PROJECT SCHEDULING

The essence of planning is to develop and substantiate goals, determine the best methods and ways to achieve them while effectively using all types of resources required to fulfil the tasks and establishing their interaction.

The planning process itself has four stages:

- development of general objectives;
- setting specific goals for a given period with their subsequent detailing;
- determining the ways and means of achieving the goals;
- control over the process of achieving the goals by comparing planned indicators with actual ones and adjusting the goals.

The following questions should be answered in the planning process:

- what should be done and why?
- when will it be done and who will do it?
- where will it be done and what is needed?

Addressing these questions is the function of planning, which is the basis for decision-making. This is a management activity that involves developing goals and objectives for production management, and determining how to implement plans to achieve the goals.

In project management methodology, a project has the following fundamental levels of management: conceptual, strategic, tactical(which is divided into current and operational).

At the conceptual level, the goals and objectives of the project are defined, alternative options for achieving the planned results are considered with an assessment of the positive and negative aspects of each option, and conceptual directions for project implementation are established.

Strategic planning identifies key milestones and major obstacles, characterised by the timing of commissioning of the facility, production capacity, and output; project stages, characterised by the timing of completion of the complex of works, delivery of products, and preparation of works; and forecasts the need for material, technical, and financial resources, broken down by years and quarters.

The strategic plan establishes a stable external and internal environment, fixed goals for the project team, and provides an overall vision for the project.

In tactical planning, the current plan determines the timing of the work package, the need for resources, and sets a clear boundary between the participants in the work in terms of year and quarter. The operational plan details the tasks for the participants for a month, week, and day by work packages.

Plans can be detailed by management function. A functional plan is developed for each set of works or a set of works performed by one organisation.

Current trends, solutions and approaches

Gantt charts are a project management tool that illustrates how planned work is accomplished over time. They allow you to visualise the constituent parts of a project and break it down into smaller tasks for easy management. Gantt Charts make it easy to create complex plans, especially those involving multiple teams and changing deadlines. Gantt charts help teams plan for deadlines and allocate resources appropriately.

Critical Path Method is a methodology that includes different tools for planning and project management. Its main goal is to set realistic deadlines and complete all key tasks according to the deadline. To do this, a simple principle is used: identify the highest priority tasks, put them in chronological order, find dependencies and, based on this, build a plan that takes all deadlines into account.

PERT (Program Evaluation and Review Technique) is a project management tool used to schedule, organize, and coordinate tasks within a project. It is used to identify task dependencies and critical paths, plan resources, estimate task duration, and identify potential risks. It also helps to define and sequence activities, coordinate resources, and track progress. PERT is useful in project planning because it allows project managers to accurately predict project completion time, costs, and resource utilization. By using PERT, project managers can ensure that projects are completed on time and within budget.

Modern IT tools that support manager's work

Microsoft Project is a leading tool, offering detailed Gantt charts, resource management, and progress tracking. Its comprehensive features allow project managers to plan, execute, and monitor projects with precision, ensuring deadlines and budgets are met.

Asana provides task assignments, timelines, and collaboration features that help keep teams aligned and projects on track. Its user-friendly interface and integration capabilities make it a popular choice for managing tasks and tracking project progress.

Smartsheet combines familiar spreadsheet functionality with advanced project management features, such as automated workflows and real-time updates. It enables project managers to streamline scheduling, enhance collaboration, and ensure projects are completed efficiently.

Opportunities and forecasted directions of development:

> **AI and ML Integration**: AI and ML are set to revolutionize IT project scheduling by enhancing predictive analytics. These technologies enable project managers to accurately forecast project timelines and resource requirements by analyzing vast amounts of historical data. Additionally, they can identify patterns that predict potential delays, allowing for proactive adjustments to the schedule.

> **Collaboration Tools**: The use of cloud-based platforms for collaboration will become more prevalent, facilitating real-time updates and communication among team members spread across different locations. This improved coordination will lead to better information sharing, quicker problem resolution, and more cohesive project management.

Threats:

> **Over-Dependence on Technology**: There is a risk that project managers may become overly reliant on AI, ML, and automated systems. This dependence could lead to a decline in critical thinking and problem-solving skills, as managers might trust the technology blindly without applying their judgment and expertise.

> **Data Privacy and Security**: As project scheduling becomes more interconnected and reliant on digital platforms, the risk of cyberattacks increases. Protecting sensitive project information from breaches and unauthorized access will be a significant challenge, necessitating robust cybersecurity measures to ensure data integrity and confidentiality.