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**Assignment:**

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**Course Name:**

**Software Project Management**

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**Submitted To:**

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**PERT (Program Evaluation and Review Technique)** VS

**Kanban**

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1. **Introduction**

Project management methodologies play vital role in successful project execution, and choosing the right approach depends on various factors, including project size, complexity, and the nature of work. This report provides an overview and detailed comparison between the Program Evaluation and Review Technique (PERT) and Kanban, focusing on key aspects such as resource management, uncertainty handling, project size, implementation overhead, adaptability, visualization, cycle time, team collaboration, and project monitoring and control.

1. **PERT**
   1. **Definition:**

PERT is a project management method that uses three time estimates (optimistic, pessimistic, and most likely) to calculate the expected duration for each project activity. It integrates probabilistic activity durations to analyze uncertainty in project schedules.

* 1. **Features:**
* **Probabilistic Approach:** PERT considers variability in activity durations, providing a more realistic perspective on project timelines.
* **Critical Path Analysis:** Similar to CPM, PERT identifies the critical path, highlighting tasks that might impede project progress.
  1. **Pros and Cons**
* **Pros:**

Risk Management: PERT's probabilistic approach aids in identifying and managing risks associated with project timelines.

Detailed Planning: The three-time estimate model allows for a more comprehensive understanding of potential activity durations.

Quantitative Analysis: Provides quantitative data for project planning and decision-making, enhancing precision.

* **Cons:**

Resource Allocation: While it aids in resource planning, the focus on time estimates might not directly address resource constraints.

Dependency Complexity: In highly interdependent projects, the complexity of critical path analysis can be challenging to manage.

Limited Adaptability: The detailed planning might make it less adaptable to dynamic project changes.

1. **Kanban**
   1. **Definition:**

Kanban is an agile project management method that visualizes work on a board, categorizing tasks into stages (e.g., to-do, in-progress, completed). It emphasizes continuous delivery and workflow efficiency.

* 1. **Features:**
* **Visual Management:** Kanban provides a visual depiction of the project's flow, facilitating progress tracking.
* **Flexibility**: It allows for changes in project priorities and swift adaptation to evolving requirements.
  1. **Pros and Cons:**
* **Pros:**Efficiency: Prioritizes workflow efficiency, reducing bottlenecks and enhancing overall project efficiency.

Customer Satisfaction: Continuous delivery aligns with customer expectations for regular updates and improvements.

Easy Implementation: Simple to implement, making it accessible for teams without extensive project management experience.

* **Cons:**
* Limited Planning Detail: Kanban may lack the detailed planning and analysis provided by methods like PERT. Kanban doesn't inherently emphasize time constraints or critical paths, which may be a drawback for projects with stringent deadlines.
* Complex Projects: Might face challenges in managing larger and more complex projects with numerous dependencies.
* Dependency Management: In projects with intricate dependencies, Kanban might not provide as clear a picture as critical path methods.

1. **Comparison of PERT and Kanban**
   1. **Resource Management:**

* **PERT:** Focuses on probabilistic time estimates, aiding in resource planning by presenting a range of potential activity durations.
* **Kanban:** Prioritizes the visualization of work and workflow efficiency, making it well-suited for resource management in a continuous delivery model.
  1. **Approach to Uncertainty:**
* **PERT:** Explicitly addresses uncertainty through its probabilistic time estimates, offering a nuanced understanding of project timelines.
* **Kanban:** Manages uncertainty through its adaptive and continuous delivery model, allowing for prompt adjustments based on changing project needs.
  1. **Project Size and Complexity:**
* **PERT:** Suited for larger projects with complex dependencies and a need for in-depth critical path analysis.
* **Kanban:** Particularly effective for smaller to medium-sized projects with more straightforward task dependencies and a focus on continuous delivery.
  1. **Implementation Overhead:**
* **PERT:** Can involve higher implementation overhead due to the need for three time estimates and probabilistic calculations.
* **Kanban:** Generally, has lower implementation overhead, making it quicker to adopt and easier to integrate into existing workflows.
  1. **Adaptability to Change:**
* **PERT:** Adaptable to changing circumstances but may require more effort to modify plans due to its probabilistic nature.
* **Kanban:** Highly adaptable, allowing for quick adjustments and accommodating changes in priorities or requirements seamlessly.
  1. **Visualization of Project Flow:**
* **PERT:** Visualization is limited to the critical path and time estimates, potentially making it less intuitive for stakeholders.
* **Kanban:** Excels in visualizing the entire project flow, providing a clear picture of work progress and bottlenecks.
  1. **Cycle Time and Throughput:**
* **PERT:** Focuses on estimating time, making it less directly concerned with cycle time and throughput.
* **Kanban:** Emphasizes cycle time and throughput, making it suitable for projects with a priority on fast, continuous delivery.
  1. **Team Collaboration:**
* **PERT:** Collaboration might be more task-focused due to its emphasis on time estimates and critical path analysis.
* **Kanban:** Encourages collaborative work as tasks move through different stages, fostering continuous communication and teamwork.
  1. **Project Monitoring and Control:**
* **PERT:** Emphasizes control through detailed time estimates, aiding in monitoring project progress against expectations.
* **Kanban:** Focuses on continuous monitoring and control through visual boards, providing real-time insights into project status.
  1. **Examples:**
* **PERT:** In the context of a large construction project, PERT would assist in estimating the time for each construction phase, considering uncertainties in construction tasks.
* **Kanban:** For a software development team employing a continuous delivery model for a mobile app, Kanban would be beneficial in visualizing tasks and adapting quickly to changes in priorities or requirements.

1. **Conclusion**

In conclusion, the choice between PERT and Kanban is nuanced and should align with the unique characteristics of the project at hand. PERT's strength lies in its meticulous planning and focus on time estimates, making it ideal for large, intricate projects. On the other hand, Kanban's forte lies in visual organization, flexibility, and streamlined workflow, making it well-suited for smaller to medium-sized projects.

Understanding these methodological differences empowers teams to make informed decisions that align with their project's requirements and goals. Ultimately, success in project management hinges on selecting the right approach tailored to the project's nature and the team's priorities. The careful consideration of these factors ensures optimal results and project success.

1. **References**

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