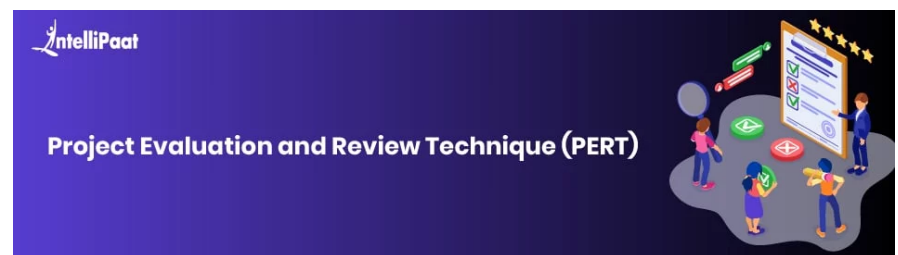




Teknik Evaluasi dan Peninjauan Proyek (PERT)

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Mengelola proyek membutuhkan perencanaan yang baik, penjadwalan yang tepat, dan koordinasi tugas yang lancar. Salah satu alat bantu yang bermanfaat adalah bagan PERT, yang merupakan singkatan dari Program Evaluation and Review Technique. Bagan ini digunakan untuk memperkirakan berapa lama setiap tugas akan memakan waktu dan bagaimana tugas-tugas tersebut saling terkait. Baik proyek itu sederhana maupun kompleks, bagan PERT memberikan gambaran yang jelas tentang alur kerja dan membantu mengidentifikasi tugas-tugas penting yang dapat menunda proyek. Bagan ini juga meningkatkan estimasi waktu, mempermudah kerja tim, dan mendukung pengambilan keputusan yang lebih baik. Dalam blog ini, Anda akan mempelajari apa itu PERT, pentingnya dalam manajemen proyek, kelebihan dan keterbatasannya, serta panduan langkah demi langkah tentang cara membuat dan mengelola bagan PERT secara efektif.

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Apa itu Teknik Evaluasi dan Peninjauan Proyek (PERT)?

PERT menggunakan tiga estimasi waktu untuk setiap tugas: waktu optimis, waktu paling mungkin, dan waktu pesimis. Estimasi ini membantu [manajer proyek](#) menghitung perkiraan waktu yang dibutuhkan untuk menyelesaikan tugas. Tujuan utama PERT adalah untuk menemukan jalur kritis, yaitu rantai tugas dependen terpanjang yang memengaruhi keseluruhan jadwal proyek. Jalur ini menunjukkan tugas mana yang harus diselesaikan tepat waktu agar proyek tetap sesuai jadwal. Dengan mengidentifikasi tugas-tugas ini, manajer proyek dapat fokus pada aktivitas yang paling penting dan mengambil tindakan jika terjadi keterlambatan yang dapat memengaruhi seluruh proyek.

Pentingnya PERT dalam Manajemen Proyek

Ada banyak manfaat menggunakan Teknik Evaluasi dan Peninjauan Proyek (atau bagan PERT) untuk perencanaan dan penjadwalan proyek:

1. Estimasi waktu yang lebih baik: PERT dapat membantu manajer proyek memperkirakan waktu untuk setiap tugas dengan tiga estimasi waktu:

- **Waktu optimis (O):** Ini adalah waktu minimum yang dibutuhkan untuk menyelesaikan suatu tugas.
- **Waktu yang paling mungkin (M):** Ini adalah waktu tipikal yang dibutuhkan untuk menyelesaikan suatu tugas.
- **Waktu pesimistis (P):** Ini adalah waktu maksimum yang dibutuhkan untuk menyelesaikan suatu tugas.

Using these estimates provides a better project schedule than simply using one time estimate.

2. Helps identify the critical path: The critical path demonstrates the longest string of dependent tasks. If delayed, that string of tasks will delay the whole project. PERT charts help demonstrate this relevant path for the project managers.

3. Better planning and coordination of tasks: The PERT chart will show what tasks must be completed before other tasks can begin. This will help to minimize task confusion and coordination.

4. Minimizes project risks: By visualizing all paths in a project and estimating time wisely, PERT techniques can limit the amount of unforeseen delays in [project management](#).

5. Improves Resource Management: PERT helps project managers understand which tasks need more attention and more resources.

Streamline Your Project Workflow

Organize tasks, manage teams, and achieve milestones with clarity and control.

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Advantages and Disadvantages of the PERT Chart

Like any other project management tool, there are advantages and disadvantages to a PERT chart. A PERT chart improves planning, scheduling, and coordination of tasks, but has some limitations depending on the size of your project and the confidence in the task estimates. Let's take a look at the major advantages and disadvantages of utilizing a PERT chart.

Advantages of the PERT Chart

Let's explore the advantages of the PERT chart:

1. **More Accurate Time Estimates:** In each task, PERT assigns three time estimates, which gives a more accurate picture of how much time the task might take.
2. **Identifies Task Relationships:** It shows which tasks must be done first and which can follow, helping the team stay on track.
3. **Focuses on Key Tasks:** PERT will assist the manager in locating the critical path, which means they can focus on the critical tasks that impact the project's finished timeline.
4. **Enhances Project Planning:** It provides a complete overview of the project, making it easier to plan for each step accurately and mitigating the risk of delays.

Disadvantages of the PERT Chart

Let's explore the disadvantages of the PERT chart:

1. **Takes Time to Create:** Implementing a detailed PERT chart that includes time estimates and task dependencies can be labor-intensive.
2. **Estimates May Be Inaccurate:** The time estimates in PERT rely on subjective assumptions. It simply takes one incorrect assumption, and the whole schedule is at risk.
3. **Not Ideal for Simple Projects:** PERT charts may be unnecessary for small or straightforward projects, as the level of detail can be excessive and overly complex.
4. **Can Get Complicated:** In extremely large projects with a multitude of tasks, reading and managing the chart can be challenging.

Steps to Create a PERT Chart

Let's explore the steps required to create a PERT chart:

Step 1: List Activities for the PERT Chart

The first step is to list all the tasks or activities that need to be done in order to complete the project. Every task has to have a clear start point and endpoint. It helps you break down the project into smaller segments that are easier to understand and manage. At this stage, you are not worried about the order of the tasks. You are just concerned with writing down everything that needs to be done in order to complete the project.

Step 2: Identify Activity Dependencies in the PERT Chart

After you have completed a list of tasks, the second step is to identify how the tasks are related. Some tasks can only start after another task is finished. These are called dependent tasks. For example, you cannot begin testing a product until you have built it first. As a result of identifying these relationships among the tasks, you will be able to properly sequence the tasks as they relate to the project. This will provide you with an understanding of the flow of work through the project.

Step 3: Assessing Task Duration by Using PERT

Once you've identified the dependencies, you'll need to estimate how long it will take to do each task. In PERT, this is done using three time estimates:

- **Optimistic time (O):** The shortest time a task could take
- **Most likely time (M):** The most probable time the task will take
- **Pessimistic time (P):** The longest time the task might take if there are delays

Using these values, you can calculate the **expected time (TE)** for each task with this simple formula:

$$\text{Expected Time (TE)} = (O + 4M + P) / 6$$

This formula gives more weight to the most likely time and helps you create more realistic and accurate project schedules.

Step 4: Calculate the Critical Path on the PERT Chart

Once you have your time estimates, you can now begin to draw your PERT chart. Connect the tasks according to their dependencies and show the expected time for each. Once you are done, you can identify your critical path. The critical path is the longest path from the start of the project to the end. The critical path must be done on time. If any of the projects on the critical path are late, the entire project will be late. Determining your critical path keeps your project focused on the most critical tasks.

Step 5: Monitor and Control Progress using PERT

Once the PERT chart is created, it serves as an important tool for tracking the performance of the project. You should use it to determine if the work is progressing as planned. If any of the critical path tasks are not completed on time, you'll know corrective action is necessary. And, as the project moves on, you can also modify the chart, which will help keep you better informed about the schedule and allow for plan changes.

Note: PERT charts are not suitable for small, simple, or repetitive projects where tasks are predictable and timelines are fixed. In such cases, using a simpler tool like a Gantt chart or Kanban board is more practical, as PERT can become unnecessarily complex and time-consuming.

Characteristics of a PERT Chart

Let's explore the characteristics of the PERT chart:

- **Displays Task Sequence Clearly:** A PERT chart is used to visually display the order in which tasks need to be completed, as it helps members of the team to understand what is coming next and which task depends on the other task.
- **Identifies the Critical Path:** The most important feature of the PERT chart is its ability to show the critical path. This is the longest sequence of tasks that must be completed to keep the project on schedule.
- **Emphasizes Dependencies:** Tasks are displayed as interconnected events. A task will typically begin only after another task has ended. These relationships explain a task's relationship to others.
- **Helps with Uncertainty:** Since PERT charts explicitly report different time estimates, project managers can utilize them to manage timelines that are uncertain or unpredictable.

Tools and Software for PERT

Let's explore tools and software for PERT:

1. **Microsoft Project:** Microsoft Project is one of the leading commercial project planning tools available. It allows for the development of PERT charts, dependencies, and progress tracking.
2. **Lucidchart:** If you need a free, simple, and online solution for generating PERT charts, look at Lucidchart. Lucidchart will let you create PERT charts using a simple drag-and-drop approach, and is a helpful tool for teams that would like to create visual project plans.
3. **SmartDraw:** SmartDraw provides PERT chart templates. It has an easy-to-use interface for beginner-level users who want to create PERT charts that are clean and organized.
4. **Wrike and Monday.com:** Wrike and Monday.com are collaboration tools for team members. It allows the teams to track their project tasks, set due dates, and visualize task dependencies.
5. **Excel or Google Sheets:** You can also use Excel or Google Sheets to create basic PERT charts. Spreadsheets are flexible and allow you to organize the data manually in your desired arrangement.

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How PERT Is Evolving with Agile and AI

Project management is shifting with Agile frameworks and AI-based tools. Modern PERT applications are adapting in the following ways:

- **Integration with Agile:** PERT can now be used at the sprint level to estimate uncertain or research-heavy tasks.
- **AI-Powered Scheduling:** Tools like Wrike, Asana, and Monday.com use AI to automatically adjust task timelines and predict potential delays.
- **Predictive Analytics:** Machine learning algorithms analyze past project data to forecast risks and suggest better critical paths

Difference Between PERT and CPM

Feature	PERT	CPM
Focus	PERT focuses on time and uncertainty.	CPM focuses on time and cost.
Time Estimates	PERT uses three time estimates (optimistic, most likely, pessimistic).	CPM uses one fixed time estimate per task.
Best For	PERT is best for research, development, or uncertain projects.	CPM is best for construction and routine projects.
Flexibility	PERT is more flexible than CPM and handles uncertainty well.	CPM is less flexible and assumes fixed timelines.
Cost Control	PERT is not used for cost tracking.	CPM includes cost control and resource planning.
Type of Tasks	PERT is mostly used for unpredictable tasks.	CPM is used for well-known and repetitive tasks.

Common Mistakes in PERT Chart Creation

Let’s explore the common mistakes that people make while creating PERT charts:

- **Missing Tasks:** Forgetting to include all the necessary tasks can affect the entire plan. Every small component of the project needs to be listed in full detail.
- **Wrong Time Estimates:** Providing inaccurate or unrealistic time estimates can lead to finding yourself late on the project. Consider time estimates seriously and be willing to draw on experts for guidance, if needed.
- **Ignoring Dependencies:** If task relationships have not been displayed correctly, the chart can easily provide incorrect information. Always double-check to determine which tasks are dependent upon others.
- **Overcomplicating the Chart:** Adding too many variables to the chart can result in a confusing chart, rendering it useless. The chart needs to be as simple as possible and only contain the important tasks and timelines.

Common Software Mistakes When Using PERT Charts

Even with modern tools, teams often make mistakes while building or using PERT charts:

- Overloading the chart with unnecessary subtasks makes it cluttered.
- Ignoring software-calculated dependencies, can distort the critical path.
- Not updating estimates as the project evolves.
- Relying only on automation, without manually verifying dependencies or durations.

Best Practices for Presenting a PERT Chart to Stakeholders

Let's explore the best practices for presenting a PERT chart:

- **Utilize Visuals Wisely:** When designing a PERT chart, ensure it is clearly organized. Use colors, shapes, and symbols effectively to highlight the critical path and key tasks.
- **Clearly Describe The Critical Path:** Make sure to clearly define the critical path every time. Stakeholders must know what tasks really affect the success of the project.
- **Show Time Estimates:** In an easy-to-read table or on the chart, provide the three time estimates for each task. This will show that planning has been done.
- **Allow Time For Questions:** Allow the stakeholders time to ask questions. They may want to add something to the chart that is good for the overall project.

Real-World Example

Example 1: NASA's Polaris Missile Program

One of the earliest and most successful applications of PERT was during the U.S. Navy's Polaris Missile Program in the late 1950s. The project involved coordinating over 250 contractors and was completed two years ahead of schedule, thanks to PERT's ability to visualize dependencies and identify critical tasks effectively.

Example 2: Software Development Project

A modern software company used PERT to manage a complex product launch involving multiple development and testing phases. By mapping dependencies and estimating task durations, the team reduced scheduling conflicts and improved delivery accuracy by nearly 20%, ensuring smoother collaboration between developers and testers.

Conclusion

The PERT chart is a powerful tool that makes project planning, scheduling, and tracking easier, especially for tasks with unclear timelines. It helps estimate how long tasks will take and shows how they depend on each other, leading to more accurate schedules and smarter decisions. It also reduces the risk of delays, makes better use of resources, and highlights the most important tasks to keep the project moving forward. Whether your team is small or your project is large and complex, using a PERT chart can lead to clearer planning and better results.

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Project Evaluation Review Technique (PERT) – FAQs

Q1. When should you not use a PERT chart?

-
- Q2. What is the main purpose of a PERT chart?
- Q3. What is the critical path in a PERT chart?
- Q4. What type of projects use PERT charts?
- Q5. How is PERT different from CPM?
- Q6. How is PERT evolving with AI and Agile methods?
- Q7. What are common mistakes when using PERT software?

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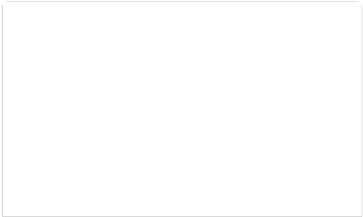
With 7+ years of experience in working with multiple industries and technical products, Waseem has diverse experience in product management. His attention to detail and ability to simplify complex problems make him a great product leader. In his free time, he likes to write about the changing landscape of product management and how more people can get into this field!

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