PLANTA

Whitepaper

Project Management in Research and Development

How can I optimize my projects and avoid mistakes?

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LEAN MORE

Here you will find more information for your projects:

IT and Organizational

Discover practical solutions for the most common challenges in IT and organizational projects. Learn more aboust risks, proven methods and tools

To the Whitepaper

Machine and plant engineering

The whitepaper provides a comprehensive overview of mechanical and plant engineering projects and shows practical solutions and best practices for more efficient projects

To the Whitepaper

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CHAPTER 01

R&D Projects in Different Industries

Research and development projects are highly complex and require precise planning, close collaboration and the ability to react flexibly to changes.

Pharmaceutical Industry

The development of a new drug is a **highly complex and lengthy process** that is divided into **various phases:** preclinical research, clinical trials (phases I-III) and approval. These phases are often characterized by many uncertainties. For example, new side effects can occur in the clinical phases that influence the project plan. In order to shorten the time to market launch, **several studies often run in parallel**, such as the investigation of different dosages or the simultaneous development of production processes. Strong multi-project management is essential here in order to optimally distribute resources - especially medical experts and laboratory capacities - and coordinate regulatory requirements in different countries. One example of this is the parallel development of a drug for **several markets**, such as the USA, Europe and Asia, each of which has different approval requirements.

Information Technology

In the IT industry, R&D projects often involve the **development of new software solutions**, such as systems for the use of artificial intelligence (AI) or blockchain technologies. For example, a company could work on different components of an AI-supported system in parallel: One team is developing the algorithms, another team is working on the user interface and yet another team is already testing the first version of the system. In such a scenario, multi-project management is crucial to ensure that the various teams **synchronize their progress and that no dependencies are overlooked** that could delay the overall project.
A centralized multi-project management tool allows the IT company to ensure that resources (such as software developers and test environments) are used efficiently and that no project priorities are lost sight of.

Energy Sector

The development of **new energy sources and storage systems** is another example of complex, multidisciplinary R&D projects. An energy company could simultaneously work on optimizing solar panels, increasing the efficiency of energy storage systems and developing smart grid technologies.
These projects not only require a high level of technological expertise, but also clear coordination, as the **success of a project often depends on the progress made in another area**. For example, increasing the efficiency of solar technologies could depend directly on advances in energy storage. Here it is crucial that multi-project management tools are used to **monitor progress, coordinate resources** such as test facilities and ensure that regulatory requirements, particularly in the area of **environmental protection**, are met.

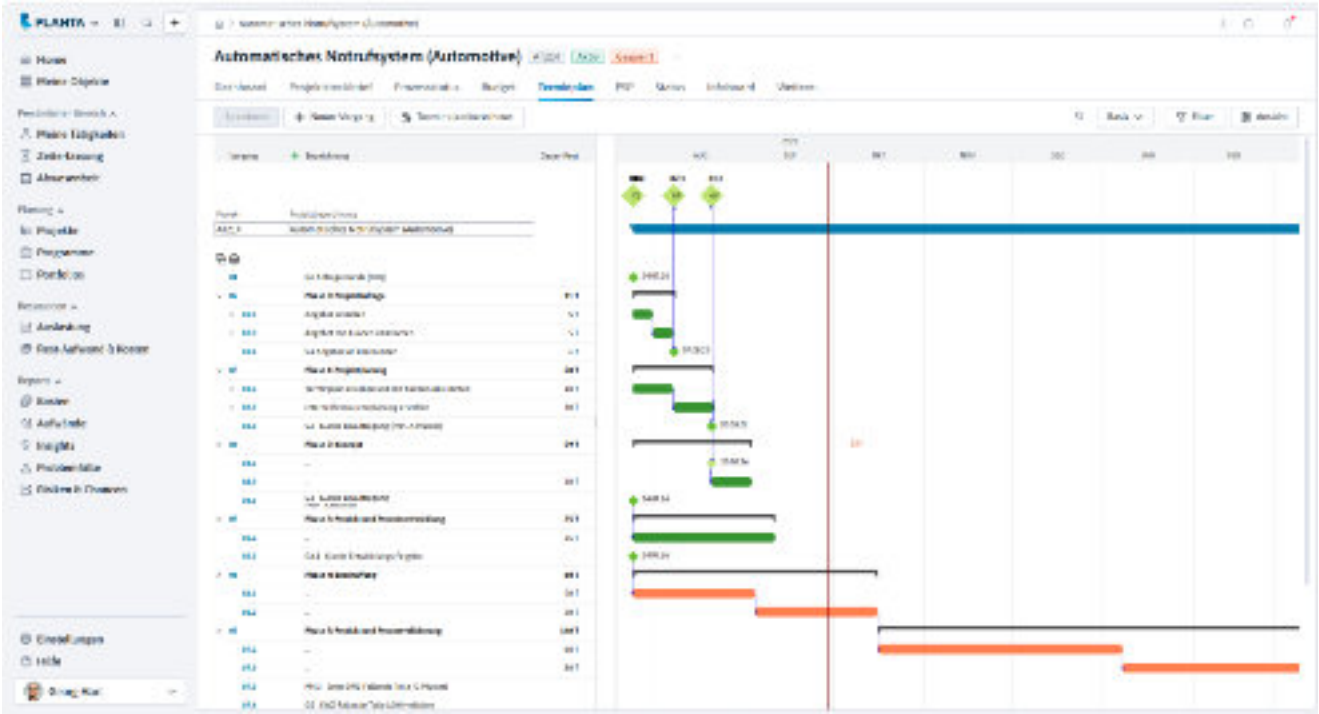
Automotive Industry

The development of **new drive technologies**, such as electric or hydrogen engines, requires **multidisciplinary research** in areas such as chemistry, mechanical engineering, electronics and software development. In an automotive company, **several research projects can run in parallel**: While one team is working on the development of more efficient batteries, another team is researching improved hydro gen storage systems, and a third group is simultaneously developing the associated software for ener gy management. These parallel R&D projects must be optimally coordinated in order to exploit synergies and reduce the overall development time. Efficient multi-project management helps to identify dependencies between projects, share resources such as test facilities and reguan have an impact on the market launch of the entire vehicle.

Aerospace Industry

The development of **new technologies in the aerospace industry** is strongly characterized by longterm and extremely complex research and development projects that require **multidisciplinary cooperation**. For example, a company may be working on the development of a new aircraft system while at the same time conducting research into improved engines, new lightweight materials and aerodynamic optimizations. In addition, projects for the integration of satellite technologies or autonomous flight control systems could run simultaneously.

In such a scenario, multi-project management becomes particularly important, as all projects are clo sely interlinked. Advances in engine development, for example, could change the requirements for the materials needed for the aircraft structure. Efficient multi-project management helps to manage the dependencies between these projects, make **efficient use of resources** such as research engineers and test facilities and ensure that all projects are coordinated for merket entry



Time schedule in PLANTA project

PLANTA

One Software for Everything

PLANTA Project

Project management-software

PM-Methods

Plan your projects in an agile, traditional, or hybrid manner—according to your requirements

PPM

Don't take any risks—rely on project portfolio management

Integrations

Adjust the software to your needs and extend it using our interfaces.

Single and multi-project management

Comprehensive project management software for every project

Read more

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02 CHAPTER

Typical Challenges for R&D projects

There are various factors in multi-project management that pose particular challenges for R&D projects.

R&D projects are often characterized by uncertainties, interdisciplinary teams and lengthy processes. In multi-project management, these problems are exacerbated by the simultaneous management of several parallel projects, which often compete for the same resources and share similar risks.

Uncertainty of results

R&D projects often start with **unclear objectives**, as research results are unpredictable.
In a multi-project environment, uncertainties must be dealt with in a **particularly flexible** manner, as priorities can change quickly.

Interdisciplinary collaboration

Teams from **different disciplines** must **work together efficiently** in order to manage projects successfully. In multi-project management, the challenge increases as several teams work in parallel and ef fective coordination is crucial.

High innovation and time pressure

The need to **deliver market-ready solutions** as quickly as possible causes considerable **time pressure**. This calls for a strategic prioritization of projects in order to advance time-critical developments.

Scarcity of resources

R&D projects often require **highly specialized experts** and **scarce resources** that need to be managed efficiently. Resource allocation must be carefully planned and monitored in order to avoid bottlenecks.

Regulatory requirements:

Strict regulations must be adhered to, especially in regulated industries such as the pharmaceutical industry and the medical technology sector. In a multi-project environment, managing **compliance requirement**s can be **considerably more difficult** if documentation and audits are required for several projects in parallel.

CHAPTER 03

Common Mistakes in R&D Projects

R&D projects often have weaknesses that can be exacerbated by parallel project work. A study by the Project Management Institute (PMI) shows that up to 30% of projects fail because basic project management principles are not observed.

Lack of a clear target definition

Without clear objectives and prioritization, a project loses its direction. In a multi-project environment, this can result in multiple projects running inefficiently at the same time.

Solution: Define clear, measurable objectives at the start of the project and use frameworks such as SMART. A central project management tool helps to keep an eye on targets for all projects and to make adjustments.

Insufficient risk management

Many R&D projects fail because technological or regulatory risks are not sufficiently taken into account. Systematic risk management is crucial here in order to protect simultaneously running projects.

Solution: Perform continuous risk management to identify and assess technological and regulatory risks. Use risk analysis tools and carry out regular risk reviews.

Lack of flexibility in the planning process

In R&D, unexpected results can change the course of a project. In a multi-project environment, project plans must be flexible enough to allow you to react to these changes without compromising other projects

Solution: Use agile methods such as Scrum or Kanban to react flexibly to changes.
Update plans and resources centrally so that adjustments can be made quickly..

Poor communication

Especially in interdisciplinary teams, a lack of communication leads to misunderstandings. This is even more critical in multi-project management, as different projects are interlinked and require centralized, transparent communication.

Solution: Implement a central communication platform and promote regular, structured meetings.
Use tools with integrated communication functions for transparent team interaction.

CHAPTER

04 Supporting PM Tools

With the right PM functions and tools, even complex projects in research and development become easier to manage..

These challenges can only be mastered using modern project management tools and functi-ons. So phisticated functionality is particularly important for project success in multi-project management, in cluding centralized manage-ment of schedules, resources and risks.

Important project management functions

In order to manage R&D projects efficiently, project management tools should have certain functions. These functions make it possible to plan projects clearly, identify risks and improve collaboration within the team.

Agile project management (Scrum, Kanban)

Agility plays a central role in R&D projects, especially in projects with a **high degree of uncertainty and changing findings**. Methods such as Scrum and Kanban enable iterative and flexible planning, with teams keeping a transparent eye on progress through sprints and Kanban boards. This is particularly suitable for research projects or the development of new technologies where rapid adaptability is required.

Waterfall model

The waterfall model is perfectly suited for R&D projects in which the **requirements are clear from the beginning** and **remain the same** throughout the course of the project. The work is carried out in defi ned phases, such as research, development and validation, which are completed one by one. This mo del is often used in regulated industries such as pharmaceu-tical or medical technology, where there are strict documentation and testing requirements.

PRINCE2

PRINCE2 is a **process-oriented method** in which clear roles and responsibilities are defined. It is **particularly suitable for complex R&D projects** that require a **high level of control** and gover-nance. PRINCE2 provides a structured frame-work for projects of any size and helps to plan, implement and monitor R&D projects efficiently.

Critical Path Method (CPM)

CPM is helps to identify the critical path in R&D projects. The critical path describes the **sequence of tasks** that determine the schedule. Especially in projects with technical dependencies, such as the development of a new drug or an innovative technology, CPM makes it possible to ensure that **no delays occur in the critical process.**

Hybrid Approaches

Many R&D projects use hybrid methods that combine elements from agile and traditional approaches. These adaptations make it possible to meet the specific requirements and complexi-ty of R&D. For example, the waterfall model can help to **define clear requirements** in the initial research phase, while agile methods offer the necessary **flexibility** during development.

Earned Value Management (EVM)

EVM is a method for **monitoring project progress based on costs and schedules**.
EVM is particularly valuable in large, budget-intensive R&D projects, as it identifies deviations at an early stage and thus helps to keep the budget and schedule under control.
This method offers important **transparency** in R&D projects with several stakeholders and enables **well-founded decisions**.

Gantt Charts and Time Scheduling

A Gantt chart is a crucial tool for visualizing the **tasks and milestones** in an R&D project.
It shows the chronological sequence of tasks, milestones and dependencies.
This allows **bottlenecks** to be identified at an **early** stage and resources to be rescheduled.
Example: In an R&D project for the development of a new drug, a Gantt chart helps to maintain an overview of the preclinical phases, clinical trials and approval procedures.

Important Functions of such Tools

Task and resource management

Effective resource management is essential in R&D projects, as **specific experts and specialized equipment are often required**.
Resource management tools help to distribute tasks efficiently and avoid bottlenecks by taking **availability, skills and workloads into account.**
One example would be an R&D project for the development of a new car engine, where the tool indicates when certain test facilities and experts are required and available.

Gantt charts and milestone planning

Gantt charts provide a visual representation of the project schedule and make it easier to keep **track of important tasks and phases**.
Milestones mark decisive events in the project that must be achieved to ensure success.
For example, an R&D project to develop a new drug formulation could have milestones such as the end of preclinical studies or the start of the clinical phase. Using Gantt charts, the team can immediately see which tasks depend on these milestones and can recognize potential delays at an early stage.

Time and budget tracking

This function is important to ensure that **project costs remain within budge**t and **deadlines are met.** R&D projects benefit from tools that monitor the budget and timeline in order to detect deviations at an early stage. A typical example would be the development of a new material technology that could exceed the budget due to **unexpected test phases**. With the help of time and budget tracking, **adjustments can be made at an early stage** to keep the project on budget and on schedule.

Risk management and change tracking

Sound risk management is crucial in order to identify and mitigate potential risks in R&D projects at an early stage. A project management tool should offer functions for **risk identification, assessment and monitoring** in order to plan countermeasures. For example, in an R&D project to develop new so lar technology, the risk of technical challenges could be high. A risk tracking tool helps to regularly **monitor progress in solving problems** and ensure that risks are actively managed. In addition, a change tracking system is useful for documenting all project adjustments and considering their im pact on time and budget.

Communication and collaboration tools

Smooth collaboration is crucial in R&D projects, for they often involve interdisciplinary and international teams. Communication and collaboration tools promote constant exchange and allow to share in formation efficiently. An international R&D project to develop new solar technology could hold regular virtual meetings to ensure that everyone involved is on the same page. Tools such as Slack or Microsoft Teams enable **quick queries and document sharing**, which supports project success, especially in dynamic teams.

Dashboards and reporting

Real-time dashboards and reports provide a **visual overview** of project status and performance. Dashboards show key figures such as completed tasks, resource availability and budget utilization at a glance. In an R&D project to develop a new drug, a dashboard could show progress in the individual project phases, open risks and financial status information. Regular reports are also important to **inform stakeholders about the current status and adjustments** during the course of the project. Most project management tools offer customized reporting functions that improve the overview of all aspects of R&D projects

Documentation and versioning

Complete documentation is essential, especially in R&D projects where research results are constantly updated. A tool should make it possible to **store all relevant documents centrally and track different versions**. In a pharmaceutical R&D project, new laboratory results are documented in a central system so that the results are traceable at all times and comply with regulatory requirements.

Top 10 of the Best Project Management Tools for R&D Multi-Project Management

1 PLANTA Project

A robust multi-project management tool that offers detailed planning, control and monitoring functions, making it particularly suitable for R&D projects that often involve complex processes and long schedules. The tool supports the management of several projects running simultaneously and helps to coordinate resources and schedules efficiently.

2 Jira

Initially used in software development, Jira has also become a standard tool for R&D projects thanks to its support for agile methods such as Scrum and Kanban. It facilitates iterative work and the flexible adaptation of tasks, which is particularly valuable for R&D projects with dynamic requirements.

3 Asana

This versatile tool is suitable for organizing tasks and collaboration in R&D teams. Asana enables structured task distribution and progress tracking, which is helpful for R&D projects with many sub tasks and interdisciplinary teams.

4 Microsoft Project

Microsoft Project offers efficient management of Gantt charts and resources, making it suitable for R&D projects with complex schedules.
It supports the tracking of dependencies and helps project ma nagers to monitor schedules and milestones in a structured manner.

5 Wrike

Wrike offers both agile and traditional PM methods and numerous integration options that make it easier for R&D teams to adapt to specific project requirements. It enables the seamless integration of data and flexible adaptation to changing project goals

6 Monday.com

The tool is characterized by its ease of use and flexible customization options, making it useful for R&D teams. It supports collaboration and provides a visual distribution of tasks that creates transparency in the processing of complex R&D projects.

7 Smartsheet

Smartsheet provides a comprehensive platform for project planning and tracking, which is particularly useful for long-term, complex R&D projects. It allows clear structuring and control of the project phases and is suitable for projects with extensive task allocations and schedules.

8 Trello

As a Kanban tool, Trello is particularly suitable for smaller R&D teams that need a simple visual overview of their tasks. It allows for a flexible adaptation of workflows and facilitates the organization of tasks and progress in smaller projects.

9 Planisware

Planisware is specially designed to meet the requirements of R&D projects and offers extensive functions for strategic and operational planning. It supports the long-term management and prioritization of projects, which are often required in R&D, and makes it easier to align projects with corporate objectives.

10 Projektron BCS

An all-in-one tool that supports multi-project management, resource planning and reporting. For R&D projects, it provides a structured overview of project progress and resource availability, which is useful when managing several projects running simultaneously.

05 CHAPTER

Testimonials

Experience reports and testimonials from experts and companies that successfully use project management software in the R&D sector offer valuable insights into how theoretical concepts have actually led to success when applied in practice.

An ideal project system should provide management with comprehensive reporting with milestones and trend analyses and at the same time offer the project teams agile planning and control as well as fast working time recording.
These functions create a solid basis for detailed reporting and the planning of new projects.
For companies that wish to introduce professional PM software, checklists offer valuable guidance to identify the key requirements for the right software.

HACK Formenbau GmbH

“The visualization of production processes contributes to improved decision-making“



Ketek GmbH

“The greatest benefit is to have a “clearly structured” multi project management. All projects are stored centrally in PLANTA. Our colleagues now have a better project overview and can plan dependencies between the projects.“



Losan Pharma GmbH

“All employees can work on their tasks in the boards and benefit from significantly better communication and collaboration“



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Conclusion

R&D projects are essential for innovation and long-term competitive advantage in companies. However, without a methodical approach and the right tools, these projects can quickly come to a standstill or cause unexpected costs. Understanding the particular challenges and applying proven PM methods and functions are therefore crucial for project success.
Choosing the right tools is an important step in efficiently planning, monitoring and successfully implementing R&D projects.
With a clearly structured project plan and consistent communication within the project teams and with stakeholders, R&D projects can be concluded successfully.
Tools for task distribution, risk management and cost monitoring play an indispensable role here.

FAQ

Why is specialized project management necessary for R&D projects?

R&D projects are complex and require thorough planning and control with suitable tools to keep an eye on project progress at all times.
Flexible and agile project management helps to minimize risks and make optimal use of resources.

How does project management software help to tackle risks?

It identifies risks at an early stage and provides support with measures to keep projects on schedule.

How can limited resources be managed efficiently?

Through clear allocation and monitoring of personnel resources and budget.

Why is change management important?

Changes are unavoidable in R&D projects, and good change management ensures that projects can be flexibly adapted to necessary changes.

How does data analysis help with project management?

Data-driven decisions improve the course of the project and prevent wrong priorities from being set.

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