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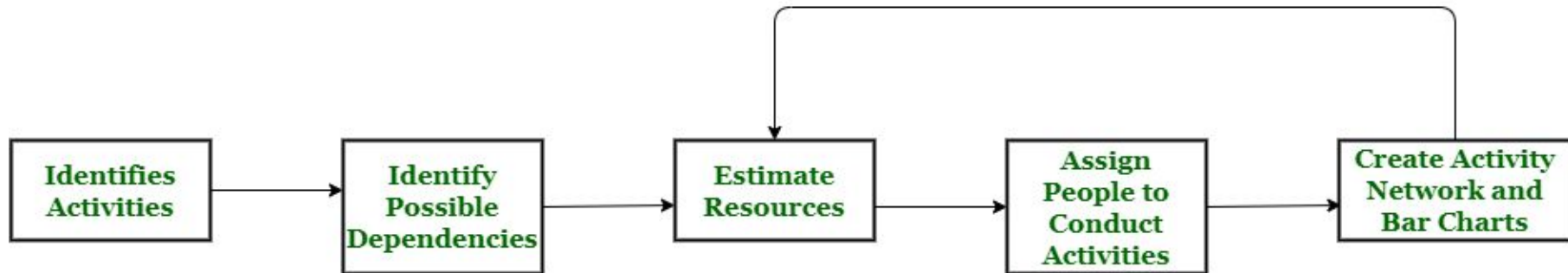
Module3

Project Scheduling

What is Project Scheduling?

- ▶ Project-task scheduling is a significant project planning activity.
- ▶ It comprises deciding which functions would be taken up when.
- ▶ To schedule the project plan, a software project manager wants to do the following:
 - ▶ Identify all the functions required to complete the project.
 - ▶ Break down large functions into small activities.
 - ▶ Determine the dependency among various activities.
 - ▶ Establish the most likely size for the time duration required to complete the activities.
 - ▶ Allocate resources to activities.
 - ▶ Plan the beginning and ending dates for different activities.
 - ▶ Determine the critical path. A critical way is the group of activities that decide the duration of the project.

Project Scheduling Process:



Project Scheduling Process

Problems arise during Project Development Stage :

- People may leave or remain absent during particular stage of development.
- Hardware may get failed while performing.
- Software resource that is required may not be available at present, etc.

Resources required for Development of Project :

- ▶ Human effort
- ▶ Sufficient disk space on server
- ▶ Specialized hardware
- ▶ Software technology
- ▶ Travel allowance required by project staff, etc.

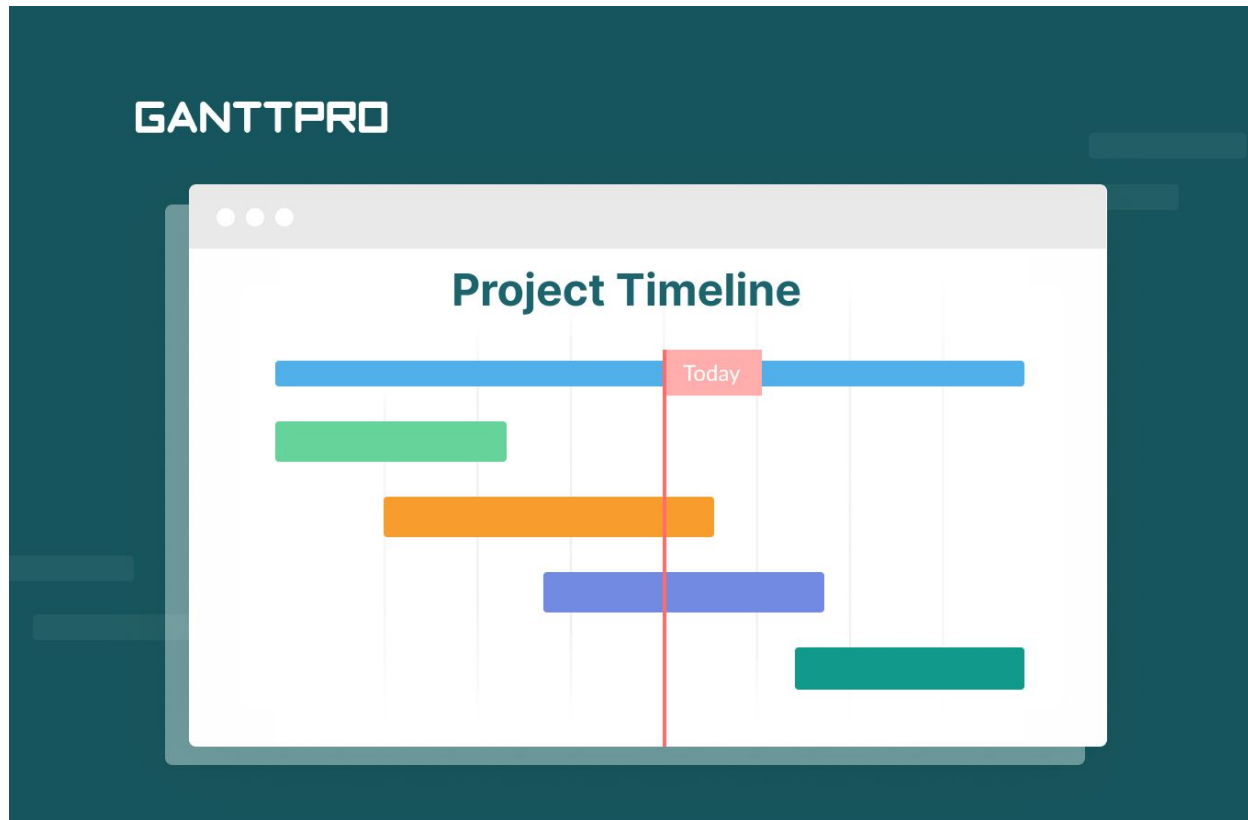
Advantages of Project Scheduling :

- ▶ There are several advantages provided by project schedule in our project management:
- ▶ It simply ensures that everyone remains on same page as far as tasks get completed, dependencies, and deadlines.
- ▶ It helps in identifying issues early and concerns such as lack or unavailability of resources.
- ▶ It also helps to identify relationships and to monitor process.
- ▶ It provides effective budget management and risk mitigation.

Wrike:

- ▶ <https://www.wrike.com/project-management-guide/faq/what-is-scheduling-in-project-management/>

Timeline:



Project Timeline:

- ▶ A project timeline is a visual list of tasks or activities placed in chronological order, which lets project managers view the entirety of the project plan in one place.
- ▶ A project timeline typically takes the form of a horizontal bar chart, where each task is given a name and a corresponding start and end date.
- ▶ A project timeline provides an in-depth overview of the entire project from start to finish. You can see when a task starts and when it's due—and importantly, whether or not it's dependent on another task.
- ▶ A project timeline can be priceless for a project team, but they can be challenging to make by hand or even in Excel. Fortunately, project planning software can create an interactive timeline in just a few clicks.

Project Manager:

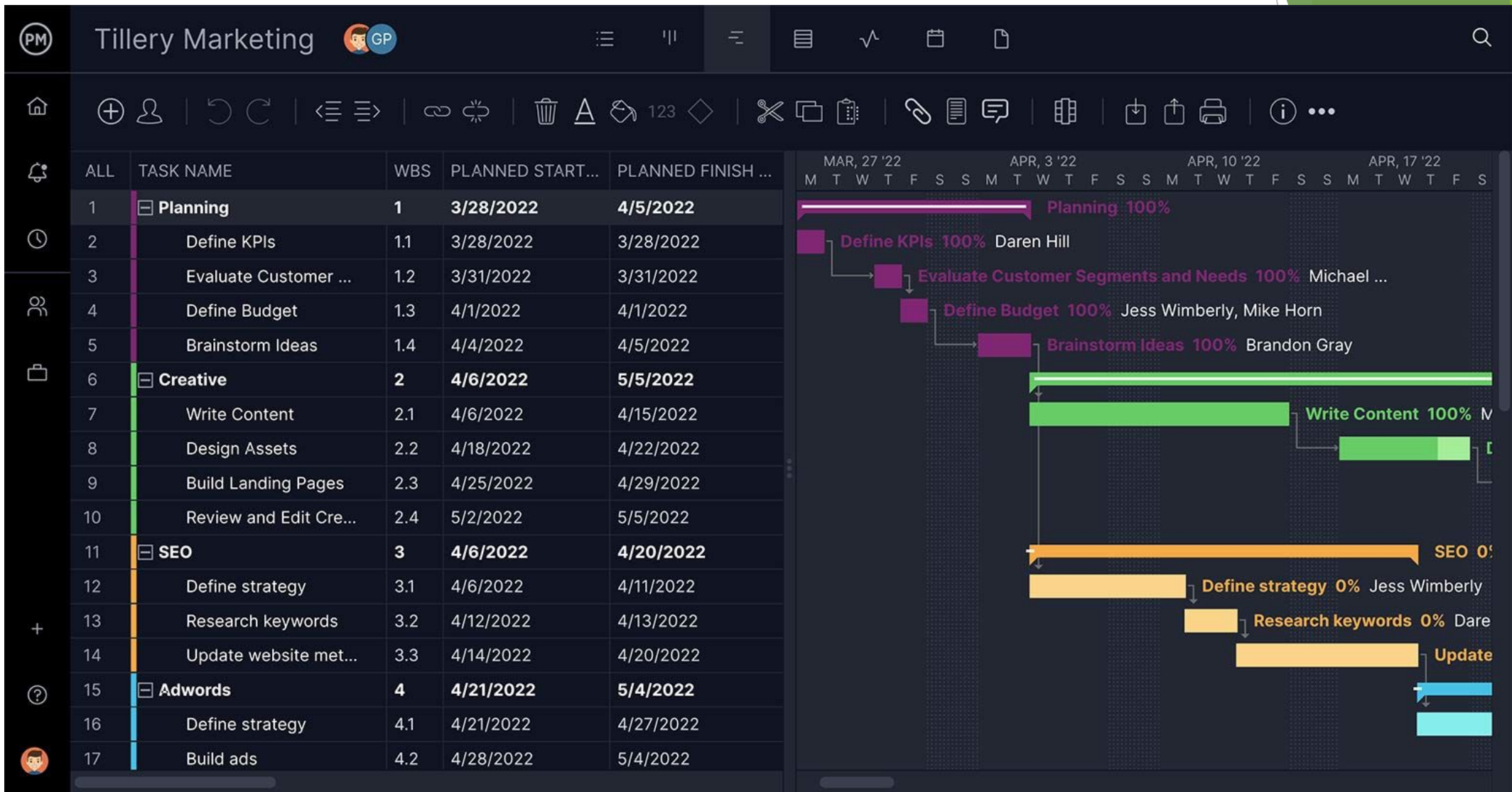
- ▶ <https://www.projectmanager.com/guides/project-timeline>

Project Timeline Uses:

- ▶ Organize their tasks
- ▶ Show when in the project the tasks start
- ▶ View task deadlines
- ▶ Link dependent tasks
- ▶ Break the project into phases
- ▶ Identify team members assigned to a task

How Do You Calculate a Project Timeline?

- ▶ Write a project scope statement: A scope statement outlines the tasks, milestones and deliverables for the project. It's an essential part of the project management plan and it has all the information you need for your project plan timeline
- ▶ Make a work breakdown structure (WBS): Use this graphic tool to break down the project scope into smaller work packages. The WBS allows you to visualize and organize the project's tasks, milestones and deliverables by hierarchy to establish a chronological order
- ▶ Identify task dependencies: Now that you've identified every task required for the project, find out which of those activities are dependent on other tasks to start or end
- ▶ Estimate task duration: Make a reasonable time estimate for each task. This is a critical step to create your project management timeline, and determine the time required to complete the project
- ▶ Define deadlines: Determine how much time your team can spend on each task
- ▶ Set milestones: Milestones are important dates that mark the end of one phase and the beginning of the next, which makes them an important component of a project management timeline. Milestones are reached by completing task sequences and deliverables



Critical Path Method:

- ▶ Critical Path Method (CPM) is a method used in project planning, generally for project scheduling for the on-time completion of the project.
- ▶ It actually helps in the determination of the earliest time by which the whole project can be completed.
- ▶ There are two main concepts in this method namely critical task and critical path.

Critical Path and Task:

- ▶ Critical task is the task/activity which can't be delayed otherwise the completion of the whole project will be delayed. It must be completed on-time before starting the other dependent tasks.
- ▶ Critical path is a sequence of critical tasks/activities and is the largest path in the project network. It gives us the minimum time which is required to complete the whole project.

Major steps of the Critical Path Method:

- ▶ Identifying the activities
- ▶ Construct the project network
- ▶ Perform time estimation using forward and backward pass
- ▶ Identify the critical path

- The table given below contains the activity label, its respective duration (in weeks) and its precedents. We will use critical path method to find the critical path and activities of this project.

Activity	Duration (in weeks)	Precedent s
A	6	–
B	4	–
C	3	A
D	4	B
E	3	B
F	10	–
G	3	E, F
H	2	C, D

- ▶ <https://www.geeksforgeeks.org/software-engineering-critical-path-method/>

Fishbone Diagram:

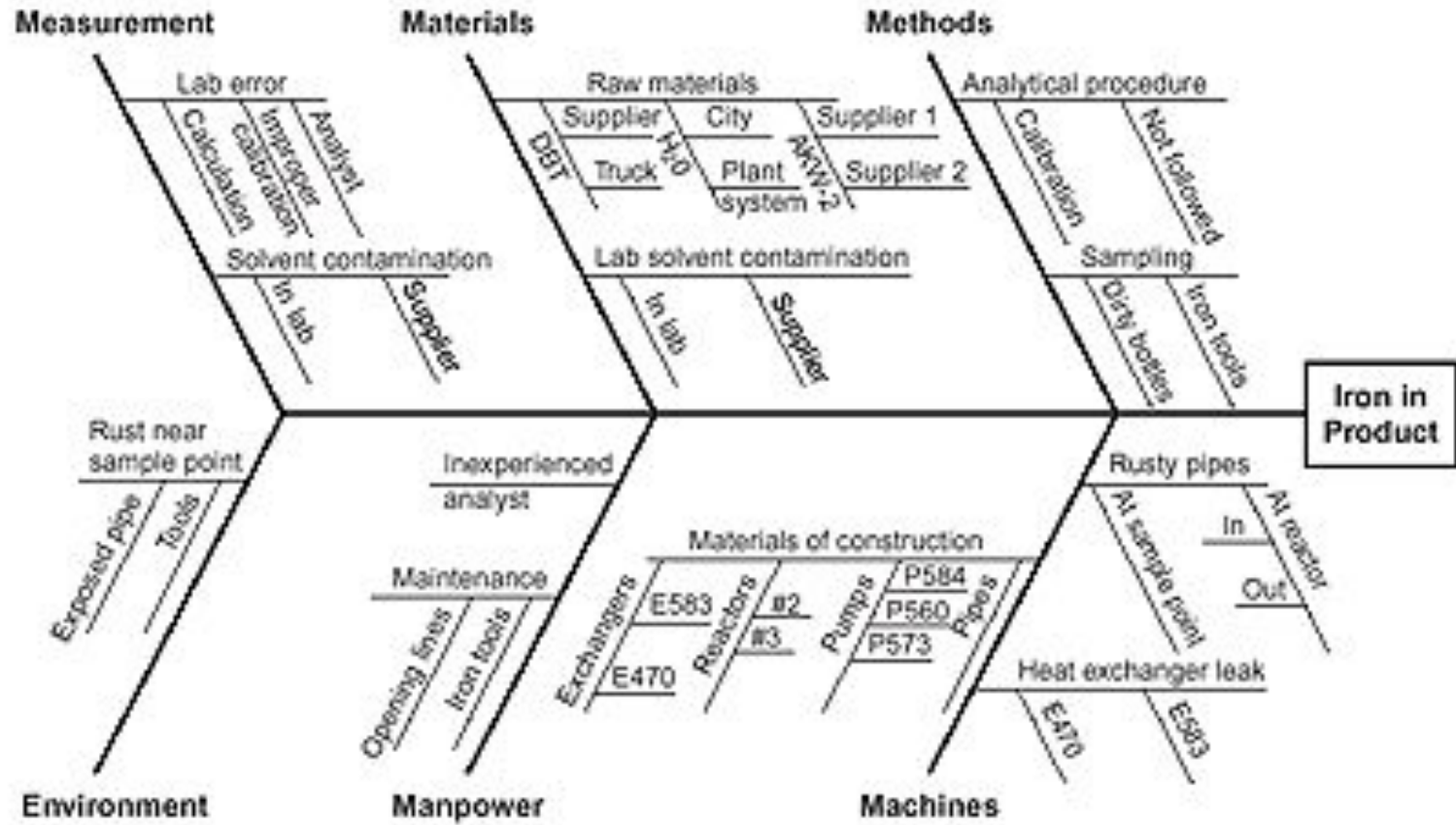
- ▶ Also called: cause-and-effect diagram, Ishikawa diagram
- ▶ Variations: cause enumeration diagram, process fishbone, time-delay fishbone, CEDAC (cause-and-effect diagram with the addition of cards), desired-result fishbone, reverse fishbone diagram
- ▶ This cause analysis tool is considered one of the seven basic quality tools. The fishbone diagram identifies many possible causes for an effect or problem. It can be used to structure a brainstorming session. It immediately sorts ideas into useful categories.

WHEN TO USE A FISHBONE DIAGRAM

- ▶ When identifying possible causes for a problem
- ▶ When a team's thinking tends to fall into ruts

FISHBONE DIAGRAM PROCEDURE

- ▶ Materials needed: marking pens and flipchart or whiteboard.
- ▶ Agree on a problem statement (effect). Write it at the center right of the flipchart or whiteboard. Draw a box around it and draw a horizontal arrow running to it.
- ▶ Brainstorm the major categories of causes of the problem. If this is difficult use generic headings:
 - ▶ Methods
 - ▶ Machines (equipment)
 - ▶ People (manpower)
 - ▶ Materials
 - ▶ Measurement
 - ▶ Environment
- ▶ Write the categories of causes as branches from the main arrow.
- ▶ Brainstorm all the possible causes of the problem. Ask "Why does this happen?" As each idea is given, the facilitator writes it as a branch from the appropriate category. Causes can be written in several places if they relate to several categories.
- ▶ Again ask "Why does this happen?" about each cause. Write sub-causes branching off the causes. Continue to ask "Why?" and generate deeper levels of causes. Layers of branches indicate causal relationships.
- ▶ When the group runs out of ideas, focus attention to places on the chart where ideas are few.



- ▶ This fishbone diagram was drawn by a manufacturing team to try to understand the source of periodic iron contamination.
- ▶ The team used the six generic headings to prompt ideas.
- ▶ Layers of branches show thorough thinking about the causes of the problem.
- ▶ <https://www.reliableplant.com/fishbone-diagram-31877>