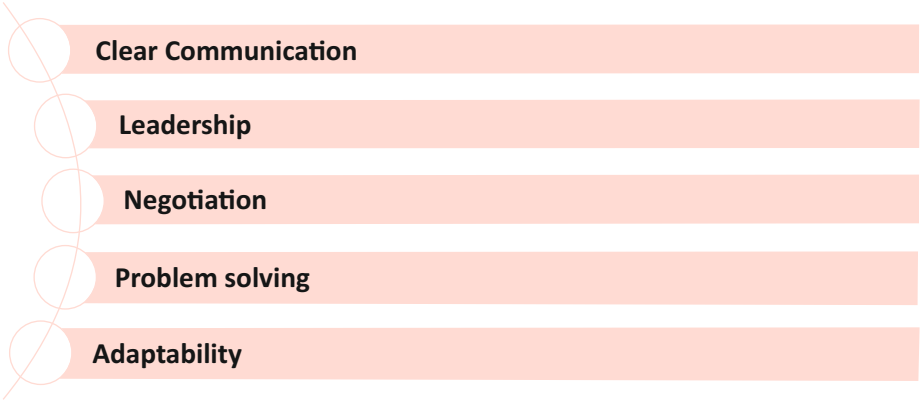


Fig. 4.2 Interpersonal Communication Skills of Project Manager

4.1.2 Communication Process

The process of communication is a dynamic structure that explains how a message is transmitted between a sender and a receiver via various communication channels. Its purpose is to ensure that the receiver accurately decodes the message and can provide feedback with precision and convenience.

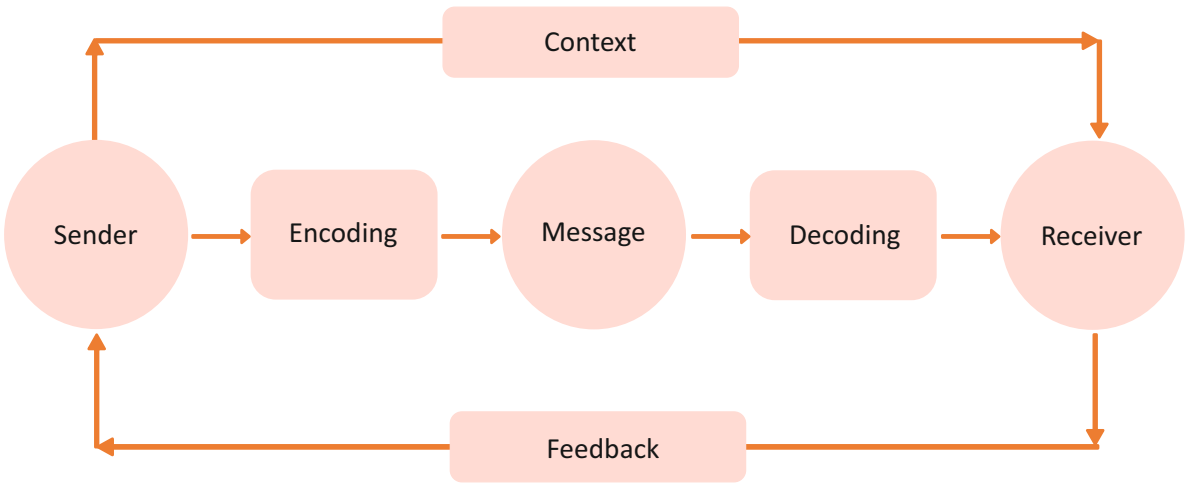


Fig. 4.3 Process of Communication

As demonstrated in the exhibit above, there are 8 elements of communication:

Sender
Who sends the message or is the source of the message.

Encoding
Transferring the message into a format that can be shared. It includes the language or tone chosen.

Message
The idea being communicated by the sender.

Channel
The mode chosen for communicating. Example- phone, oral, text, gestures, or writing.

Decoding
It means how the sender comprehends and understands the message that sender has communicated

Receiver
The idea being communicated by the sender

Feedback
The revert or the response communicated by the receiver to the source/sender after having decoded the message

Context
The environment, situation, or the circumstances in which the communication is happening

Fig. 4.4 Elements of Effective Communication

4.1.3 Communication Barriers

All of the elements depicted above can also act as a barrier to communication. Communication barriers are factors that prevent a message from being received in the way the sender sent it. People frequently face the problem of the message being received in an assumed manner when communicating. As a result, it leads to miscommunication and misunderstandings. Let us look at the table below to understand four significant barriers to communication.

Communication Barriers	
	**Physical or Environmental Barriers** • The barriers in the surroundings or in the environment are the physical barriers. • Example- Noise in the surroundings, the physical distance between the sender & receiver, defects in the communication system like network problems, poor signal, etc.

Communication Barriers	
	**Language Barriers** • This barrier arises due to the different language or differences in the language of the sender and receiver. • This problem often occurs because of the different meanings perceived in the same word, or the receiver does not understand the jargon used in the message. The language barrier is not limited to spoken language. It also includes body language. • The same message is perceived differently by the receiver said with different body language.
	**Psychological Barriers** • Barriers or problems arising due to the differences in perception, ego clashes, prejudices, state of mind, poor past experiences, behaviors, attitudes, moods, and value systems are psychological barriers. • These barriers are generally exceedingly difficult to overcome.
	**Socio-Cultural Barriers** • Sometimes the differences in social or cultural norms cause communication problems. • These include how the people generally speak, wear, follow customs, behave, or eat is not completely understood by the receivers who are not accustomed to the differences. • For example, some communities are louder and more extravagant than others.

Table. 4.1 Potential Barriers in Communication

4.1.4 Effective Communication with Superior and Colleagues

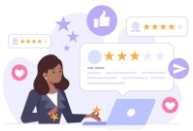
It is significant to convey information as per defined protocols to the authorized person's/team members, as it reduces communication gaps, strengthens alignment with all levels of leadership, and ensures that employees receive consistent messages. The Communication Protocol specifies the types of information to be communicated to the organization, as well as the person(s) in charge of communicating specific topics. The audience, frequency, and suggested communication vehicles are also discussed. The Protocol, which is prominently displayed in all common areas such as lobbies and conferences, and is distributed to all new hires, ensures that communications align with the company's key strategic priorities.

Effective communication with the supervisor is essential for professional development and advancement. Refer to the exhibit below for tips on communicating with the supervisor effectively.

Listen to your supervisor carefully and understand the goals and requirements

Report the facts and problems and ask for possible solutions if necessary

In case of an unsuccessful attempts, highlight it to the supervisor rather than covering it up



Stay open to feedback and keep a positive attitude

Inform immediately about any situation that needs attention

Follow the code of conduct that has been established by the organization

Igreet the supervisor with a smiling face

Don't argue with the supervisor in front of other employees

Concisely put your point of view, concerns, and requests in a polite and respectful manner

A loud voice tone suggesting impatience, sarcasm or taunt, is not acceptable by anyone

I Avoid words and topics which may offend someone

Communicate regularly with your supervisor to develop and maintain a successful professional relationship

Fig. 4.5 Tips for Effective Communication with Superior

Following proper communication, rules are critical to keeping a healthy relationship with colleagues and co-workers. The quality of the relationship with colleagues and co-workers will depend on the behavior you demonstrate while interacting with them. A relationship built on trust, excellent, clear communication, polite language, and appropriate behavior helps you succeed at work.

Fig. 4.6 Tips for Effective Communication with Superior

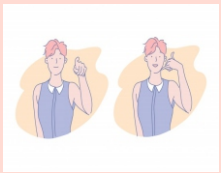
4.1.5 Organizational Communication

Organizational communication can be divided into two categories: formal and informal communication.

1. **Formal communications** are those that are official and are part of a recognized communication system that is involved in the organization's operation. These communications can be either verbal or written.
    a. It can take place between a superior and a subordinate, or between a subordinate and a superior, administratively or externally.
    b. It can happen outside of the organization, i.e. with suppliers, clients, unions, government agencies, and community groups.
    c. It can sometimes be obligatory, indicative, or informative. Mandatory communication implies an order or command to be followed and is known by various euphemisms such as instructions, briefing, and so on.
2. **Informal communications** emerge from the social interactions of coworkers. These are bound by conventions, customs, and culture rather than any chart on the wall. In the form of grapevine, such communication provides useful information for upcoming events.

Any communication style is only effective if the listener actively listens, observes, and empathizes. In an organization, four major types of communication are used on a daily basis:

Verbal
- Use strong, confident speaking voice.
- Use active Listening
- Avoid filter words



Non-verbal
- Notice how your emotions feel physically
- Be intentional about your nonverbal communications
- Mimic nonverbal communications you find effective

Visual
- Ask others before including visuals
- Consider your audience
- Only use visuals if they add value
- Make them clear and easy to understand

Written
- Strive for simplicity
- Is to the point and avoid unnecessary repetition
- Avoid offensive language

Fig. 4.7 Types of Communication and Ways to Use Them

4.1.6 Managing Emotions at Work

Humans are emotional beings. It is difficult for us not to be emotional. While it is generally beneficial to be in touch with our emotions and not suppress them, there are some situations in which we must manage our emotions especially well. This is especially true at work. Emotional outbursts at work could be caused by work-related issues or by stressors from our personal lives spilling over into our work lives. Handling our emotions (especially negative ones) at work is frequently regarded as a test of our professionalism. Although, it is never good to repress or suppress emotions, whether positive or negative. However, in order to function in a variety of situations, we must manage our emotions. The following are some coping strategies to deal with heightened emotions at work.

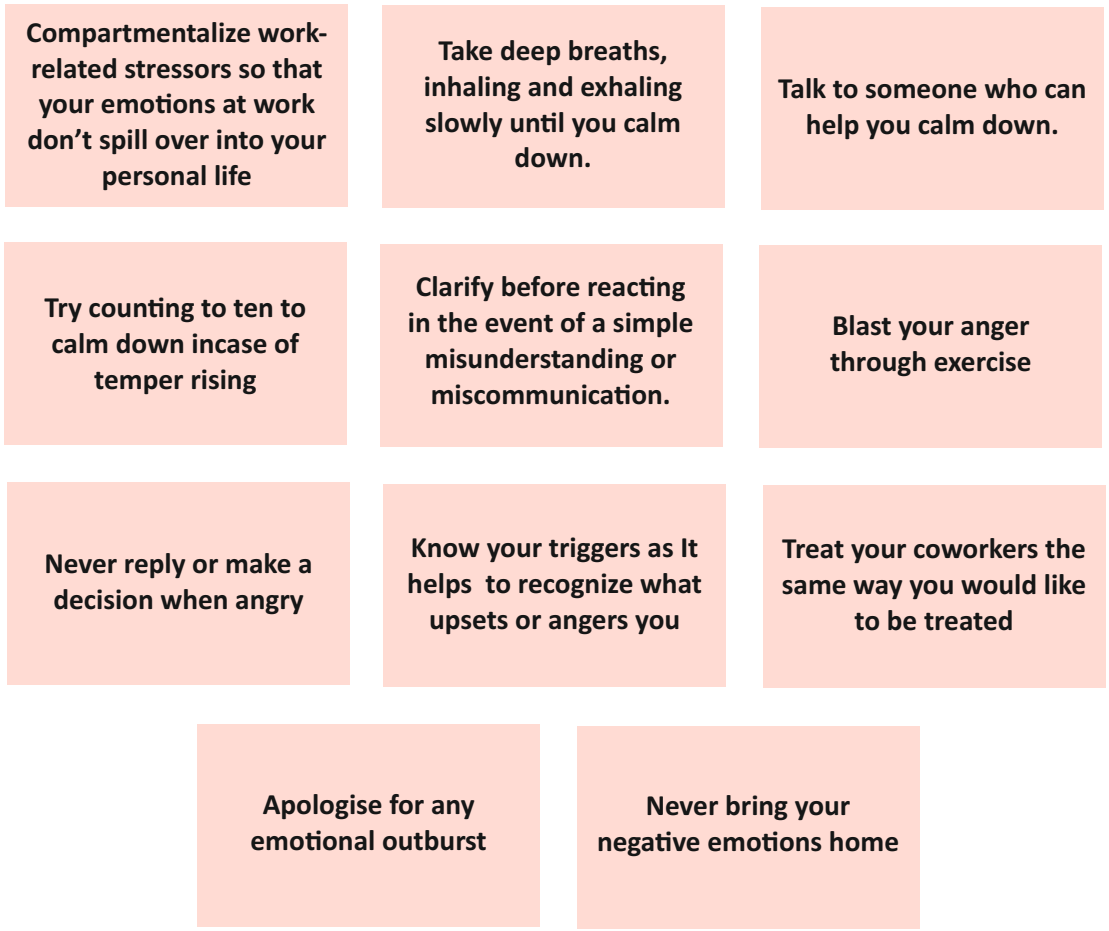


Fig. 4.8 Strategies for Coping with Heightened Emotions at Work

Notes

4.1.7 Organizational Structure

An organizational structure is a system that defines how specific activities are directed in order to achieve an organization's goals. These activities may include rules, roles, and responsibilities. The organizational structure also governs how information flows within the company. There are numerous types of organizational reporting structures, each with its own set of benefits and drawbacks. The reporting structure is chosen based on the organizational requirements. The following are the top organizational reporting structures.

Hierarchical organizational structure

- It is a pyramid-like top-down management structure

Functional organizational structure

- It is a business structure that divides a company into departments based on areas of expertise.

Divisional or product organizational structure

- In a product-based structure (also known as a divisional structure), employees are assigned to self-contained divisions based on the -market, product line and geography.

Line-and-staff organizational structure

- In this structure, authorities (e.g., managers) establish goals and directives that are then carried out by employees and other workers.

Flat organizational structure

- A flat organizational structure means that there are few (if any) levels of management between the workforce and the highest-level managers.

Matrix organizational structure

- A matrix organization is a work structure in which team members report to multiple leaders.

Network organization structure

- It is a type of internal structure that prioritizes communication and relationship goals over hierarchy.

Fig. 4.9 Types of Organizational Structure

4.1.8 Importance of Working as per the Organization's Workflow

Workflow, in a broad sense, is the set of tasks—grouped chronologically into processes—and the set of people or resources required to complete those tasks to achieve a specific goal. The workflow of an organization consists of the processes that must be completed, the people or other resources that are available to perform those processes, and the interactions between them.

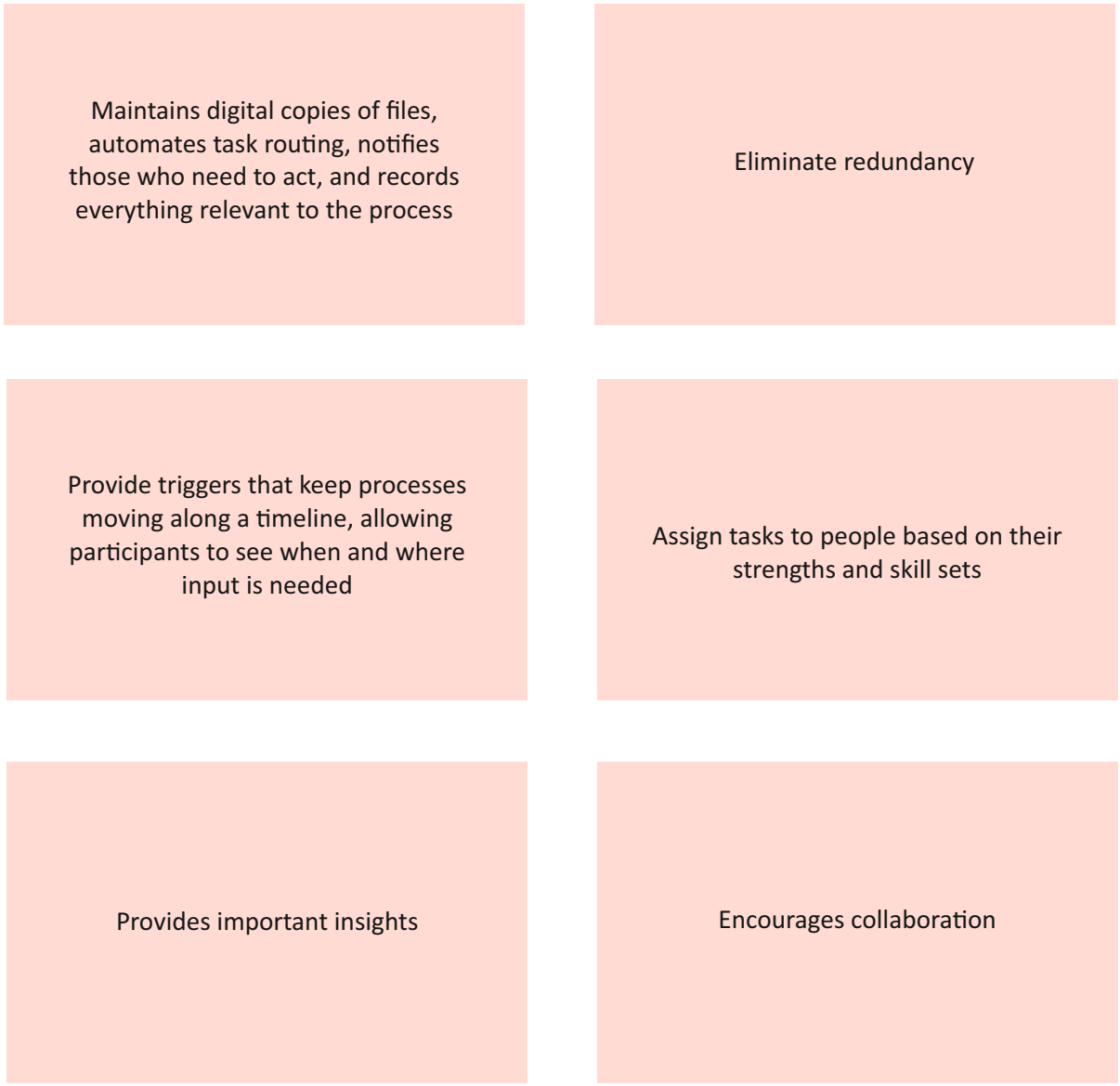


Fig 4.10 Importance of Working as per the Organization's Workflow

4.1.9 Organizational Communication Policies and Procedures

Communication is a vital management component of any organization. Effective communication is a critical issue for effective management, whether the purpose is to update employees on new policies, prepare for a natural disaster, ensure safety throughout the organization, or listen to employees' attitudes. To attain success, organizations should have comprehensive policies for communicating with their, employees, stakeholders, and the community at large. With a formal, defined and comprehensive communication strategy, organizations can make sure that they:

1. Communicate consistent messages

2. Establish a distinguishable brand

3. Deliver messages that are congruent with the organization's mission, vision, and culture

Communication policies of an organization establish expectations and manage the flow of communications within and outside the organization. As a result, it facilitates meaningful and necessary communication for employee productivity and morale without restricting employees' feeling intimidated and powerless. In addition, good communication policy, reduces conflicts and misunderstandings.

An organization has many channels for communication, running internally and externally. It is imperative to regulate these channels for the sake of business interests. Therefore, communication policy and procedures need to be written out in clear, straightforward language for all the employees. When outlining these communication policies and procedures, it is essential to consider existing policies and regulations that must comply with the organization. It is important for a workplace where employees need to understand proper lines of communication and behavior with one another. Communication policy and procedures guide the employees for handling information, either outgoing or incoming, that pertains to the organization. It focuses on spreading important news and information to other co-workers, customers and stakeholders. Creating clear rules avoids liability issues and embarrassing or damaging situations in the organization.

1. **Procedures for verbal communication -** It is essential to communicate well verbally to understand what others are saying to you. Following are the key points when communicating verbally in an organization:

   a. Employees should speak clearly and listen carefully when communicating with each other. If it is not clear, ask the person to repeat it or explain what they mean.

   b. Speak clearly and slowly to deliver the correct message. Avoid speaking quickly or in a mumbling tone. Repeat the message to make sure it is right.

   c. Pass on the urgent messages as soon as possible. If the person is busy, then then wait for your chance to speak. On the other hand, if the message is very urgent, inform them politely.

2. **Procedures for written communication -** Most workplaces have standard writing methods. They have special forms or layouts to use. These are sometimes called 'templates'. Using these is part of the organizational procedure. Each employee must use these standard layouts for written communication. For example, writing e-mails, letters, memos, faxes and messages and other office tasks. Below are the key points when using written communication in an organization:

   a. Keep it simple. Make your sentences, paragraphs, and the overall document as short and concise as possible.

b. Strive for clarity
c. Keep it in a structured form
d. Use appropriate tone
e. Give the right amount of detail
f. Give copies to everyone concerned

4.1.10 Sharing Information with Team Members

In the workplace, information drives communication, and communication, in turn, allows all members of the organization, from entry-level employees to the CEO, to work together to achieve the company's goals and maximize productivity. Transparently sharing data and information ensures that everyone is in the loop and aware of any potential issues with the business, product, or service that can be addressed collaboratively. Employees might have lots of knowledge that is crucial for the organization and other employees. **Sharing information helps them connect, perform better, and become more vital as professionals**. The following chart explains the importance of sharing information with team members in an organization:

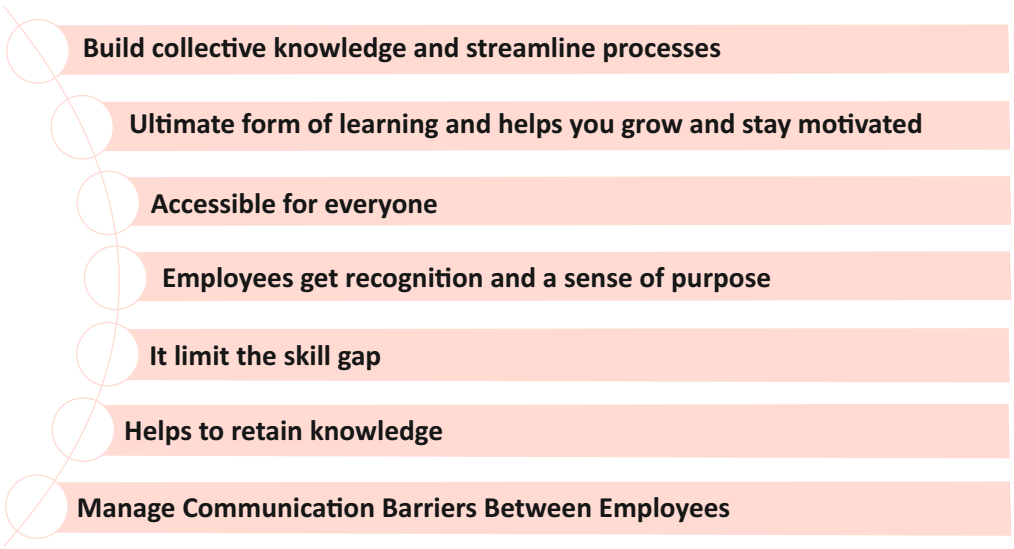


Fig. 4.11 Importance of Sharing information with team members

4.1.11 Individual and Team goals

Goal setting is undoubtedly one of the most effective motivational tools in the organization. Almost every organization requires employees to set goals regularly. Even when times change, continuously updating and setting goals is necessary to keep your business on track. Goals in each organization should be **S.M.A.R.T: specific, measurable, actionable, realistic, and timely**. It helps you and your team feel a stronger sense of purpose and direction. In addition, setting goals in place will help you and your team feel productive with each bit of accomplishment and ensure that more significant production stays on track.

Individual goals are significant because they give direction to the employees. While team goals are great for the overall guidance, personal goals will allow your team members to take distinct paths to digest the larger plan and turn it into action.

Team goals are necessary to guide the entire organization. It includes broad objectives that can be broken down into team projects and initiatives with individual key results. In addition to helping the organizations achieve their objectives, setting team goals also **boost employee engagement, productivity and retention by ensuring that every team member has a complete understanding of their role in the overall approach**. This also **saves time and improve efficiency**. In addition, setting team goals also offers organizations the following benefits:

Fig. 4.12 Benefits of Team Goals in an Organisation

Notes

4.1.12 Performance Measurement

Team performance evaluation is a key factor in inspiring teams, improving the quality of work, and keeping them motivated. It is the best channel to understand how the team is performing and an effective measure to get feedback about how production is going, whether the employees are working positively towards achieving goals, and what can be done to improve employees' engagement. It also provides a foundation to determine increments and succession plans for the team and the development of an organization.

A comprehensive team performance evaluation process often consists of different evaluation methods to help judge a team's performance. Using multiple techniques can help in getting a broader perspective of the areas where a team needs to improve and the steps you can take to support the team's growth.

The following chart explains the need for employee performance measurement methods:

Fig 4.13 Importance of Performance Measurement

Performance evaluation methods include the following:

1. **Peer review:** This is one of the strategies that many organizations and employee evaluation software use to enhance the traditional evaluation process. The peer-review process consists of anonymous feedback from shift managers, colleagues, teammates, and peers on specific aspects of team members' performance.

   a. It provides a unique prospect to study the team member’s skills and capabilities and help identify individuals’ networking, leadership, occupational, and collaboration skills within an organization.

   b. This process provides a unique chance to determine each team member's strengths and weaknesses and use this valuable data to decide succession planning, building teams, and shift rotations.

2. **Self-evaluation:** Self-evaluation is a vital activity to help make the evaluation process more efficient. When done correctly, it can provide several critical inputs to the organization. In addition, this method offers a chance for the team to play an active role in their evaluation process. Thus, the employees are given a voice rather than simply receiving the management's feedback. This directly links their jobs and the evaluation process and thus, fosters better communication between the staff and the management. With active participation, employees tend to experience better engagement with the overall review process, while managers can better understand the individual's performance and their perception of their performance.
3. **Quantitative evaluation:** It is based on statistics and utilizes various standards to track the productivity. The process begins with the formulation of organizational standards against which employee data can be measured. Different industries have different ways to articulate their quantitative output. For example, the number of units produced in traditional manufacturing is generally a reliable quantitative metric. Similar metrics are still used in modern organizations.
4. **360-degree feedback:** This is another tool to evaluate employee's performance. To assess an employee's score, his managers, peers, subordinates, and customers are asked to provide feedback for specific areas. This feedback often gives an accurate and multi-perspective view of the employee's performance, skill level, and improvement points.

Fig.4.14 360-degree Feedback Method

5. **Competency on a scale:** This is among the most frequently used employee performance evaluation techniques. In this method, the employee's performance in various job duties is rated on a defined scale. A wide range of criteria, including productivity, quality of work, concern for safety, customer service, teamwork etc., are evaluated. This method can be achieved with letters or numbers, and it usually consists of a range, unsatisfactory to outstanding. This method also allows employers to evaluate several employees simultaneously.
6. **Subjective appraisal by the manager:** In most organizations, performance is assessed several times a year during (bi-)annual performance reviews. Employees are evaluated on various criteria, the job-quality being the most common.
7. **Human Capital ROI:** It is a metric that assesses the human capital value (i.e., knowledge, habits, and social and personal attributes). Human Capital ROI can be determined by calculating the company's revenue (minus benefit-cost and operating expenses and compensation) and dividing this by the total compensation and benefit-cost that the company pays for its employees.
8. **Absenteeism Rate:** Absenteeism and performance are highly correlated constructs. Highly motivated and engaged employees generally take fewer sick days. Additionally, absent employees are less productive, and high absenteeism rates throughout an organization are a key indicator of lower performance.
9. 9. **Overtime per Employee:**

Overtime per FTE = Total hours of overtime / FTE

The average overtime per FTE (full-time equivalent) is a final employee performance metric. Employees, eager to put in the extra effort are generally highly motivated and tends to produce more (in terms of work quantity).

Notes

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4.1.1 Significance of Effective Communication & Interpersonal skills

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4.1.2 Communication Process

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4.1.3 Communication Barriers

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4.1.5 Organizational Communication

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4.1.6 Managing Emotions at Work

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4.1.7 Organizational Structures

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4.1.12 Performance Measurement

Exercise

1. Fill in the Blanks:
    a. _____is a building block of successful organizations.
    b. A healthy relationship with colleagues is built on _____, _____ and_____.
    c. _____ is a part of your organization's duties to its community and stakeholders.
    d. Sharing information helps employees to limit the _____ gap.
    e. _____ is a mechanism or strategy that enables different entities to work together.
    f. _____ facilitates meaningful and necessary communication for employee _____and manage the communication flow within and outside the organization.
    g. Fill in the Blanks-
    h. _____ is a set of rules indicating the proper and polite way to behave at work.
    i. _____include how the people generally speak, wear, follow customs, behave by the receivers who are not accustomed to the differences.
    j. _____ is the response communicated by the receiver to the source/sender after having decoded the message.
    k. The quality of the relationship with colleagues and co-workers will depend on the _____ demonstrate while interacting with them.

2. Goals in each organization should be:
    a. Specific, monthly, adjustable, realistic, and timely
    b. Smart, measurable, actionable, realistic, and timely
    c. Specific, measurable, actionable, realistic, and timely

3. The following are the types of communication at workplace, except:
    a. Employer – employee
    b. Colleagues
    c. Stakeholders
    d. Customer – friend

4. Which one is not the correct way of verbal and written communication?
    a. Short
    b. Irrelevant
    c. Simple
    d. Direct

5. Differentiate between team goals and individual goals.
6. What is effective communication?
7. How language barriers create gaps in workplace?
8. List any two tips for communicating effectively with superiors.

Unit 4.2 Work in a Disciplined and Ethical Manner

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Explain the importance of work ethics and workplace etiquette
2. Explain ways to maintain discipline at the workplace
3. Discuss the importance of following organisational guidelines for dress code, time schedules, language usage and other behavioural aspects
4. Discuss the common reasons for interpersonal conflict and ways of managing them effectively
5. Explain the common workplace guidelines and legal requirements on non-disclosure and confidentiality of business-sensitive information

4.2.1 Importance of Work Ethics and Workplace Etiquette

A professional code of ethics establishes an organization's ethical guidelines and best practices for maintaining honesty, integrity, and professionalism. Violations of the code of ethics can result in sanctions, including termination, for members of an organization. The following figure explains the standard practices and professional code of ethics follow in every organization.

Fig.4.15 Professional Code of Ethics

Work ethics are the morals or principles that govern a person's or group's behavior, whereas etiquette is a set of rules indicating the proper and polite way to behave at work. Both contributes positive energy and influence to the growth of an organization. Workplace etiquettes inspire healthy and interactive communication among employees and promote honesty, integrity, and respect for each other in the organization.

Fig.4.16 Workplace Etiquettes

4.2.2 Managing Conflicts at Workplace

Dealing with conflict at the workplace is inevitable. The ability to recognize conflict with your colleagues, understand its nature, and try to bring a quick and fair resolution to the conflict is critical to anyone who works in a team. **Conflict management** is a crucial skill that enables an individual to handle confrontations tactfully and constructively. It aims to yield a positive result from disputes and disagreements that occur between people in the workplace and resolve the conflict in a way that respects everyone's wants and needs. At some point, we need skills for managing conflict in the workplace. The following tips can help us resolve the conflict or a disagreement in that situation.

Fig. 4.17 Tips for Managing Conflicts

4.2.3 Maintaining Discipline at Workplace

Employee discipline isn't about power or punishment. It is about making the workplace safe and enjoyable for both employees and management. Discipline is most effective when there is mutual trust between managers and employees. It all begins with clear communication and continues with consistency. Discipline assists employees in correcting any shortcomings to become valuable, contributing members of the workforce. Documentation created as a result of the disciplinary process can also help an employer protect itself if termination or other adverse employment decision is required. Here are the ways to maintain workplace discipline in the organization while maintaining employee respect:

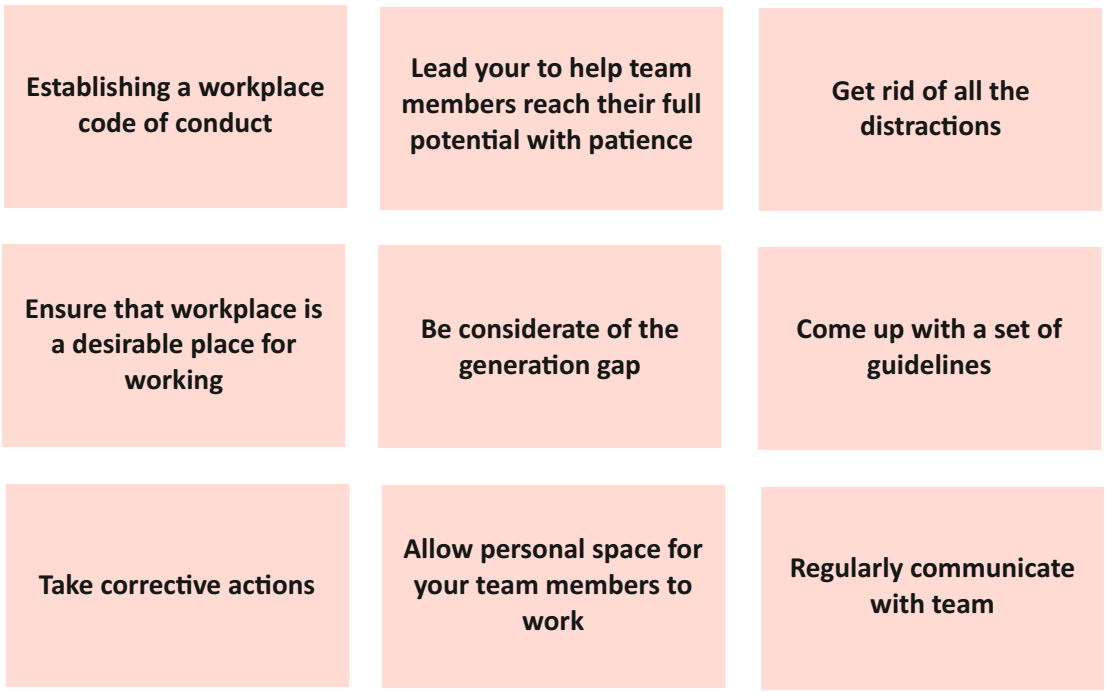

Fig. 4.18 Tips for Maintaining Discipline at Workplace

4.2.4 Confidentiality in the Workplace

Confidentiality, or not disclosing specific information, is essential in a variety of jobs. Confidentiality is important for legal and reputational reasons, but it is also important because future employment may be contingent on it. Some information, such as personally identifiable information and 'business secrets,' is legally protected in several countries. As a result, it is crucial to understand the nature of confidentiality and how to ensure that employees follow legal or ethical guidelines. Confidentiality refers to the state of keeping information secret or not disclosing it. Following are the type of information that comes under the non-disclosure and confidentiality of business-sensitive information.

Notes

Employee Information
- Includes the private information of employees such as name, address, maiden name and so on

Managerial Information
- Includes both information about individuals, such as disciplinary action, and also about broad management actions such as planned redundancies or employee relations issues

Organisational Information
- Also known as business information or 'trade secrets'

Customer or Contact Information
- Partially covered by 'trade secrets'

Professional Information
- Information about individuals or organisations through their professional position.

Fig. 4.19 Types of Confidential Information

Notes

Exercise

Answer the following questions:

1. Write a short note on work ethics and workplace etiquette.

_____
_____
_____

2. List any 3 ways of maintaining discipline at the workplace.

_____
_____
_____

3. What is conflict management?

_____
_____
_____

4. Explain confidentiality in the workplace.

_____
_____
_____

5. How language barriers create gaps in workplace?

_____
_____
_____

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youtu.be/NJH0XV9jGIE

4.2.2 Managing Conflicts at Workplace

youtu.be/qv2nxVXXD8I

4.2.3 Maintaining Discipline at Workplace

Unit 4.3 Uphold Social Diversity at the Workplace

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Describe the process of reporting grievances and unethical conduct such as data breaches, sexual harassment at the workplace, etc.
2. Explain the concept and importance of gender sensitivity and equality.
3. Discuss ways to create sensitivity for different genders and Persons with Disabilities (PwD).

4.3.1 Grievance Management

Grievances results in collective disputes when they are not resolved timely. Also, this lowers the morale and efficiency of the employees. Frustration, employee dissatisfaction, low productivity, lack of interest in work, high absenteeism, etc. might be a result of unattended grievances. In short, grievance arises when the organization does not fulfill employees' expectations, resulting in a feeling of discontentment and dissatisfaction. This dissatisfaction must have cropped up from employment issues and not from the personal issues.

A grievance may result from the following factors-

a. **Working Conditions and Safety:** These consists of any complaint or grievance that directly addresses the employees' work environment. These can include everything from unsafe working conditions to difficult and indifferent managers.

b. **Unreasonable Management Policies:** If employees believe that a particular policy is unfair or unreasonable, they will want their concerns addressed. Such policies can include a gap in production standards or overtime regulation compliance.

c. **Violations of Rules and Policies:** These are related to any organizational rules which the employees feel are being violated by other workers and/or middle or senior management.

The project manager should immediately identify all grievances and take appropriate actions to eliminate the causes of such grievances to achieve employee's loyalty and commitment to their work. Thus, effective grievance management is an essential part of personnel management.

For Addressing Grievance, project manager should adopt the following approach to manage grievance effectively:

1. **Complaint:** As soon as the grievance arises, it should be identified and resolved. This lowers the detrimental effects of grievance on the employees and their performance.
2. **Acknowledging grievance:** Acknowledge the grievance put forward by the employee as a manifestation of true and genuine feelings of the employees. Acknowledgment implies that you are eager to look into the complaint impartially and without bias. This creates a conducive work environment with instances of grievance reduced.
3. **Gathering facts:** Gather relevant and adequate facts that explains the nature of the grievance. These facts must be recorded to be used at a later stage of grievance redressal.
4. **Examining the causes of grievance:** The actual cause of resentment should be identified. Consequently, remedial actions should be taken to prevent the repetition of the grievance.

5. **Decisioning:** After identifying the causes of grievance, an alternative course of action should be suggested to manage the grievance. The effect of each action on the existing and future management policies and procedures should be analyzed, and accordingly, the manager should take a decision.
6. **Execution and review:** The manager should implement the decision quickly, ignoring the fact that it may or may not hurt the concerned employees. After implementing the decision, a follow-up must ensure that the grievance has been resolved completely and adequately.

An effective grievance procedure ensures a pleasant work environment because it redresses the grievance to the mutual satisfaction of the employees and the supervisors.

Fig 4.20 Grievance Addressing Process

4.3.2 Sensitivity for Person-With-Disability (PwD)

Disabled workers are a part of the diversity in today's workforce. However, being disabled does not imply that the individual is incompetent or unable to do his/her job. In fact, being disabled simply means the person has an impairment, which can be anything ranging from physical to psychological.

Disabled co-workers and employees are not any different in that they are there to earn a living, advance their career, and better the organization through their contributions.

Listed below are some tips for interacting and communicating with people with disabilities.

Fig. 4.21 Communicating and Interacting with PWD

The RPWD Act, 2016 provides that "the appropriate Government shall ensure that the PwD enjoy the right to equality, life with dignity, and respect for his or her own integrity equally with others." The Government is to take steps to utilize the capacity of the PwD by providing appropriate environment.

Gender inequality in an organization's is a complex phenomenon that can be seen in organizational structures, processes, and practices. Following chart explains gender based issues in workplace:

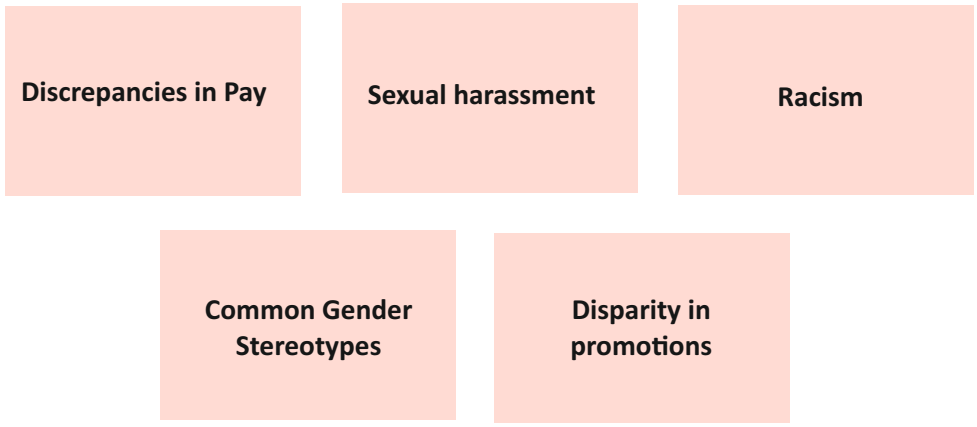

Fig. 4.22 Gender based Issues at Workplace

Females with disabilities are subjected to multiple layers of discrimination. Based on their gender and disability status, they often face double discrimination. They often face disproportionately high rates of gender-based **violence, sexual abuse, neglect, maltreatment and exploitation.** The exclusion experienced by women and girls with disabilities is a social issue that requires active participation of everyone.

It is important to follow organizational standards related to PwD at workplace because, it:

Protects them from any physical harm or any accidents

1. Provides them equal rights
2. Protects them from any kind of discrimination and racism
3. Provides security from any kind of violence and harassments
4. Protects their respect and dignity
5. Provides equal opportunities to deserving candidates

4.3.3 Gender Sensitivity

Gender sensitization is vital because representation is important. Representation of a person and community advocates equality and adds a sense of inclusion to the previously marginalized community. For a healthy performance-oriented culture, organizations need the correct mix of talent which is not bound by any gender. More than ever, accountability has become important now, organizations only have today to make the changes that count, as tomorrow they won't be able to hide under the pretext of ignorance. Each member of an organization seek out to learn and grow at their workplace, and an insensitive place of work not only hinders that but also tends to become an unfriendly workplace. Gender sensitization is extremely significant as it helps the employees feel appreciated and cared for within the organization. Lastly, for the betterment of society, organizations have got an ethical responsibility in shaping the current structures by breaking the old norms. Organizations that do not emphasize on gender sensitization usually develop cultures where inequality and discrimination becomes normal. This kind of culture leads to a higher attrition rate, a higher rate of employee absenteeism, etc. Such policies also propogates the presence of a superior gender.

The concept of gender sensitivity shows the path to reduce barriers to personal and economic development created by gender differentiation. In addition, it helps to generate respect for individuals regardless of their gender.

Gender sensitivity is not about fighting women against men. On the contrary, gender-sensitive education, benefits members of all genders. It helps the individuals determine what assumptions are valid and which are stereotyped generalizations in matters of gender. Gender awareness not only requires intellectual efforts but also sensitivity and open-mindedness. It opens up the broadest possible range of life options for both women and men.

Some of the best practices followed to stay gender-sensitive would be to

- Use respectful language while communicating with each other. Do not reinforce gender stereotypes.
- Provide fair opportunity to everyone irrespective of their gender
- Do not promote creating gender-specific social groups.
- Neither victimize nor patronize based on gender

Notes

4.3.4 Rights and Duties at Workplace Concerning PwD

The following chart explains the rights and duties at the workplace with respect to PwD:

Rights	Duties
1. To an accessible workplace free of hazards and risks	1. To provide complete and honest information as it relates to the job
2. To complete information about the job	2. To request reasonable accomodation or assistance if needed
3. To information, education, training and safely equipment that reduces risks and hazards	3. To practice safely procedures and use equipment to reduce risks to self and others
4. To equal access to benifits, conditions of employement and promotional opportunities	4. To report illness or injury promptly
5. To special safety procedures and considerations that may relate to one's disability in case of emergency	5. To cooporate and work with rehabitation professionals and employes in good faith regarding return to work.
6. To be treated with dignity and respect	6. To use the access and services provided to be fully productive
7. To special tools and services that be needed to accomodate a disability on the job or in the community	7. To advocate, educate and collaborate with legel, service and other systems to meet needs and resolve conflicts

Fig. 4.23 Rights and Duties at Workplace with Respect to PwD

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youtu.be/qsbA72yA87I

4.3.1 Grievance Management

youtu.be/YiX1nbDK9xo

4.3.3Gender Sensitivity

Summary

- Effective communication is required for all employees in the organization to perform basic management functions and carry out their jobs and responsibilities.
- It is extremely difficult for project managers to manage their teams and coordinate efforts for successfully completion of a project without strong interpersonal communication skills. A project cannot be successful if there is no communication.
- The process of communication is a dynamic structure that explains how a message is transmitted between a sender and a receiver via various communication channels. Its purpose is to ensure that the receiver accurately decodes the message and can provide feedback with precision and convenience.
- Communication barriers are factors that prevent a message from being received in the way the sender sent it. People frequently face the problem of the message being received in an assumed manner when communicating.
- Effective communication with your supervisor is crucial to your professional development and career advancement. Refer to the exhibit below for tips on communicating with the supervisor effectively.
- Following proper communication, rules are critical to keeping a healthy relationship with colleagues and co-workers. The quality of the relationship with colleagues and co-workers will depend on the behavior you demonstrate while interacting with them.
- Transparently sharing data and information ensures that everyone is in the loop and aware of any potential issues with the business, product, or service that can be addressed collaboratively. Employees might have lots of knowledge that is crucial for the organization and other employees. Sharing information helps them connect, perform better, and become more vital as professionals.
- Organizational communication can be divided into two categories: formal and informal communication.
- Emotional outbursts at work could be caused by work-related issues or by stressors from our personal lives spilling over into our work lives. Handling our emotions (especially negative ones) at work is frequently regarded as a test of our professionalism.
- An organizational structure is a system that defines how specific activities are directed in order to achieve an organization's goals.
- The workflow of an organization consists of the processes that must be completed, the people or other resources that are available to perform those processes, and the interactions between them.
- Communication policies of an organization establish expectations and manage the flow of communications within and outside the organization. As a result, it facilitates meaningful and necessary communication for employee productivity and morale without restricting employees' feeling intimidated and powerless.
- Goals in each organization should be S.M.A.R.T: specific, measurable, actionable, realistic, and timely. It helps you and your team feel a stronger sense of purpose and direction. In addition, setting goals in place will help you and your team feel productive with each bit of accomplishment and ensure that more significant production stays on track.

- Team performance evaluation is a key factor in inspiring teams, improving the quality of work, and keeping them motivated. It is the best channel to understand how the team is performing and an effective measure to get feedback about how production is going, whether the employees are working positively towards achieving goals, and what can be done to improve employees' engagement.
- A professional code of ethics establishes an organization's ethical guidelines and best practices for maintaining honesty, integrity, and professionalism. Violations of the code of ethics can result in sanctions, including termination, for members of an organization.
- Work ethics are the morals or principles that govern a person's or group's behavior, whereas etiquette is a set of rules indicating the proper and polite way to behave at work.
- Dealing with conflict at the workplace is inevitable. The ability to recognize conflict with your colleagues, understand its nature, and try to bring a quick and fair resolution to the conflict is critical to anyone who works in a team.
- Discipline is most effective when there is mutual trust between managers and employees. It all begins with clear communication and continues with consistency. Discipline assists employees in correcting any shortcomings to become valuable, contributing members of the workforce.
- Confidentiality is important for legal and reputational reasons, but it is also important because future employment may be contingent on it.
- Disabled co-workers and employees are not any different in that they are there to earn a living, advance their career, and better the organization through their contributions.
- The RPWD Act, 2016 provides that "the appropriate Government shall ensure that the PwD enjoy the right to equality, life with dignity, and respect for his or her own integrity equally with others." The Government is to take steps to utilize the capacity of the PwD by providing appropriate environment.
- Gender inequality in an organization's is a complex phenomenon that can be seen in organizational structures, processes, and practices.
- Females with disabilities are subjected to multiple layers of discrimination. Based on their gender and disability status, they often face double discrimination.
- For a healthy performance-oriented culture, organizations need the correct mix of talent which is not bound by any gender.
- Use respectful language while communicating with each other. Do not reinforce gender stereotypes.
- Gender sensitivity is not about fighting women against men. On the contrary, gender-sensitive education, benefits members of all genders. It helps the individuals determine what assumptions are valid and which are stereotyped generalizations in matters of gender.

Exercise

1. Write a short note on:

a) Grievance Management

_____
_____
_____

b) Rights and duties of PwD at the workplace

_____
_____
_____

c) Gender based issues at workplace

_____
_____
_____

d) Best practices for gender sensitivity

_____
_____
_____

e) List down the steps for addressing grievance.

_____
_____
_____

2. Match the following.

Column A	Column B
Gender inequality	Gender-specific social groups
Listen attentively	Equal access to benefits
Rights at Workplace concerning PwD	With hearing disability person to get his attention
Tap a person on shoulder	Disparity in promotions
Do not promote	While talking with people having difficulty speaking

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Skilling India in Electronics

5. Basic Health and Safety Practice

Unit 5.1 Dealing with Workplace Hazards & Risks

Unit 5.2 Fire Safety Practices

Unit 5.3 Emergency, Rescue and First-aid Practices

Unit 5.4 Effective Waste Management Practices

ELE/N1002

Key Learning Outcomes

At the end of this module, the trainee will be able to:

1. Apply health and safety practices at the workplace

Unit 5.1 Dealing with Workplace Hazards & Risks

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Discuss job-site hazards, risks and accidents
2. Explain the organizational safety procedures for maintaining electrical safety, handling tools and hazardous materials
3. Describe the importance of maintaining appropriate postures while lifting heavy objects
4. Explain various warning and safety signs
5. Describe how to interpret warning signs while accessing sensitive work areas
6. Elaborate on electronic waste disposal procedures
7. List the name and location of concerned people, documents and equipment for maintaining health and safety in the workplace
8. Explain the importance of good housekeeping

5.1.1 Workplace Safety

Workplace safety is one of the key aspects of any manufacturing business or facility. Getting it right can boost overall operation performance and lead to growth. On the other hand, putting safety at risk can lead to lost time, money, occupational injuries, and even reputational damage. Although every employer is required by law to adhere to workplace safety standards established by governments in order to ensure the safety of its employees and workers, it must be understood that safety is everyone's responsibility. Nobody wants to be hurt at work. As a result, employees/workers must be aware of and strictly follow the safety procedures in place.

Project managers are in a unique position because, as project leaders and coordinators, they indirectly influence health and safety. As safety is an integral part of the workplace, project managers should not turn a blind eye and, if necessary, issue instructions. Project managers discuss health and safety during the following stages:

1. Planning because of its impact on accessibility and work methods

2. Initial workplace inspections due to the project's immediate environmental impact

3. Onsite meetings if the contractor or subcontractors are not addressing it

4. Site inspections and discussions as most important aspect of the worksite is health and safety

It is everyone's responsibility, whether the project manager or team member, to keep the workplace clean, healthy, and safe. Everyone in the workplace must be extremely cautious and adhere to the established safety guidelines. The following are the standard practices to ensure health and safety in an organization.

Fig. 5.1 Health and Safety Guidelines

5.1.2 Safety Hazards, Risks and Accidents

A hazard or risk is something or someone that has the possibility of causing, serious harm, damage, or negative health effects. It has the potential to cause human injury or illness, property damage, environmental damage, or a combination of these effects. The figure below depicts the most common on-site hazards, risks, and accidents:

Notes

Fig. 5.2 Hazards and Risks at Workplace

The safety hazards and risks in the electronics industry vary depending on the various sub-sectors:

1. Various chemical hazards in the semiconductor and fabrication industries include exotic and dangerous chemicals such as arsine, phosphine, and silane
2. Noise, ionizing and non-ionizing radiation used for testing, quality control, and curing operations are all physical hazards in electronic work
3. Repetitive assembly line work or manual handling results in cumulative trauma disorders, backache, and musculoskeletal strains
4. Low humidity in clean room work, causing dermatological symptoms
5. Prolonged visual inspection work, especially when using a microscope, frequently causes eyestrain
6. Biological hazards are uncommon in electronics work, but communicable diseases can easily spread to other workers
7. Negative psychosocial factors such as the fast and constant pace of work, the monotonous nature of work, and rotating shifts

It is significant to ensure a high level of safety that no machine tool should be used unless the risk management process outlined below is understood and applied by the user:

1. Determine the potential hazard(s) that the machine tool may produce.
2. Using the Risk Assessment Matrix, determine the likelihood and severity of the hazard(s). The following individuals have risk acceptance decision authority for the risk levels:
   a. very high
   b. very high
   c. moderate and low
3. Determine the risk-control measures that will eliminate or reduce the hazard(s). Then, implement risk control measures before and during machine tool operation to eliminate threats or mitigate their risks.
4. Monitor and evaluate the process. Enforce the established standards and risk management procedures. Evaluate the effectiveness of the control measures and make any necessary adjustments/updates.

5.1.3 Organizational Safety Procedures

An organizational safety procedure is a step-by-step instruction manual for carrying out a work procedure. It is used when a deviation from the procedure could result in injury or an accident.
When working with machinery, tools and equipment, employees are exposed to a variety of hazards and risks that can result in a variety of injuries. The following are the most common hazards in handling tools, hazardous materials and machining work:

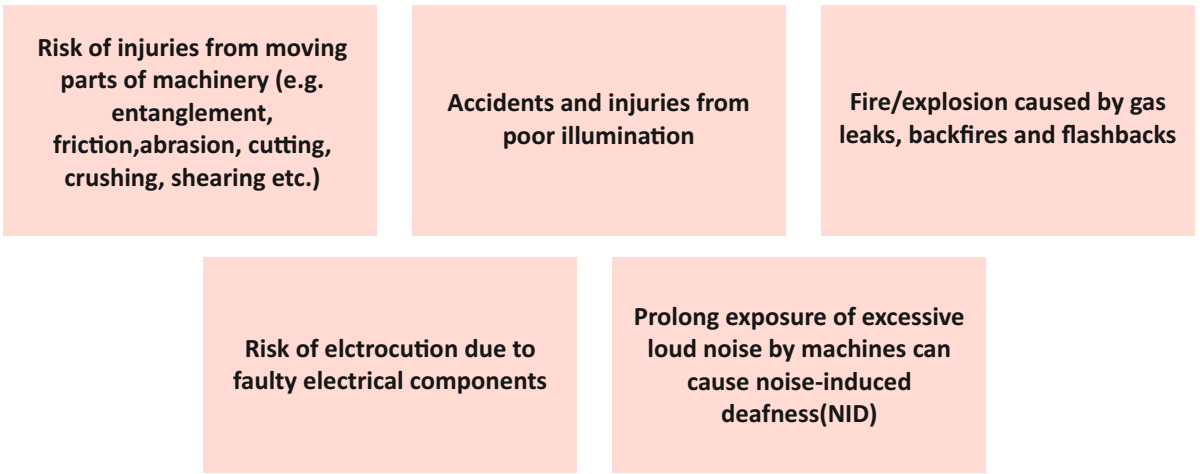


Fig. 5.3 Machine Hazards

Therefore, when working with tools and equipment in the workplace, specific safety procedures must be followed to prevent these hazards and accidents:

1. SOPs (Standard Operating Procedures) must be followed and maintained for all machinery in the manufacturing unit.
2. SOPs must be based on manufacturer recommendations and must include specific hazards associated with the machine as well as safe use recommendations.
3. SOPs (standard operating procedures) must be accessible at or near the machine.

Electricity is widely recognized as a serious workplace hazard that can cause electric shock, burns, fires, and explosions. Every year, many employees suffer pain, injuries, and even death as a result of electric shocks. To keep yourself and others safe, it is critical to adhere to electrical safety-related work practices.

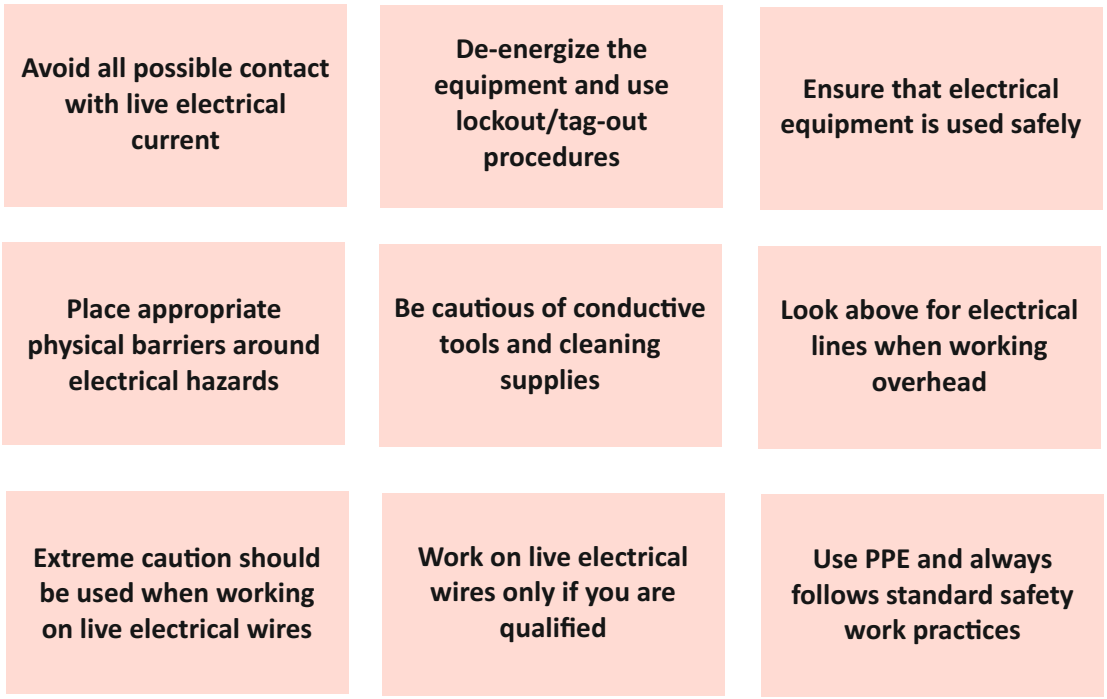


Fig. 5.4 Standard Procedures for Electrical Safety at Workplace

Notes

The following are some basic rules who work with or near hazardous materials should know and follow:

1. Pay close attention while working with or around hazardous materials.
2. Always wear the appropriate PPE.
3. Ensure that all containers are properly labeled and that hazardous materials are stored in an appropriate container.
4. Report damaged containers or illegible labels to your supervisor as soon as possible.
5. Read labels and the Safety Data Sheets (SDSs) before using any material to make sure you understand hazards and precautions Use hazardous materials solely for their intended purpose.
6. Never eat or drink while working with hazardous materials.
7. Store all hazardous materials properly, separate incompatibles, and keep them in well-ventilated, dry, and cool locations.
8. After handling any hazardous material, employees must keep themselves and the work area clean.
9. Gain knowledge about first-aid, emergency procedures, and evacuation procedures for dealing with fires or spills/leaks.
10. It also entails knowing what to do if a coworker is injured or poisoned by chemicals.

5.1.4 Significance of Maintaining Appropriate Postures While Lifting Heavy Objects

Lifting heavy objects is one of the leading causes of workplace injury. The main causes of these injuries were overexertion and cumulative trauma. Bending is the most frequently cited movement that resulted in back injuries, followed by twisting and turning.

Lifting loads incorrectly or carrying loads that are either too large or too heavy are common hazards associated with manually moving materials. Employees who use safe lifting techniques are less likely to sustain back sprains, muscle pulls, wrist injuries, elbow injuries, spinal injuries, and other injuries as a result of lifting heavy objects. The following figure explains on safe lifting and material handling at workplace.

Fig. 5.5 Tips for Maintaining Appropriate Postures While Lifting Heavy Objects

5.1.5 Warning and Safety Signages

Workplace safety signage evolved with the Industrial Revolution when workplace safety became a major concern. The purpose of a workplace safety sign is to identify and warn employees who may be exposed to various hazards. Safety signs help to communicate important instructions, reinforce safety messages, and provide emergency instructions. Workplaces that lack the necessary safety signs not only violate safety regulations but may also face hefty fines and regulatory action if they are audited by legal authorities. If an accident occurs and it is determined that proper safety signs were not present, the employer or other responsible parties could face legal consequences. It is essential to know the meaning of safety signs. Such signs warn us of danger and allow us to take precautions to keep safe. There are four main types of safety signs:

1. Prohibition signs
2. Mandatory signs
3. Warning signs
4. Information signs
5. Fire Safety signs
6. Danger Signs

The following table represents the various signages related to health and safety measures:

S. No.	Signage	Message
1.		Basic floor sign to stop moving ahead
2.		Stop Look Out for Forklifts
3.		Eye safety warnings
4.		Fire exit sign
5.		Authorized personnel only
6.		Fire hose notification
7.		Caution signage

S. No.	Signage	Message
8.		Caution signage
9.		Wet floor warning
10.		Watching out for step
11.		Water-saving signage

Table. 5.1 Safety & Warning Signages

5.1.6 Electronic Waste Disposal Procedures

E-waste is an abbreviation for electronic waste. That is, waste produced by broken, obsolete, or surplus electronic devices. It is also referred to as e-scraps. These electronics frequently contain toxic chemicals and hazardous materials. And if it is not disposed of properly, it can result in the release of toxic substances into our environment. The reprocessing and re-use of these electronic wastes are referred to as e-waste recycling. It is straightforward. It is a method of recovering material from electronic waste. This allows you to incorporate them into new electronic products. These electronic wastes can take the form of household appliances such as air conditioners, televisions, electric cookers, air conditioners, heaters, DVDs, fans, microwaves, and radios. They can also take the form of information technology equipment such as computers, laptops, mobile phones, batteries, hard discs, circuit boards, and monitors. E-waste recycling is one of the most discussed issues in the world today due to its potential to

reduce environmental hazards and pollution. It can also protect our lives as humans and other life forms in our world. E-waste recycling is the reuse and reprocessing of any type of discarded or obsolete electrical and electronic equipment.

Recycling electronics can be a difficult task. This is due to the fact that e-scraps are typically sophisticated and made from a variety of materials such as metals, plastics, and glass. While this process frequently varies, the following figure explains the standard process of electronic waste disposal.

Step 1: Collection and Transportation

- This is the first stage of e-waste recycling. Recyclers set up take-back booths or collection bins in specific locations. When these bins are full, recyclers transport the e-waste to recycling centers and plants.

Step 2: Shredding and Sorting

- After collecting and transporting the e-waste, the next step is to shred and sort it. Shredding is the process of breaking down e-waste into smaller pieces for proper sorting. These tiny prices are sorted by hand and then manually dismantled. This is typically labor-intensive because waste items are separated at this stage to retrieve different parts.

Step 3: Dust Removal

- The tiny waste particles are evenly distributed on the conveyor belt by a shaking process. The uniformly distributed e-waste is then further broken down. The dust is extracted and disposed of in an environmentally responsible manner at this point. There is no environmental degradation in this manner.

Step 4: Magnetic Separation

- Following that, a powerful overhead magnet aids in the separation of steel and iron from other wastes. It has successfully recycled the steel from the waste stream in this manner.

Step 5: Water Separation

- Water separation technology is used to separate the glass from the plastic.

Step 6: Purification of Waste Stream

- The next step is to locate and extract leftover metals from plastics to further purify the waste stream.

Step 7: Preparing Recycled Materials For Sale

- The last step is to prepare recycled materials for sale. The materials are separated here for sale as raw materials to manufacture new electronics.

Fig. 5.6 Standard Process of Electronic Waste Disposal

5.1.7 List of Concerned Authorities, Documents and Equipment for Workplace Health and Safety

It is simply a huge task for a single person to be solely responsible for workplace health and safety. As a result, the **health and safety executive (HSE), legal bodies, business owners, managers and supervisors, contractors, and employees at all levels in a company all share equal responsibility**. However, this does not imply that responsibilities are distributed evenly. Staff in various roles will have varying health and safety responsibilities. **Employers**, for example, bear more responsibility than their employees because they are held accountable for their employee's safety and well-being. They are required by law to protect their employees and anyone else who may be harmed by their business, including customers, visitors to the workplace, temporary workers, and contractors. Employers must perform the following duties in order to meet their health and safety obligations:

Fig. 5.7 Roles and Responsibilities of Employers for Workplace Health & Safety

Procedure for Reporting Workplace Health & Safety Issues to Concern Person

1. To raise a workplace health & safety issue with the concerned authorities, constructive steps should be taken immediately to resolve the problem. These steps may include:
2. Reporting the issue to your supervisor or manager
3. Reporting the issue through the workplace's hazard reporting procedures
4. Raising the issue with the health and safety representative
5. Raising the issue with management through union representative

Issues can be related to:

1. Personal hygiene
2. Handling of food and beverages
3. Storage and Work area
4. Suitable dress and personal protective equipment and clothing
5. Cross-contamination
6. Machinery, tools, and equipment
7. Inappropriate handling and disposal of garbage
8. Cleaning and sanitizing

List of documents for maintaining workplace health and safety

Health and safety documents assist in controlling risks and communicating safe working procedures. Many health and safety documents, such as risk assessments and health and safety policies, are also required by law.

1. **Method Statements -** Method statements include information such as project start and end dates, a project description, and all potential hazards associated with the project. Emergency procedures and guidelines for monitoring are also included.
2. **Risk Assessment –** Risk assessment documents serve as a strategic tool for planning for and responding to specific workplace risks. These documents help to raise awareness of hazards, identify specific people who may be at risk and note ways to eliminate or control that risk.
3. **Near Miss Reports -** A near-miss report is a document that details a problem or issue that occurred at work that had the potential to injure or harm someone. This usually happens when a break in a chain of events prevents harm or damage from occurring. This type of safety document is similar to an accident/incident investigation report in which the accident did not occur but could have.
4. **Equipment and Machinery Inspection Reports -** These reports detail when specific equipment or machinery was inspected, who inspected it, and what they discovered. Regular inspection reports also help to ensure that employees are using up-to-date and safe equipment.
5. **Emergency Action Plan -** These plans provide clear, detailed instructions on how people in a building should behave in the event of a specific disaster. Emergency action plans provide a comprehensive overview of all potential disasters, including fires, tornadoes, earthquakes, floods, and explosions.
6. **Personal Protection Equipment Manual -** This manual assists both employers and employees in doing the following:
    a. Understand the various types of PPE.
    b. Understand the fundamentals of conducting a "hazard assessment."

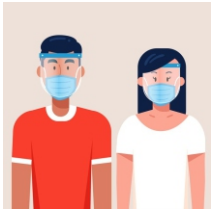
Personal Protective Equipment

Every worker at workplace is responsible for their safety as well as the safety of their coworkers. A person must take different precautions for different situations to avoid accidents and hazards. To begin, everyone on the job site must wear Personal Protective Equipment (PPE) for their safety.

Fig. 5.8 PPE

PPE refers to the clothing or equipment designed to protect the workers/employees from shop floor hazards. It includes items such as hard hats, safety boots, coveralls, gloves, safety glasses and goggles, earplugs, high visibility vests, lifejackets, fall protection, and respirators.

Common types of PPE include the following:



Eye and Face Protection

Hand Protection

Head Protection

Hearing protection

Foot Protection

Body Protection

Fall Protection

Respiratory protection

Fig. 5.9 Types of Personal Protective Equipment

5.1.8 Significance of Good Housekeeping at Workplace

Effective housekeeping assists in the control or elimination of workplace hazards. Poor housekeeping practices frequently contribute to incidents. If the presence of paper, debris, clutter, and spills is accepted as normal, other, more serious hazards may be overlooked. Cleaning is only one aspect of housekeeping. It entails keeping work areas neat and orderly, keeping halls and floors free of slip and trip hazards, and removing waste materials (such as paper and cardboard) and other fire hazards from work areas. It also necessitates paying close attention to details such as the overall layout of the workplace, aisle marking, the adequacy of storage facilities, and maintenance. Good housekeeping is also a fundamental component of incident and fire prevention. Effective housekeeping is a continuous process, not a one-time event. Effective housekeeping is a continuous process; it is not a one-time or sporadic clean-up. Periodic "panic" clean-ups are both costly and ineffective in terms of incident reduction.

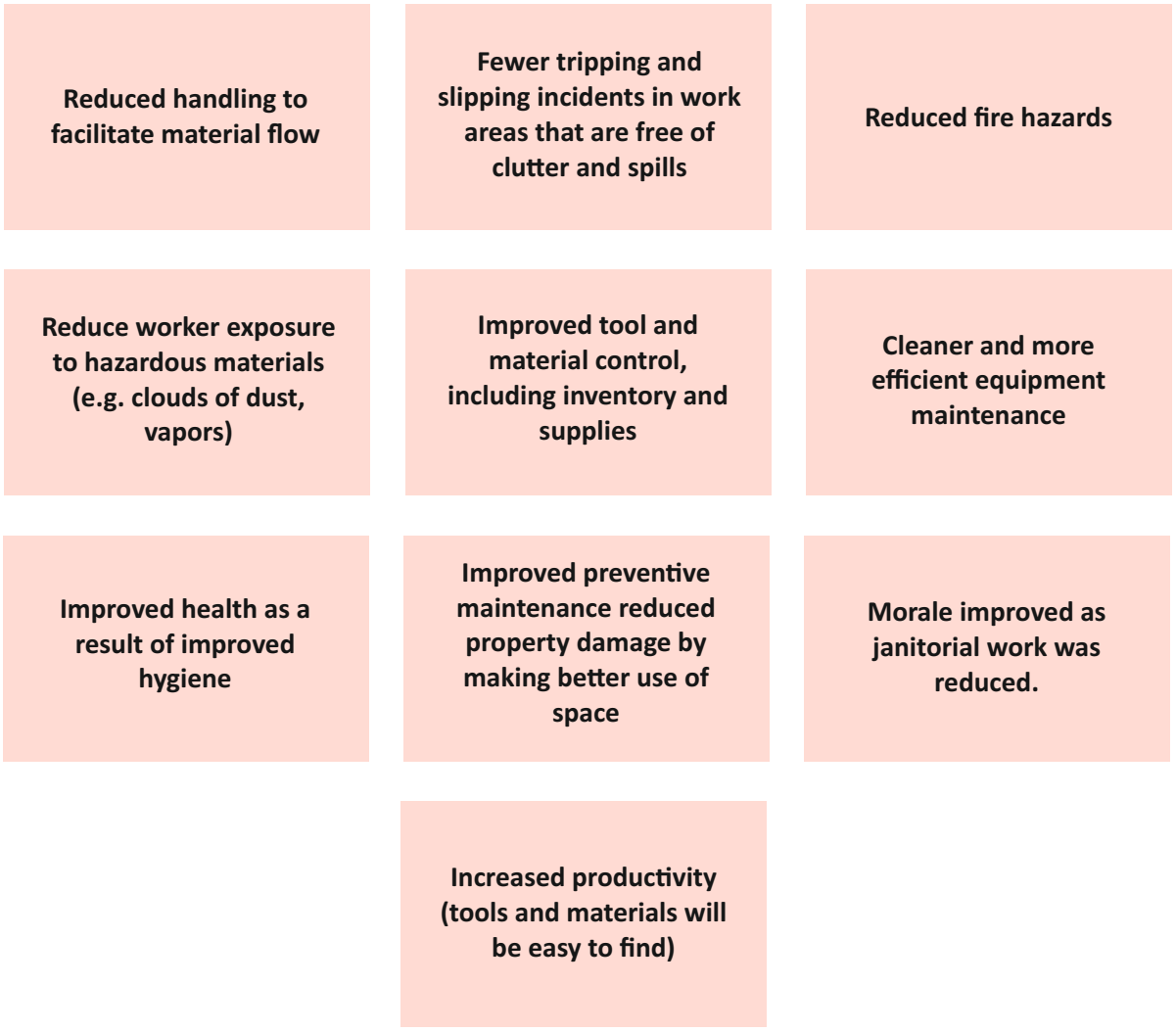


Fig. 5.10 Significance of Good Housekeeping at Workplace

5.1.9 5S

5S is intended to be a visually-oriented system of cleanliness, organization, and arrangement to attain greater productivity. It engages all employees and is a foundation for more self-discipline on the job for better work and better products. Along with engaging employees, it also builds a strong and positive culture of self-discipline at the workplace for better work and quality outcomes.

5S, sometimes referred to as 5s or Five S, refers to five Japanese terms used to describe the steps of the 5S system of quality management. Each term starts with an S. In Japanese, the five S's are **Seiri, Seiton, Seiso, Seiketsu, and Shitsuke**. The five S's are translated as Sort, Set in Order, Shine, Standardize, and Sustain in English**.**

S.No.	Japanese Words		English Translation	Definition
1	Seiri		Sort	Sorting means keeping only the essential items required in the workplace and removing all the nonessential items.
2	Seiton		Set in order	Ensures that all the items are organized and placed logically to make the task easier and convenient for the worker.
3	Seiso		Shine	Efforts to keep the orderly workplace area clean and maintain routine tasks are involved, like dusting, mopping, and maintenance of machinery, tools, and other equipment.
4	Seiketsu		Standardize	Create a set of standards for organization and processes where rules are made for how 3S will be maintained and when these tasks will be performed.
5	Shitsuke		Sustain	Sustain new practices and conduct audits to maintain discipline. Th2is means the previous four S's must be continued over time. This is achieved by developing a sense of self-discipline in employees who will participate in 5S.

Table. 5.2 5S

The guiding principles underlying the 5S technique involve organization, cleanliness, and standardization. Overall workplace cleanliness, created by removing waste from the work area, promotes internal organization and enhances visual communication. By reducing wasted time and materials, productivity is increased along with safety, and costs are reduced. The system as a whole minimizes waste and improves efficiency by ensuring that employees are spending time doing productive tasks rather than looking for misplaced items, sorting unnecessary through stacks of waste material, or rearranging the work environment at the change of shifts.

Advantages of Implementing 5S Principle

1. **Sort**: It helps better allocate valuable resources, as additional space becomes available once the unnecessary items are removed from the area. Furthermore, the process forces inspection of the items, thereby recognizing the need to repair or eliminate any obsolete equipment and also preventing the equipment from being misplaced.
2. **Systemize**: A systematic work area also supports the efficiency of work. When kept at a fixed location, each object remains there until it is taken away while in use and is immediately kept back at the same place after use. Labeling and other identifying methods are also a part of this step. In addition, systematically storing and arranging things prevents a lot of time wasted searching for items. Overall, if each team member arranges things in an orderly fashion, it leads to the success of the whole organization.
3. **Shine**: It provides qualitative and quantitative results and improvises employee's pride and morale while working in a clutter-free pleasant work area. A clean area also results in a safe and healthy workplace.
4. **Standardize**: Following the standardized procedures helps achieve efficiency, improve workplace safety, and reduce workplace injuries.
5. **Sustain**: Maintenance of any system is essential as it increases its sustainability. Thus, maintaining the system is necessary; otherwise, the cost and effort spent on developing the system will go to waste.

Notes

Notes

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youtu.be/4bkr5lpKGUM
5.1.1 Workplace Safety

youtu.be/aH495epWeAE
5.1.2 Safety Hazards, Risks and Accidents

youtu.be/4bkr5lpKGUM
5.1.3 Organizational Safety Procedures

youtu.be/Fs2iT_4l3aM
5.1.5 Warning and Safety Signages

Exercise

Answer the following questions:

1. Explain potential risks and hazards at the workplace.

_____

_____

2. Explain the benefits of 5S principles.

_____

_____

3. Explain any two types of Personal Protective Equipment.

_____

_____

4. List the ways for maintaining appropriate postures while lifting heavy objects.

_____

_____

5. Discuss the importance of good housekeeping at workplace.

_____

_____

6. List of documents for maintaining workplace health and safety.

_____

_____

7. What is PPE?

_____

_____

8. Write a short note on organizational safety procedures.

_____

_____

Fill in the blanks:

1. To raise a _____ with the concerned authorities, constructive steps should be taken immediately to resolve the problem.
2. _____ is one of the key aspects of any manufacturing business or facility. Getting it right can boost overall operation performance and lead to growth.
3. As safety is an integral part of the workplace, _____ should not turn a blind eye and, if necessary, issue instructions.
4. _____ has the potential to cause human injury or illness, property damage, environmental damage, or a combination of these effects.

5. An _____ is a step-by-step instruction manual for carrying out a work procedure.
6. Lifting heavy objects is one of the leading causes of _____.
7. The purpose of _____ is to identify and warn employees who may be exposed to various hazards.
8. _____ is one of the most discussed issues in the world today due to its potential to reduce environmental hazards and pollution.
9. _____ bear more responsibility than their employees because they are held accountable for their employee's safety and well-being.
10. _____ documents assist in controlling risks and communicating safe working procedures.

Choose the correct answers (MCQ)

a) The way of protecting individuals' well-being of health is classified as:

   1. Safety
   2. Health
   3. Adverse Situation
   4. Security

b) What are the most common risks in the workplace?

   1. Risk of electrocution
   2. Risk of injuries from faulty equipment
   3. Being hit by falling objects
   4. All of the above

Unit 5.2 Fire Safety Practices

Unit Objectives

At the end of this unit, the trainee will be able to:

1. List the types of fire and fire extinguishers

5.2.1 Fire Safety

Fire safety refers to a set of practices designed to reduce the devastation caused by fire. Fire safety measures include those used to prevent the ignition of an uncontrolled fire as well as those used to limit the development and effects of a fire once it has begun. Following are the standard practices for fire safety at workplace.

1. **Follow the emergency instruction in case of fire**
   a. Activate the ALARM.
   b. Evacuate the area.
   c. Call the fire department.
   d. Stay Calm
2. **Fight the fire only if:**
   a. You know-how.
   b. The fire is small.
   c. You are confined to the area where it started.
   d. You have a way out.
   e. You can work with your back to the exit.
   f. You have the right type of extinguisher.
   g. You feel confident that you can operate it effectively.
3. **Do not fight the fire if:**
   a. You have any doubts about fighting it.
   b. It is spreading beyond the area where it started.
   c. It could block your escape route.

4. Precautions to be taken during the fire:

Following precautions are to be taken in case of fire –

a. Switch off the main switch.

b. Snuff the fire by throwing dry sand on it.

c. Make sure that the fire extinguisher is operational and not expired.

d. Do not use water to extinguish an electrical fire.

e. Know the location of emergency exits and procedures.

Fire can be prevented by following these do's and don'ts at the workplace

Do's	Don't
Keep the work area clean.	Do not wear inflammable materials like nylon etc.
If empty containers contain inflammable materials, fill them with water.	Do not use inflammable materials near electrical lines.
Report any unsafe situation that may cause a fire.	Never weld near combustible materials.
Watch where the sparks and metals are falling from your work.	Never leave any cable without insulation.

Table. 5.3 Do's and Don'ts of Preventing Fire

Notes

5.2.2 Fire Extinguishers

Electrical fires are different from regular fires. They cannot be extinguished with water. Also, using water to put out an electrical fire is very dangerous and could lead to electrocution. To put out an electrical fire, the right type of fire extinguisher must be used. The following figure represents the different classes of fires:

Class of Fire - A

- Type of Fire - Ordinary Combustible : wood, paper, rubber, fabrics and many plastics.
- Type of Extinguisher- Water, dry powder, halon

Class of Fire - B

- Type of Fire - Flammable liquids and Gases: Gasoline, Oils, paint, lacquer and tar.
- Type of Extinguisher- Carbon Dioxide, dry powder, halon

Class of Fire - C

- Type of Fire - Fires involves live electrical equipment .
- Type of Extinguisher- Carbon Dioxide, dry powder, halon

Class of Fire - D

- Type of Fire -Combustible metals or combustible metal alloys
- Type of Extinguisher- Special Agents

Class of Fire - K

- Type of Fire - Fires in cooking appliances that involve combustible cooking media: vegetable or animal oils and fats.
- Type of Extinguisher - Wet Chemical

Fig. 5.11 Types of Fire

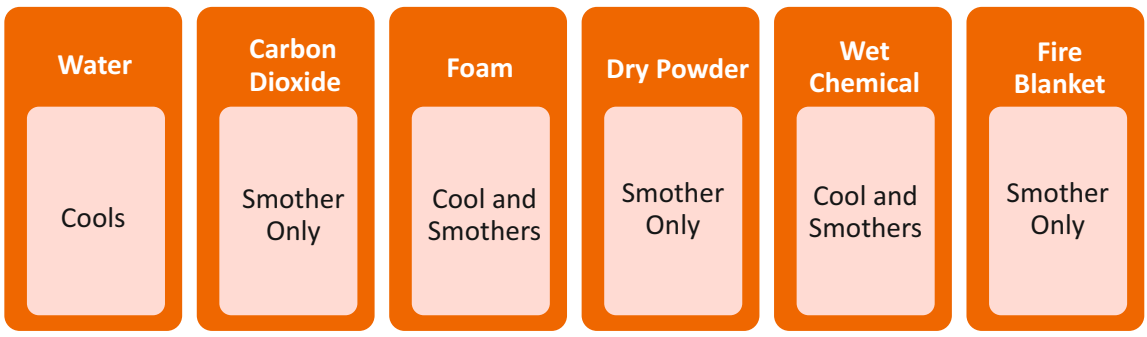

Fig. 5.12 Types of Fire Extinguishers

Fig. 5.13 Using a Fire Extinguishers

Notes

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5.2.1 Fire Safety

Exercise

Fill in the blanks:

a) _____cannot be extinguished with water.
b) Safety is _____ responsibility.
c) _____ in case of fire.
d) Do not fight the fire if_____.

Answer the following questions:

1. Explain various types of fire and fire extinguishers.

_____
_____
_____

2. Write a short not fire safety.

_____
_____
_____

3. Explain do's and don'ts of preventing fire.

_____
_____
_____

4. List the precautions to be taken during the fire.

_____
_____
_____

Unit 5.3 Emergency, Rescues and First-aid Practices

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Describe different ways of preventing accidents at the workplace

5.3.1 Different Ways of Preventing Accidents/Hazards at the Workplace

ISO 45001 is an international standard for health and safety at work developed by national and international standards committees of government. An Occupational Health and Safety Management System (OHSMS) is a fundamental part of an organization's risk management strategy.

Implementing an OHSMS enables an organization to:

a. Protect its workforce and others under its control

b. Comply with legal requirements

c. Facilitate continual improvement

The following figure explains different ways/methods to control hazards and prevent accidents at the workplace:

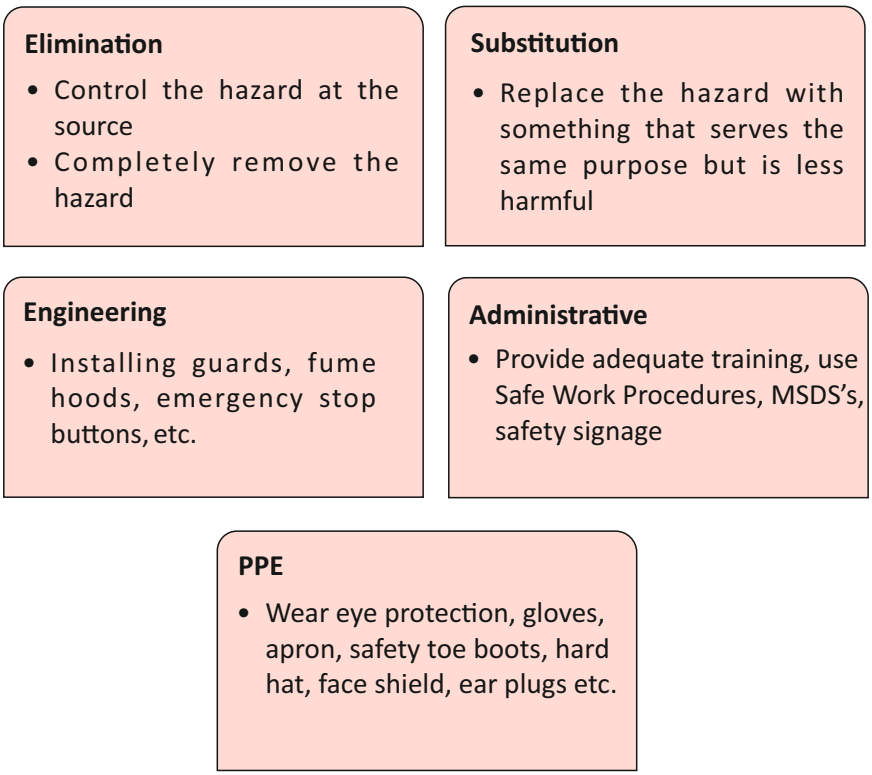

Fig 5.14 Steps to Control Hazards and Prevent Accidents

5.3.2 Emergency Procedures to Deal with Electric Shock and Accidents

When a person somehow comes in contact with the live wire and gets shocked and faints, the following are the steps to be undertaken immediately as a first aid to save his/her life:

Responsibilities	Descriptions
Recognize the symptoms	• Common shock signs and symptoms include the following: o Pale, cold, clammy skin. It may appear grayish, the lips and fingernails may look blue. o The pulse and breathing are rapid. o The person is exhibiting disorientation or giddiness. o Nausea or vomiting may occur. o The person seems weak, with vacant eyes.
Call local emergency services number	• It's crucial to have paramedics on the way while you administer the treatment since the shock is a severe condition that will require hospitalization. • Stay on the line with the emergency services dispatcher in case of any need and provide the proper first aid. • In India, the Ambulance Emergency number is – 102
Make the person lie down	• Be extremely gentle since any sudden movements could injure the person. If the person is not in pain, place his or her legs on a pillow to elevate them about 12 inches above the head. • Do not move the person's head. • Keep the person flat and still after he or she is lying down.
Check for signs of breathing	• Observe the person's chest to see if it rises and falls, and place your cheek next to his or her mouth to check for breath. If the person is not breathing, perform CPR. Check the breathing every 5 minutes until the emergency services arrive.
Make the person comfortable	• Loosen the collars and unbutton or cutaway tight clothing. Unbuckle the person's belt, loosen the shoes and remove all tight jewelry on the person's wrists or neck. Cover the person with a blanket. • Do not give the person food or water. • Reassure and comfort the person; try to keep him or her calm until help arrives.

Responsibilities	Descriptions
Check for vomiting and bleeding from the mouth	• If you observe vomit or blood coming from the mouth or nose, turn the person on his or her side to prevent him or her from choking. Help to prop the person up with pillows.
Administer treatment for injuries or blood loss	• If the person sustained a trauma, you might need to stop blood flow from a wound or provide first aid for a broken bone. • Seek further instructions from the emergency personnel over the phone.

Table. 5.4 Emergency Procedures to deal with Accidents

5.3.3 Safety Mock Drills

Safety is a priority to provide a safe working environment. Efforts should be taken to reduce the scale & probability of hazards. However careful we can be, hazards may still occur. Effective action has been possible in the emergency. In dealing with such emergencies, effective action is likely a pre-planned and practiced procedures for dealing with such emergencies.

What is a Mock Drill?

Mock Drill is a situation in which a fake emergency is announced, and workmen are asked to follow an emergency evacuation plan. This allows the workman to get familiarized with the emergency and act according to plan. Mock drills for chemical accidents and firefighting drills should be organized at regular intervals at the sites.

At the time of emergency evacuation, one must:

1. Raise the alert by crushing the glass cover of the closest break-glass alarm unit.
2. Be calm and composed.
3. Switch off all electrical apparatus except lights.
4. If possible, shut doors around the fire area to stop it from spreading.
5. Leave the building/site area immediately.
6. Follow the evacuation queue.
7. Give first preference to the physically disabled, expectant mothers, and the elderly
8. If it's dark and smoky, get down on your hands and knees and crawl to the nearest exit by counting the number of doors. If manageable, cover your nose with a wet towel or handkerchief.
9. Be acquainted with the hot exit door and pay attention to the thick smoke in the staircase. If the stairs are free from smoke, follow the directional signs and handrails.
10. Gather at the designated assembly point.
11. Do not re-enter the building until the signal is given
12. Max. time for evacuation should be 2.5 to 3.0 minutes.

5.3.4 Procedure for Reporting Accidents and Hazards

The essential responsibilities of an individual for reporting hazards and accidents are:

1. The people responsible for health and safety at the workplace;
2. The name, designation, and location of the person responsible to contact at the time of emergency

Additionally, an individual should also be adept in writing accident reports. An accident report needs to include all the essential information about the incident or near-miss. The report-writing process begins with facts and ends with recommendations for preventing future accidents.

An accident report involves four steps:

Gathering Facts: Collect and note all the facts, including –

- Date, time, and location of the accident
- Names, job titles, workers, and immediate supervisors involved
- Events leading up to the accident
- Job that the worker was handling at the time of the accident
- Names of employee who witnessed the accident
- Surrounding conditions (e.g., greasy floor, insufficient lighting, noise, etc.)
- Circumstances at the time of the accident (including tasks, equipment, tools, materials, etc.)
- PPE worn by the worker at the time of the accident
- Injuries that occurred (name of the injured body part and characteristics and extent of injuries)
- Type of treatment for injuries (first aid, if given)
- Damage to equipment, materials that the worker was working on or any other equipment or material around it.

Determining the Sequence: Describe the sequence of events after gathering the facts –

- **Events leading up to the accident:** Task the employee was performing at the time of the accident. For example: bending over, climbing, lifting operating machinery, using a tool, handling hazardous materials, etc.
- **Events involved in the accident:** Was the employee struck/caught in the machine or caught in the fire? Did the worker fall on the same level or from a height? Did he inhale hazardous fumes or get splashed with a hazardous chemical?
- **Events immediately following the accident:** What did the employee do: started bleeding? The body caught fire? Complain about back pain? Put a hand over a bleeding wound? Response from other workers/supervisors. Did they call for help, administer first aid, shut down equipment, move the victim to another place, etc.?
- The accident should be described in the report in sufficient detail that any reader can picture what happened.

Analysing: Analyse the causes of the accident. Causes include:

- Primary cause (e.g., a slip and fall from a ladder)
- Secondary causes (e.g., an employee not wearing appropriate goggles or helmet)
- Other contributing factors (e.g., poor ventilation).

Recommending: Recommendations for corrective action might include immediate as well as long-term corrective actions such as:-

- Training on safe work practices
- Preventive maintenance exercises that keep equipment in excellent working condition.
- Assessment of job techniques with a proposal for changes.
- Conducting a job hazard analysis to evaluate the task for any other hazards and then train employees on these hazards.
- Engineering changes that make the task safer or administrative changes that might include changing the way the job is performed.

Fig. 5.15 Accident Report Procedure

Exercise

Answer the following questions:

1. What are the different ways/methods to control hazards and prevent accidents at the workplace?

_____
_____
_____

2. Explain emergency procedures to deal with electric shock and accidents.

_____
_____
_____

3. Write a short note on safety mock drills.

_____
_____
_____

4. Discuss the process of reporting accidents and hazards.

_____
_____
_____

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5.3.1 Different Ways of Preventing Accidents /Hazards at the Workplace

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5.3.3 Safety Mock Drills

Unit 5.4 Effective Waste Management Practices

Unit Objectives

At the end of this unit, the trainee will be able to:

1. List the common sources of pollution and ways to minimize it
2. Describe the concept of waste management and methods of disposing hazardous waste
3. Explain the importance of efficient utilization of water, electricity and other resources
4. Describe the process of disposal of hazardous waste

5.4.1 Workplace Pollution

Workplace pollution is defined as the presence of hazardous materials or noises within a workplace that may affect employees while they are performing their duties. Such workplace pollutants can harm workers' health, especially if they are exposed for extended periods, even at low levels. The most common type of exposure is workplace air pollution. This includes workplace hazards from airborne pollution or the presence of hazardous substances in the workplace indoor air as gases (fumes) or as particulate matter (tiny particles - dust) dispersed in the air. Other modes of exposure include skin contact, ingestion, and/or injection.

Good Air Ventilation	**Identifying and avoiding direct contact with corrosive or toxic materials,**	**Not eating or drinking the presence of toxic or hazardous materials,**
Wearing protective gear as and when required).	**Effective Waste management practices at workplace**	**Effective cleaning and hygiene practices among the employees**
Re-use and Recycle	**No to plastic bags**	**Carpool or using public transport**

Fig. 5.16 Various Ways to Minimize Pollution

Notes

5.4.2 Effective Waste Management

Waste management refers to the activities and actions required to manage waste from its inception to its disposal. This includes the collection, transport, treatment, and disposal of waste and monitoring and regulation of the waste management process.

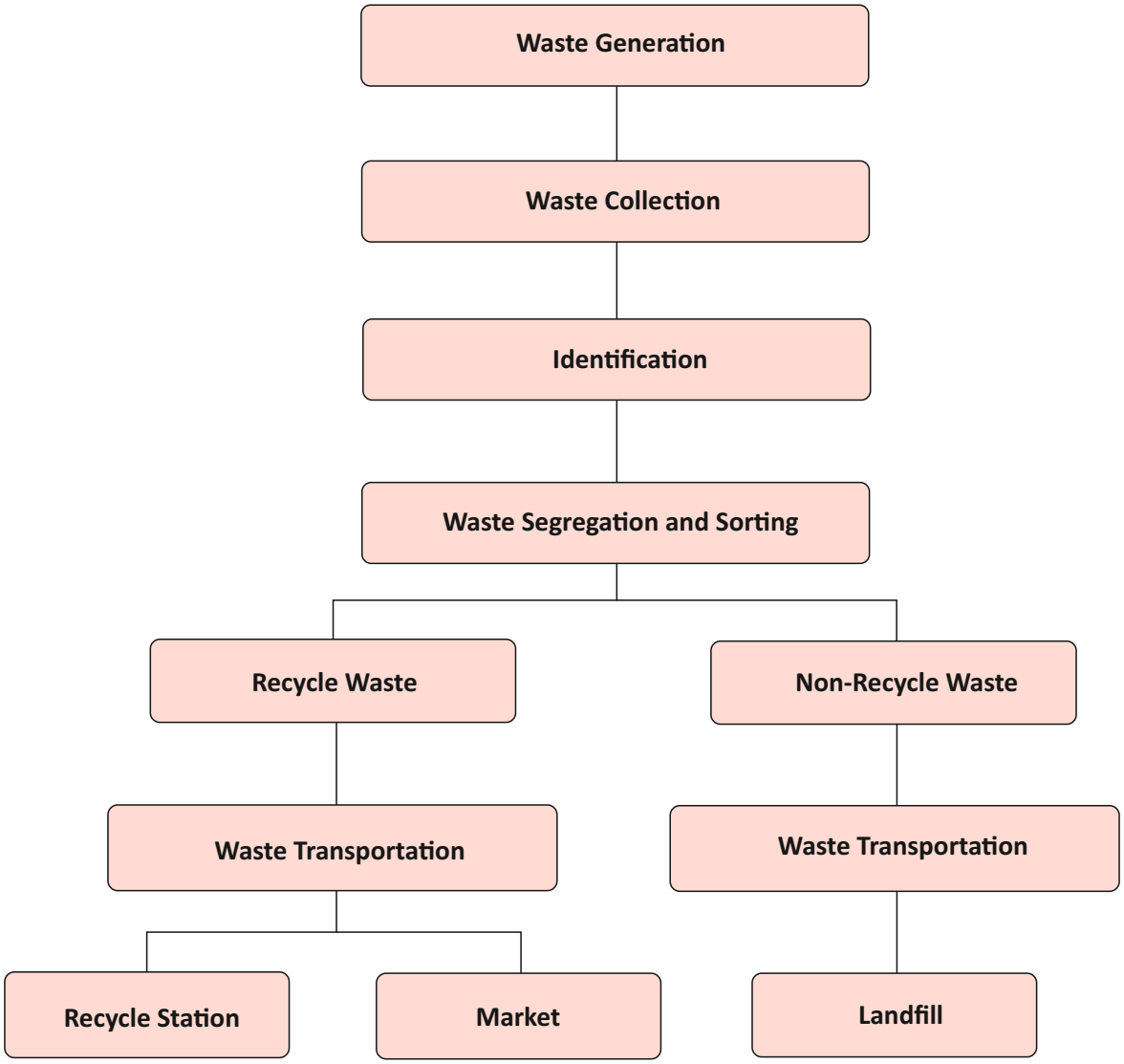

Fig 5.17 Waste Management Process

Waste elimination is one of the utmost effective ways to escalate the profitability of any trade or business. To eliminate waste, it is essential to understand exactly what waste is and where it exists. While products significantly differ between places, the typical wastes found in electronic manufacturing environments are pretty similar.

There is a strategy to decrease or eliminate its effect on a company for each waste, thereby refining overall performance and quality. Everything that is done in an organization is divided into two groups: value-adding and waste. Usually speaking, value-adding is something the consumer pays for, and waste

is anything the consumer does not care about. All non-value-added activities belong to waste.

Specifically, waste metal is often difficult for businesses to manage in the electronic industries. Often exceptionally heavy and problematic to store, proper scrap metal disposal is a continuous challenge for businesses that produce large amounts of metal waste.

That is where the concept of waste mineralization becomes a must for every employee to understand. There are many ways to define waste mineralization. However, in its broadest sense, waste mineralization includes all practices including waste prevention, reuse, and recycling that reduce the amount of waste entering the environment.

Fig 5.18 Waste Minimization

Waste Segregation

In general, waste is segregated as dry and wet waste. Dry waste includes wood, paper, plastic, glass, etc., related products that can be recycled, and wet waste refers to organic and biodegradable waste. The waste can be segregated using color-coded dustbins.

Fig 5.19 Waste Segregation

1. Green Bin

The green-colored bin is used to dump biodegradable waste, for example, wet/organic material, including cooked or leftover food, vegetable and fruit rinds, eggshell, rotten eggs, chicken/fish bones, tea or coffee grinds, coconut shells, and garden waste, including fallen leaves/twigs or the worship flowers/garlands.

2. Blue bin

The blue-colored bin is used for segregating dry or recyclable left over. This category includes waste like plastic covers, bottles, boxes, cups, toffee wrappers, soap or chocolate wrappers, and paper waste, including magazines, newspapers, tetra packs, cardboard cartons, pizza boxes, or paper cups/plates, metallic items like tins/cans, foil paper, and containers.

Fig 5.20 Dry &Wet Waste Bins

Recyclable Waste	Non-Recyclable Waste
Recyclable waste is renewable. The waste material can be reused or converted into new products or raw material, like paper, corrugated cardboard, glass, plastics container and bags, hard plastic, metal, wood products, e-waste, textile, etc.	Non-recyclable waste commonly includes materials that can be easily degraded in nature. For example, fruit shells, vegetable leaves, food leftovers, flowers and leaves, etc. it also includes cigarette end, muck, coal, cinder, construction waste, and paint waste which do not have big value after being discarded.

Table 5.5 Recyclable and Non-Recyclable Waste

The most commonly used methods of waste disposal are:

Landfill

It is a man-made method of disposing of solid and hazardous waste on land.

Incineration

It is a waste treatment method that involves the combustion of organic substances found in waste materials.

Waste Compaction

It is the process of compacting waste in order to reduce its size.

Biogas Generation

It is a renewable fuel that is created through the breakdown of organic matter. It can be used for vehicle fuel, heating, and electricity generation.

Composting

It is the natural process of decomposing and recycling organic material into a humus-rich soil amendment.

Vermicomposting

It is the process by which worms are used to convert organic materials (usually wastes) into a humus-like material known as vermin-compost.

Fig 5.21 Methods of Waste Disposal

Notes

5.4.3 Hazardous Waste Management

Hazardous waste is defined as waste that poses significant or potential risks to public health or the environment. Characteristic hazardous wastes are materials that have been proven or tested to have one or more of the following hazardous properties:

1. Ignitability
2. Reactivity
3. Corrosively

Following are the impact of various hazardous material on the manufacturing process:

Increase risk and contamination	**Substandard quality and defective products**	**Certain hazardous substances also have the potential to explode or cause a fire**
Possible injuries and illness among the workers	**Possible damage of equipment and machinery**	**Low productivity**
Material and resources wastage	**Loss of time, money and goodwill**	**Economic consequences of recall and outbreak**

Fig 5.22 Impact of Hazardous Material in Production Process

There are several options for hazardous-waste management. The most desirable option is to reduce waste at its source or to recycle the materials for another productive use. Nonetheless, while reduction and recycling are desirable options, they are not regarded as the final solution to the hazardous-waste disposal problem. There will always be a need for hazardous waste treatment, storage, or disposal.

1. **Chemical Treatment -** Chemical treatment processes include ion exchange, precipitation, oxidation and reduction, and neutralization.
2. **Thermal Treatment -** Thermal methods include high-temperature incineration, which can not only detoxify but also destroy certain organic wastes. Thermal equipment of specialized design is used to burn waste in solid, liquid, or sludge form. Fluidized-bed incinerators, multiple-hearth furnaces, rotary kilns, and liquid-injection incinerators are some examples of thermal treatment.

3. **Biological Treatment -** The waste is carefully mixed with surface soil on a suitable plot of land in this technique. Microbes that can metabolize waste, as well as nutrients, may be added.
4. **Surface storage and land disposal -** Hazardous wastes that cannot be destroyed by incineration or other chemical processes must be properly disposed of. Land disposal is the ultimate destination for the majority of such wastes, though it is not an appealing practice due to the inherent environmental risks involved. Landfilling of hazardous solid or containerized waste is subject to stricter regulations than municipal solid waste landfilling. Hazardous wastes must be disposed of in so-called secure landfills, which must have at least 3 meters (10 feet) of space between the landfill's bottom and the underlying bedrock or groundwater table. Two impermeable liners and leachate collection systems are required for a secure hazardous-waste landfill.

Manufacturers of hazardous substances must provide warning labels and safety guidelines with their products. Employers must ensure that the safety guidelines for each hazardous substance used in the workplace are available to employees and warning labels on hazardous substances should feature:

- Hazard Pictograms
- Signal Words (e.g. Danger and Warning)
- Hazard Statements (e.g. Fatal If Swallowed)
- Precautionary Statements (e.g. Wear Protective Gloves).

The Safety guidelines must include important information on handling the product safely, including:

- Potential Health Effects
- Precautions for Use
- Safe Storage Suggestions
- Emergency First Aid Instructions

5.4.4 Material Utilization

Material efficiency means producing the same result with reduced amounts or lower grades of raw materials. Material efficiency measures seek to decrease the number of natural resources required to produce a certain output level and recycle post-consumption waste material back in the manufacturing process.

The reuse of wear parts and components is also part of material efficiency, extending the lifetime of machinery, components, and spare parts through reconditioning. Material efficiency includes new product innovations to replace previous products that consume greater amounts of raw materials.

5.4.5 Energy Conservation Practices

In general terms, energy conservation refers to the simple practices that we follow in our day-to-day life to preserve energy. Manufacturing facilities are among the largest consumers of energy. Therefore, efforts to improve energy efficiency are an increasing concern for many manufacturing facilities. This can be accomplished by evaluating energy end uses e.g., lighting, processing equipment, and heating, air conditioning, and ventilation, HVAC systems, and by implementing measures to reduce the total amount of energy consumed for one or more of the end uses. The following exhibit suggests a few steps which can be followed for achieving energy efficiency and consumption.

Switching off lights remains one of the easiest ways to save on energy but it's surprising how often lights are kept on, even when no one is in the lit area. This problem is compounded in when employees go in and out of various buildings and work areas as they go about their duties.

Ensure you shut off machinery and equipment when not in use. Walking through your plant after-hours and ensuring equipment is powered down when not in use can result in significant savings over time.

Regular cleaning and planned maintenance of the electrical and mechanical equipment will go a long way towards optimising its performance and lifespan, which can translate to energy efficiency savings.

Newer heating and cooling systems will be far more efficient than old ones, so it may be worth getting systems more than 10 years old replaced.

Insulation acts as a barrier against temperature shifts. By installing insulation in the roof, and walls of your workspace, you can reduce the amount of energy needed to maintain room temperature during heat loss and heat gain.

Use fixed or adjustable shading, plant trees and vegetation or install sun filters on the windows and walls of the workplace— especially industrial sheds— to protect from acute heat during summers.

Use LED lights which are more energy efficient.

Use natural airflow where possible to avoid usage of cooling systems.

Optimise the energy consumption settings of the appliances being used in the unit, like refrigerator and AC can be made to run by a couple of degrees higher.

Create awareness on importance of energy consumption among the employees

Fig 5.23 Energy Conservation Practices

5.4.3 Water Conservation Practices

Water conservation is the practice of using water efficiently to reduce unnecessary water usage. It is essential because fresh clean water is a limited resource and a costly one. We are already well aware of the financial costs of inefficient water use. Conservation of this natural resource is critical for the environment — and our wallets.

Fig 5.24 Water Conservation Practices

Summary

- Workplace safety is one of the most significant concerns for any manufacturing company or facility. Getting it right can improve the overall performance of the operation and lead to growth.
- It is the responsibility of everyone, whether employer or employee, to keep the workplace clean, healthy, and safe.
- As safety is an integral part of the workplace, project managers should not turn a blind eye and, if necessary, issue instructions.
- A hazard is something or someone that has the potential to cause damage, harm, or adverse health effects.
- An organizational safety procedure is a step-by-step instruction manual for carrying out a work procedure. It is used when a deviation from the procedure could result in injury or an accident.
- Electricity is widely recognized as a serious workplace hazard that can cause electric shock, burns, fires, and explosions. Every year, many employees suffer pain, injuries, and even death as a result of electric shocks. To keep yourself and others safe, it is critical to adhere to electrical safety-related work practices.
- Lifting heavy objects is one of the leading causes of workplace injury. The main causes of these injuries were overexertion and cumulative trauma. Bending is the most frequently cited movement that resulted in back injuries, followed by twisting and turning.
- Workplace safety signage evolved with the Industrial Revolution when workplace safety became a major concern. The purpose of a workplace safety sign is to identify and warn employees who may be exposed to various hazards.
- Electronic-waste recycling is one of the most discussed issues in the world today due to its potential to reduce environmental hazards and pollution. It can also protect our lives as humans and other life forms in our world. E-waste recycling is the reuse and reprocessing of any type of discarded or obsolete electrical and electronic equipment.
- Recycling electronics can be a difficult task. This is due to the fact that e-scraps are typically sophisticated and made from a variety of materials such as metals, plastics, and glass.
- Employers bear more responsibility than their employees because they are held accountable for their employee's safety and well-being.
- Health and safety documents assist in controlling risks and communicating safe working procedures. Many health and safety documents, such as risk assessments and health and safety policies, are also required by law.
- PPE refers to the clothing or equipment designed to protect the workers/employees from shop floor hazards. It includes items such as hard hats, safety boots, coveralls, gloves, safety glasses and goggles, earplugs, high visibility vests, lifejackets, fall protection, and respirators.
- Effective housekeeping assists in the control or elimination of workplace hazards. Poor housekeeping practices frequently contribute to incidents.
- 5S is intended to be a visually-oriented system of cleanliness, organization, and arrangement to attain greater productivity. It engages all employees and is a foundation for more self-discipline on the job for better work and better products.

- Fire safety refers to a set of practices designed to reduce the devastation caused by fire. Fire safety measures include those used to prevent the ignition of an uncontrolled fire as well as those used to limit the development and effects of a fire once it has begun.
- Electrical fires are different from regular fires. They cannot be extinguished with water. Also, using water to put out an electrical fire is very dangerous and could lead to electrocution. To put out an electrical fire, the right type of fire extinguisher must be used.
- If you observe vomit or blood coming from the mouth or nose, turn the person on his or her side to prevent him or her from choking. Help to prop the person up with pillows.
- A mock Drill is a scenario in which a fake emergency is declared and employees are instructed to follow an emergency evacuation plan. This allows the worker to become acquainted with the emergency and act accordingly.
- Workplace pollution is defined as the presence of hazardous materials or noises within a workplace that may affect employees while they are performing their duties. Such workplace pollutants can harm workers' health, especially if they are exposed for extended periods, even at low levels.
- Waste management refers to the activities and actions required to manage waste from its inception to its disposal. This includes the collection, transport, treatment, and disposal of waste and monitoring and regulation of the waste management process.
- Waste elimination is one of the utmost effective ways to escalate the profitability of any trade or business. To eliminate waste, it is essential to understand exactly what waste is and where it exists. While products significantly differ between places, the typical wastes found in electronic manufacturing environments are pretty similar.
- In general, waste is segregated as dry and wet waste. Dry waste includes wood, paper, plastic, glass, etc., related products that can be recycled, and wet waste refers to organic and biodegradable waste. The waste can be segregated using color-coded dustbins.
- Recyclable waste is renewable. Non-recyclable waste commonly includes materials that can be easily degraded in nature.
- Hazardous waste is defined as waste that poses significant or potential risks to public health or the environment.
- Material efficiency means producing the same result with reduced amounts or lower grades of raw materials. Material efficiency measures seek to decrease the number of natural resources required to produce a certain output level and recycle post-consumption waste material back in the manufacturing process.
- In general terms, energy conservation refers to the simple practices that we follow in our day-to-day life to preserve energy. Manufacturing facilities are among the largest consumers of energy. Therefore, efforts to improve energy efficiency are an increasing concern for many manufacturing facilities.
- Water conservation is the practice of using water efficiently to reduce unnecessary water usage. It is essential because fresh clean water is a limited resource and a costly one.

Notes

QR Code

Scan the QR Code to watch the related video

youtu.be/nL354fxAfBk

5.4.2 Effective Waste Management

youtu.be/rSzXa2w9-dU

5.4.3 Hazardous Waste Management

youtu.be/QLOGvbSrIDk

5.4.6Water Conservation Practice

Exercise

Fill in the blanks:

a) Dry waste includes _____, _____ and _____ etc.

b) _____ can be reused or converted into new products or raw material.

c) The waste can be segregated using _____ dustbins.

Answer the following questions:

1. Differentiate between recycle and non-recycle waste.

_____

_____

_____

2. Explain waste elimination.

_____

_____

_____

3. Name any methods of waste disposal.

_____

_____

_____

4. List various ways to minimize pollution at workplace

_____

_____

_____

Match the following:

Column A	Column B
Energy Conservation Practices	Strains and sprains from lifting loads
Water Conservation Practices	Reuse of wear parts
Potential injuries occurs during moving of materials manually	Shut off machinery when not in use
Material efficiency	Turn off the tap when it is not necessary

Write a short note on:

a) Hazard Waste Management

b) Material Utilizations

c) Energy Conservation Practices

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		1.1.2 Roles and Responsibilities of a Project Manager			youtu.be/KG5cltHpbYs
		1.1.3 Various Employment Opportunities for Project Manager			youtu.be/CSoubY-WM5s
Chapter 2 Carry out project initiation and planning	Unit 2.1 Carry out Project Initiation	2.1.1 Creating Business Case	27		youtu.be/UQP5MmCAQ3Y
		2.1.2 Project Scope Statement and Determining the Deliverables			youtu.be/QDLk2QIuJkg
		2.1.3 Significance of Identifying Project Risks and its Solutions			youtu.be/Crzo6HnGPO4

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	Unit 2.2 Carry out Project Planning	2.2.1 Work Breakdown Structure	39		youtu.be/WjUZik9CGDY
		2.2.2 Estimating Duration, Cost & Resources for Project			youtu.be/rN0FrDpQNUk
		2.2.4 Importance and Process of Creating a Contingency Plan			youtu.be/w2kOqmaSJj8
		2.2.6 Planning software Tools for Time-Bound Scheduling and Critical Tasks			youtu.be/WNWSQOynrl0
	Unit 2.3 Participate in Resource Planning and Procurement	2.3.1 Process of Planning and Procuring Project Resources	42		youtu.be/akj4R1xZHzA
	Unit 2.4 Obtain Necessary Approvals	2.4.1 Process of Obtaining Necessary Approvals	47		youtu.be/Do8iykQKMfU

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		3.1.2 Assigning Tasks, Setting Deadlines and Availability of Necessary Resources			youtu.be/zPtI8q9gvX8
		3.1.4 Maintaining Effective Relationship and Communication with Stakeholders			youtu.be/2CggVQfEek8
		3.1.6 Process of Analysing Data and Reports			youtu.be/lV1s5NQWN_A
		3.1.7 Appropriate Verification Techniques for Managing Changes in Scope, Schedule and Costs			youtu.be/D7Jx1ob1sPg

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	Unit 3.2 Monitor and Control Project	3.2.1 Project Planning Parameters	82		youtu.be/HWeUb1VMgJg
		3.2.2 Appropriate Project Management Software			youtu.be/3ltc-h-S9mQ
		3.2.3 Process of Tracking Commitments and Stakeholders Involvement			youtu.be/RS4djBoGSRA
		3.2.5 Quality Control Management Practices			youtu.be/18cN8MZvJRA

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	Unit 3.3 Carry Out Project Closure	3.3.1 Importance of Delivering Project on Time	94		youtu.be/C0p5fSNLW8Q
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		4.1.12 Performance Measurement			youtu.be/dAF4bAx2gJM
	Unit 4.2 Work in a Disciplined and Ethical Manner	4.2.2 Managing Conflicts at Workplace	120		youtu.be/NJH0XV9jGIE
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Chapter 5 Apply health and safety practices at the workplace	Unit 5.1 Dealing with Workplace Hazards & Risks	5.1.1 Workplace Safety	148		youtu.be/4bkr5lpKGUM
		5.1.2 Safety Hazards, Risks and Accidents			youtu.be/aH495epWeAE
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		5.4.3 Hazardous Waste Management			youtu.be/rSzXa2w9-dU
		5.4.6 Water Conservation Practices			youtu.be/QLOGvbSrIDk

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