Thor Möller

Project Manager

Pragmatic Guide
for results-oriented, agile and hybrid project management
with learning tips for IPMA Level D
and Agile PM certificates

con-thor

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to the 4th edition (2025)

The first three editions of this book were published in German language only. Due to the high demand of my international customers, colleagues, students and friends, I have translated this fourth edition into English language for the first time.

Six years after its first publication, the fourth edition is now being published. I am happy about the huge demand and the many nice feedback. Each edition has given the book a big push forward.

The fourth edition brings some updates and additions. There are now several new or revised big pictures or posters, including on the topics: sustainability, PM Office, result-oriented PM, Level D competencies, teamwork, multi-PM.

When I developed the first PMO certificate course in Germany and piloted it for TÜV Nord in 2024, I was able to rearrange and develop my PMO skills. I have now been able to contribute selected information on PMO to this edition in short form.

I have now consistently transferred the term classic PM used in this book to result-oriented PM, because terms such as "classic project management" and "modern project management" are unfortunately misleading and are misused.

Throughout the text and illustrations, I have made many minor corrections, updates and additions.

I am still looking forward to your feedback: If you have correction or improvement suggestions, please send an email to thor@con-thor.de!

Thor Möller, Germany, June 2025

to the 3rd edition in 2023 (excerpt, adapted)

The megatrends of digitization and sustainability determine our lives and our future more than ever. That is why I have included both topics in the third edition. Furthermore, I have again added the practical tips and tools for Agile and hybrid project management. Objectives and Key Results (OKR) for strategy implementation and Design Thinking as a hybrid approach are located here for the first time. In addition to the Big Picture as a journey through a Scrum project, which I have completely updated, a Big Picture as a journey through a classic project is now also integrated. I have made many minor corrections, updates and additions throughout the text and illustrations.

Thor Möller, Germany, March 2023

to the 2nd edition in 2020 (excerpt, adapted)

In the second edition, I have completed and explicitly marked learning instructions for the written exams for IPMA Level D certificate according to the standard ICB4 as well as for the AGILE certificate of Scrum. In total, there are around 170 notes for Level D certificate and 35 notes for Agile PM certificates. All learning instructions are considered as a supplement to the official learning material and do not claim to be complete and up to date. I also added practical hints and tools for Agile and hybrid project management. In addition to updates and small corrections, I have also refreshed graphical elements.

Thor Möller, Germany, Juli 2020

to the 1st edition in 2019 (excerpt, adapted)

„Slow down sailor, it's urgent!“

With a project, you take responsibility for yourself and other people and organizations. In order to fulfill this responsibility, it must be consciously assumed. This is only possible with a basic competence in managing projects. This is exactly what this book is providing to you.

The aim of this book is to provide a simple practical guide to successful project management, which can be used step by step or modularly and quickly leads to sound project management with little effort. The book deals with the essential approaches, processes and tools of results-oriented, Agile and hybrid project management in a compact form. It contains practical tips and offers tools such as templates, checklists as well as examples.

Due to the modular structure of the book, I was able to limit myself to the essentials without sacrificing the many challenges of managing projects. In addition, this allows it to be used for a wide variety of projects. Regardless of industry, size, degree of innovation, approach (result-oriented, Agile or hybrid), etc., the book accompanies the user through all steps and challenges of project work.

The basis for this system and content are my worldwide experience from practice, research, consulting, personnel development, teaching and publication on the topic of project management from over 25 years.

With this book, I would like to provide a small contribution to enable projects to make our world a better place. Because **projects are the bridge to our future!** May the projects enable us humans to deal more justly with all fellow human beings and more sustainably with our planet.

I wish you every success with your projects and look forward to contributing to them.

Thor Möller, Germany, September 2019

About The Author

Thor Möller studied economics and upgrated to PhD at Institute for Project Management and Innovation (IPMI). Afterwards he worked as head of the business administration department at the Central Association of the German Construction Industry and as a project manager at Umwelt Consult Berlin GmbH. Since 1995, he has been building up the con-thor group of companies. Together with Jan-Henning Blanke and Mey Mark Meyer, he founded the consulting company prometicon projects GmbH, which specializes in project management.

As a consultant and trainer, he has appeared in many companies and universities worldwide and has published numerous books. From 2004 to 2012 he was a member of the board of directors of GPM and in 2021 and 2022 president of GPM.

In 1999, Thor Möller received the 1st Study Prize for SME Research for his doctoral thesis. In 2011, the IPMA awarded him the IPMA Otto Zieglmeier's Award for Excellent Project Management Performance. He has been voted "Teacher of the Year" many times by students at various universities.

List of Abbreviations

3P	Profit, Planet, People
AI	Artificial intelligence
BI	Business Intelligence
CIP	Continuous improvement process
CPM	Critical Path Method
CR	Change Request
CTA	Cost Trend Analysis
DevOps	Development and Operations
DoD	Definition of Done
DoR	Definition of Ready
EMS	Environmental Management System
EV	Earned Value
EVA	Earned Value Analysis
FMEA	Failure Mode and Effect Analysis
IT	Information technology
KPI	Key Performance Indicators
LeSS	Large Scale Scrum
LOP	List of Open Points
MPM	Multi-project management
MS	Milestone
MTA	Milestone Trend Analysis
MVP	Minimum Viable Product
OKR	Objectives and Key Results
OPL	Open Points List
PCT	Performance, Cost, Time (Magic Triangle)
PDCA	Plan-Do-Check-Act (Deming-Cycle)
PEM	Project Excellence-Model

PM	Project management
PM-HB	Project Management Handbook
PMO	Project Management Office
PM-SW	Project Management Software
PPM	Project Portfolio Management
QM	Quality Management
Safe	Scaled Agile Framework
SC	Steering Committee
SDG	Social Development Goals
SDT	Self-Determination Theory
SER	Social and Environmental Responsibility
SP	Subproject
TCR	Tasks, Competences and Responsibilities
WBS	Work Breakdown Structure
WP	Work Package
XP	eXtrem Programming

Content

1 Introduction and Big Picture

Regardless of how many projects you have already led or participated in or whether it is the very first project. You have been given a project and are supposed to implement it as well as possible as a project manager. Don't take it as a burden, but see the opportunity in it!

"What seems to us to be a severe test
often proves to be a blessing." **Oscar Wilde (1854-1900)**

With this project management guide, you'll start a journey through your project. We guide and accompany you step by step with tried-and-tested procedures from the project idea to the many stumbling blocks to the sound conclusion.

"It is not because it is difficult that we do not dare, but because we do not dare, it is difficult." **Seneca (4 BC-65 AD)**

1.1 What, for whom and why this book?

What does this book offer to you?

With this guide, we provide you with orientation and guidance on your project journey. During the course of the project you will receive many practical tips that should make your work easier and avoid mistakes. But a book can't do magic. In the end, it is your responsibility to make the project a success. To do this, you have to make many decisions during the course of the project and implement them consistently. By the way:

Unrealistic targets remain unrealistic even with the best project management. A practical tip in Chapter 2 shows you how you can deal with this professionally.

„The only constant is change.“ **Heraclitus of Ephesus, pre-Socratic philosopher (about 540 – 480 BC)**

Constant change is an integral part of today's world. It's not about avoiding changes, it's about using them. Instead of defining obsolete plans as failures and looking for someone to blame or simply complaining, it is better to see changes as an opportunity. This book gives you the competence and composure to do so, along with the corresponding arguments in case of criticism.

Who is the target group of this book?

This book is aimed at people who want to or should carry out a project and are looking for well-founded and pragmatic guidance or support. They can be beginners and advanced project managers. Furthermore, this book provides valuable learning tips for candidates for the Level D certificate of IPMA according to the ICB4 standard and for the Professional Scrum Master certificate.

Why this book?

The book market currently does not offer a book that presents both the result-oriented and Agile as well as hybrid approaches in a pragmatic way in the form of a manual with a manageable scope including structured instructions for certificate examinations. This book closes this gap! And with additional topics, it looks beyond the horizon of an individual project.

1.2 Big Picture and Structure of the Book

The Big Picture not only provides an overview of this book, but also gives you a structured overall picture of the most important processes and elements in project management, including chapter references (*see **Figure 1***).

The core activities for the entire handling of a project are provided by **Part A** in the middle area. It includes the sequential procedure. After the project is initiated and the PM approach is selected, the processes and elements differ depending on the PM approach. In the end, however, all approaches are reunited with the "project conclusion" process.

Part B lists project-accompanying activities. They should be applid by project managers with initial or sound experiences. Beginners also have to apply most of these activities, but they still do so rather intuitively and less structured.

Part C lists cross-project tasks. It is no longer part of handling a single project, but rather ensures that the organization introduces and continuously develops project management. It is aimed at senior executives, project portfolio managers and experienced project managers.

Chapter 10 deals with important megatrends in our society and illustrates the relations to project management.

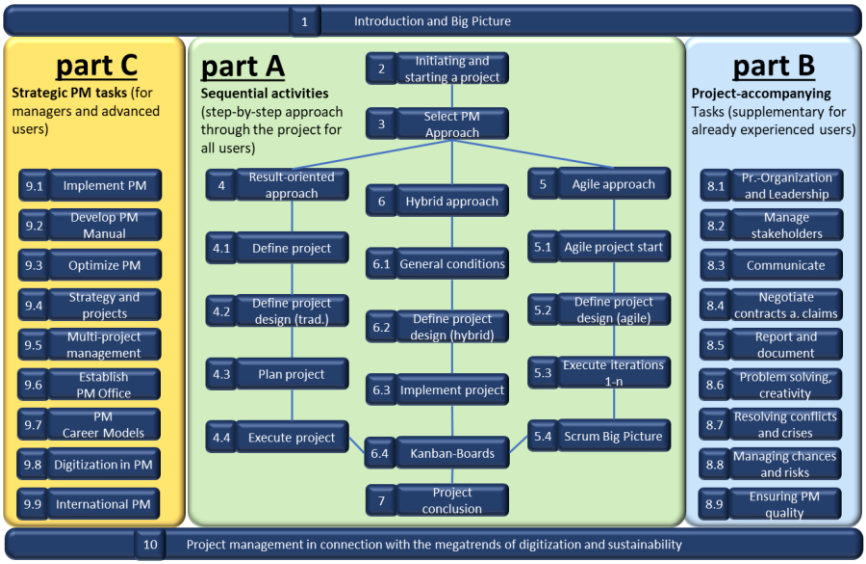


Figure 1: *Big picture: Processes and tasks in PM*

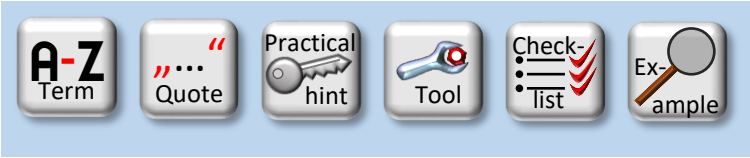
1.3 How to use this book

You can use this book in many ways, especially as:

- **Guideline** that accompany you through your project and always offer you orientation, tools and practical tips and thus more safety.
- **Decision-making support** whether you want to carry out your project in a result-oriented, Agile or hybrid way.
- **Toolbox** that provides you with a lot of tools during the course of the project.

- **Learning book for beginners** to get to grips with project management and as a **learning book for advanced learners** to better understand relations and procedures as well as single methods and tools.
- **Learning book for certification** in project management for candidates who are pursuing a **Level D certificate** from the IPMA or as a **Scrum Master**.
- **Reference work** to refresh and deepen single aspects again and again.

In order to make working with the book and orientation as comfortable as possible, I have used the following icons in addition to the usual directories, etc., corresponding text passages are highlighted in color:



For preparation for IPMA Level D certification (see ***Figure 2***) as well as Agile PM certifications, you can use the learning instructions marked as follows:

Relevant content for the preparation of written exams of Level D certificate.

Relevant content for the preparation of Agile PM certificates.

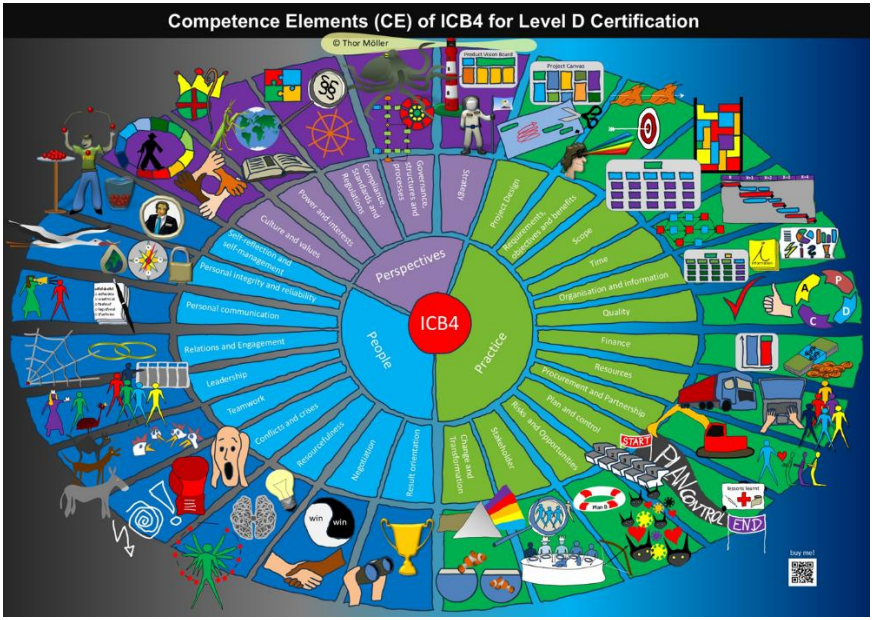


Figure 2: *Big Picture: Competence Elements for Level D*

1.4 Further information

If you would like to expand your knowledge of project management beyond this book, you will find helpful information in the following recommendations on the norms and standards, further literature, important institutions and websites on project management.

Important **Standards** in project management are:

- ISO 21500:2012-09 Guidance on project management
- ISO 21503:2017-08: Project, programme and portfolio management – Guidance on programme management
- ISO 21504:2015-07: Project, programme and portfolio management - Guidance on portfolio management
- ISO 21505:2015-08: Project, programme and portfolio management - Guidance on governance
- IPMA Individual Competence Baseline (ICB4)
- IPMA Organisational Competence Baseline (OCB)
- IPMA Project Excellence Model
- PM^2 of the European Union
- PMI Project Management Body of Knowledge (PMBOK)
- Scrum Guide
- Other industry-specific standards

Recommended **literature** about project management:

- **ICB4 – Individual Competence Baseline**, free download at IPMA
- European Commission, Centre of Excellence in Project Management (CoEPM²): **Project Management Methodology Guide 3.0**, free download
- **The Scrum Guide** and **The Nexus Guide**, free download in many languages at www.scrum.org
- Flyvbjerg, Bent/Gardner, Dan: **How Big Things Get Done**

Important **institutions** for project management:

- **IPMA** – International Project Management Association, worldwide organization for project management with approx. 70 member associations, www.ipma.world
- **GPM** Deutsche Gesellschaft für Projektmanagement e.V., www.gpm-ipma.de
- **pma,** Project Management Austria, www.pma.at
- **spm**, Swiss Association for Project Management, www.spm.ch
- PMI – Project Management Institute, Global Project Management Association from USA, www.pmi.org

Other **recommended websites**:

- **PM-Zert**: GPM Certification Body, www.pm-zert.de
- **Scrum.org**: Kommerzielle Inhaberin der Scrum-Methode, www.scrum.org
- **Prince2**: PM Standard and Certifications for Project Managers, www.prince2.com

1.5 Basic terms and parameters

The terms project, project manager, project manager, etc. have long been used inflationary. Therefore, it is important to define them.

According to ICB4, a **project** is „a unique, temporary, multidisciplinary and organized endeavor to realize agreed deliverables within predefined requirements and constraints.“ **Project**

management are therefore all the tasks required to initiate, define, plan, control and complete a project.
A **process** is a time-limited number of activities that generates a targeted output on the basis of an input through logically linked tasks. A **task** is a requirement to carry out activities to achieve a given goal or result under certain conditions.

Each project is caught between three measures (parameters): the performance, the cost and the time. These are formed in the so-called **Magic Triangle** of project management (*see **Figure 3***). In each project, these parameters are prioritized and weighted individually. The phrase "magical" means that the parameters influence each other. If one parameter changes, then this has consequences for at least one other parameter.

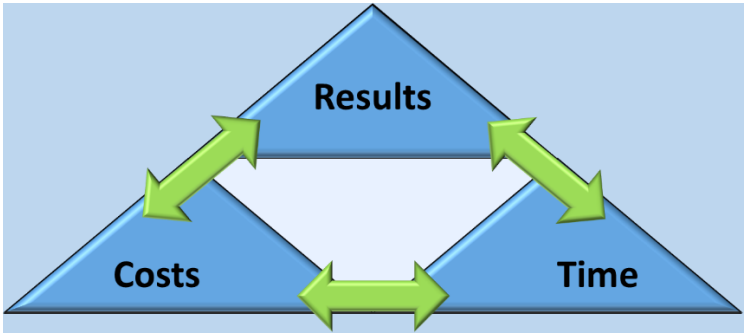


Figure 3: *The Magic Triangle in Project Management*

As a project manager, you should always observe the three parameters of the Magic Triangle throughout the entire course of the project – from the project idea to project completion.

Checklist Introduction and Big Picture

• I know the structure of this book and thus the big picture of project management.	
• I know about the icons of this book.	
• I know the recommendations for deepening my knowledge learned in this book.	
• I know the basic terms.	
• I understand the Magic Triangle.	

2 Initiate and Start the Project

„A journey of a thousand miles must begin with a single step."
presumably: Lao-Tzu (604-531 BC), Chinese philosopher

Project initiation checks the usefulness of a project by answering the core question of whether the project should be carried out or not. To answer this core question, the existing alternatives of action must be analyzed - including the alternative of omission. Once the decision has been made to carry out the project, it can be started as soon as the necessary capacities are available.

2.1 Project initiation

All beginnings are difficult, and you have to check whether you want to take on a challenge or not. So, before we get started, there are a few things that need to be investigated and decided. In **project initiation phase** the aim is to check and decide whether the project idea should be implemented in one way or another or discarded. Without these constitutive decisions, no further activities for the project should be started. It would be a waste of resources and frustrating for everyone involved if detailed planning steps or even initial implementations were already taking place, but then it turns out that the project has to be implemented completely differently or not at all.

„If you want to build tall towers, you have to spend a long time on the foundation."
Anton Bruckner, Austrian Composer (1824 to 1896)

The initiation of a project starts with the project idea. A customer, employee, supplier, etc. makes an inquiry or has an idea, a problem, etc. It must be checked whether it is a project and whether it is necessary or senseful. The **central questions are:** ***What is our benefit of the project? What do we need to invest? What risks do we take? And final question: Will we do it?*** To answer these questions, one roughly examines the expectations, conditions, costs and benefits, opportunities and risks, feasibility, alternatives, etc. You only go as deep as it is necessary to be able to assess whether the project is expedient and helpful for the executing institution and should be carried out accordingly or not.

„Nothing is more powerful than an idea
whose time has come." **Victor Hugo (1802-1885)**

The project idea as the first milestone can be created by many different **triggers**. Among other things these can be:

Implementation of elements of the strategy

- Request from a customer
- Idea for a new product or service
- Suggestion of an employee for product improvement
- Proposal from an employee for process improvement
- Complex problem that cannot be solved on an ad hoc basis
- Amendment of laws, directives, etc.
- Targeted sales increases

- Need for cost reductions / efficiency initiatives
- Replacement of operating systems or IT solutions that will no longer be maintained in the future
- etc.

„You only see something where you look, and you only find something where you look." **Karlfried Graf Dürckheim (1896-1988), German psychotherapist and author**

Quote

As soon as the project idea is available, a short description and very first assessment should be made. In practice, this is often done with a **project profile**. The project profile answers the **6 W questions in particular** and should – if possible, senseful and necessary – include an initial assessment of the economic impact of success. This is a very rough description of no more than one page at best. In the course of this, it should also be checked whether there has been an identical or similar project idea recently and how it was decided. ***Figure 4*** shows an example of a project profile.

Level D

A ***project profile*** is a short description of the project, usually as *one-pager*, which answers the 6 W's questions to assess and evaluate the project idea in a few sentences and thus serves as the basis for the implementation decision. In addition, by filling it in, it calibrates the ideas of the participants about the basic ideas and characteristics of the project and provides a shortdescription of the project that can be used in many ways.

A-Z Term

6 W	Hinweis zu den Inhalten
What?	Brief information on project including working title
Why?	Purpose and/or benefit of the project, if possible including monetary valuation
Who?	Important participants and, if necessary, also affected persons
When?	Estimation of the total duration, start and/or end date
How much?	Estimation of the total expenditure, if possible in monetary terms, otherwise in personnel and material efforts, etc.; the risks can also be outlined here
Where?	key locations of project implementation and results

Figure 4: *template for a project profile*

On the basis of the project profile or in parallel to its creation, further aspects and questions can be considered that support the decision on the implementation of the project. ***Figure 5*** shows an example of a **project selection flowchart**. Answering the questions either leads to the result that the project idea is selected or rejected.

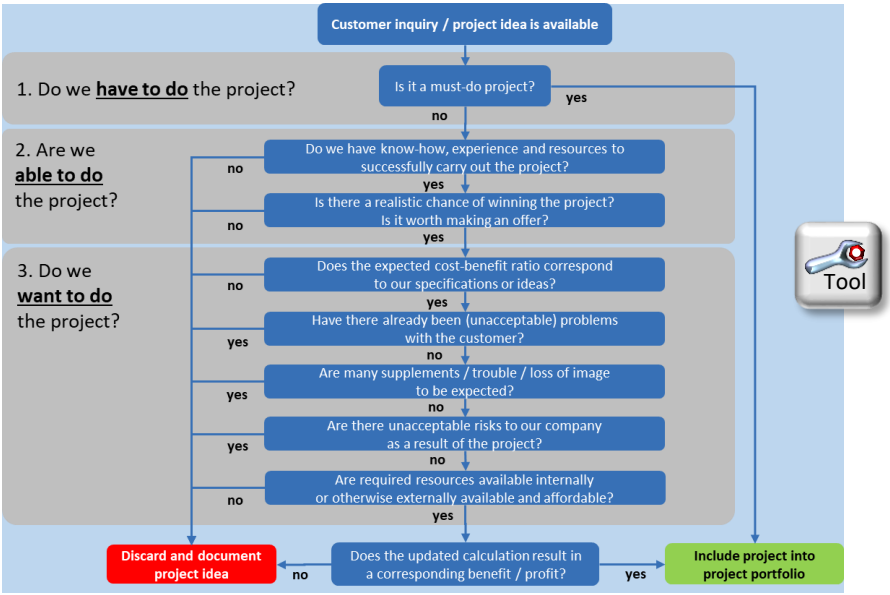


Figure 5: *Example Flowchart for Project Selection*

In organizations with advanced project management, the project is included in the project portfolio after approval by the initiation and initiated the next step there (see section 9.5). If there is no multi-project management, the project will start immediately, i.e. transferred to the next phase. If there is no approval through the initiation - i.e. the project idea is discarded - then this should be briefly documented with the arguments of rejection. As soon as the same or a similar idea comes up again, you can fall back on this documentation and, above all, check the arguments for rejection again in relation to the current situation and decision.

Unrealistic specifications for projects by clients/sponsors are widespread. Goals are set far too high, not enough resources are made available, unrealizable deadlines are given, and much more. The following instruments can be used to substantiate and renegotiate such problems. If in doubt, it is better to reject the project. If a rejection is not possible, you at least have proof that you had already pointed out the unrealistic framework conditions at the beginning.

One of the key issues in this phase is **make or buy decisions**, because they have a significant influence on the project. These decisions can relate to single parts and even to the entire project. This involves analysing which areas of responsibility are better carried out in-house and which are better procured externally.

Depending on the size, novelty, complexity, risks, etc. of the intended project, other tools can be used. The decision on the use of the individual tool can only be weighed and made on a project-by-project basis. These tools include, in particular:

- Feasibility study
- Success factors, success and acceptance criteria
- SWOT-Analysis
- Cost-benefit analysis
- Business Case
- Business Plan

The **feasibility study** investigates the feasibility of the project in various areas. These include, in particular:

- **Legal feasibility**: Are there legal restrictions due to laws and other regulations or other concerns about legal practice and law enforcement, etc.?
- **Technical feasibility**: Is a technical solution conceivable? What technical problems could occur?
- **Financial feasibility**: Is the project financially viable?
- **Social feasibility**: Are there social concerns that are not or difficult to solve?
- **Personnel feasibility**: Is there sufficient staff available internally for the project in terms of quality and quantity or can it be acquired externally in affordable conditions?
- **Capacity feasibility of additional operating resources: Are the other required operating resources available internally in quality and quantity or can they be purchased of rented affordably?**

„Gather the facts first, then you can twist them as needed.“ **Mark Twain (1835-1910)**

The order is not mandatory, but it is recommended. If feasibility is not given in one or more aspects, the usefulness of the project is questionable.

Furthermore, it is helpful to consider the **success factors** at this early stage in the project as well as definition of the **success criteria** and **acceptance criteria**. Success factors are all activities that can increase the success of the project. The success criteria measure the success of the project during the course of the project and especially at the end. Therefore, the success criteria always go **hand in hand with the** acceptance criteria, which, as far as possible, are included in the contract (see section 8.4), to avoid negative surprises later. The **failure factors and criteria** can also be determined. However, many of them are only the reversal of the success factors and criteria.

While project success refers purely to the success of the project, **project management success focuses on** on the successful application of project management. Here, very own success criteria are used to check how effective and efficient project management is for the project, the project portfolio and the entire organization.

The **SWOT analysis** defines the strengths, weaknesses, opportunities and risks of a project, derives appropriate measures from them and pursues them (see ***Figure 6***).

	Influence	general strategy	Respon-sible	Action Points	Time frame	Actions fulfilled?
STRENGHT	internally and thus directly influenceable	extend				
WEAKNESSES		dismantle				
OPPORTUNITIES	external and thus little to no influence	take				
THREATS		avoid, fight				

Figure 6: *Example template for a SWOT analysis*

Especially in Germany, the focus is often on problematizing and thus on weaknesses and risks. The SWOT analysis supports a more balanced consideration of the four areas of investigation. Thus, the strengths and opportunities are not neglected. Paying attention to strength increases the team's self-confidence. In terms of opportunities, important potential for success can be exploited here (see also section 8.8).

The **cost-benefit analysis** analyses or forecasts the expected costs and benefits of the project and defines key performance indicators. Even though this number arithmetic is not rocket science, it is advisable to seek support from the finance department or financial controlling.

The results of cost-benefit analyses are only as good as their input. If the input data is of poor quality, then the result will also be of poor quality (garbage in → garbage out). In addition, the results only serve as a rough orientation. The input is mostly forecasts, so the output cannot be an exact key figure, but only a reference value. This must be explained emphatically to superiors and clients again and again.

A further analysis of the project is the development of a **business case**. The central content is the cost-benefit analysis. The business case, which makes more sense for larger projects, also contains many qualitative aspects and further descriptions, such as the purpose and goals and other potential benefits of the project. The business case can be started in the initiation and refined in the definition phase. It should be reviewed and updated regularly over the further phases of the project.

A Business Case can be extended to a **Business Plan** and thus the project can be examined and presented more comprehensively. This is especially the case for large and high-risk investments. A business plan is created, for example, when founding a company. It is used in particular internally to plan the business and externally to acquire investors.

„Some people see things as they are and say, 'Why?' I dream of things that never existed and say, 'Why not?'"
John F. Kennedy (1917-1963)

2.2 The start of the project

The exact scope of a **project start** depends on the project immensely. Depending on how large, novel, risky the project is and the team is known to each other, etc., the project start can be kept relatively short or has to be larger in scope.

In practice, the terms **kick-off**, **start-workshop** or **start-up workshop** are often used to describe the start of a **project**. There are no normative definitions of the terms. As a rule, a kick-off refers to smaller and a workshop to larger launch events.

The best **time to start a project** is also not defined firmly and is set very differently in the industries and organizations and even individual projects. It should take place in the period at the earliest at the end of the initiation and at the latest shortly after the project design has been defined or the project has been contractually commissioned. The project manager should determine the appropriate time for each project.

The **content of the project start** is also strongly dependent on the project management approach (see chapter 3) and project design. In results-oriented approaches, different definitions sometimes have to be made than in Agile ones. Basically, however, it is about officially starting the project, at least roughly specifying the requirements and framework conditions, defining responsibilities and roles, initiating the first planning and implementation steps as well as the first steps of team development, etc.

The **agenda of a start-up workshop** could contain the following contents:

- Welcome and introduction
- Objectives and contents of the project start event
- Getting to know each other
- Presentation and current status of the project
- Stakeholder expectations of the project
- Requirements for project management and validity of the PM manual
- Questions and information
- Clarification of roles and rules of team work
- next activities and meetings
- Feedback

In principle, several project starts can take place with different participants. In addition, they can be more or less **formally or informally**.

Checklist Project Initiation and Project Start

• The project was announced in the IT system.	
• A project profile is available.	
• The project has been checked by project selection flowchart.	
• A feasibility study is available.	
• The project success factors are known.	
• The project success criteria are defined.	
• A SWOT analysis is available.	
• A cost-benefit analysis is available.	
• A business case is needed and has been initiated/developed.	
• A business plan is needed and has been initiated/developed.	
• Scope, content, participants and time of the start of the project have been determined.	
• A kick-off / start workshop was held.	

3 Choosing Project Design

„The beginning is half of the whole.“
Aristotle (384-322 BC)

For some years now, there has been a strong trend towards 'agilization' in project management and management as a whole. Agile mindsets enable new innovation strategies and offer a lot of benefits. However, it is not possible without sacrificing important advantages of results-oriented project management. Depending on the requirements, focuses, etc. of a project, the appropriate **project design** should be selected first . In the first step, this includes the suitable **PM approach** and in the second step the Tayloring, i.e. adapting the PM methods in order to create a good proportionality of the benefits and costs of project management.

„If there is no agreement on the fundamentals,
it is pointless to make plans together.“
Confucius (probably 551 - 479 BC)

If you had all types of bicycles to choose from, then you would choose the right vehicle for every bike ride. A cargo bike for a transport trip, a folding bike for a combination with a train ride, a racing bike or mountain bike for a sporty tour and a comfortable bike for a leisurely trip. You simply choose the right bike for the riding purpose.

Similarly, you can choose the right PM approach for the respective project. However, the criteria for selecting the right PM

approach are more diverse, so a schematic selection guide is an important tool.

The PM approaches of result-oriented, Agile and hybrid project management are not presented here, but in chapters 4, 5 and 6 at the beginning. This section compares the basic approaches only and offers a schematic selection tool at the end.

„If the train is on the wrong track, there is no need to discuss the timetable.“ **Norbert Blüm (1935 - 2020)**

However, the decision as to which approach is the right one can never be made by a selection tool, but must always be made by the project manager – if necessary in consultation with the client or steering committee and/or the project team.

„Slow down sailor, it's in a hurry!“ If you save time at this point, but do not choose the most suitable approach, you will certainly lose many times more time later!

3.1 Comparison of approaches

The biggest difference between a results-oriented and Agile approach is **advance planning**. While results-oriented project management plans a project as far as possible in advance and only then begins implementation, Agile project management only plans ahead step by step (iteratively) in order to implement the planned step (iteration) and only then plan the next step, and so on. Result-oriented project management is therefore sometimes referred to as plan-based. Due to the special focus on goals and adaptation of the plans, the term goal-

based or results-oriented is certainly more appropriate. The frequently used, misleading term classical or traditional PM is dispensed with here.

Another big difference, which looks rather small, is the content or time orientation. While in results-oriented project management the **phases are content-driven**, in Agile project management the **iterations are time-controlled**. What does that mean? A phase only ends when the content is fulfilled, even if the period is extended. The iteration, on the other hand, ends when the time is up. Tasks that have not been completed by then must be implemented in a later iteration. The strict time limit in Agile project management is called **time boxing**.

A third significant difference is that in results-oriented project management, the **project manager** usually bears both content and organizational responsibility for the project. In Agile project management, these two responsibilities are usually divided between two people, e.g. in Scrum with the **Product Owner** (in terms of content) and the **Scrum Master** (organizational).

An overview of these three major and other differences between results-oriented and Agile project management shows ***Figure 7***.

	result-oriented PM	Agile PM, e.g. with Scrum
Procedure	Waterfall model: everything is pre-planned and worked through in firmly defined phases	Spiral model: repetitive cycles with firmly defined processes creating increments (interim solutions)
Orientation	Content-related orientation, time is downstream	Temporal orientation, content is downstream
Leadership / Responsibility	Project manager responsible for content and organization of the project	Product Owner is responsible for the content and Scrum Master for the organization of the project
Defaults	Huge collection of procedures, processes and methods	Clear framework that must be supplemented with methods and processes.
Binding Defaults	Project manager selects suitable approaches, processes and methods from the huge pool.	Consistent demand for the few specifications for procedures, processes and tools.

Flexibility	Sufficient flexibility by adjusting goals and plans with a change request process	High flexibility, as plans do not have to be adjusted, but are just done step by step for each cycle.
Safety	Relatively high level of result and contract certainty	Relatively low result and contract certainty
Negotiations	Time-consuming and energy-consuming renegotiations if many claims	Fewer negotiations due to constant search for joint solutions
Quality of results	Client receives deliverables that are defined at the beginning of the project and adjusted during project implementation.	With more flexible customization, customers are more likely to get what they want at the end of the project.

Figure 7: *Differences between result-oriented and Agile PM*

Using the **Magic Triangle** further differences can be clearly illustrated (see ***Figure 8***). In result-oriented PM, the result is often predetermined, e.g. by a specification (cost to design). On this basis, the project is planned and thus the budget and deadlines are determined according to the minimum principle. However, design-to-cost or design-to-time approaches are also possible. In the course of the project, the parameters are adjusted if necessary and then influence each other in their

characteristics. All three parameters are thus planned in advance, but still variable during the course of the project.

In Agile PM, the **budget** and **deadlines are** specified (Design to Cost and Time). Within this conditions, a result to be maximized is developed. Minimum result must be a **minimum Viable Product** (MVP) according to the maximum principle. The project is completed with the deadline or budget consumption. Later, in operation phase of the product, continuous improvements, e.g. through **DevOps**, will be done.

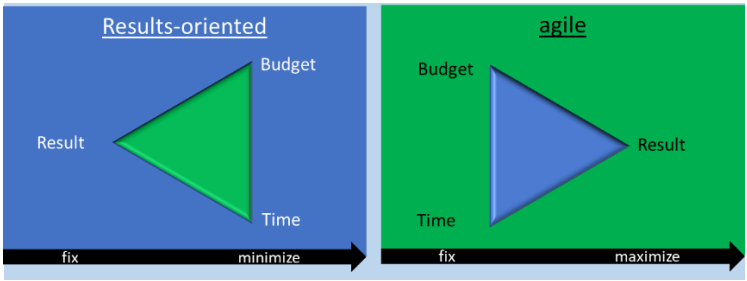


Figure 8: *The Magic Triangle in Results-Oriented and Agile PM*

Both approaches have their advantages and disadvantages (***Figure 9***). These should be known and compared with the requirements of the current project in order to select the appropriate approach for the project (see following section 3.2 as well). At this point, the differences and respective advantages are deliberately only related to a result-oriented and Agile approach, as hybrid project management is intended to combine the advantages of the two approaches depending on the situation, i.e. to combine the most suitable of both worlds. This only becomes relevant in the selection tool in the next section.

	Results-oriented project management	Agiles PM
Advantages	• Better predictability of results, scope (quantitative and qualitative), costs and durations • Fixed terms for contract • High flexibility and responsiveness through permanent overview of the whole and previous analyses and decisions	• Better flexibility of the adjustment of results in the course of the project • Less nerve-wracking and time-consuming renegotiation • Customer is more likely to get what they need at the end of the project
Disadvantages	• Additional effort due to adaptation of plans • sometimes nerve-wracking and time-consuming renegotiations	• More uncertainty about the results, scope (quantitative and qualitative), costs and durations • Minor corrections with corresponding additional costs

Figure 9: *Selection of advantages and disadvantages of PM approaches*

3.2 Auswahlhilfe ergebnisorientiert, hybrid, agil

The Stacey Matrix **offers an initial orientation** (see ***Figure 10***). It fans out the characteristics of a project, depending on how clear or unclear the requirements and approaches are. Basically, it can be assumed that result-oriented approaches are more suitable for the area at the bottom left and Agile approaches at the top right. The middle range can be covered by

more hybrid approaches. As an alternative to the Stacey matrix, you can also use the **Cynefin model**.

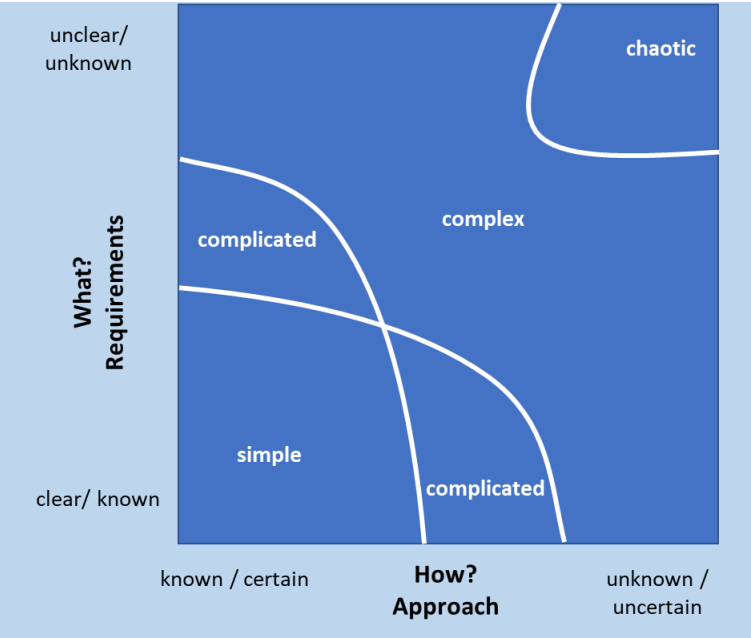


Figure 10: *Stacey matrix for first orientation*

Choosing the right PM approach requires much more than just a gut decision. The different prerequisites and preferences must be analyzed and evaluated. As a rule, this will result in contrary recommendations. However, this is not surprising given the high number of criteria. The characteristics can, for example, result in a profile and thus show a tendency that can support the final decision (see ***Figure 11***).

Differentiation criterion	Results-oriented	Basis results-oriented	hybrid	Basis agile	agile
Focus on project type	investment	organization		Research & Development	
Project objectives	easy to define in advance			not easy to define in advance	
Novelty	more routine	Relatively new		Quite new	
Creativity	small	medium		strong	very strong
Technology situation	rather static	normal		rather dynamic	
Project environment	rather static	normal		rather dynamic	
Ideas of the client on project results	clear	available		little available	
The client's need for security	high	normal			low
Contract security required	very high	high	normal	low	
Number of changes to be expected	manageable	normal		many	
Project Scope	easy to define in advance			not easy to define in advance	
Project Scope	All project sizes			No small projects	
Project team self-organized	very advantageous, but not absolutely necessary				required
Team members 100% in the project	not required		conditional		required
External suppliers	more results-oriented	depends on specific task			rather agile

Figure 11: *Example of a selection tool with profile display*

Another option would be to use a scoring model. The special advantage is the weighting of the individual criteria. The weighting can be standardized for all projects of the organization or can be determined on a project-by-project basis. Here, too, the result can only be a tendency for the final decision. An example shows the ***Figure 12***.

Whether you arrive safely at your destination during a car journey, however, depends much less on the type of vehicle than on the driver and his driving style himself. The situation is similar with project management. Whether the project is successful or not depends less on the PM approach and more on the project manager's management of the project. An experienced project manager selects the most suitable PM approach and then manage the project safely to success.

Practical hint

Differentiation criterion	result	hybr.	agil	Weight	result	hybr.	agil
	Points				Points weighted		
Focus on project type	0	4	1	10%	0	0,4	0,1
Project goals / results can be planned	3	2	0	5%	0,15	0,1	0
Novelty	3	4	2	10%	0,3	0,4	0,2
Creativity	2	3	4	5%	0,1	0,15	0,2
Technology situation	1	4	4	10%	0,1	0,4	0,4
Project environment	3	4	5	5%	0,15	0,2	0,25
Ideas of the client on project results	0	0	5	10%	0	0	0,5
The client's need for security	4	2	0	10%	0,4	0,2	0
Contract security required	3	1	0	5%	0,15	0,05	0
Number of changes to be expected	0	1	3	10%	0	0,1	0,3
Project Scope	1	1	0	5%	0,05	0,05	0
Project team self-organized	0	1	2	5%	0	0,05	0,1
Team members 100% in the project	4	2	0	5%	0,2	0,1	0
External suppliers	4	0	0	5%	0,2	0	0
Sum	**28**	**29**	**26**	**100%**	**1,80**	**2,20**	**2,05**

Example

Figure 12: *Example of a scoring model as selection tool*

„If you want to fly, you have to let go of things that pull you down.“ **Toni Morrison (1931-2019)**

Quote

Tayloring must now determine the appropriate level of PM methods and their intensity of application for this specific project. Many organizations use project categories for this purpose, which usually refer to the project size (A, B, C or large,

medium, small or XL, L, M, S). However, it is advisable to take other aspects into account. Typical parameters for Tayloring can be effort (person-days), budget, duration, novelty, degree of risk, environmental dynamics, level of competence of those involved, and much more. Tayloring, which is also part of the project design, depends on the PM approach and is therefore described separately in the respective sections: result-oriented see section 0, Agile see section 5.2, hybrid see section 6.2.

Checklist to select suitable PM Approach

• The requirements to project design have been defined.	
• A selection tool was used to analyse a tendency for the appropriate PM approach.	
• On this basis, the most suitable PM approach for this project was selected.	
• The Tayloring was done.	

4 Procedures in results-oriented PM approaches

„Thinking makes superior.“
Antoine de Saint-Exupéry (1900-1944)

Quote

The results-oriented project management approach is characterized by the fact that the activities and results of a project are planned in advance in a structured manner up to a certain depth and then consistently implemented. The special advantage is that you know quite early in the project pretty much exactly where the project is headed, which resources you need when and to what extent, how long it can take and what it can cost. Nevertheless, changes are possible at any time and are quite normal in practice.

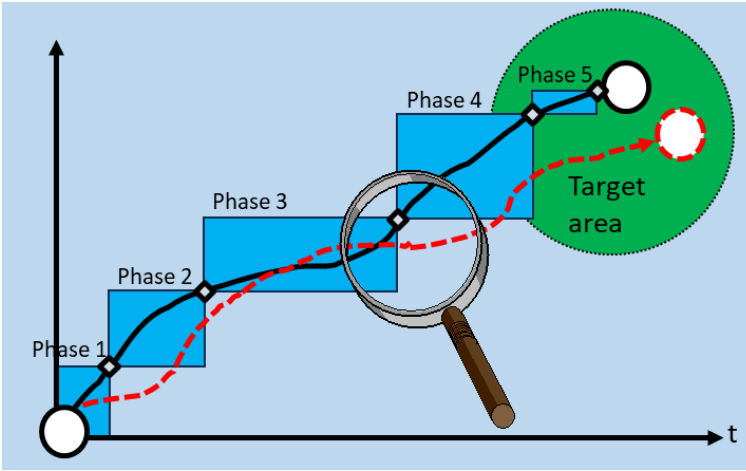


Figure 13: *Procedure in result-oriented PM*

Figure 13 shows the basic process in the result-oriented approach as a **phase model including milestones**. First of all, you analyze the initial situation. Then you define the target situation of the project. In projects with a high development component, these two steps can also be swapped. As soon as the initial situation and objective definition have been determined, the best path between the two fixed points is selected and divided into phases. The end of the phases is marked with milestones. Furthermore, work packages are defined, the necessary resources are determined, and deadlines and costs are calculated. Only then does the implementation of the planned activities take place. The implementation status will be analyzed regularly and compared with planning ("tracking"). If a larger deviation occurs, control should be taken. Changes in objectives can also occur in the course of the project. The original planning must be adapted from the current to the new situation now. Finally, you reach the objectives and carry out an orderly project completion with handover, recalculation, lessons learned, etc.

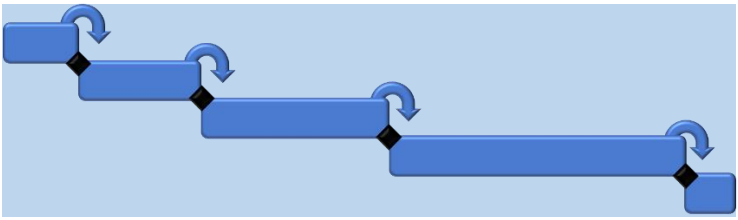


Figure 14: *Phase plan as a waterfall model*

Figure 14 shows the **waterfall model** as the basis for the results-oriented PM approaches. You plan all the steps in

advance and then work through them one after the other, comparable to a waterfall, where one pool fills up first before the next pool gets water. Theory dictates this cascading thinking, but practice has been working for decades with phases that sometimes overlap strongly, a so-called **avalanche model** (see ***Figure 15***). With the same duration of the phases, the entire project duration can be significantly shortened. On the other hand, the overlap can always result in additional work, which in turn can reduce this time advantage.

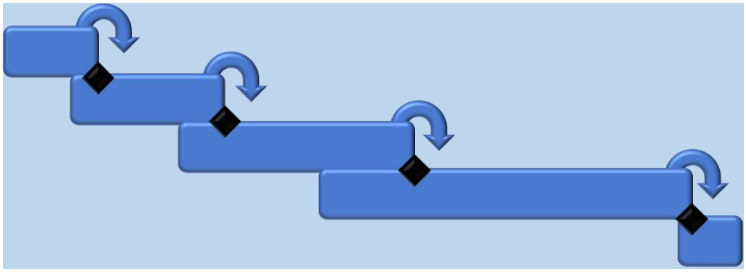


Figure 15: *Phase model with overlapping phases*

A **milestone** serves not only as an important date orientation, but also as a so-called **stage gate** or **Quality Gate**. At a **milestone review** you check whether all required tasks and results of the past phase have been fulfilled and thus the next phase can be released. This is possible even in overlapping phases, even if the next phase has already started. Furthermore, milestones are also often used as a part in contractual agreements.

Level D

This results-oriented PM approach has proven itself millions of times over many decades and has continued to evolve. Depending on the framework conditions of a project, it will continue to be the best approach.

„In the long run, a short cut seldom is."
Malcolm Forbes, (*1947)

4.1 Define the result-oriented project

After project initiation phase and the positive decision to implement the project, the **definition phase** starts. In this phase, the characteristics of the project parameters are defined and negotiated, so that at the end of the **project definition** a **project assignment** or. **Project contract** can be signed. This milestone can be both an internal and external project charter. The documents already created in the project initiation, such as SWOT analysis, cost-benefit analysis, etc., are updated with the findings obtained here.

In order to determine the most important contract features, it is necessary to plan much further in advance than at the time of initiation. First of all, the range of services or results of the project is determined. In a **specification**, such as a **requirement specification**, all required content-related result characteristics are listed in a measurably definition. Based on this, effort, duration and cost estimates can be made. If there is a high level of experience with the project content, reference values or key figures may be available. The more novel the project content is, the more detailed planning tasks must be done. This is the only way to make sound estimates of the required efforts, durations and costs in sufficient, i.e. contract-ready quality.

This entire process is also often referred to as **order clarification**. The client and supplier negotiate and agree on the initial situation and inputs, the framework conditions and influencing factors as well as the output to be aimed for.

It can be assumed that the **analysis of the initial situation** will already be carried out as far as possible in the initiation phase (see chapter 2). Here in definition phase, this should at least be checked again and usually also updated or continued. The next big step is the definition of objectives.

Objectives fulfill important functions in projects. These include:

- Orientation function
- Motivation function
- Connection function
- Supervising function
- Selection function
- Coordination function

Objective types show the basic focus of objectives. Typical **objective types** are benefit objectives, quality objectives, deadline objectives, cost objectives, social objectives, non- objectives as well as result and procedure objectives. **Result objectives** define the results or a desired state at a specified time in the future. **Procedure Objectives** relate to the project process.

„I don't know a sure path to success, only one to certain failure: to want to please everyone."
Plato (ca. 428-348 BC)

The particular challenge with project objectives is that, on the one hand, it is usually a complex bundle of objectives and, on the other hand, different interest groups with different perspectives on the project have their own expectations and objectives. This results in **conflicting objectives**, which must be identified, analyzed and, if possible, solved. In an **objective relationship analysis** these trade-offs can be investigated and then resolved as far as possible.

„To see clearly, a change of direction of view is often enough."
Antoine De Saint Exupéry, (1900-1944)

The individual objectives are usually related. **Objectives hierarchies** are formed when sub- objectives can be combined into main objectives. **Objective relationships** show the position of objectives among each other. They can influence each other positively (support) or negatively (compete). The entire **spectrum of objectives relationships** ranges from antinomy (incompatibility) to competing, neutral, complementary to identical. Furthermore, you can set objectives in **objective categories**, e.g. in must, should and can objectives or A, B and C objectives.

Those who do not identify with the project goals can only be motivated to a limited extent. In this respect, it is a particular challenge in projects to set the goals in such a way that win-win situations can be achieved for all those involved and affected. . Unfortunately, this is rarely possible exclusively, but should still be strived for. To this end, you should approach the objectives openly and define or at least discuss the objectives

together with everyone if possible. This effort is arduous, but it is usually worth it because it pays off later in the project.

The **formulation of goals** is not trivial. A common mistake is that not a state, but a process is formulated ("*test software*" instead of "*software is tested*" or better "*all software tests* passed"). A good support for objectives formulation is the **goal definition according to SMART formular**. The five letters of SMART stand for:

- **S = Specific:** Does everyone have (exactly) the same understanding of the objectives?
- **M = Measurable:** Is the success of the project objectively measurable in the end?
- **A = Attractive or Accepted:** Are the participation in the project and/or the project results interesting?
- **R = Realistic:** Are the objectives really achievable?
- **T = Time-bound:** By when do the objectives have to be achieved?

The **formulation of non-objectives** of the project makes it clear to all participants which deliverables and results are not part of the project. This avoids false expectations that later lead to irritation and time-consuming renegotiations.

Ultimately, an **objective system** is created, that defines the operational objectives for the project. With this objective system, the project is given in particular the orientation and focus in terms of content. The objective system also includes clear **prioritization of objectives**.

Objectives are of considerable importance for the commission. In particular, there should be written requirements for the external commissioning of services. In a **requirement specification** the objectives are specified (what is to be achieved in what quantity and quality). In the next step a **specification sheet**, provides the information with which activities it is to be achieved, including cost estimations.

	Requirements sheet	Specification sheet
Who provides it?	Client	Contractor
What's in it?	what has to be achieved in quantity and quality	with which activities it is to be achieved incl. costs

Figure 16: *Requirements and specifications sheets*

Especially in **tenders** the client publishes a requirement specification. Potential contractors offer their corresponding services with a specification sheet (see ***Figure 16***). On this basis, the client can negotiate with the applying candidates and commission the services agreed on from this.

The definition phase in results-oriented project management usually ends with the project commissioning. The **project contract** should content in particular the

- Objectives and expected results,
- General conditions, incl. dates and costs,
- Responsibilities and necessary resources as well as
- joint expressions of intent of the client and supplier.

For **negotiation of the project contract** and the **signing of contracts**, it is essential to take into account the information in section 8.4.

Checklist Project Definition in Results-Oriented PM

• The initial situation has been fully analyzed.	
• The stakeholders are known and analyzed.	
• Opportunities and risks have been identified and analyzed.	
• The objectives have been agreed and formulated.	
• The objectives are supported by all those involved.	
• The project was put out to tender.	
• The project contract has been negotiated and signed.	

4.2 Define the result-oriented project design

Since the project definition tends to be the "*What?*", project design is more about "*How?*", i.e. the **general procedures of the project**. Many activities have to be initiated in advance, because in order to define the "what?" in a contractually secure way, the "how?" must be thought through at least to a certain extent.

If this has not already been done in detail in project definition, the **phases and milestones** (phase model) should be defined and scheduled first. At the same time, the **project organization** must be designed and established (see section 8.1).

The procedure is primarily determined by the selection of **project management processes and tools**. This means which processes and tools of project management should be used with what intensity and in which cycles to plan and control the project. This also includes many of the cross-phase activities (see chapter 8). A typical example is reporting. With the definition of the project design, you define the report matrix, which says which reports must be done by whom and to whom, how often and in what form, etc. At the same time regulated project meetings must be defined.

Organizations with a certain **degree of maturity** in PM have clear guidelines for this. Basing on transparent criteria, the projects are divided into project types (e.g. investment, product development, organization, etc.) and project categories (e.g. A, B and C projects). For the respective **project type** and **project category**, there are then minimum requirements for the procedure in the project and for project organization (see also section 9.2).

If an organization does not specify these requirements, then the project must fundamentally determine the project design itself. **The central questions** for this are:

- What committees and roles are there in the project with which tasks and responsibilities?
- Which project management tools should be used to plan and control the project (e.g. WBS, cost plan, schedule, etc.) and to what extent?
- Which data platforms should be used, who administers them and who has which access rights?

- Which software should be used and who has which access rights?
- Which meetings should take place with which contents, participants, durations, in what cycles?
- Which reports should be created by whom, to whom, with what content and cycle?

Checklist Project Design in Results-Oriented PM

• Project type and category have been determined.	
• The project organization with roles and responsibilities is in place.	
• The PM processes and tools are defined.	
• The project meetings and reports are defined.	
• The access rights for data are defined.	

4.3 Plan the results-oriented project

„If you have big plans, take your time."
Sophocles, Greek tragedian poet

At the heart of planning in results-oriented PM is the **work breakdown structure** (WBS). This summarizes all the necessary project content in a structured way and provides the basic information for the further planning steps. A WBS is an upside-down tree diagram whose root element (1st level) continues to branch out. The first level of these **structural elements** characterizes the overall project. For larger projects, the second level consists of sub-projects and the third level represents subtasks. For smaller projects, one or even both middle levels

can be omitted. The lowest level are work packages always (see ***Figure 17***).

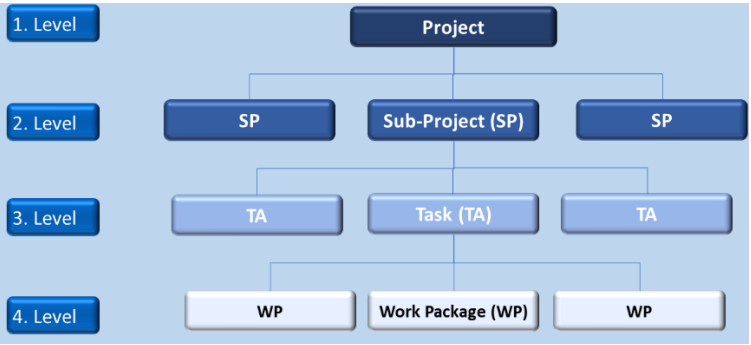


Figure 17: *Potential Levels of WBS*

The consistent delimitation of the project content in the WBS also enables the clear delimitation of **responsibility**. In project practice, this is usually not done in a clear-cut manner, so that overlapping responsibilities arise, which in turn can lead to considerable problems in the project. This is not just about wrangling over responsibility, but rather about delaying problems and risks with significant negative consequences for the project.

In the WBS, you prevent overlapping responsibility by not mixing objects (project content) and functions (activities). A distinction is therefore made between object-oriented and function-oriented WBS. However, a mixed-oriented WBS is also possible and widely used in practice if you do not switch inside one level, but only between the levels from objects to functions and vice versa. Furthermore, phase-oriented WBS are

also often used in practice. ***Figure 18*** clarifies the four different **types of structure of WBS**.

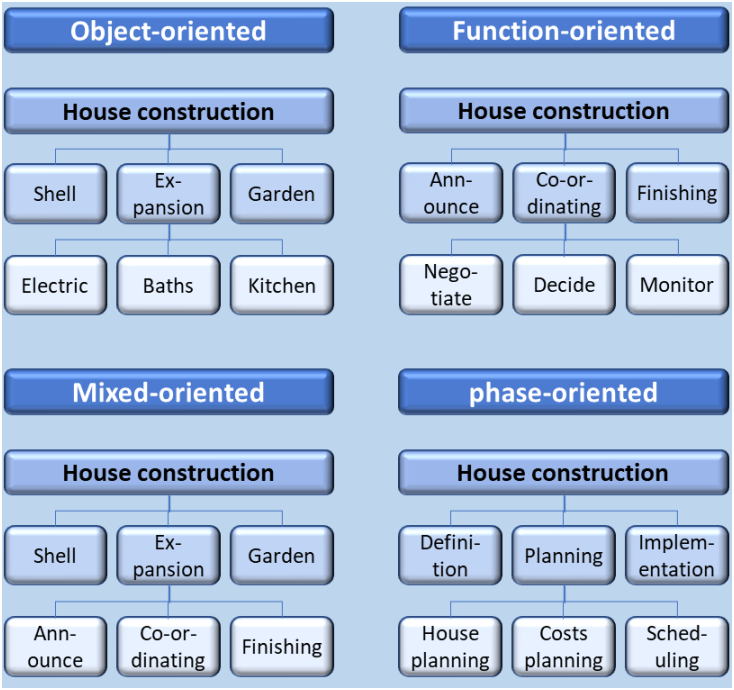


Figure 18: *Structural types of WBS (e.g. in house construction)*

The elements of a WBS should also always be encoded. **WBS codation** can be numeric (numbers only) or alpha-numeric (combination of letters and numbers). A typical example of numerical coding is decadal coding. It is comparable to a typical book structure: 1, 1.1, 1.1.1, etc.

When developing a WBS, two other aspects should be considered. On the one hand, the scope of the individual work

packages should **be reasonably balanced** and on the other hand, the WBS should **be as complete as possible**. The balance is achieved by splitting larger work packages and merging smaller ones. If the work packages have similar sizes overall, then they are more comparable. Completeness is a difficult but desirable objective. Any project content that is forgotten at this point will generate additional time and costs later on. Therefore, you should always develop the WBS in a team, compare it with several experts, let it mature for a few days, include aspects and experiences from comparable projects, etc.

It is also important **to compare the WBS with the objective system**. It is checked whether all the objectives of the project are pursued by corresponding elements in the WBS.

In order to work innovatively and find really new ideas and approaches, you should always start a WBS on a blank sheet of paper ("greenfield"), i.e. not overwrite an existing WBS. By "copying and pasting" an existing WBS with timid adaptation, you will hardly find new ways. However, it makes a lot of sense to compare the WBS with existing WBS once it has reached a certain level of maturity. At this point, important impulses can still be easily introduced and completeness can also be improved.

Work packages (WP) contain individual tasks, but are not further subdivided as the lowest branch in a WBS. There should be a definition for each work package, which is documented in a **work package description** (*see **Figure 19***). Alternatively or additionally, this can also be done in a WBS dictionary. This is

a cross-table including all WP, which are described with their characteristics.

Work package description		Blatt:	of
Project:	Phase:	WBS-No:	
WP-Title: Client: Sub-System: WP-Start (Date): WP-End (Date): WP manager:		Editor: date:	
1. Specifications (If necessary, use an additional sheet):			
2. Documents to be used (exact name):			
3. Required supplies (Hard- u. Software):	Supplier (internal/external):		Date:
4. WP Results (Hardware and/or Documents):			
WP Approval/Release Sub-System Engineer: Project Control: Project Manager:		Name/Date/Signature _____ _____ _____	
6. Appendix a. Schedule (bar chart, milestone list, etc.), b. Cost plan, c. Miscellaneous			

Figure 19: *Sample WP Description Form*

Once the detailed project content has been defined in the WBS, the processes and deadlines of the project can be planned in combination with the capacities and then compared with the costs. The logical dependencies of the activities are defined in a schedule and can thus determine the required sequence and possibilities for the parallel processing of the activities. With regard to the available **capacities**, durations for the individual activities can now be estimated. This results in an initial **schedule**. However, this still has to be reconciled, as some capacities can be planned at the same time due to parallel

work. These overloads must be corrected, for example, by postponing or extending activities and/or increasing capacities. This results in a new schedule and/or increases capacity. On this basis, the costs can now be determined and compared with the **budget**. If the costs determined exceed the budget, appropriate adjustments must be made.

When modern project management was developed about 70 years ago, **network planning technology** was a main tool. With simple mathematical logarithms, complex processes and deadlines could be calculated. Even today, it is still good for a project manager to master the basic features and logic of network planning technology. However, the calculation is then done by **project management software** (PM-SW). However, this can only calculate the processes and appointments correctly if the activities are correctly networked. An example of a simple network according to the Critical Path Method (CPM) shows ***Figure 20***.

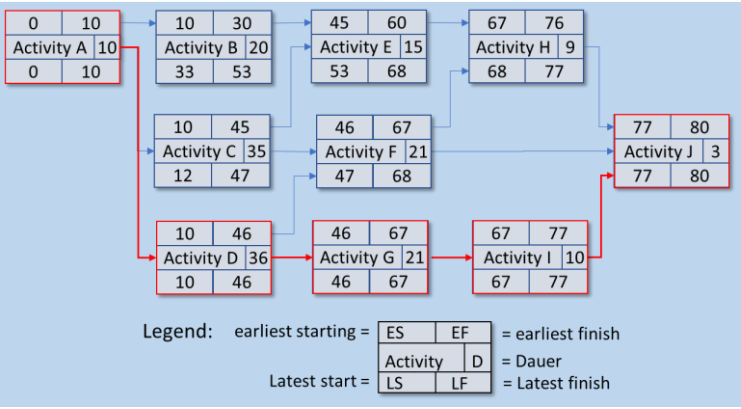


Figure 20: *Example of a simple network by CPM*

Nowadays, however, the process and scheduling is usually only done with a **bar chart diagram** (**Gantt Chart**). A networked bar chart is highly recommended. It integrates the advantages of network planning technology with the graphical expressiveness of the bar chart. All activities - except the start process and the end process - are assigned predecessors and successors and the dates are automatically calculated and updated by the PM-SW. ***Figure 21*** shows an example of a bar chart diagram (excerpt).

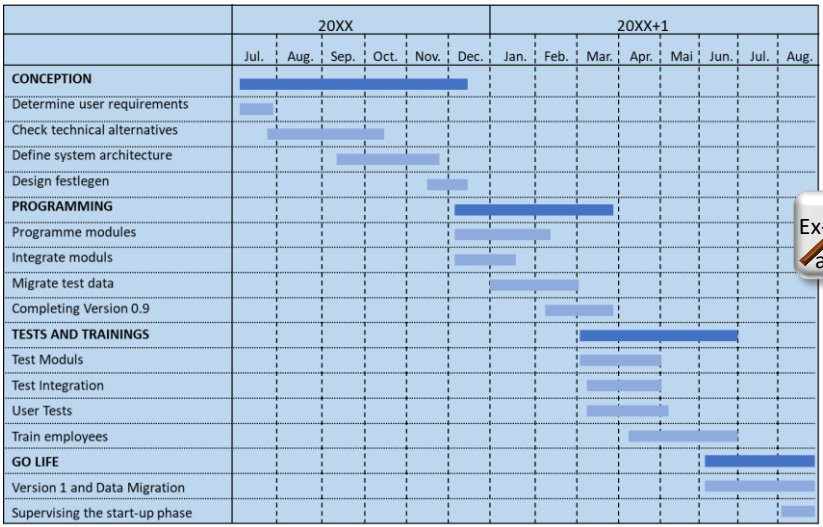


Figure 21: *Example of a bar chart diagram (excerpt)*

When scheduling, every experienced planner includes **time buffers**. They serve above all to ensure that the schedule is not immediately blown up in the event of unplanned events. Although this approach is correct, it leads to projects that take longer and longer, because more and more time buffers are

being built in for safety across all hierarchical levels. If you don't need the time buffer, you still have to wait because follow-up activities are scheduled later already. The critical chain approach **prevents this problem** . The entire time buffer is shifted to the end and certainly also partly needed, but the part that is not needed usually saves a lot of time and shortens the project.

Resource planning determines which **resources** for which processes are needed and when, and makes a comparison so that the best possible utilization of resources can take place with little over- and underutilization.

Typical resources in projects are personnel, vehicles, machines, materials, etc. By assigning the resources to the individual activities, multiple stresses on personnel and thus overloads can now be quickly detected. These should be solved with a capacity adjustment/**resource levelling**, but not by the PM-SW "automatically", but "manually" and one after the other. In a resource table and/or graphic, you can quickly identify and clean up the over- and underutilization.

„You should never have so much to do that
you don't have time to think.“
Georg Christoph Lichtenberg (1742-1799)

„And then you have to have time to just sit there and look in front of you.“ **Astrid Lindgren (1907-2002)**

In addition, resources and especially people should never be planned 100%. For a wide variety of reasons, such as set-up

times, self-administration, further training, absence due to illness, a certain amount of free time is required here.

Now the detailed **costs** can be determined by assigning the corresponding costs to each activity. Important **types of costs in projects** are personnel, material, machinery, external services, capital, sales, communication, travel and overhead costs. If you aggregate the costs of individual work packages through the subtasks and subprojects to the project level, you get the total costs of the project. Cost planning and later control can be carried out in the PM-SW or separately in an accounting or spreadsheet software based on the WBS. In principle, it is possible to plan the costs in the WBS from top to bottom (**top down**) or from bottom to top (**bottom up**). Ultimately, both planning paths should be used.

When using different tools, the **identical structure** is of particular importance. This is the only way to really compare data. The uniform structure should be specified by the WBS.

Cost estimates can be supported by databases of empirical knowledge. So, if information on comparable projects or subtasks in projects is already available, then it can be adapted. Not only is the estimate of the planned costs particularly valuable, but also the actual costs incurred by the reference project. Price increases may have to be factored in if the reference project is a little older. Ratios or **Key Performance Indicators** (KPI) may even be available for individual tasks. In these cases, one speaks of **KPI-based estimation methods**. In some cases, quotes can be obtained and compared.

If these possibilities are not available, then **estimations by experts** can still be used, such as the Delphi method or three-point estimation. In the **Delphi method**, experts estimate anonymously, a moderator calculates the average value of the estimates and communicates it to the experts. The experts can now reconsider their estimate or justify it separately, especially if they themselves have estimated the lowest or highest value. In the so-called **broadband Delphi**, an open discussion arises about the estimates and their justifications. The estimate usually becomes more accurate when the lower and upper extremes are deleted. In the **three-point estimation**, experts jointly estimate an optimistic, a pessimistic and a probable value. The probable value is weighted fourfold. So, the formula is: estimated value = (pessimistic value + (4 x probable value) + optimistic value) / 6.

In addition to the tabular cost overview, a graphical picture of cost flow and cumulated cost is helpful to quickly record the cost development and compare it with project progress and actual costs later. While the **cost curve** shows the costs per unit of time (period), the **cumulated cost curve** shows the costs totaled over the course of the project (see ***Figure 22***).

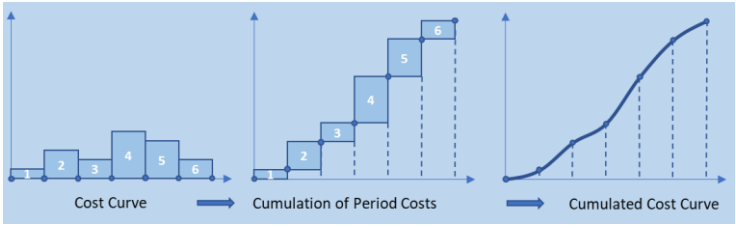


Figure 22: *Cost curve and cumulated cost curve*

The costs should also be divided according to **cost types, cost centers and sponsors**. In the first step, the costs incurred are determined, i.e. the costs are divided according to cost types (see above). Cost center accounting determines where the costs are incurred, and cost unit accounting determines who pays the costs (sponsor). The deeper you go into detail here, the better the evaluations, but also the higher the effort. In small projects, the subdivision according to cost types is usually sufficient. The project then has only one cost center and one cost unit, namely the project itself.

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„The science of planning is to anticipate the difficulties of execution." **Luc de Clapiers Vauvenargues (1715 - 1747), French philosopher and writer**

Quote

Since project planning in the results-oriented approach consists of various sub-plans, an overarching **project management plan** is helpful (see ***Figure 23***). It integrates all sub-plans and is of course also used in the control and closing phase.

Level D

Example

Figure 23: *Example of a project management plan*

Checklist Project Planning in Results-Oriented PM

• The work breakdown structure is done and coded.	
• Work package descriptions are available.	
• A detailed schedule is available.	
• A detailed capacity plan is available and has been compared with the schedule.	
• I know the main estimation methods.	
• A detailed cost plan is available.	
• A project management plan is in place.	
• The activities across phases (Chapter 8) are taken into account.	
• The planning has been confirmed / approved.	

4.4 Implementing the results-oriented project

With the completion and approval of the project planning, detailed operational planning with implementation of the planned activities and their monitoring begins. In the event of deviations from the project plan or changes in the project environment, etc., project management activities are initiated. Depending on needs and dimensions, these are carried out at different levels and with different scopes, so that either only the plans are adjusted or the goals are adjusted or even redefined (see ***Figure 24***).

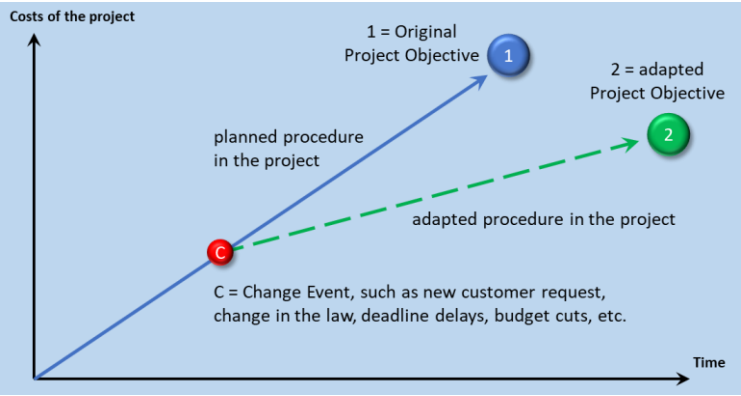

Figure 24: *Adaptation of goals and procedures in the project*

Detailed **operational planning** is usually only about which currently available capacities are used for the implementation of the activities, as planned capacities can be cancelled at short notice, e.g. illness, machine failure, etc.). **Instructing employees** in the tasks to be performed is a management and communication task (see sections 8.1 and 8.3).

The continuous process of implementation, status determination and adaptation correspond to **cybernetics**. You set goals, plan their implementation, implement the activities and check whether you are on schedule or whether deviations have occurred. If you are on schedule, you will continue the implementation. In the event of deviations from the plan, these are analyzed and the plans are adjusted in the case of minor deviations, and in the case of larger ones, even the content and goals may be adjusted (see ***Figure 25***).

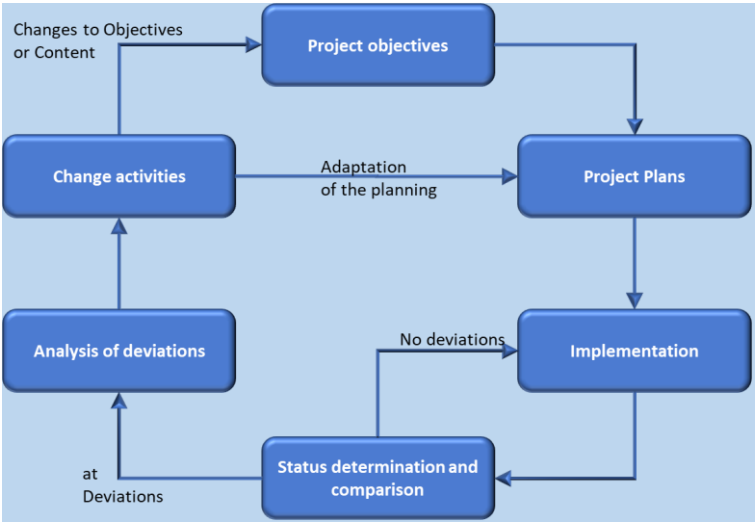

Figure 25: *Control Loop (Cybernetics) in Project Management*

„Not everything that counts can be counted, and not everything that can be counted counts." **Albert Einstein (1879-1955)**

Quote

Based on the content of the project results, the project is controlled with a **configuration management plan**. This plan describes the configuration characteristics of the project object. In **Change Requests**, the defined configurations may be adjusted (see further down in this Section).

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During the course of the project, the **project status** must now be determined regularly. An important key figure for the project status is the **percentage completed**, i.e. the percentage of the work performed or the result achieved. Percentage completed is usually determined at the work package level. The

A-Z Term

Level D

percentage completed of the work packages can then be aggregated into subtasks and subprojects up to the project level.

In aggregation, weights can be made. PM-SW often do this on the basis of durations, it would be better to take the effort as a basis. ***Figure 26*** shows an example of how an unweighted and weighted percentage completed is calculated.

	Effort in Person Days (PD)	% complete	
		unweighted	weighted
Project …	**412**	**50%**	**57%**
SP 1: …	**90**	**85%**	**87%**
WP 1.1: …	35	100%	100%
WP 1.2: …	30	85%	85%
WP 1.3: …	25	70%	70%
SP 2: …	**179**	**70%**	**71%**
WP 2.1: …	56	80%	80%
WP 2.2: …	78	70%	70%
WP 2.3: …	45	60%	60%
SP 3: …	**81**	**35%**	**37%**
WP 3.1: …	37	45%	45%
WP 3.2: …	27	35%	35%
WP 3.3: …	17	25%	25%
SP 4: …	**62**	**5%**	**3%**
WP 4.1: …	12	15%	15%
WP 4.2: …	36	0%	0%
WP 4.3: …	14	0%	0%

Figure 26: Example: Aggregation of Percentage Completed

There are various **methods for determining Percentage Completed**, which differ in effort, accuracy and objectivity:

- **Estimate**: Everyone estimates progress in their area of responsibility, hint: simple, but subjective and therefore quite inaccurate

- **Status step technique (also milestone technique):** a status achieved determines progress, e.g. milestone 1 reached = 20%, milestone 2 reached = 50%, etc., Note: objective, but quite rough, link to contractually defined milestones possible
- **50:50 Method**: Before starting an activity it is set to 0%. When starting, it jumps to 50% immediately and remains at 50% until it is fully completed. Then it is set to 100%. Note: highly recommended, as very little effort, high objectivity and quite high accuracy due to aggregation
- **0:100 Method**: same as 50:50 method, except that the intermediate step is omitted. An activity remains at 0% until it is fully completed and is then set to 100%. Note: better to use the 50:50 method
- **Quantity proportionality**: on the basis of a quantity achieved or consumed, the Percentage Completed is deduced, note: objective, quite accurate, useful if quantities are easily measurable
- **Secondary proportionality**: on the basis of a secondary variable, such as consumption of auxiliary materials, the Percentage Completed is inferred. Note: quite inaccurate, only useful if no other method works
- **Time proportionality**: based on the time consumed, the result is deduced. Note: very imprecise, only useful if no other method works

With the help of the Percentage Completed, the **Earned Value (EV)** can be calculated. The EV is the amount that you should have spent in relation to the current progress of the project.

You compare it with the previous actual costs and thus see whether you are currently within budget. The formula for the EV is:

EV = % Completed x Budget

	...	Fortschritt in %		
		% complete	% of Budget	% of Time
Project ...		**57%**	**64%**	**60%**
SP 1: ...		**87%**	**92%**	
WP 1.1: ...		100%	110%	
WP 1.2: ...		85%	90%	
WP 1.3: ...		70%	75%	
SP 2: ...		**71%**	**68%**	
WP 2.1: ...		80%	75%	
WP 2.2: ...		70%	70%	
WP 2.3: ...		60%	60%	
...		**...**	...	

Figure 27: *Example Earned Value Analysis (EVA) in tabular form*

The **Earned Value Analysis (EVA)** represents the project status basing on earned value.

	...	Fortschritt in %		
		% complete	% of Budget	% of Time
Project ...		**57%**	**64%**	**60%**
SP 1: ...		**87%**	**92%**	
WP 1.1: ...		100%	110%	
WP 1.2: ...		85%	90%	
WP 1.3: ...		70%	75%	
SP 2: ...		**71%**	**68%**	
WP 2.1: ...		80%	75%	
WP 2.2: ...		70%	70%	
WP 2.3: ...		60%	60%	
...		**...**	...	

***Figure* 27** displays a tabular EVA with current project status - highly aggregated from WP to SP to the total project. In this example project, 57% of the output is reached, 64% of the budget was expended on it, and 60% of the time was spent. However, one should not simply interpret an imbalance of the project from these figures only. It may be that more results can be produced in the further course of the project with less money and time. One advantage of the tabular EVA is the detailed overview of the individual sub-projects and work packages.

Figure 28 shows a graphical EVA. It is to be interpreted as follows: If the actual costs are above the EV, then there is a corresponding cost overrun. If the planned costs are above the EV, then there is a corresponding delay. A particular advantage of the graphical EVA is the trend display over the course of the

project so far. It is recommended to perform both a tabular and graphical EVA.

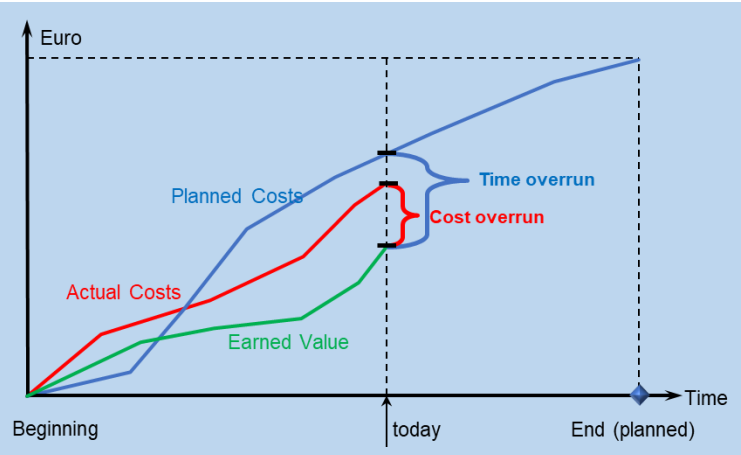


Figure 28: *Example Earned Value Analysis (EVA) graphically*

„I am more interested in the future than in the past, because I intend to live in it.“ **Albert Einstein (1879-1955)**

The EVA initially has a focus on the past because it draws on corresponding actual data. With an earned value forecast, you can predict the further course of the project. The further development of the EV is predicted until complete completion (100%) and the necessary costs are estimated. ***Figure 29*** shows an example of an earned value forecast with predicted deadline and cost overruns.

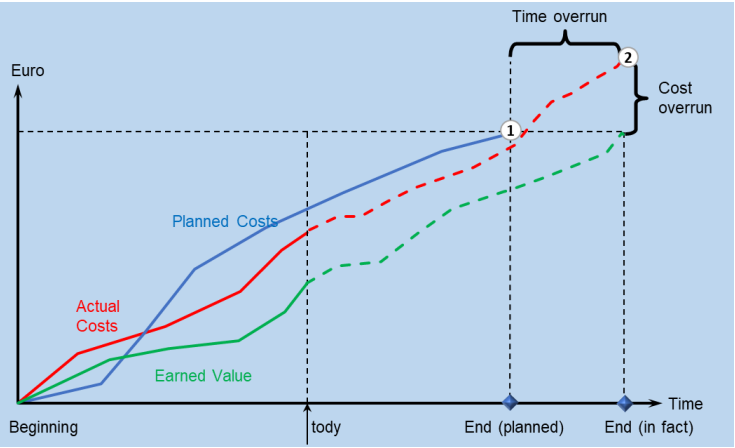


Figure 29: Example Graphical Earned Value Forecast

At the center of the forecast about the continuation of the project from the current status (see ***Figure 30***) is always the **main question**: Will we manage to provide the open services and achieve open results in full quality in the remaining time and with the remaining budget?

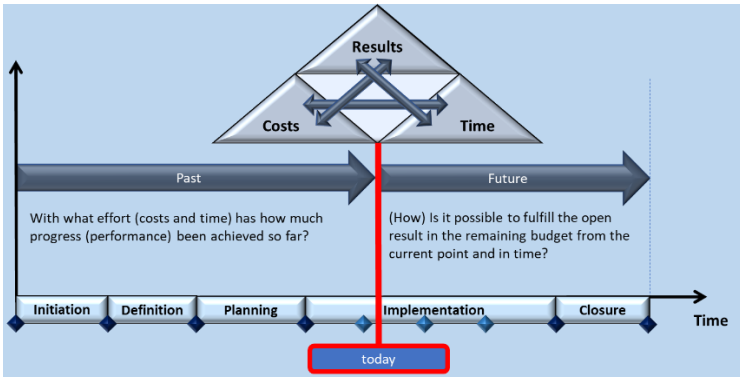


Figure 30: Forecasting the course of the project

Other tools for determining project status include the **Tracking Gantt Chart**, **Cost Trend Analysis** (CTA), **Milestone Trend Analysis** (MTA), and **Milestone Cost Chart**.

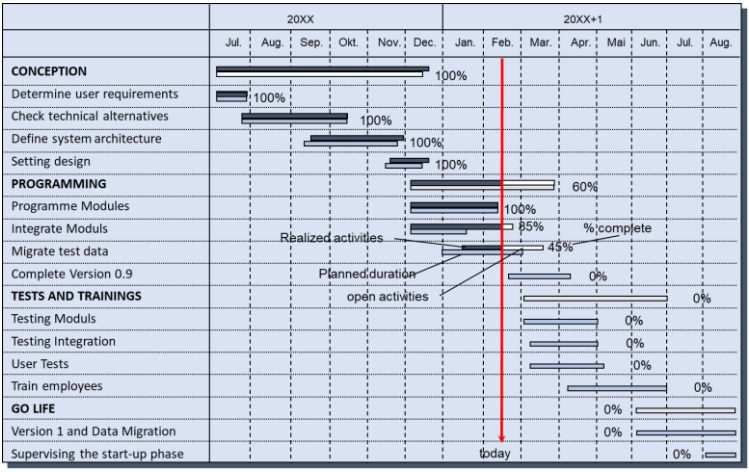


Figure 31: *Example Tracking Gantt Chart*

The **Tracking Gantt Chart** is a common tool. A lot of relevant information can be presented clearly (see ***Figure 31***).

Cost trend analysis (CTA) is best done graphically to better identify trends. You can see at a glance the course of the estimated total costs of the project (see ***Figure 32***). As a reference, the available budget is displayed. It should be taken into account whether a profit margin must be included.

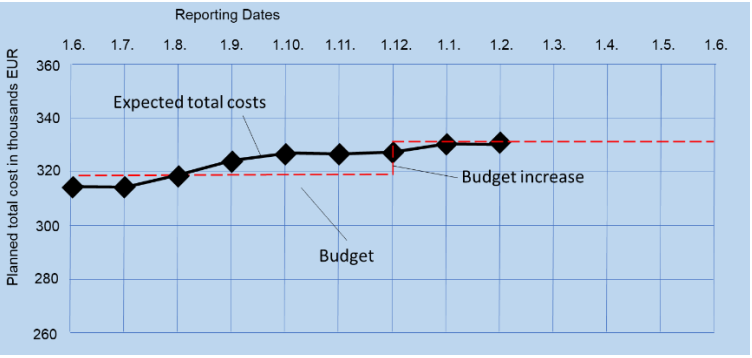


Figure 32: Example cost trend analysis

Milestone Trend Analysis (MTA) displays the history of estimated milestone dates for each project's reporting dates. It is more suitable for larger or long-term projects. If the trend lines run horizontally, then everything is on schedule. If they rise, they show delays, if they fall, then you have made up time. As soon as a trend line reaches the diagonal, the milestone is complete (see ***Figure 33***).

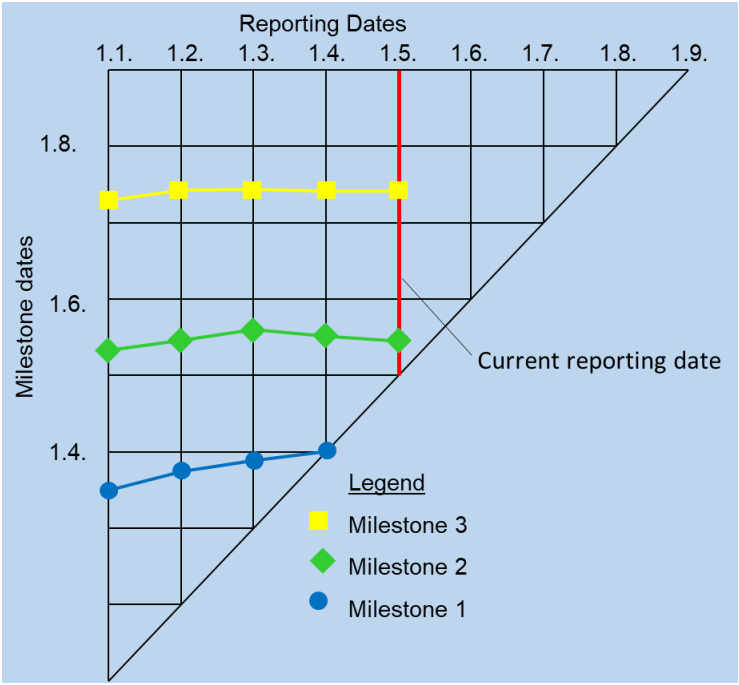


Figure 33: *Example milestone trend analysis*

A combination of the representation of cost and schedule trends is shown in the **milestone-cost diagram**. You can see at a glance whether and how milestones have changed in terms of dates and costs (see ***Figure 34***).

„If you say A, you don't have to say B. He can also recognize that A was wrong.“ **Bertolt Brecht (1898-1956)**

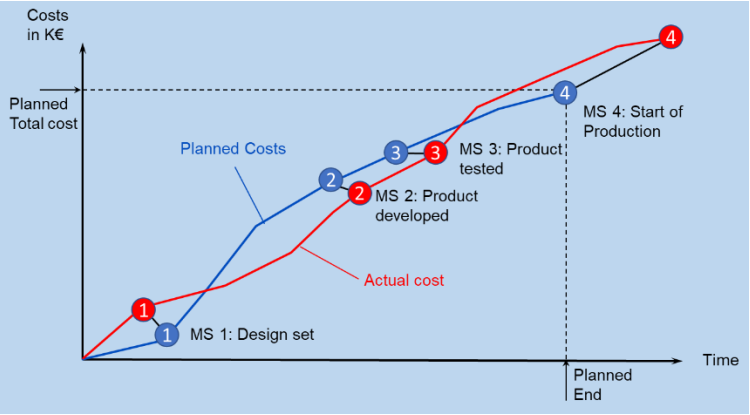
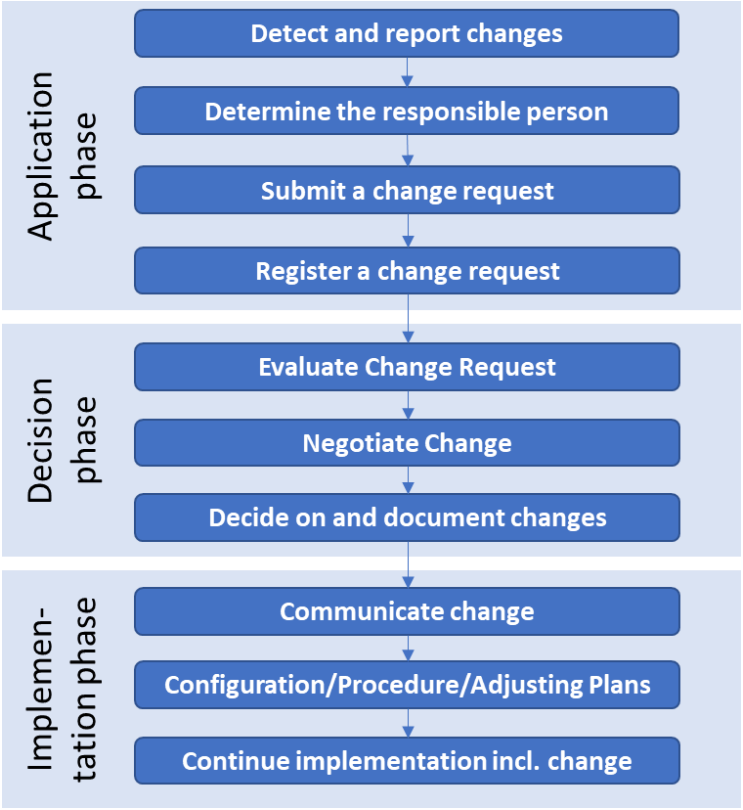


Figure 34: *Example milestone cost diagram*

As soon as a stronger deviation or trend in the wrong direction is detected, **control activities** should be initiated. The control activities can track specific target areas individually or in combination. This includes quality improvement, increasing or reducing results, accelerating deadlines, reducing costs, etc. Control activities can be aimed at increasing productivity, motivation, capacity, "nice to have" goals, project organization, and much more.

Control activities and every adjustment are organized in **project change management** and usually also require activities in contract and claim management, communication, stakeholders and project marketing, reporting and documentation, etc. (see corresponding sections in Chapter 8).

„Nothing can go wrong. The only thing that can happen is that things take a different course than planned.“
Stephan Sarek (*1957)



Level D

Figure 35: *Steps of a change process in projects*

Change management should be organized quite formally to avoid typical problems. On the one hand, it is about legal certainty, so that it can be proven that one has worked in a legally sound manner, especially in the case of contract-relevant changes at later dates. On the other hand, it is a matter of coordinating the parties involved, so that no unnecessary effort is incurred. In principle, existing plans should be worked with

until a change is officially confirmed. The amended plans were only to apply from this point on. If a change is so serious that current activities and results are no longer usable, then the work should be suspended until a change decision has been made. Accordingly, a change process should always be implemented quickly. ***Figure 35*** shows a typical change process.

A **change request (CR)** is made in a predetermined template. ***Figure 36*** shows a simple example of this. Approval should only be granted by authorized persons. In the case of external projects, written approval by the client should always be given in addition to internal approval.

„We often have to start over, but rarely from the beginning."
Ernst Festl, *1955, Austrian writer

In principle, there is a risk of a creeping, uncontrolled increase in the scope of services in every project, the so-called **scope creeping**. In this process, the scope of services is increased in small, barely noticeable steps, without the other parameters (costs and deadlines) being adjusted accordingly. This must be prevented as far as possible with sound project control and change management.

Change Request (CR) No: .....

Project: ..... Idea Provider / Applicant: .....

Description of the change:

Justification of the change:

Effects for the client (performance, costs, time):

Effects for the contractor (performance, costs, time):

Opinions:

Change requested: (name, date, signature):.....

Approval: (name, date, signature):.....

Figure 36: *Example change request template*

Checklist Project Controlling in Result-Oriented PM

• All the tools for project management have been defined and prepared.	
• Meeting management and reporting is prepared.	
• Change management is prepared.	

4.5 Big Picture – result-oriented PM

Figure 37: *Big Picture - result-oriented PM*

5 Procedures in Agile PM approaches

„In a world full of uncertainty, you have to try a lot of things. One can only hope that some of them work."
Douglass North, (1920-2015), economic historian and economist, 1993 Nobel Prize winner

The Agile project management approach has been rapidly gaining in importance for years. The first precursors were already in the 1930s, when engineers invented the method of "iterative and incremental design and development" (IIDD). A significant step in development was the **Agile Manifesto**, which was presented in the 1990s . In it, the dogmas of project management that had prevailed up to that point are critically questioned and a partly almost opposite, but at least contrary behavior is proposed. Typically, this approach was initially perceived as crazy for the established project management world, but on closer inspection it does have advantages.

„Where would we end up if everyone said where we would end up, and no one would go to see where they would get if they went.“ **Kurt Marti (1921-2017)**

Instead of planning in detail as in the results-oriented approach, this is done step by step (iteratively). A product vision including a dynamic list of requirements for the entire project is specified. The first **iteration** is planned, implemented and tested. Only then is the following iteration subjected to the same cycle (planning – implementing – checking), and so on. While this creates slightly greater uncertainty about the final

outcomes, costs, and durations of the project than a results-oriented approach, the results are developed closer to the customer, so that in the end, customer needs are more likely to be met to a higher degree. In addition, there are fewer renegotiations, as there is usually much less need for readjustment.

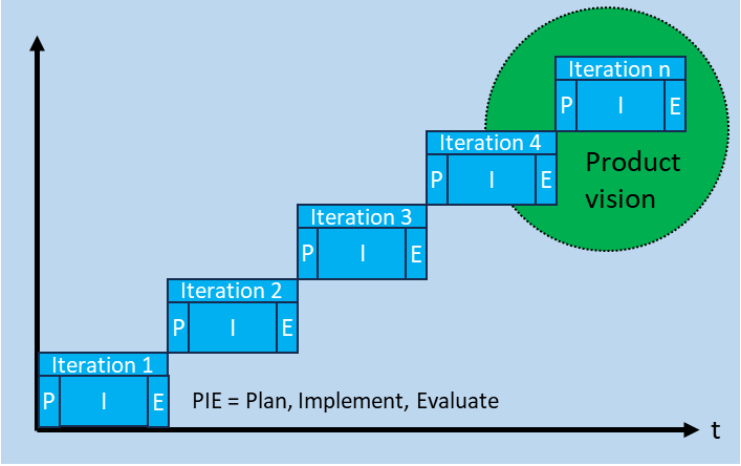


Figure 38: *Basic procedure in Agile PM*

"You never get lost as easily as when you think you know the way." **Chinese wisdom**

„A good traveler is a person who doesn't know where the journey is going." **Lin Yutang (1895–1976), Chinese writer**

The **basic procedure in Agile PM** (see ***Figure 38***) begins with the definition of the product vision in the first step. This is not an exact specification, but rather a vague description of the result to be achieved, including a list of the already known, but by no means complete, result requirements, which are listed

in a product backlog, for example. The iterative process follows with the steps (iterations 1 to n). You plan the first iteration, carry it out and at the end check the intermediate results and the procedure in order to then start the next iteration, and so on. From the findings of the individual iterations, the product backlog is supplemented or changed and, if necessary, the procedure is also adapted.

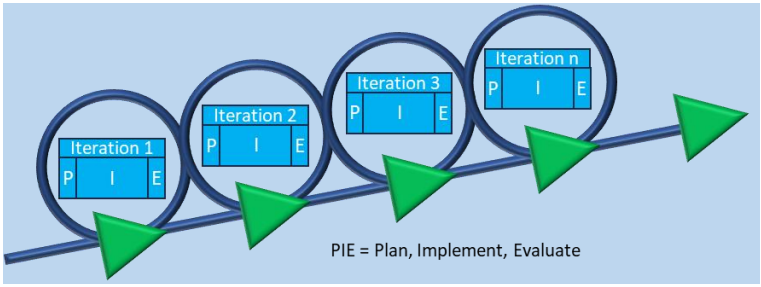


Figure 39: *Spiral model as the basis for Agile PM*

The Agile approach is often described as a **spiral model** (see ***Figure 39***). Each turn of the spiral corresponds to an iteration and each iteration always follows the same process (planning the iteration, implementation, review and adjustment) before the next iteration starts. In this way, you work your way towards the goal step by step.

In this context, the **Scrum** method speaks of empirical process control through an iterative and incremental approach based on the three pillars of **transparency, verification and adaptation**. Scrum only provides a rough **framework** instead of providing details. However, this framework is to be implemented consistently.

The Agile PM approaches are very popular. It is to be assumed that teams feel more comfortable with these approaches. Many elements of the so-called "**Agile mindset**" seem to meet the zeitgeist well. Above all, however, individual weaknesses of results-oriented project management, such as excessive planning, renegotiations, meetings, reports or even too little customer proximity, are skilfully avoided or reduced.

The so-called **Agile mindset** can best understood by reading the **twelve Agile principles**:

1. It is a top priority to actively involve the customer at an early stage and thus meet their real needs.
2. Changes are to be introduced until the end in order to improve customer benefits.
3. The interim results are to be implemented in short cycles so that the team can easily control itself and potential for change can be identified at an early stage.
4. Team members should only work on one project at a time.
5. The team members are self-organized, you should create the best environment for them so that they can act independently.
6. Direct, personal communication is a priority.
7. Progress is measured by incrementally growing interim results.
8. It is a high value to focus on sustainable work so that the team can provide continuous performance over a long period of time.
9. It is important to deliver optimal results in terms of technical requirements and design.

10. You should concentrate on the essentials at work. Activities without clear benefits should not be carried out.
11. Teams motivate themselves in an independent environment and thus produce optimal results.
12. The teams regularly reflect on their approach and optimize it consistently.

Agile approaches are often perceived as more successful. Scientifically sound evidence of greater success than with result-oriented approaches has not yet been provided. Existing studies lack a scientifically sound basis and therefore their statements should be treated with extreme caution and questioned very critically. In any case, instead of blindly trusting studies or believing the slogans of "black-and-white thinkers", one should find the appropriate approach to the specific project, as suggested in this book (see Chapter 3).

"There is no security, there are only different degrees of uncertainty." **Anton Chekhov (1860 - 1904), Russian playwright**

Scrum has four **roles**: stakeholder, product owner, scrum master, and development team. The latter three together make up the Scrum team. In Scrum, stakeholders are essentially limited to the client and the users. The Product Owner is responsible for the project content and the Scrum Master is responsible for the project process and collaboration. Both can also work on other projects at the same time. The development team consists of up to 8 equal members, who are 100% assigned to the project and can work largely self-organized. All members of the Scrum team are committed to the five **values of Scrum**: commitment, respect, openness, focus, and courage. For the roles

in Scrum and in particular their "accountability" see also Section 8.1.

A special feature is the **design of contracts in Agile project management**. It can be implemented when the first product backlog is available, but also before or later. If it is done beforehand, the determination of the specifications and definition of the requirements can be part of the contract. If it is only made when the project design is defined, then the durations of the iterations are already fixed and more specific information can be implemented in the contract. But regardless of the timing, drafting the contract is difficult. Typical contract components, such as project results, durations and costs, can only be determined extremely roughly. One possible solution is a service contract, which, however, entails larger risks for the client (see section 8.4). However, the budget and duration can also be fixed in order to develop maximum output. This is referred to as a **minimum viable product** (see ***Figure 8***). This makes it easier to proceed with a service contract.

Figure 40: *Step-by-step commissioning in Agile PM*

Another possible solution is the step-by-step commissioning. A separate contract is created for each iteration and after several iterations and an increasing trust and knowledge base about the course of the project and the project results, a contract is

concluded for the remaining time (see ***Figure 40***). The disadvantage is the very short-term commissioning with small orders and follow-up orders. The larger the contracting company, the more difficult it is to conclude short-term and small-scale orders.

5.1 The project start in Agile PM

The Agile project start defines in particular the specifications for the project, the product vision and requirements as well as important specifications for the operational process.

„More important than the right path is the right direction."
Stefan Persson (*1947), Swedish entrepreneur

The specifications for the project are primarily the **conditions and expectations of the client**. These can be, for example, on the one hand content-related requirements of the future users for the project result (see below on the topic of requirements) and on the other hand deadlines and cost specifications. Furthermore, technical requirements and interfaces, compliance with the corporate design, data protection regulations, data security, operation and maintenance of the system, and much more. should be taken into account. The **deadline and cost restrictions** can be specified with very different degrees of severity. Especially in Agile project management, however, there should always be a certain flexibility in favor of the project result. The assumption behind this is that a project can cost a little more and take longer if the result is all the better afterwards and the higher money and time investments can be

quickly amortized or compensated. However, this in turn requires a high level of trust on the part of the client. A corresponding uncompromising approach on the part of the client would reduce the Agile idea.

A variant that is often used in practice is the **Minimum Viable Product (MVP)**. According to the maximum principle, the budget and the deadlines are specified as input (Design to Cost and to Time) and the output is maximized. The project is completed with the deadline or budget consumption. In later operations (operations), continuous improvements, e.g. through DevOps, take part.

With the **product vision**, the product owner sets the rough direction. If possible, he creates a product vision board in cooperation with the Scrum Master and development team. ***Figure 41*** shows an example template for this. In addition to the project title, the vision is formulated and schematically supplemented with the columns below.

Project title:	**Vision:**		
Target groups	Needs of the target groups	Functionalities (USP)	Benefits for your own company

Figure 41: *Example template Product Vision Board*

The **requirements** are the expectations of all stakeholders of the project and in particular those of the final users of the project result (user requirements) as well as the client. They are collected in the **User Requirements Specifications**.

Requirements are controlled with **requirements management**. The requirements management process is also iterative and takes place in cycles over the entire course of the project. The entire process can include the following **steps**:

- Identify requirements
- Analyze requirements
- Assess requirements
- Define success criteria for each requirement
- Formulate requirements
- Cluster requirements
- Prioritize requirements
- Integrate requirements into implementation planning
- Measuring the degree of fulfilment of the requirements during the course of the project (controlling)
- Final measurement of compliance with the requirements
- Evaluation of requirements management

In order to overlook as few requirements as possible at the beginning, the following **checklist** can be consulted:

- Requirements of the Client
- Requirements of the future users
- Requirements of other stakeholders
- Technical requirements from the entire IT architecture (global system requirements)

- Technical requirements for the IT solution
- Design requirements
- Security and safety requirements
- Economic requirements
- Ecologic requirements
- Ergonomic requirements

The requirements are processed and documented, e.g. in a form to list the requirements (see ***Figure 42***).

No.	Requirement	Owner	Justification	Acceptance criteria
Example	The software must be intuitive to use.	User	The user group generally does not use user manuals.	• Test user can operate software after a short orientation (max. 5 minutes). • A pop-up window with explanations can be called up for each feature.

Figure 42: *Sample Request Form*

With an **epic** or **Use case**, desired user interactions with a system can be described and thus their more global requirements can be defined. Epics or use cases are somewhat more extensive and represent a rough description of the expectations of the system. They contain several user stories.

The formulation of the individual requirements from the epics or use cases can be done in so-called **user stories**. These have their origin in eXtreme Programming (XP), but can be transferred to all approaches. User stories briefly and concisely

describe individual, specific requirements of the users, client and other stakeholders for the project result. The advantage over a simple keyword list is that the requirements are examined and described in more detail, so that all relevant participants get a uniform understanding.

An **example of an Epic** is the setup of several payment functions in an online shop: As a user, I can choose between several payment functions and make the payment in just a few steps. An **example of a user story** from this could be: As a user, I want to be able to pay by bank transfer to better control of my spendings. So, every single payment function would get its own user story.

The **acronym "INVEST"** supports the formulation of the user stories. The six letters stand for:

- I – Independent
- N – Negotiable … and Negotiated
- V – Valuable
- E – Estimable
- S – Small
- T – Testable

To ensure that the requirements are understood uniformly and precisely, the participants carry out so-called **refinements**. The Product Owner explains the individual requirements / user stories to the development team. The development team replies the requirements in their own words and check the exact understanding. After refinement, the requirement / user story is given the status **Definition of Ready** (DoR).

The collection and coordination of requirements takes place in a database, often referred to as the **product backlog**. As soon as the implementation process of a requirement begins, it is taken from the database. If new requirements arise during the course of the project, they are added to the product backlog. The project is finished when the product backlog has no more entries and all extracted entries have been fully implemented and tested. Thus, the product backlog is a central control instrument in Agile project management.

The **important definitions and tasks of the operational process** include, among other things:

- Define roles
- Clarify project assignment
- Understanding requirements exactly (refinements)
- Know stakeholders and their requirements
- Getting to know the team members with each other
- Set the duration of the sprints
- Set the time and location of the dailies
- Set DoD
- Determine First Velocity

Checklist for an Agile project start

• Project contracts may already have been drafted and signed.	
• The Scrum roles have been filled.	
• A product vision is defined.	
• Specifications and requirements have been determined.	
• The user stories are described.	
• The product backlog is set up.	
• Important specifications for the operational process have been defined or tasks have been carried out.	

5.2 Define the Agile project design

Project design in Agile project management refers on the one hand to defining the Agile method, including the duration of the iterations, the place and time of the daily's and the definition of done. On the other hand, the tools must be selected and defined, especially during the implementation of the iterations, such as the use of planning poker, burndown or burnup charts, determination of velocity, Kanban board, etc.

First of all, you should define the **Agile method** or mixture of Agile methods. There are a variety of Agile methods that are also combined often in practise. ***Figure 43*** presents a selection of Agile approaches.

Scrum
Iterative approach (sprints) instead of planning everything in advance. Each sprint provides an increment. The next sprint starts after reviewing the current increment with the customer.
Extreme Programming (XP)
Clear focus on pure programming without any process models or formalities, working closely with the customer, small steps (frequent design definitions), intermediate versions, tests. Special feature: Pair programming (two programmers work together on a PC and take turns in their tasks).
Crystal
No process model, but principles: Continuous considerations for improvement, intermediate versions are regularly reflected with customers, customer permanently provides an experienced user, regular tests and shipable intermediate versions.
Feature Driven Development (FDD)
5 defined process steps (develop an overall model, create a feature list with sequence, plan, design, construct features step by step) with clearly defined roles.
Adaptive Software Development (ASD)
ASD is based on Rapid Application Development. Principle of continuous adaptation to ever new requirements. By 'speculating', 'collaborating' and 'learning', a program version is created monthly and discussed with the customer.
Test Driven Development (TDD)
First, tests are developed, then programmed on this basis and then tested.

Behavior Driven Development (BDD)
DThe user stories are supplemented with behavior: In my role as xxx, I expect yyy so that I have the zzz advantage. The scheme "Given - When - Then" helps here: If xxx is given, then the action yyy takes place with consequence zzz.
Design Driven Development (D3)
The measure of all things is the design of an application. Other PM approaches are used.
Lean Software Development (LSD)
LSD is based on seven principles: avoid waste, support learning, decide as late as possible, deliver as early as possible, give responsibility to the team, build in integrity, see the big picture.
Agile Unified Process (AUP)
The (Rational) Unified Process (RUP) is a waterfall model with predefined phases, i.e. not an Agile method, but the basis for Agile modifications such as AUP. Agile procedures and lean principles are integrated into the RUP.

Figure 43: *Selection of Agile approaches*

Probably the best known and most widespread method is **Scrum**. For these reasons, the further steps are presented in general or on the basis of Scrum. Since Scrum is only a framework, users apply a lot of tools from other Agile approaches, especially from **Extreme Programming (XP)**.

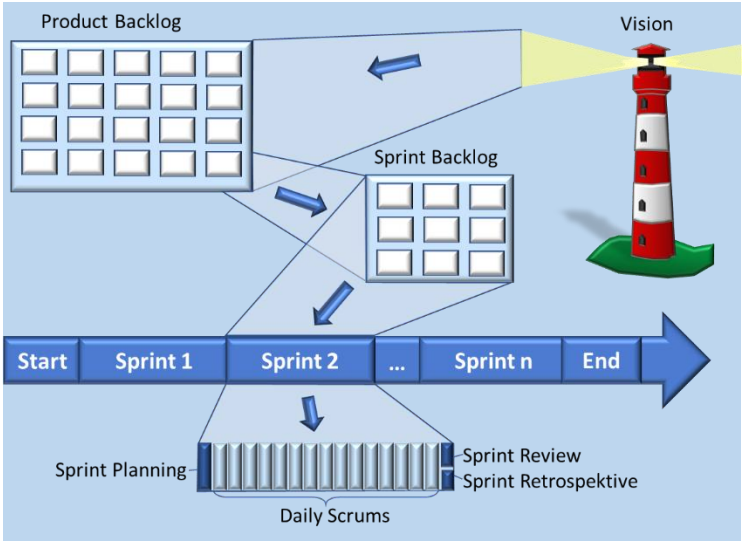


Figure 44: *Process model of the Agile method Scrum*

The **process of Scrum** (see ***Figure 44***) begins with the development of a **vision** of the project outcome (**product goal**). This can be, for example, a short text and/or a sketch and serves as orientation and motivation for the team. A **product backlog** is developed on the basis of the vision. In this database, the user **requirements** are collected. Scrum refers to the iterations as **sprints**. At the beginning of a **sprint planning**, a **sprint backlog** is created. To do this, you take the user requirements from the product backlog that are to be implemented in the next sprint and define the sprint goal as well as the activities (items, tickets) with which the user requirements are implemented. During the sprint, **Daily Scrums** are used to exchange information about progress and any problems. At the end of the sprint, a **sprint review** is carried out together with customers to

evaluate the current interim result (increment). This can create new user requirements, which in turn are added to the product backlog. In addition, the Scrum Team conducts a **Sprint Retrospective** to review and improve collaboration. It runs as many sprints until the product backlog runs out, or the budget is spent, or the time is up. The individual process steps are presented in more detail in the following two sections. In this context, the term **backlog** is to be understood as a small database or collection or list of items, such as requirements (product backlog) or tasks (sprint backlog).

An important determination is the **duration of the iterations**. In contrast to the phases in results-oriented project management, all iterations are of the same length and are not content-driven, but time-driven. This means that an iteration ends when the time is up, not when the content is done. Unfinished content is returned to the product backlog and usually tackled in the next iteration. Iterations should not last longer than a month. In practice, a duration of two weeks has proven to be effective in software development and is preferred. A shorter duration does not seem to be pragmatic. For larger projects or projects for which a lot of experience is available, a duration of three or four weeks is recommended. As soon as the duration of the iterations is determined, the **durations of iteration planning, reviews and retrospectives** should also be defined.

Furthermore, the location and start time of the **Daily's** must be determined. To minimize coordination, the Daily's always take place at the same time in the same room. The room in question should be booked immediately after determination for the

entire duration of the project for the Daily's at the appropriate time. In the case of distributed teams, the dailies take place almost exclusively digitally.

An important definition of the content is the exact formulation of the **Definition of Done** (DoD). A work product may only be reported as "done" if all elements of the DoD are met. The elements of the DoD to be fulfilled are determined by the team together. Most of the time, existing DoD from previous projects are copied and may adapted.

Typical **elements of a DoD** can be:

- the user story is implemented
- all variations are covered
- No complaints in code review
- no complaints in the developer tests
- Developer documentation is fully complied with
- Instructions for operation and maintenance are written and tested
- Instructions for users are written and tested
- No complaints in system and integration tests and quality assurance
- etc.

The first determination of the **velocity** can be done here or at the beginning of the first iteration. It is adjusted after each iteration. Velocity is the number of tasks ("items") that a team can complete within an iteration. When planning iterations, tasks should be planned in such a way that they take a similar amount of time.

Example: An iteration lasts two weeks, a team member can complete an item in three hours on average, the team has five members. The result is the following velocity:

Velocity = 9 working days x 7 hours x 5 team members
Velocity = 315 hours / 3 hours per iteration
Velocity = 105 items per Sprint

The nine working days result from the fact that an iteration planning must take place for about half a day at the beginning and a review and a retrospective for about half a day at the end of the iteration (see the following section). In addition, you should only calculate a maximum of 7 hours per day. The durations of the dailies alone have to be taken into account.

All other elements mentioned are described in more detail in the following sections.

Checklist Agile Project Design

• The Agile approach is selected.	
• The duration of the iterations is fixed.	
• The processes and tools are defined.	
• The place and time of the dailies are fixed and the room is booked.	
• The DoD is formulated.	
• The first velocity is determined.	

5.3 Plan, implement and evaluate iterations

The iterations are carried out according to a **standardized cycle**: first there is planning, then implementation and finally the evaluation of the iteration. The follow-up iteration begins immediately after the current iteration is completed.

„Small deeds that you do are better
than big ones that you plan."
George C. Marshall (1880-1959), USA Ministry of Foreign Affaires

In **iteration planning,** the first step is to set an iteration goal. It briefly and concisely describes what the central result of the current iteration should be. This serves as an important orientation for team members in planning and daily work. Scrum speaks of the **sprint goal in this context**. In **Sprint Planning**, the user stories to be completed in the current Sprint are still selected and the tasks (synonymous: items, tickets) are planned for their implementation. The **timebox** for sprint planning is 8 hours for monthly sprints and is scaled down for shorter sprints. In the first half, it is determined **what** needs to be done in the next sprint (including the sprint goal) and in the second half, **how** it is to be done, i.e. with which tasks. The following procedures and tools support the sprint planning process.

If the first determination of the **velocity** has not yet been made in the project design (see previous section), it must be determined in the first iteration planning. In the current iteration planning, the empirical values of the previous sprints must be taken into account and, for example, any holidays, vacation days of individual team members or other events that result in

fewer available working days must be subtracted. Accordingly, the velocity must be adjusted and fewer tasks can be implemented in the respective iteration.

Furthermore, the tasks for meeting user requirements must be developed, formulated and estimated in terms of their effort. This effort estimate can be made with duration. However, since many people have a hard time with this, you can also use so-called **story points**. You define a reference task and specify the story points for it, e.g. create search function = 4 story points. All other tasks are then estimated in relation (if there are 4 story points for task X, how many story points would you have to give for task Y?) This makes estimation easier for many.

In addition, the estimation can be made easier with the so-called **planning poker** . All participants receive cards with numbers from 1 to X and everyone puts the card on the table with their estimate of the story points of a specific task. The result is discussed, individual estimates are justified if necessary and a common value is determined. In case of doubt, the average of the estimates is used.

During **iteration implementation**, a daily session takes place, the so-called **Daily's**. Here, the development team exchanges information on three aspects:

- the progress of the past day (which and how many tasks were implemented?)
- the coordination of the following day (who does which tasks?)

- what obstacles ("impediments") have arisen and who has to take care of solutions?

Product Owners and Scrum Masters can, but do not have to attend the dailies. A Daily takes place at the same time and place every working day. It is strictly limited in time. After 15 minutes (timebox) it is over and all team members devote themselves again to their content-related work. Open items will be moved to the next daily.

The progress within the iteration is best represented with a burndown chart or burnup chart. In the **burndown chart**, the number of tasks or story points to be completed in the iteration is entered in a coordinate system on the vertical axis. With each working day, this number is reduced by the number of completed tasks and thus burns down to zero. A trend line indicates whether the team is in time or faster or slower (see ***Figure 45***).

Working days	Activities per working day		Open activities	
	planned	Realized	planned	Realized
0			80	80
1	4	3	76	77
2	4	3	72	74
3	4	2	68	72
4	4	4	64	68
5	4	4	60	64
6	4	7	56	57
7	4	5	52	52
8	4	6	48	46
9	4	6	44	40
10	4	0	40	40
11	4	0	36	40
12	4	4	32	36
13	4	6	28	30
14	4		24	
15	4		20	
16	4		16	
17	4		12	
18	4		8	
19	4		4	
20	4		0	

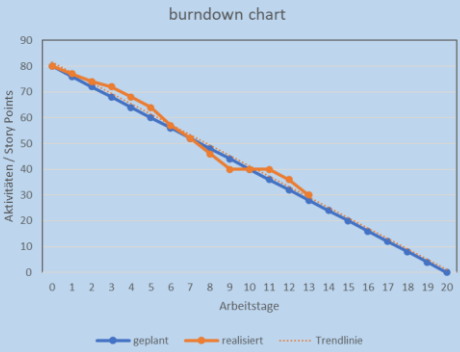


Figure 45: *Example burndown chart*

However, using a **burnup chart** is better for two reasons. On the one hand, it doesn't sound as negative as if you were to "burn down" something like in the burndown chart. On the other hand, later changes in the number of tasks can be visualized. A burnup chart shows the number of completed tasks cumulatively. Initially, the original target value serves as a guide. Once the target size is adjusted, the updated target size serves as a guide (see ***Figure 46***).

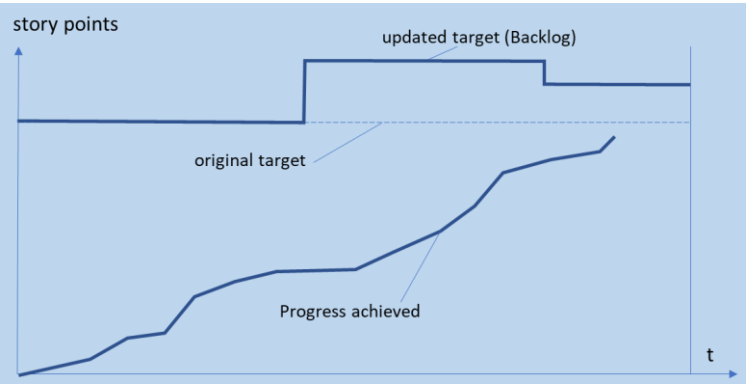


Figure 46: *Example of a burnup chart*

Kanban boards are also becoming increasingly popular for coordinating tasks and displaying progress. Since this is not an original method of Agile management, it is part of section 6.4 in this book.

„All people are clever – some before, others after.“
Voltaire (1694-1778)

The last step in the process is an **iteration evaluation**. In a **review**, the current interim result (**increment) is considered** together with customers and it is checked whether all requirements set up to this point have been met. The increment should always be releasable at the end of a sprint, but does not have to be released every time (it should be "potentially shippable"). At this point, the customer can express wishes and requirements, which are then included in the product backlog to be implemented in one of the following iterations. Then a **retrospective is** held. This is done without the customer. The project team reviews the cooperation and determines what went well and how it can be consolidated, what went badly and how it can be improved. As part of the retrospective, you should also **check the velocity** again. How many tasks or story points were planned for the sprint and how many were actually implemented. In case of larger deviations, the velocity should be adjusted for the next sprint. Review and retrospective, like all sessions in Agile project management, have **limited durations**. For a monthly iteration, the review should last a maximum of four hours and the retrospective a maximum of three hours (**timebox**). If the iteration duration is shorter, these sessions are also shortened (e.g. iteration duration 2 weeks → , review 2 hours, retrospective 1.5 hours).

„Failure is just an opportunity to start over with new views.“
Henry Ford (1863-1947)

Checklist Iterations in Agile PM

• The iteration goal is formulated.	
• The user stories to be fulfilled in the current iteration are selected.	
• Tasks for completing the user stories are defined and evaluated with story points (possibly with a planning poker).	
• The controlling tools have been set up.	
• The iteration evaluation is prepared.	
• The iteration evaluation has been carried out.	
• The velocity has been checked and adjusted if necessary.	

5.4 Big Picture - a journey through a Scrum project

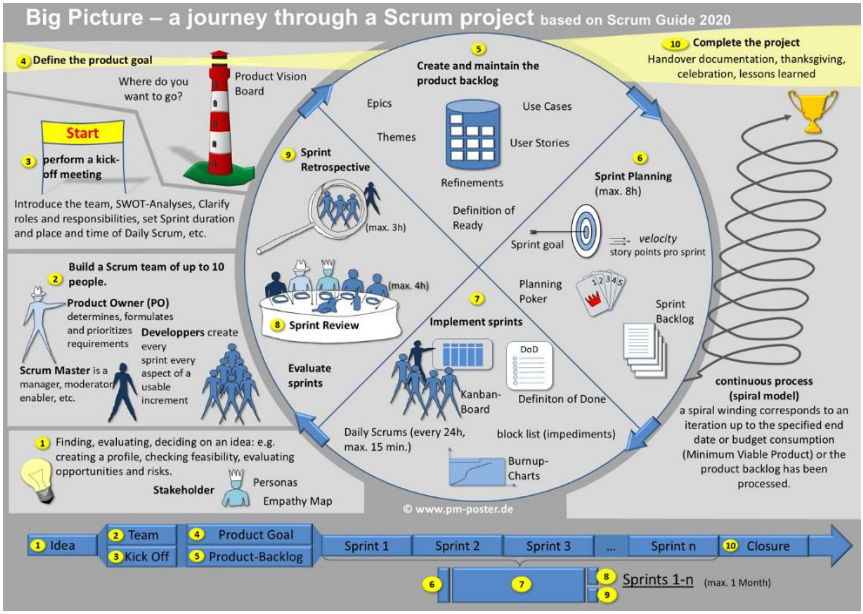


Figure 47: *Big Picture - a journey through a Scrum project*

6 Procedures in hybrid PM approaches

Hybrid **approaches** leverage the best of both worlds of results-oriented and Agile PM. Nowadays, hardly any projects are managed purely results-oriented or Agile, but almost always make use of at least individual thought patterns and elements of the respective other approach. In this respect, it can be assumed that the future lies in hybrid approaches.

„If you measure twice, you only have to saw once."
Armenian proverb

„If you know exactly where your path will lead from the beginning, you will never get far.“
Napoleon Bonaparte, (1769-1821)

These two quotes show the apparent contradiction between results-oriented (first quote) and Agile (second quote) project management. Hybrid solutions are therefore a combination of elements that are actually mutually exclusive. From *"either ... or ..."* we take a *"both ... as well as ..."*. It is by no means an arbitrary application, but on the basis of several assessment variables (parameters). Results-oriented approaches and tools are selected specifically for certain parts of the project and Agile approaches and tools for others.

In the case of a hybrid approach on an outcome-oriented basis, there are four basic variants (see ***Figure 48***):

1. Result-oriented, phase-based approach, in which individual project elements such as sub-projects, work packages that require special innovations, creativity, customer coordination, etc. are implemented in an Agile manner.
2. Result-oriented, phase-based approach, in which a complete phase that requires special innovations, new challenges, creativity, customer alignment, etc. is implemented in an Agile manner.
3. Result-oriented, phase-based approach in which the Agile mindset, processes and tools are used in a targeted manner, such as Agile backlog, daily stand up meetings, regular reviews (with customers), regular retrospectives, time boxing, etc.
4. Result-oriented, phase-based approach, in which the phases are implemented in short, consistent steps (iterations) with clear specifications.

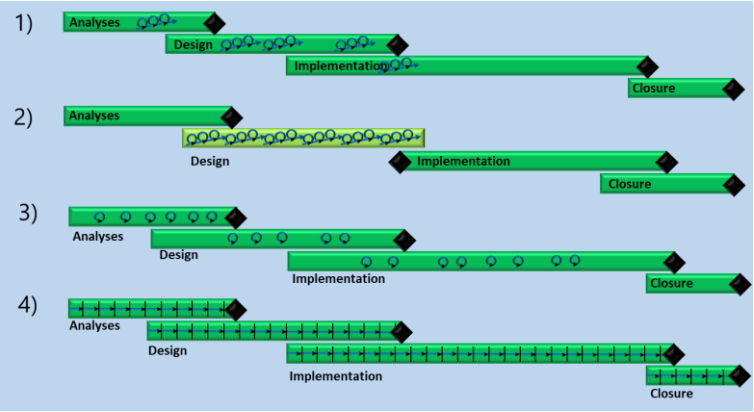


Figure 48: *Example of hybrid PM on results-oriented basis*

Figure 48 shows the hybrid approach based on results-oriented project management. This is very often the case, because clients demand agility on the one hand, but do not want to do without fixed milestones, etc. It is also conceivable to use hybrid approaches based on Agile project management, in which the Agile process is supported with a results-oriented mindset, processes and tools (see ***Figure 49***).

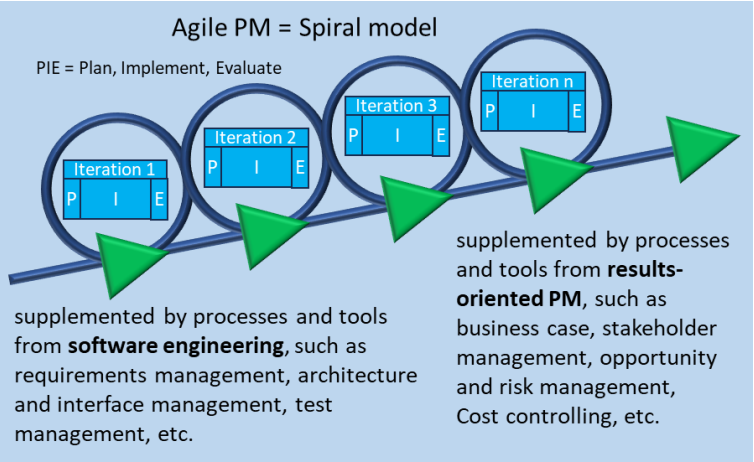


Figure 49: *Example of hybrid PM on Agile basis*

6.1 Determining framework conditions

As soon as you have decided on the hybrid approach, the framework conditions can be determined. Initial information about the project is usually already available from the project initiation (see Chapter **Fehler! Verweisquelle konnte nicht**

gefunden werden.). In particular, the framework conditions must now be clarified:

- Are there clearly fixed content, financial and/or time requirements??
- How much safety does the client need with regard to the parameters of performance, costs and time?
- What is the (intended) contractual basis?
- What work must / should / can be done the client?
- Do we have to explore really new areas?
- Are special innovations required?
- Are there particularly high risks?
- etc.

Here**, result-oriented and Agile tools** can be used and combined. These are presented in the corresponding chapters 4 und 5**Fehler! Verweisquelle konnte nicht gefunden werden.**.

If the commissioning for the project has not been placed at the end of the project initiation, the project contract should be finally negotiated and signed as soon as the framework conditions have been clarified, if possible at the end of this process, but at the latest as soon as the project design has been determined.

Checklist framework conditions hybrid PM approaches

• The tools for determining the framework conditions have been defined.	
• The framework conditions have been determined.	

6.2 Determine the hybrid project design

The possible combinations of result-oriented and Agile approaches are very diverse. Basically, one can distinguish whether the approach should be based on the results-oriented or Agile approach, as has already been presented at the beginning of this chapter. The decision on this depends very much on the prerequisites of the project and expectations of the project, in particular by the client. The more certainty the client needs about content, costs and durations, the more likely it is that a result-oriented basis should be used. If the required creativity and better meeting of end customer expectations are of greater importance, then an Agile basis is certainly more suitable.

As a basis for the decisions on which procedures and tools from which approaches are selected for which parts of the project, several assessment variables should be defined. For this purpose, the project must be divided into individual parts in order to examine them individually with regard to the more suitable procedures and tools.

Checklist project design hybrid PM approach

• The requirements for the PM in the different subareas of the project have been determined.	
• The combination of results-oriented and Agile approaches is defined.	
• The processes and tools for managing the project are selected and defined.	

6.3 Implementing the hybrid project

The implementation of the project is very much dependent on the project design. Depending on which procedures and tools from results-oriented and Agile project management have been combined and how, planning and control instruments must now be used. The respective descriptions can be found in the relevant sections 4.4 for results-oriented and 5.3 for Agile project management. A universal method is Kanban boards, which can be used as a versatile and popular tool in all approaches (see next section).

Checklist for hybrid project implementation

• The contracts have been negotiated and signed.	
• The processes and tools for planning the project have been set up.	
• The processes and tools for controlling the project have been set up.	

6.4 Kanban boards as a tool for all approaches

Kanban comes from production and lean management. It is not – as some claim – one of the Agile approaches. A **Kanban board** can be used as a tool in all project management approaches and enjoys great popularity for various reasons: It is easy to understand and use, descriptive, motivating, can be used directly for reporting, versatile, and much more.

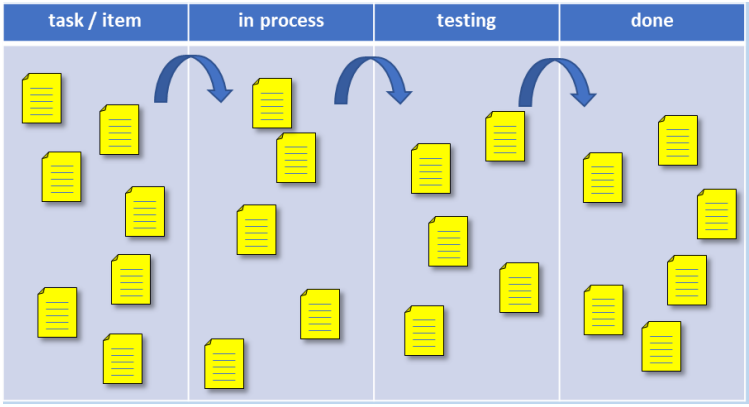


Figure 50: *Example of a simple Kanban board for projects*

Kanban means signal card and is used in production as a "routing slip" that accompanies an order throughout the entire manufacturing process. Transferred to project management, each task in a Kanban board receives a signal card that shows the current status of a task over several process steps. This allows you to see all tasks and the progress of the individual tasks as well as the entire project at a glance. ***Figure 50*** shows a simple example of a Kanban board in projects.

A Kanban board proceeds according to the **pull principle**. The project team members choose the tasks they currently need to work on themselves (pull) instead of a specification from superiors as to what to do and when (push).

In addition to the core information in the simplified example, a lot of other helpful information can be added. ***Figure 51*** shows an example of a Kanban board including added information. At the top center is the project title, to the left of it is

the Definition of Done, so that it is always present. Below that, the team is introduced with responsibilities, roles and photos and at the very bottom, the open points from the lessons learned or retrospective can be collected until they have been fully implemented. On the right side, you can add information about the current phase or iteration, such as the sprint goal. Furthermore, tools for measuring progress, such as burnup charts, etc. can be displayed. A parking lot or a List of Open Points (LOP) can contain other open points.

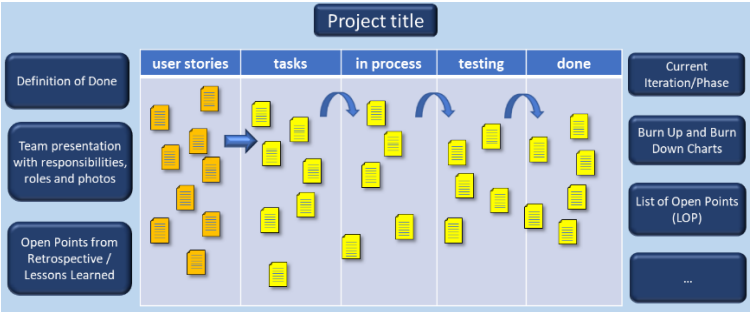


Figure 51: *Example of a Kanban board for callout projects including added information*

Originally, Kanban boards were implemented analogously on a large wall. The grid can be created in a simplified way with insulating tape. The information can be displayed with adhesive or magnetic cards. The haptic experience of moving a card to the next status step should not be underestimated. With increasing digitization and if the team members are not all in the same place on a regular basis, a digital solution is recommended. This can be done either with standard office software, such as a spreadsheet or a presentation program, or with

special software for project management or Kanban boards, some of which are also available as freeware (see on this also Section 9.8).

Checklist Kanban Boards

• The contents are fixed.	
• Analogue or digital decision has been made.	
• In analogue implementation, the wall is reserved, prepared and secured.	
• In case of digital implementation, the software is selected, installed and the access rights are granted.	
• All team members are familiar with the Kanban board and know their duties and responsibilities in this regard.	

7 Finish the Project properly

„With all the effort we put into hiding some of our mistakes, we could easily get rid of them." **Michelangelo (1475-1564), Italian sculptor, painter, builder and poet**

Regardless of the approach (results-oriented, Agile, or hybrid), a project must be completed properly. The tasks for this are almost congruent. If necessary, individual activities must be adapted to the respective approach.

Unfortunately, project completion is often neglected in practice, although all practitioners know how important an orderly conclusion is. However, since many resources are allocated to this project at the end of a project and other projects are neglected as a result, in many cases the resources are immediately allocated to the neglected projects after the end of implementation. As a result, there are no longer sufficient resources available for structured project completion. This "cost-cutting measure" takes its toll at the latest when mistakes are repeated in follow-up projects that entail many times the effort or when problems arise with the project results afterwards and no proper handovers, including documentation, have taken place.

„The clever one learns from everything and from everyone, the normal person from his experiences and the stupid one knows everything better." **Socrates (470-399 BC)**

In particular, the following **tasks** can be included in a structured project closure:

- Handing over project results including documentation
- Document changes in the course of the project and their consequences for performance, costs and time
- Obtain written confirmation of the handover of results, adherence to deadlines and costs
- Issue a final invoice
- Complete list of open points
- present open services and ensure their fulfilment
- Giving an outlook (how can we continue?)
- Provide information to stakeholders about project completion
- Survey and document the satisfaction of the customer and other stakeholders
- Carry out follow-up acquisitions, arrange follow-up orders
- Determine when and by whom the project evaluation will be carried out
- Conduct lessons learned (if necessary at a later date outside the project)
- Carry out and document comparison of initial / contractual calculation and actual costing
- Get recommendations / references
- Relieve project managers and project staff
- Giving thanks to those involved

„Stupid and clever people differ in that the stupid always makes the same mistakes and the clever always new ones.“
Kurt Tucholsky (1890-1935)

The **project handover** should be well prepared and as formal as possible. In particular, it is a matter of handing over the

complete project results and having this confirmed in writing. To this end, the planned goals in terms of performance, quality, costs and deadlines, which have been adjusted in the course of the project through approved changes, must be summarized and compared with the results achieved. The **acceptance** of projects by the client includes not only the acceptance of the project results, but also their examination and acceptance declaration within a reasonable period of time.

Another component of the project completion is the **final report**. It summarizes the project handover and summarizes key incidents and lessons learned. Furthermore, it can contain information on the satisfaction of the individual stakeholders.

At the end of the project, **Lessons Learned Workshops** record the experiences gained during the project and document them in order to learn from them for future projects. Lessons Learned Workshops therefore serve in particular the **Continuous Improvement Process** (CIP), which is deepend in Section 8.9). In order for the project itself to be able to learn from the experience, lessons learned workshops should also be held at the end of phases. In Agile projects, a **retrospective** takes place after each iteration.

„In the end, everything will be fine, and if it doesn't turn out well, then it's not the end.“ **Oscar Wilde (1854-1900)**

Checklist Project Completion

• Processes and tasks for project completion are defined.	
• The appropriate resources for an orderly conclusion are allocated.	
• The project results were handed over.	
• All necessary tasks and documentation have been implemented.	
• A final report was prepared.	
• The team and the project manager were relieved.	

8 Cross-phase Activities

The cross-phase activities cannot be assigned to a single phase or iteration, but must be constant, regular or situational over the entire course of the project. They are comparable to the "oil in the gear" and ensure that everything runs more smoothly. This makes them indispensable for the project.

While a beginner in project management will certainly concentrate on the sequential processing of the project at first and carry out these accompanying activities rather intuitively and uncontrollably, advanced project managers can approach and implement these activities in a much more structured way and thus increase the success of the project, improve the satisfaction of those involved and affected, and make better use of the opportunities and reduce the risks.

8.1 Project Organization and Leadership

This section is diverse and includes several success factors of project management. Project organization is about optimally integrating the project into the implementing organization (e.g. the company or the authority). Furthermore, the **tasks, competences and responsibilities (TCR)** must be defined for all committees, such as the steering committee and in particular the project manager. These are then documented in an **TCR matrix**. The project manager has to lead and motivate the team and make important decisions again and again. Such a small organization and management of the project takes into

account the **principle of congruence**. It states that the tasks, competencies and responsibilities must be in a balanced or even congruent relationship to each other.

The **project organization** is the way in which the project is integrated into the implementing organization. Depending on the complexity, novelty, risk value, scope, duration, dynamics, etc. of the project, different approaches can be chosen

In case of **influence organization**, the project is managed like a unit that has no assigned employees, but only requests them from the departments when necessary. The **matrix organization** is assigned employees in fixed proportions. It is thus more formal than the influence organization. However, the employees will remain in their departments, at least in terms of discipline. Only in **pure project organization** the employees are assigned completely to the project and also subject to disciplinary responsibility. When choosing the most suitable form of project organization for the project, the corresponding advantages and disadvantages must be weighed. However, this task is less the responsibility of the project managers, but rather the higher-level or supporting bodies.

For smaller and rather uncomplicated projects, the influence PM is usually the most suitable. As the degree of the above-mentioned project characteristics increases, a more formalized organizational form is necessary. For this purpose, the matrix organization is used. Particularly complex and long-lasting projects often require a more independent solution, which is referred to as pure project organization. ***Figure 52*** provides an overview of these three basic forms of project organization.

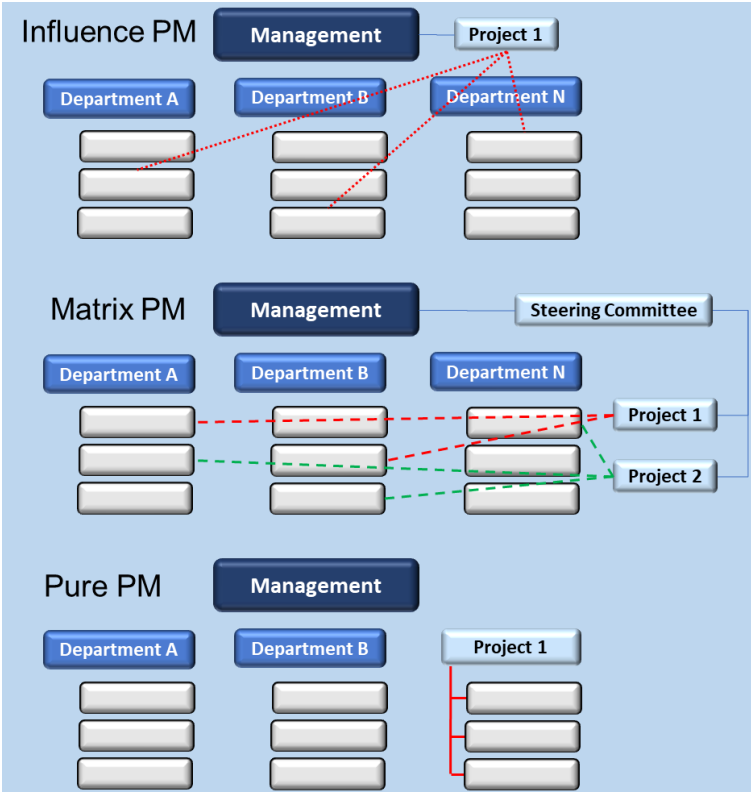


Figure 52: *Overview of Project Organizational Forms*

In addition, a **project organizational chart** can be created. Just like the organizational chart of an organization, it represents the places and their relationships in a (tree) structure. In results-oriented projects, this can be derived from the WBS.

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In addition to the project manager, the sub-project managers and team members, there are **two other important committees** that must be taken into account in the project

organisation: the client and the steering committee. The composition and TCR of these committees must also be determined for the project.

For internal projects, there is only one internal **client**. If there is an external commission, an internal client can be appointed in addition to the external client for important or large projects. Clients also have obligations. These can be, for example, providing rooms, tools, materials, data or other production factors or additional work. This also includes decisions in a given time and their communication, acceptances, project marketing, etc. The project manager should demand this at the beginning of the project and, if possible, fix it contractually – especially in case of external projects.

If the organisation has to master many projects at the same time or if the project is particularly novel, large, complex or risky, then the client can be represented by a **steering committee (SC).** The SC is the reporting, decision-making and escalation body for the project manager. A SC usually consists of other managers of the project implementing organization.

„If someone wants to do everything himself, he doesn't have to complain that he has to do everything himself.“
Henri Nannen (1913-1996)

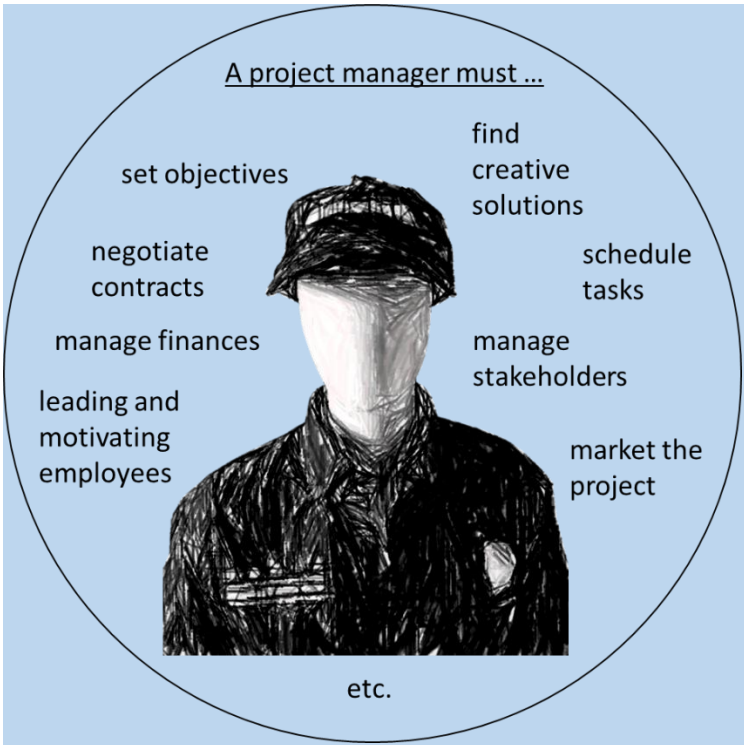


Figure 53: *Selected tasks of a project manager*

As the overall person responsible for the project, the **project manager** carries a whole bundle of TCR (see ***Figure 53***). These include, in particular:

Level D

- Planning, coordination and execution of the project. This essentially includes the planning of all necessary activities to achieve the project objectives (task determination and structuring, the assignment / agreement of tasks, determination of the process, deadlines and costs in cooperation

with implementing organizational bodies), monitoring and control of the project process, analysis of deviations and bringing about control measures, the establishment and management of the project team, the assurance of the information flow in the project, reporting to and coordination with the client, the development and maintenance of the project documentation, the application of quality management and an opportunity and risk management system, etc.

- Ensuring the success of the project for external and own organizations
- Contact person of the project for all participants and affected persons
- Coordination and leadership of the project team
- Initiating and accompanying problem and conflict solving
- Contractual handling of the project
- Representation of the project externally and internally
- Public relations/marketing for the project

The project manager continues to have a **duty of care** to protect employees and the environment. In a **risk assessment,** the **safety**, **health** of employees and **environmental protection** must be analysed and the necessary activities to maintain them must be planned and implemented.

For overview and transparency in projects, the **roles and responsibilities** of the individual participants should be clearly defined and documented. The **RACI matrix** is particularly suitable for this purpose. The four letters stand for **Responsible**, **Accountable**, **Consulted** and **Informed**. For the individual tasks

in project management, it shows who is responsible for the implementation (R), who has the commissioning responsibility (A), who is to provide support (C) and who is to be informed (I).

The project manager should demonstrate strong personal integrity. This includes, in particular, a high level **of reliability**, **trusting cooperation** and the personal handling of errors, i.e. an exemplified **error culture**.

„Trust is created by saying what you do and doing what you said.“ **Jan-Henning Blanke (*1976)**

In Agile approaches and Scrum in particular, the theory does not provide a role called project manager. A **Scrum team** consists of a **Product Owner**, a **Scrum Master** and up to eight developers (**developers**). All members of the Scrum Team are **jointly accountable**. The Product Owner is also responsible ("accountable") for the result (product responsibility) and the Scrum Master is responsible ("accountable") for the application of Scrum. The developers work in a self-organized way and are supposed to generate an applicable increment with each sprint (see also the introduction to the Chapter **Fehler! Verweisquelle konnte nicht gefunden werden.**).

As part of the overall task of leading and being responsible for the project, the project manager must **lead and motivate the project team**. Overall, the same processes, mechanisms and tools apply here as in the management of organizations. The project manager should therefore be an experienced manager who can transfer the leadership style and the spectrum of leadership tools from organizational leadership to the project.

„If you want to lead people, you have to walk behind them."
Lao Tzu (604-531 BC)

Selected theories, instruments, etc. are, among others:

- Spectrum of leadership styles and situational application
- Use of personality models
- Activities for team building and team development
- Motivational theories like Maslow, Herzberg, Deci and Ryan, etc.

Every manager has his or her own leadership style. It is not congenital but develops over the course of the years. Based on experience and other findings, the management style is constantly adapted. You never stop learning. The **spectrum of leadership styles** ranges from autocratic to the democratic leadership style, which is widespread today, to laissez-faire leadership. However, the management style depends not only on the manager, but also on some other factors, such as the prevailing organizational culture, the employees to be led and the current situation in the project. Since projects have other aspects, such as potential for conflict with the line, division of disciplinary and technical leadership (lateral leadership), leadership from a distance, higher dynamics, etc., managers in projects have to question and adapt their leadership style more often and more intensively.

The so-called management-by techniques **offer helpful orientation**. Examples include:

- Management-by-Objectives (MbO): Target agreements guide the person to be managed
- Management-by-Exception (MbE): the manager only intervenes actively or correctively in the event of deviations
- Management-by-Delegation (MbD): the manager delegates tasks and the person to be led takes responsibility
- Management-by-Vision (MbV): the person to be led is guided by a vision

„I can calculate the movement of the celestial bodies,
but not the behavior of humans." **Isaac Newton (1643-1727), English physicist, mathematician and astronomer**

To better understand how you and others behave, i.e. what personal characteristics you have and what behavior could result from them, **personality models** are used. They are very helpful for assessing individuals. However, it is important to refrain from thinking in stereotypes ("pigeonholes"). These models always have limited informative value and it takes good communication – based on this information – to create solid solutions for the parties involved.

“Coming together is a beginning; keeping together is process; working together is success.” **Henry Ford, (1863 - 1947)**

In projects, people work together from whom teams are to develop as quickly as possible. To do this, they need common goals that they can only achieve together. On the way to becoming a team, each group goes through the **group dynamic**

process of team development (see ***Figure 54***). None of the stages can be skipped. The project manager should make sure that the first three stages are completed thoroughly but as fast as possible so that the team can quickly get into the performance phase. A solid **project kick-off workshop** is an ideal opportunity for this. In the course of the project, the project manager has to repeatedly support the team development with further team-building activities.

Forming
The team is constituted. The members get to know each other and arrange themselves for the time being.
Storming
There is a scramble for positions in the team in terms of hierarchy, position in the team, specialist tasks, etc.
Norming
The roles are found, formally defined and also informally accepted.
Performing
After the role is clear and accepted, team members can focus much more on the work content, even if the teams keep falling back into the preliminary stages.
Adjourning
Teams dissolve when the common goals are fulfilled and no new goals are given. They should be left to their own devices, but dissolved in a controlled and appreciative manner.

Figure 54: *Stages of team development according to Tuckman*

„Summer is the time when it is too hot to do what
it was too cold for in winter.“ **Mark Twain (1835-1910)**

For team development and functioning cooperation, the definition of team roles and team rules is of particular importance. **Team roles** regulate "who" is responsible for "what" or is used. With the **team rules** , you agree on the "how" of the cooperation. There are basically both formal and informal team roles and team rules. It is also important to **reflect on one's own team role**. You should ask yourself what team role you have in the project (e.g. doer, supporter, consultant, moderator, innovator, etc.), how the team role is characterized and what contribution it makes, what other team members expect from the role, and also the question of how and where it can be more of a hindrance.

An excellent **example of successful teamwork** are the four aging animals from the fairy tale of the Bremen Town Musicians (see ***Figure 55***): Left to their own, all four of them were dedicated to death. Together, they have combined their respective strengths and thus worked together successfully. Each team member has made the possible contribution to the joint success.

Figure 55: *Teamwork through mutual complementarity*

Project team members can be intrinsically or extrinsically motivated. In the case **of intrinsic motivation** , the person to be led is already so motivated by himself - i.e. from within - that no external motivational stimuli are necessary. **Extrinsic motivation** , on the other hand, is all external motivational measures to lead a person to a certain behaviour or actions. The leadership activities in extrinsic motivation should praise and/or reward positive behaviour or successful actions and their results. Negative behaviour or bad actions should be discussed, criticized and, if necessary, sanctioned.

Level D

„If you have a why, no how is too difficult for you.“
Friedrich Nietzsche (1844-1900)

Quote

Furthermore, in order to lead the project, the project leader should **know and take into account motivational theories** such as Maslow's hierarchy of needs, Herzberg's two-factor theory and Deci and Ryan's self-determination theory.

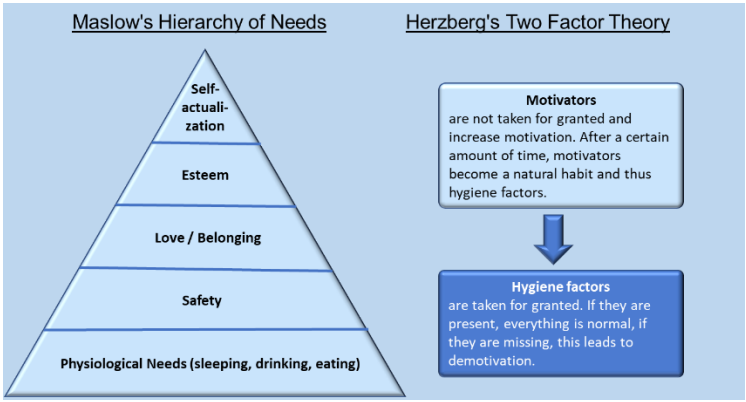


Figure 56: *Maslow's Hierarchy of Needs and Herzberg's Two-Factor Theory*

Maslow 's hierarchy of needs states that every person must have fulfilled the needs on one level in order to reach the next higher level. Due to external influences or incidents, a team member can (temporarily) drop by one or more levels. This must be recognized and acted sensitively according to the situation. In **Herzberg's two-factor theory**, there are hygiene factors and motivators. The project manager must make sure that the hygiene factors are met and that the motivators are used in a targeted manner and to the right extent (see ***Figure 56***).

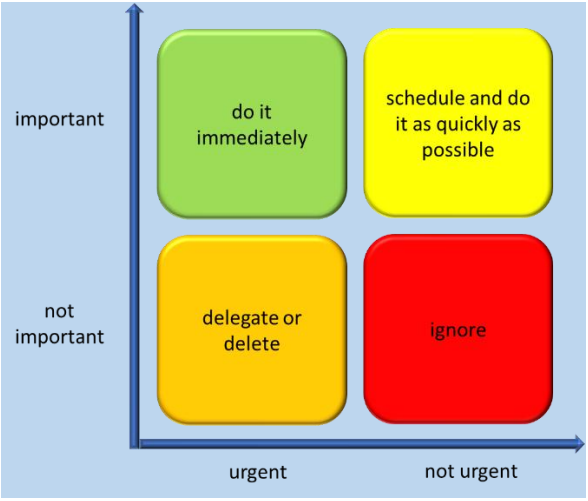
A further consideration of the two previous motivation theories is offered by the **Self-Determination Theory (SDT) of Deci and Ryan**. It is based on the three basic needs of competence (in the sense of ability), autonomy (in the sense of voluntariness) and social integration (in the sense of mutual recognition). From these three basic needs, an individual decides on a certain behavior. A manager can identify and influence the causes of a certain behavior in the sense of motivating/leading a person.

Throughout the course of the project, the project manager also has to **make decisions** again and again. Some of them are routine decisions, others ad hoc decisions, and much more. The decision-making process must be commensurate with the importance of the decision. Decisions have to be documented, communicated, reviewed and often revised. In addition, some of them have to be felled together, even if the project manager retains ultimate responsibility.

Being a project manager is a great, challenging, demanding and diverse job that takes a lot and gives a lot. Projects are like small temporary businesses. Thus, a project manager should have a broad technical and business understanding, competencies and experience. These diverse challenges bring with them many burdens, but just as much variety. The high demands on project managers usually also have a positive effect on pay and career opportunities.

The TCR are synonymous, but always graded, for **sub-project managers** and **work package managers**. The **other project team members**, as well as the committees already mentioned, are of course called upon to treat all ideas, incidents, etc. in the spirit of the project and, if necessary, to report to the next higher level.

Leadership always requires good self-reflection and self-management. One of the basics of self-management is the **Eisenhower matrix** (*see **Figure 57***), which supports to structure and prioritize the tasks.



Level D

Figure 57: *Eisenhower matrix*

Checklist Organization and Leadership

• The project organization is defined and communicated.	
• The roles are described.	
• The roles are cast.	
• The project manager spoke to all team members and determined his management concept.	
• A kick-off has taken place. All those involved are commissioned, integrated and motivated.	
• The team development process has begun and is being actively managed.	
• The project manager leads and motivates the team.	
• The project manager has a solid self-organization.	

Check-list

8.2 Stakeholders and project marketing

Every project moves in an environment. It has stakeholders within and outside the project and many other factors from the environment. These **environmental factors** are divided into factual and social factors. Factual environmental factors are, for example, the political, economic, geographical or legal environment. All personal factors, such as client, customer, supplier, team members, residents, etc. are referred to as social environmental factors.

The PESTLE analysis **offers a good orientation in the environment analysis**. Factors in the following environments are sought P = political, E = economical, S = social, T = technological, L = legal and E = environmental.

„The play was a great success. Only the audience failed.“
Oscar Wilde (1854-1900)

The **stakeholders in projects** are receiving more and more consideration in project management. Nevertheless, stakeholder management is an underestimated success factor in many organizations and projects. There are still a large number of project managers who take a very restrictive approach to stakeholder management.

„The bird prefers a simple twig to a golden cage."
Chinese proverb

Modern approaches to stakeholder management usually pursue an active, early and comprehensive integration of stakeholders. The sometimes considerable additional effort for this should pay off later. More suitable and sustainable solutions

and significantly higher acceptance are emerging. Many time, money and nerve-wracking conflicts can be avoided. On the other hand, there is the restrictive attitude towards stakeholder management, which fears insoluble wishes for the project and endless discussions, etc.

The **process of stakeholder management** can be designed as follows:

- Identify stakeholders
- Analyze stakeholders with regard to their interests and influence
- Plan stakeholder engagement activities
- Implement activities and observe stakeholder behavior, if necessary, adapt activities
- Evaluate stakeholder management

Figure 58 can provide initial support in the form of a checklist for identifying stakeholders. However, every project should think carefully about stakeholders beyond this. Likewise, identified stakeholders may need to be further subdivided, e.g. different departments of the company.

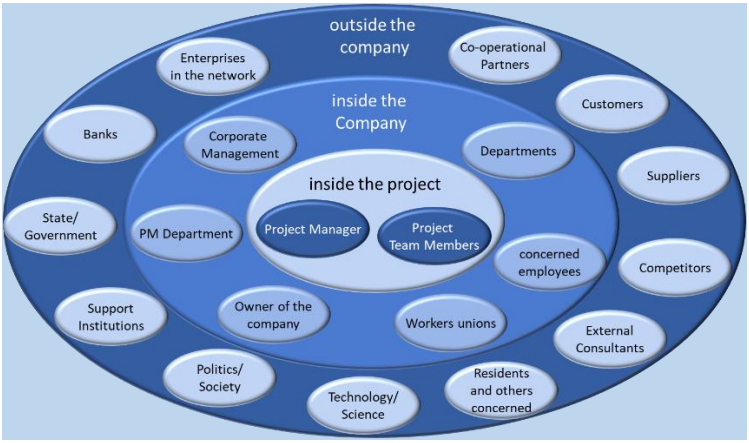


Figure 58: *Typical stakeholders in projects*

Check-liste

Tool

Level D

A **stakeholder portfolio** provides a good overview of all identified stakeholders in terms of their **interests** and **influence**. In addition to the actual function, namely the grouping of stakeholders in their importance for the project, the stakeholder portfolio can also be used as a "radar screen" for continuous observation. ***Figure 59*** shows an example of a stakeholder portfolio. Red indicates a negative attitude towards the project, green a positive one. Individual groups can have both positive and negative subgroups. When it comes to the presentation, it is not so much a matter of the exact position where the stakeholders are drawn, but rather that they have been identified in the first place and brought in here so that they are not simply forgotten.

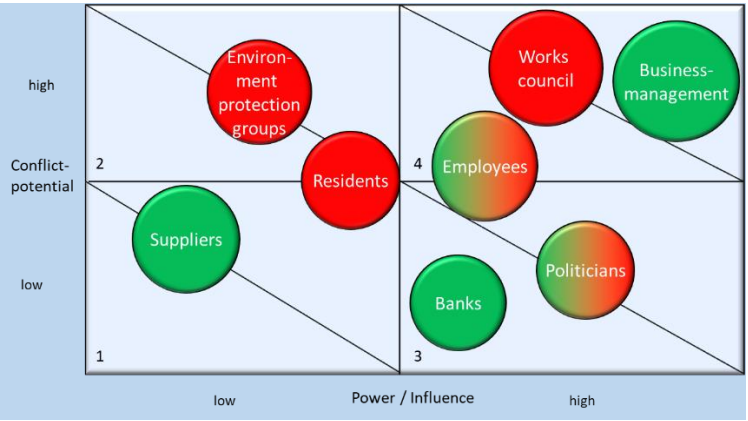


Figure 59: Example of a stakeholder portfolio

In addition to the stakeholder portfolio, a **stakeholder table** can be used. This can contain a lot more information about the stakeholders, the measures and their success, etc. This can be used to plan and control the further steps of stakeholder management.

Based on the stakeholder analysis, **stakeholder strategies** must be developed on how to involve the stakeholders as much as possible or otherwise deal with them. These strategies must be defined per stakeholder group and can take on a wide spectrum from **participatory, discursive, informative to repressive**. The procedure for involving the individual stakeholder groups is defined in a **communication plan**.

All data about stakeholders must be particularly well protected and should never be accessible to third parties in any form. This is far more important in the case of negative assessments of individual stakeholders.

The opposite of good is well-intentioned.
Kurt Tucholsky (1890-1935)

Other analysis methods used in stakeholder management include: Personas and Empathy Map. **Personas** develops fictitious people as typical representatives of a stakeholder group and determines their essential characteristics, such as age, gender, profession, hobbies, motivation (purchase decision criteria, role models), requirements and needs, information needs and information channels, expectations, fears, etc. Project teams should thus better understand the needs of their target group(s). The **Empathy Map** helps you to put yourself in the shoes of another person and look at the project from their perspective (see ***Figure 60*** as well as sample application in ***Figure 106***). Furthermore, some more modern approaches have developed in recent years, such as: **Citizen participation**, **deep democracy**, **capacity works**, etc.

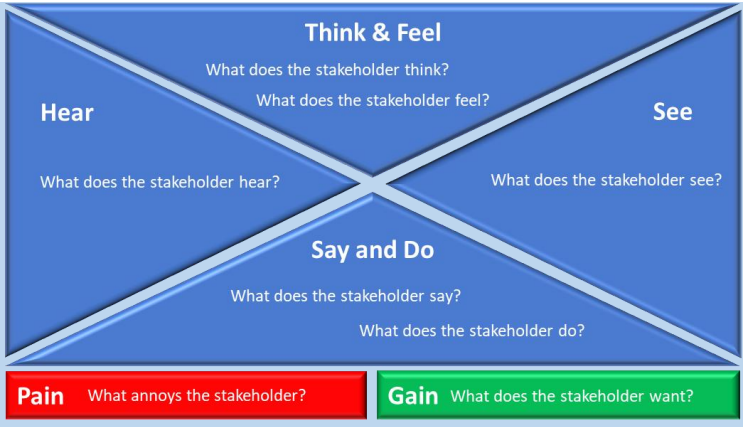


Figure 60: *Empathy Map*

The principle of any stakeholder work should be a **positive attitude**. You should always make sure to create **win-win situations** with all those involved and affected. A win-lose situation can often be easier for the project itself, but it can cause damage to the executing institution in other ways and, above all, in the long term. Future projects can also suffer if you leave "scorched earth" behind. Every project manager should be aware of this overarching responsibility, not only for business reasons, but also for ethical reasons.

„The greatest enemy of the new order is those who take advantage of the old one.“ **Niccolò Machiavelli (1469-1527)**

It is also important to take the **corporate culture** in the organization into account. Changing a corporate culture is a very long-lasting process, working against it is counterproductive. Project managers should find solutions that go hand in hand with the corporate culture. Since only a small part of the corporate culture is visible and the majority is invisible, you can carry out an analysis with the three levels of Edgar Schein. The visible or conscious level therefore includes active communication, active actions and outward appearances, such as clothing, etc. Invisible or unconscious are the second (values and norms) and third level (basic assumptions, thought and behavior patterns).

Change management has significant overlaps with stakeholder management and project marketing. In today's time of permanent change, change management is an independent discipline for a long time already. Since projects always involve change,

targeted change management must of course also take place. Change management should not be confused with changes in projects (see Section 4.4).

Change management refers to all activities for the transformation of an organization and, in particular, all efforts to get the acceptance and motivation of concerned people to change structures and processes.

A-Z Term

„The purest form of madness is to leave everything as it is and at the same time hope that something will change."
Albert Einstein (1879-1955)

„If you don't want to change anything, you will also lose what you want to preserve."
Dr. Gustav Walter Heinemann (1899-1976), German politician

„If something is to be better, it has to be different."
Georg Christoph Lichtenberg (1742–1799), German writer

„It is not the strongest species that survives, nor the most intelligent, but the one that is most adaptable to change."
Charles Darwin (1809-1882), British Naturalist

Quote

Various experts have described the typical stages of change. The very simple **model "unfreeze – change – refreeze" by Kurt Lewin** describes that you first have to break up existing, fixed structures (unfreeze), then you can make a change and finally freeze the new structures again (refreeze).

Level D

„Psychology is half of economic policy."
Ludwig Ehrhard (1897-1977)

Quote

Probably the best-known model is the **eight stages of change according to John P. Kotter**:

1. Demonstrate the need for change
2. Building a coalition of leaders
3. Define vision and strategic approach
4. Find and integrate supporters
5. Removing obstacles
6. Getting and communicating short-term successes
7. Continuing to drive change consistently
8. Demonstrating the success of the new structures and processes

Nowadays, projects also have to be marketed more and more. Above all, but not only through the Internet, those affected are better informed and demand more information and integration. Therefore, a positive positioning of a project is certainly helpful in most cases. The meaning of **Project marketing** is increasing for many years.

Project marketing is all measures that serve to inform and explain, as well as to convince and create acceptance of the project processes and results among the relevant stakeholders of the project.

Project marketing can be carried out in a mix of analogue and digital measures. The proportion of digital measures is increasing, but will never make analogue measures obsolete. Typical **examples of project marketing measures** are:

- General information events
- Workshops with those affected

- Celebrations on important milestones
- Representations in company newspapers / newsletters
- Project newsletter (regularly)
- Project homepage on the intranet/Internet
- Speaches at conventions
- Articles in journals
- Press releases
- Notices, bulletin board
- Project logo
- Project abbreviation (e.g. Delta, Y2K)
- Information hotlines
- Satisfaction survey through questionnaires, interviews

With the **Internet and especially social media**, project marketing has developed from one-way communication more to dialogue. It offers many new opportunities, but also carries new risks. You can spread project marketing more widely and thus reach more people, but also wake up "sleeping dogs". In addition, project opponents find each other more easily, connect and appear stronger together. The core of project marketing on the Internet is provided by social networks and, in the future, more and more by artificial intelligence (AI). These should be actively operated and carefully observed.

„I believe it is still better to pray the economy back to health than to talk it to death.“ **Ludwig Ehrhard (1897-1977)**

Checklist Stakeholders and Project Marketing

• The project environment and stakeholders have been identified, analysed and evaluated.	
• Stakeholder integration strategies have been defined and are being implemented.	
• The project marketing is designed and set up.	

Check-list

8.3 Communicate internally and externally

Communication plays an important role in projects. There are countless communication situations and also frequent communication accidents, such as misunderstandings, talking past each other, etc., which reduce the success of the project.

„How do people talk to people? Past each other."
Kurt Tucholsky (1890-1935)

Quote

The aim of internal project communication is to ensure that all participants have the right information available at the necessary time in terms of quality and quantity in order to be able to cope with their tasks in the best possible way. **The aim of external project communication** is to provide information to all external stakeholders to the project.

In communication, many signals are sent and received on a wide variety of channels. Much of this is rather invisible or indirectly perceptible, as the **iceberg model** illustrates. Just like a snowball, the far larger part of an iceberg floats under water (see**Figure *61***). The **factual level** takes up a considerably lower proportion of communication than the **relationship level**.

Level D

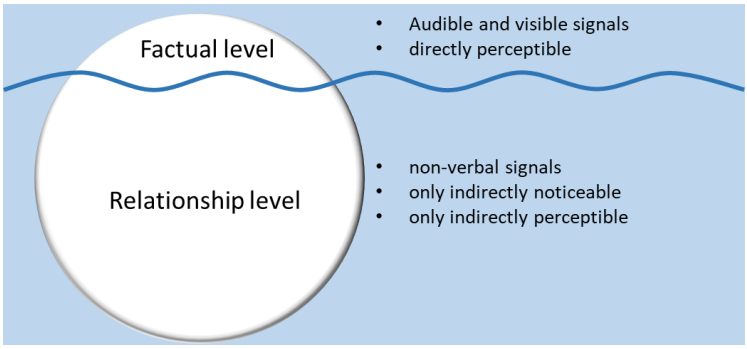


Figure 61: *Iceberg model*

In addition, Paul Watzlawik clarifies and deepens this insight through his **five axioms of communication**:

Level D

1. You can't NOT communicate.
2. Every communication has both a content and a relationship aspect.
3. The nature of a relationship is determined by the punctuation of communication processes (interaction) between the partners.
4. Human communication takes place both digitally and analogue.
5. Interpersonal communication processes are either symmetrical or complementary.

„The word belongs half to the one who speaks,
and half to the one who hears."
Michel de Montaigne. Philosopher (1533-1592)

Quote

The **sender-receiver model** clarifies the basic communication process in which a sender transmits a message/information to

Level D

a receiver (see ***Figure 62***). This trivial view does not reflect the complexity of communication. For various reasons, the recipient usually does not receive what the sender wants to convey. It may be that the sender expresses himself in a complicated or incomplete way or incorrectly assumes some aspects of the receiver. The recipient may be inattentive or draw wrong interpretations and conclusions too quickly. The transmission of information can also be disrupted externally or technically.

Figure 62: *Sender receiver model*

For these reasons, a dialogue is an effective means in which the receiver checks whether he has understood correctly and the sender checks whether he has been understood correctly. But even that is usually not enough. The behavioural scientist Konrad Lorenz (1903-1989) puts it in a nutshell with his famous quote:

„Said is not heard. Heard is not understood. Understood is not agreed. Agree is not kept. Keeping is not skilled. Skillful is not applied. Applied is not retained." **Konrad Lorenz (1903-1989), also assigned to Lao Tse in simplified form**

Quote

Communication is also never just a purely technical exchange of a message, but an exchange between interpreting individuals. Our phrases "*the tone makes the music*" or "*what is written*

between the lines" underline this. The communication researcher Schulz von Thun illustrates this in his **Communication Square**. For each message, the sender transmits on four levels and the receiver receives on four levels (see ***Figure 63***). Almost always a modified piece of information arrives at the recipient, so that ultimately communication accidents can happen all the time.

Level D

Figure 63: *Communication square by Schulz von Thun*

„We are drowning in information, but starve for knowledge."
John Naisbitt, (*1929), American trend researcher

Quote

Through **active listening**, many misunderstandings can already be avoided. The receiver first lets the sender finish. Then he questions what he has understood and formulates it in his own words ("Did I understand correctly that ...?"). The sender can now reflect this interpretation with its previously given message. In a dialogue, the misunderstandings can now be discussed and eliminated. Likewise, the sender can also initiate this process ("*please repeat again how you understood it*" or better "*how do you see the matter?*", "*how will you approach the matter?*", *what are the first steps?*").

Level D

Other **rules for good communication** are:

- I-messages ("*I wish that ...*")
- Active formulations (not: "*must be planned ...*", but: "*John has to plan.*")
- Avoid the subjunctive (not: "*you would have to ...*")
- Identify specific situations and examples
- Communicating feelings and perceptions ("*I don't feel well informed.", "I perceive that ...")*
- Change of perspective: put yourself in the other person's shoes (how do I have to communicate it so that he/she can understand it well?)
- Give feedback and receive feedback

Furthermore, a targeted **questioning technique plays** a major role. Depending on the objective, you should consciously ask at least closed or open questions or alternative questions. For example, leading questions should be avoided.

Unfortunately, **selective perception** is widespread. If a person is only looking for confirmation of his existing ideas, then he is not open to new experiences and personal development. He then only hears what he wants to hear.

When **giving feedback**, feedback givers and recipients should take care of the following rules:

- do not give unsolicited feedback
- Express facts and feelings and identify them accordingly
- speak in the first person (not "one should/could ...")
- do not give any judgements, interpretations, reproaches

- also address positive aspects and weigh them appropriately
- prompt to the situation and without time pressure
- Viewing feedback as an opportunity and not as criticism
- Feedback is subjective, but you learn what others think about you
- Listen, do not interrupt, correct, justify
- Accept and ask just factual questions

Studies show: It's better to communicate too much than too little! If you ask managers whether they communicate sufficiently, they tend to say too much. But if you ask their employees, they say far too little.

An important communication platform in projects is the most diverse **project meetings**. On the one hand, a **communication matrix** should be set up at the beginning of the project that regulates which meetings regulate what with which participants in what rhythm and for what duration. In order to avoid excessive, unnecessary meetings or meeting participation of individual persons, these specifications should be decided very carefully and adjusted if necessary in the course of the project. (see Section 8.5 and especially **Figure 66**).

Depending on the objective, different moderation techniques are required to conduct project meetings. Common moderation techniques are:

- Brainstorming
- Mind Mapping
- Participant queries, e.g. on demand or with cards

- Metaplan Method
- Thesis formation
- Weights with points, etc.
- Visual representations
- Call-out technology
- World Café
- Open Space

In addition, it is the responsibility of the project manager **to develop and exemplify a meeting management** and **a meeting culture** with the project team so that the meetings can run effectively and efficiently for all participants. This includes meeting preparation, implementation with appropriate adherence to meeting rules and follow-up. Of course, she can delegate the management of the meeting in part or in full. Examples of good practice include:

- **Meeting preparation:**
  if not specified, then selection of content, participants, duration; timely invitation with agenda and, if necessary, table template; Preparation of the room
- **Meeting conduction:**
  Participants are prepared and arrive on time; Adherence to the agenda and times; no excessive speaking time of individual participants; no unnecessary repetitions; no parallel work (emails, chats, phone calls, etc.)
- **Follow-up:**
  documentation/minutes and distribution of information; including open or new items for following sessions

Formal conversations should go through several phases in order to have a binding and at the same time pleasant or appreciative conversation. **Phases of conversation** can be:

- Welcome
- Warm-up phase
- Orientation phase (why are we talking to each other here?)
- Clarification phase (exchange of information and arguments with solution finding)
- Agreement phase (what do we agree for?)
- Summary and conclusion
- Outlook and farewell

In addition to formal communication, **informal communication** is of particular importance and must be promoted by the project manager. In a relaxed atmosphere and without time pressure, there are usually more in-depth discussions in which important information for the project can be exchanged. This can be achieved, for example, by having dinner together or going on an excursion. Furthermore, chance meetings can lead to conversations between people who do not meet on a formal level or do not exchange ideas on certain topics. These random meetings take place, for example, in the canteen, coffee kitchen, in the hallway, in the elevator, in the smoking corner, sports group, on the Internet (e.g. chats, social media), etc.

„An important tool in the project is the coffee cup.“
Daniel Stumpf (*1981)

In principle, the various **communication channels** must be observed. The most obvious and easily recognizable for everyone

is, of course, the spoken and written word, verbal communication. But there is also non-verbal communication (facial expressions, gestures, etc.) and paraverbal communication (voice, speed, etc.). Furthermore, every communication must be seen in its context: In what context and on what content does the conversation take place, where does it take place, etc.

In the course of increasing digitalization, a considerable exchange of information in projects today takes place on **digital platforms** . Information about the project is provided on a central server and, depending on the authorization, it can be retrieved and changed, supplemented or deleted. This procedure leads to a significantly simplified information provision, modification and retrieval for all participants and, if necessary, other stakeholders. In this way, it increases effectiveness and efficiency and thus saves a large amount of time. However, a corresponding authorization concept must be implemented and maintained for each committee or group of people or even person.

Virtual communication and **virtual leadership** are developing rapidly and are becoming increasingly important. The advantages are enormous. The savings in travel costs and travel time through virtual meetings alone can be significant. But despite these digital possibilities, direct personal communication must not be neglected. It will continue to be of great importance. For the project manager, leading a **virtual team** gives additional challenges. In virtual teamwork, communication is much more often **asynchronous**, i.e. delayed in time and therefore not directly. Problems can quickly arise here that

could be clarified directly with **synchronous communication**. In the case of largely virtual collaboration, the selection and mastery of the appropriate **collaboration tools** is of particular importance.

The so-called **netiquette** is of particular importance in virtual communication. The main aim is to compensate for the lines of communication that cannot be transmitted via digital channels through particularly sensitive communication. Otherwise, conflicts can quickly arise and escalate.

Checklist internal and external communication

• The team members know the background of good communication, in particular the iceberg model, the 5 axioms of communication and the communication square as well as the sender-receiver model	
• The feedback rules are known and accepted.	
• A communication plan determines what is to be communicated via which channels and how often, who is the sender and receiver and who has to communicate actively (see **Section 8.5** and especially **Figure 65**).	
• The common facilitation techniques are known and are used in a targeted manner.	
• Meetings and discussions are prepared, conducted and followed up basing on the rules of good communication.	
• There is sufficient opportunity (time and space) for informal communication.	

• The rules for digital communication have been established and implemented.	
• With virtual collaboration, additional measures are taken to communicate.	

8.4 Negotiating and renegotiating contracts

A major challenge and important success factor in project management is the negotiation and conclusion of contracts as well as their renegotiation (claim management).

Negotiation is the process of finding a solution from different interests that is supported by all parties involved. From a business point of view, the negotiating partners involved will only enter into or sign a contract if each can see an overall advantage for himself or his institution.

A-Z Term

Level D

A wide variety of **negotiation situations** arise in projects. In particular, the project manager negotiates:

Level D

- with the client the framework conditions of the project
- with suppliers the terms and conditions of purchase
- with the team members the conditions of cooperation
- various other smaller contracts and agreements

The fine art of **contract negotiation** is the creation of a **win-win situation** between the contracting parties. This makes negotiation one of the indispensable skills of project managers.

„The purpose of the discussion should not be victory, but profit." **Joseph Joubert (1754-1824), French writer**

Quote

Just as in stakeholder management and problem solving, a **change of perspective** is particularly important in order to know not only one's own interests, but also the interests of the other parties involved. It is also of particular importance to know the true interests of others. On the one hand, one should not draw hasty conclusions of one's own or always check them, and on the other hand, one should always check whether the negotiating partners have a so-called "hidden agenda". A project manager should master various **negotiation techniques** and always think about a **negotiation strategy** in advance, especially for larger orders.

The following **practical tips for good negotiation** are also helpful for the aspects mentioned:

- Determine your negotiation limits (upper or lower limit) in advance.
- Make sure that you have for a minimum the same number of people with you as your contractual partner.
- Ask about your counterpart's interests and wishes about the contract.
- If you try to meet the interests and wishes of the contractual partner through the contract, he or she will be more interested in signing the contract.
- Try to develop a win-win solution together with the contractual partner.
- Ask lots of open questions, steer the conversation and let your counterpart talk more. Listening is usually better than talking yourself.

- Never accept the first offer. Do not meet the negotiating partner too quickly.
- Don't put yourself under time pressure and never let yourself be put under time pressure. There will always be a new opportunity.
- Don't get emotional or even aggressive. A friendly and calm, but clearly spoken "no" usually has a much greater effect.

From a purely legal point of view, a contract comes with **a mutual declaration of intent** or **offer and acceptance** or even **implied action** . This means that two or more contracting parties reach an agreement and at least signal it to each other. Contracts thus regulate mutual promises of performance. Usually, the contractors provide services in return for payment by the client.

„We have to work out what we have in common
without forgetting in what divides us:
bending, bending, but not breaking.“ **Angela Merkel (*1954)**

A **purchase contract** regulates the legal transfer of a tangible or intangible object. While a contract for **work** commissions the creation of an item or other defined result and remunerates its delivery with a fixed price, a **Time and Material (T&M) contract** commissions a service that is paid for on the basis of the time and material consumed. Contracts for work get fixed price, while for T&M contracts it is billed according to expenditure. Other contracts in projects can be, for example, rental or leasing contracts.

The customer (client) wants to have a new reception desk on the executive floor. She can buy it ready-made in the office furniture trade and, if necessary, have it delivered and set up at a fixed price (**purchase contract**). If it has it built by a craftsman, e.g. a carpenter, then it can either describe the delivery item in detail (specification) and pay for its creation and installation at a fixed price (**contract for work**) or it commissions the craftsman on an hourly basis and then pays him per hour worked until the delivery item is finished and set up (**T&M contract**).

Another question that is negotiated in contracts is: Who bears which **risks of the contract** and how is it remunerated? In the case of a contract for work, the risk of additional work compared to the estimated effort is borne by the contractor, because he has to deliver a defined work at a fixed price. In the case of a T&M contract, the risk of overtime is borne by the client, because it pays according to time units (usually on an hourly or daily basis). In addition to the risk of extra work, there are many other risks associated with orders. The contractual side that bears the risk through the contractual provisions must receive compensation for this. If the contractor bears the risk, he gets more money, if it is up to the client, then she has to pay less for the contract overall.

Furthermore, the **acceptance criteria** should be precisely defined in a contract already. This is used to measure whether the order has been successfully fulfilled. If these acceptance criteria of both the client and the contractor are transparent and defined in the contract, many unpleasant surprises can be

avoided. Likewise, the non-components of the contract ("out of scope") should be defined and fixed in writing.

The **signing of the contract** for the project assignment and the large contracts that the project concludes are always important milestones. This is also often the so-called **"point of no return"**. Once this point is passed, canceling the project would have major negative consequences. With regard to the signing of the contract, it should therefore be noted that one could withdraw shortly before signing without major consequences. After that, a retreat would usually be quite expensive.

A contract does not have to be in writing. However, it is advisable to request a written contract or at least written proof for all contracts that contain guarantees and warranties, where higher amounts are regulated or higher risks are, etc.

Contract management does not end with the signing of the contract. Now it is a matter of fulfilling one's own contractual obligations and monitoring and, if necessary, demanding the contractual obligations of the other contractual partners. Checklists for the individual elements of contract fulfillment are suitable for **contract monitoring**. Regardless of whether you are the client or the contractor, you monitor your own contractual obligations and those of the contractual partner (see ***Figure 64***).

Who?	What?	until when?	fulfilled?	Notes
Client			100%	
Client			75%	
Client			0%	
…				
Contractor			100%	
Contractor			75%	
Contractor			0%	
…				

Figure 64: *Template for Tracking Contractual Obligations*

Provided that all contractual obligations are fulfilled in accordance with the contract and there are no other requests for changes by the contractual partners, the project work can be continued. However, as soon as a deviation in the contractual services or a change request by a contractual partner occurs, **claim management** begins with corresponding **renegotiations**. Claims that you send to contractual partners yourself are **own claims**. If you receive a claim from a contractual partner, then you speak of **third-party claims**.

„When your fists are clenched, you can't shake hands.“
Indira Gandhi (1917-1984)

A **checklist** is also recommended for overview and tracking in claim management, which is a minimum requirement for **documentation**, but is often not sufficient in formal terms. As a rule, contractual changes must be made in writing anyway, because this is agreed in almost all contracts. Like the amendment process, the **claim process** should be conducted in a very

formal manner, so that claims only become effective when all relevant contractual partners have confirmed them in writing. Until then, you either continue to work according to the existing plan or interrupt the work in question until the final clarification.

Regardless of whether it is an own or third-party claim, you must also be aware of a basic **claim strategy**. The focus is on the following questions, among others:

- Should own claims always be demanded harshly and should third-party claims always be harshly rejected or negotiated?
- Is it possible to achieve later advantages through generous concessions, such as follow-up orders, concessions from the contractual partners in comparable situations?

A trusting cooperation between contractual partners usually proceeds according to the motto "*one hand washes the other*". In practice, a "*as you do to me, so I do to you*" is more common. So you should not expect to get help from a person in a difficult situation, even if you have helped that person before.

The right **time to conclude the project contract** can only be determined on a project-by-project basis. It could take place at the earliest at the end of the project initiation. At the latest, project design should be determined at the end of the process . In most cases, it will be somewhere between these two fixed points. The time of signing the contract also determines whether and which concept and planning work belongs to the

acquisition – i.e. not with direct remuneration – or to the commissioning and is therefore directly remunerated.

Checklist for negotiations, contracts, claims

• The negotiating partners and their interests are known.	
• There are clear negotiation strategies and negotiation goals.	
• The contracts are fairly designed and, in the case of larger projects, also legally examined.	
• The acceptance criteria are defined and recorded in writing in the contract.	
• Structured monitoring of contract performance takes place.	
• There is a clear claim strategy.	

8.5 Report and document

Reporting and **documentation** are usually quite unpopular tasks. In practice, it often looks like this: Report creators have to spend a lot of time providing information that does not help them themselves and that is at least not read and used by the recipient. Report recipients are overwhelmed with information and have to laboriously filter the essentials out of the mass but tend to refrain from this time-consuming and boring work.

However, reporting and documentation are indispensable and can also be designed in such a way that they are much more

effective and efficient. The following **maxims**, among others, help with this:

- Do not report everything that can be reported, but only what the recipient really needs.
- Don't document everything that can be documented, but only what is really necessary.
- Design reports and documentation so that the report creator can use them for self-control.
- Reports and documentation should be generated as far as possible by themselves from the project management tools used.
- Use clearly defined structures and standards.
- Use quantitative information as much as possible, supplemented by qualitative information if necessary.
- Enable largely automatic aggregation of reports across hierarchy levels.

Figure 65: *Obligations of sender and recipient*

When reporting, information must be transmitted from sender to receiver. In this case, the question must always be decided in advance whether the sender is responsible for actively providing the information (obligation to deliver) or whether the recipient must actively obtain the information (obligation

to fetch). **Figure 65** illustrates this relation. Especially if the relationship between two people is disturbed, omissions will otherwise occur because one is waiting for the other.

The automation of standardized reporting can be done with the help of **business intelligence (BI).** To achieve this, a process must be defined and digitized in several stages, from data origin to processing and output to provision. The data provision should always include the report sender in addition to the report recipient.

The information needs of the individual report recipients can be recorded in an **information matrix**. This contains the report recipients on one axis and what they should be informed about, in what form and how often on the other.

Report	Who reports (Sender)	to whom (Recipient)	Content (what)	Form of communication (how / template)	Transmission Type (How)	Frequency (when)
Status report						
Milestone report						
Change report						
...						
Final report						

Figure 66: *Example Report Matrix / Communication Matrix*

Typical reports in projects are the status report, instant report, change report, milestone report, final report, team meeting

report, risk report, etc. For all reports, you should determine at the beginning of the project who has to report what to whom, when, etc. For this purpose, a reporting matrix / **communication matrix is usually used** (see ***Figure 66***). Appropriate templates should be available for the individual reports.

The **status report** is carried out at a fixed rhythm (regularly) and on an ad hoc basis in the event of extraordinary incidents. Ideally, it summarizes the most important data, key figures, events, etc. on the current project situation on a one-pager. An example of the structure and contents of a status report shows **Figure 67**.

Project: HSL Bremen	**Status Report**	Date: YYYY.MM.DD
Overall status of performance, costs, time, quality **(with traffic light colors)**	Status of sub-projects **(with traffic light colors)**	Earned Value Analysis and Prognosis **(tabular and graphical)**
Events since the last status report	Tasks and challenges in the following reporting period	
Opportunities and risks that have occurred and their status	Ongoing and approved CR procedures	Necessary decisions of the Steering Committee

* can be done at project, sub-project or WP level!

Figure 67: *Example of a status report*

Another important report is the **ad hoc report / instant report**. This is created immediately as soon as unforeseen events occur that have a significant influence on the course of the project and/or the success of the project. In addition to the project status, the current event and its consequences are described and, if possible, recommendations for action or decision templates are given.

Level D

Quantitative information collected at the WP level should be automatically aggregated at the SP level and then further at the project level and to the MPM level. The Reporting Pyramid in ***Figure 68*** shows these individual stages. The quantitative parameters of performance, cost, and time from Magic Triangle are represented at each level. In addition to these figures, qualitative explanations should always be added to avoid misinterpretations if necessary.

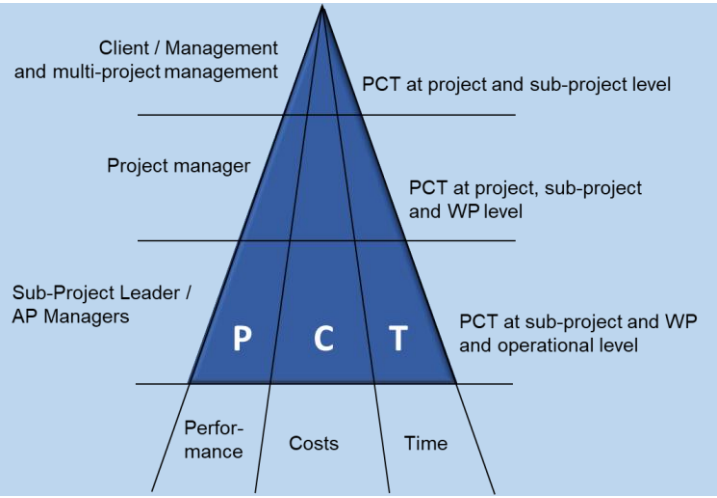


Figure 68: *Report Pyramid*

In a **document matrix**, you list all the documents used and group them together to get a better overview and findability.

In addition, a **document requirements matrix** can be used.

The documentation of products, etc. is more of a content-related part of the project work and not part of the **project documentation**. The latter stores information about processes, consumption of resources, resolutions, decisions, results, etc. of the project and thus fulfills important purposes. It serves in particular as proof of contract performance, evidence and also as an empirical value for further projects. In certain cases, project documentation is also required by law.

A large part of the project documentation is already provided by the **project management tools** used. A weekly storage of Gantt charts, product backlogs, etc. with the abbreviation CWXY for each calendar week in the file name can be helpful to better understand the history.

In addition to the usual meeting minutes, **meeting notes** are also important. In the case of important discussions and decisions, these should also be confirmed in writing by all parties involved, e.g. afterwards by email.

Document **storage and document management** are carried out in a central filing system. It is standardized with identic folder structure across all projects. Distributed and, above all, cross-company project teams use temporary platforms. It is highly recommended that you specify a **convention for file names** that includes the project short name, project number, document type, version number, date of last modification and,

if applicable, the document status. In addition, clear specifications should be made for each document regarding the **meta information of files** to be entered. Printouts should contain important meta information in headers and/or footers.

Digital **documentation** should be the leading one. All documents should be digitized and stored centrally. If an analog project folder is still used, it should have the same structure as the digital one. At the beginning of the project, it is essential to define the **access rights**. Data availability, **data protection** and **data security** are of particular importance. For **data protection**, it is essential to observe the requirements of the relevant laws for the protection of the personal data of suppliers, customers, patients and clients. **Data security** should be ensured by the corresponding telecommunications regulations.

A **project logbook** (analogue or better digital) is an excellent tool and it serves several purposes at once! Above all, it serves the project manager for self-control, management of the project team and other participants, as well as documentation and safeguarding.

Checklist Reporting and Documentation

• Only what the recipient really needs is reported.	
• The sender of report also uses his reports for self-control.	
• The reports are aggregatable in the reporting system.	
• A communication/reporting matrix is available.	
• Obligation to bring and collect are defined.	

• There is a clear filing system and convention for file names.	
• Data availability, data protection and data security are guaranteed.	

8.6 Managing Problems, Creativity and Innovation

„Wherever I look, opportunities arise from problems.“
John Davison Rockefeller (1839-1937)

If you try to fight problems with their symptoms, then that's actionism. However, these pseudo-solutions are very common, because doctoring around the effects is much more convenient than finding and implementing real solutions to problems. But if you really want to eradicate a problem, you have to analyze and eliminate the causes of the problem. This is much more complex, but the only sustainable solution.

„If you want to go to the source, you have to swim against the current." **Far Eastern wisdom / Stanislaw Jerzy Lec (1909-1966)**

An important tool for determining the causes of the problem is the **Ishikawa diagram**, also known as the herringbone diagram, the cause-and-effect diagram or the 6 M diagram. The herringbone diagram identifies the causes of a problem. In most cases, it is not a single cause alone, but a bundle of causes that only in their combination do the problem arise. Six root cause areas are examined: man, method, material, machine, millieu, environment, management (see ***Figure 69***). This is referred to as the 6M. Starting from the problem, one goes backwards in the direction of causes and examines the individual

root cause areas. If one now eliminates the individual causes, the problem should be solved in a sustainable way.

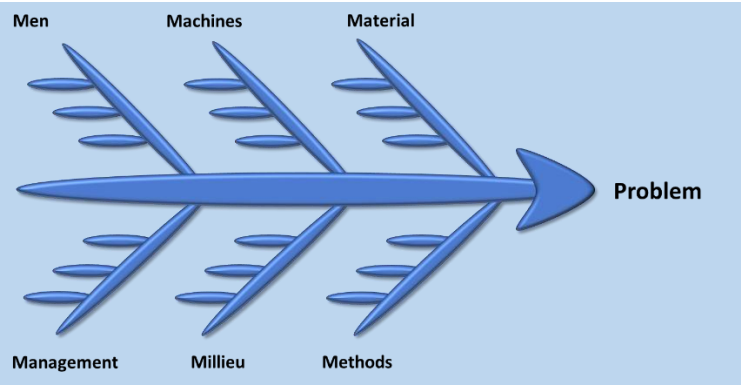


Figure 69: *Ishikawa diagram with the 6 M*

„Every problem you overcome will help you in the future. And also gives new strength."
Steffi Graf (born 1969), German tennis player

A typical blockage in problem solving is the one-sided, subjective view of the problem. Here it is important to change your perspective. It is particularly important to put yourself in the shoes of other people and think about how they see the problem. In addition, several people or groups of people are usually involved in problems. A similar motto applies here as with stakeholder management: You have to find a **win-win solution** in order to get an acceptable and sustainable way to solve the problem for all those involved and affected.

The secret to success is to understand each other's point of view. **Henry Ford (1863-1947)**

However, intelligent solutions rarely come by themselves. They have to be laboriously worked out. In order to think outside the box, **creativity techniques** should be used. The variety of techniques and methods includes **brainstorming** or **Brainwriting** and other methods derived from it. Unfortunately, these are not consistently implemented in practice, but rather resemble a casual conversation. All participants should know and adhere to the rules of brainstorming sessions. **Method 635** is comparable. Six people provide three ideas in five minutes each in a rotation method, whereby you pass on your results to the neighbor at each rotation and get the results of the other neighbor.

A creativity technique that also uses the change of perspective is the **Six Thinking Hats method by de Bono**. Symbolically, you put on six different colored hats one after the other. For each color, you look at the problem from a specific point of view. The blue hat stands for the overarching view, the red for the emotional, the black for the critical, the yellow for the optimistic, the white for the analytical and the green for the creative view. This method should be applied in a team.

Another option is the **headstand method**. The initial problem or question is formulated in the opposite way, i.e. turned upside down, e.g. "what do we have to do to fail?" From the answers, the group can now generate solutions on how to do it right. Due to its objective, this method is also often used in risk management.

Parameters	Features			
Measure/Ratio 1	1.1	1.2	1.3	1.4
Measure/Ratio 2	2.1	2.2	2.3	2.4
Measure/Ratio 3	3.1	3.2	3.3	3.4
Measure/Ratio 4	4.1	4.2	4.3	4.4
Measure/Ratio 5	5.1	5.2	5.3	5.4
Measure/Ratio 6	6.1	6.2	6.3	6.4

Figure 70: *Morphological box*

An analytical rather than creative approach is the **morphological box**. A solution space is created by defining individual parameters, i.e. characteristics or properties, for the problem. For these parameters, characteristics, i.e. possible solutions, are now defined. You can then combine the characteristics into one or more overall solutions and compare them (see **Figure 70**). The initial analytical approach can release a lot of creative potential.

Other helpful **creativity techniques** include:

- Big Picture / Canvas
- Pin board cards
- Mindmap
- Open Space
- World Café
- Creative confrontation
- 5xWhy Questioning Technique
- TRIZ (Collection of Techniques for Invention)

The techniques mentioned so far already help you to think outside the box. Nevertheless, innovations are usually approached rather half-heartedly. In many cases, you fall back on what is already there and make cosmetic changes if necessary. In order to create real innovations, i.e. something really new, you sometimes have to start on a 'green field', i.e. block out everything that exists. A basis for this is the theory of creative destruction by Josef Alois Schumpeter. Nowadays, we tend to speak of **disruptive innovation**. Experience shows that disruptive innovations are possible everywhere and can change entire markets. It is important that you free yourself from the "shackles" of what is already there and really critically examine everything.

„Men of genius begin great works,
industrious men complete them.“
Leonardo da Vinci (1452-1519)

To successfully implement innovations, you need a lot of intuition with targeted communication. In project management, many processes and tools have developed in recent years in such a way that stakeholders are involved earlier and more intensively. Although this usually makes the entire process much more tedious, the acceptance of the results is much greater and subsequent problems are avoided.

A method specially developed for this purpose and quickly spreading is **Design Thinking**. It is an approach to creative innovation that combines creativity techniques with processes and elements of results-oriented and Agile project management and thus also prepares the successful implementation of

the innovation. On the one hand, phases are worked with in a result-oriented manner, but on the other hand, they are applied more cyclically. This means that in phased development, people always jump back in order to adapt previous developments to new findings. Initial developments are tested and evaluated with the target groups in the early phases of the project, so that a constant adaptation of the requirements prevails during the course of the project (see ***Figure 71***). The assignment of Design Thinking to the Agile methods is therefore nonsense. It's a **hybrid approach**.

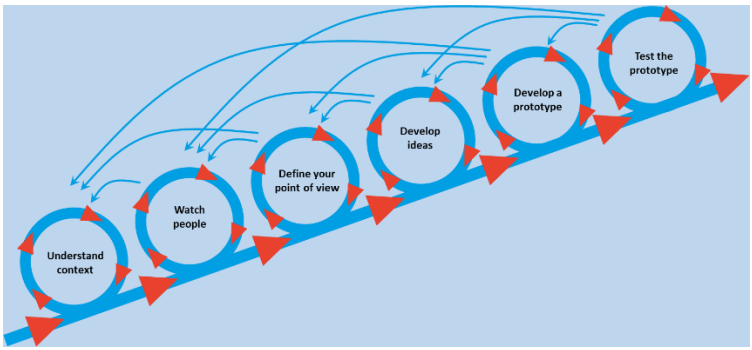


Figure 71: *Example of a Design Thinking Process*

Checklist Problems, Creativity, Innovations

• Problems are tackled at the source, actionism is avoided.	
• The points of view of all parties involved are known and win-win solutions are being sought.	
• Creativity is encouraged and the corresponding freedom is created for it.	
• Innovations are identified in a targeted manner and consistently implemented.	

8.7 Recognizing and resolving conflicts and crises

When different expectations, interests or opinions collide, tensions can arise. These tensions are called **conflict**. Conflicts can have various causes, e.g. different objectives, approaches, relationships, mutual expectations, etc.

Conflicts can quickly escalate and then develop into a tangible crisis. Therefore, conflicts should be recognized early and actively dealt with. Crises can also have other causes than conflicts, but regardless of this, the same applies as with conflicts, namely to recognize the occurrence of crises as early as possible and to find a way out of the crisis as quickly as possible (see ***Figure 72***).

„Worse than difficulties is the tendency to avoid them."
Emil Oesch (1894-1974), Swiss. Writer

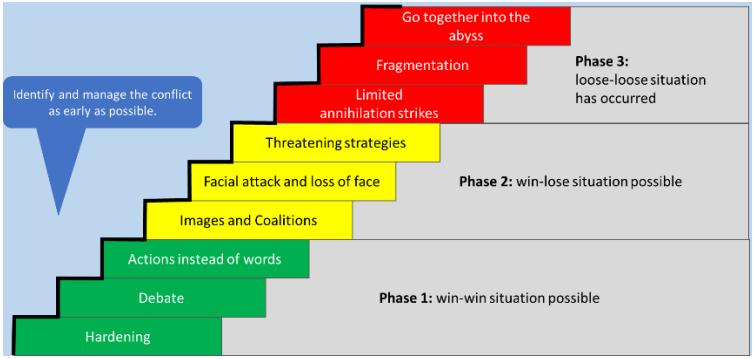


Figure 72: *Conflict levels according to Glasl*

As a basic attitude for conflicts and crises, it is important that their occurrence should not initially be regarded as a management failure, but rather as a completely normal occurrence. Projects are breaking new ground and have to reconcile many interests. This per se brings conflicts and crises with it. So you could say that a project without conflict and without crisis is not a real project. Accordingly, one should take conflicts and crises positively and always see the **opportunities** in them. So it is important to have the right attitude and how to deal with it.

„Always think of conflict as a clash of ideas, not people."
Prof. Robert Kegan (*1946)

Quote

The **process steps of conflict management** can usually be carried out as follows:

- Anticipating conflicts and planning and implementing preventive measures

- recognize and analyze the occurrence of a conflict at an early stage
- check whether the parties to the conflict can solve the conflict themselves, otherwise develop solutions together with the parties to the conflict
- Consult (external) support if necessary, especially if you are part of the conflict yourself
- Implementing solutions and monitoring conflict resolution

The **early recognition of conflicts** requires closeness and a relationship of trust with the parties involved. It is therefore particularly important because you have not yet escalated and the earlier you intervene, the easier it is to develop the conflict situation in the right direction. In the **conflict analysis**, the causes and current situation should be determined as neutrally as possible. It is not just a matter of whether it is a conflict between internal people (groups) or a conflict with external involvement. If the participants can be trusted to solve the conflict themselves in the interests of the project and the participants, then one should not intervene further, but only observe. Otherwise, it is always advisable to develop **solutions** together with the parties to the conflict.

„You can stand on your point of view,
but you shouldn't sit on it.“ **Erich Kästner (1899-1974)**

There are basic strategies in conflict behavior and conflict resolution. ***Figure 73*** shows an overview of this. According to this, a distinction is made between the extent to which one takes into account one's own interests and those of the conflict partner. **Avoidance** is tantamount to ignoring or sitting out, hoping

that 'grass will grow over the matter'. This is rarely a good strategy, as the conflict will not be resolved and will recur again and again. In some cases, **enforcement** is important. Here one tries to fulfill one's own interests without or with little consideration for the interests of others. This can be a quick fix if you're assertive. However, it may be that you only achieve a short-term victory and have to "pay" for it in a completely different place or are attacked openly or covertly. According to the motto "the smarter one rejects", a **retreat** can be a good strategy. You don't get involved in the conflict, the conflict partner asserts himself at the expense of his own interests. This strategy makes sense if the conflict partner is superior and possibly even aggressive. One of the more positive possible solutions is compromise, as long as it is not a 'rotten' compromise. Because then it will boil up again and again. A real compromise that is accepted by everyone, in which everyone is open and accommodating to each other, can make a lot of sense.

„There are moments when you don't just have to see,
but turn a blind eye.“ **Benjamin Franklin (1706-1790)**

However, the best solution is almost always to create a **win-win situation**. All parties involved have the feeling that they are coming out of the conflict predominantly with advantages.

Figure 73: Basic strategies of conflict resolution

„A compromise is the art of dividing a cake in such a way that everyone thinks they have gotten the biggest piece."
Ludwig Ehrhard (1897-1977)

Quote

In conflicts, facilitation by a third, neutral person **is often unavoidable for a sound solution finding and support**. This person can be internal to the organization, but sometimes an external person is helpful. **Mediation** has established itself as an important procedure for conflict resolution. A mediator, who is accepted by all parties involved as neutral and should be trained in mediation if possible, analyses the conflict situation with the parties to the conflict and seeks solutions together. Depending on the prior agreement, a mediator can also provide solutions in hardened cases that are to be accepted by the

parties involved. Mediation can make a big difference and save a lot of unnecessary cost and time losses.

„Obstacles and difficulties are steps on which we ascend.“
Friedrich Nietzsche (1844–1900)

A good practice in conflict resolution is a **written list of shared and opposing points of view**, if possible by a neutral facilitator. If the parties to the conflict then find that the divided opinions (where do we agree?) are often considerably more extensive than the contrary ones, then it is easier for all parties involved to come closer together and the willingness to compromise increases. ***Figure 74*** shows a helpful gradation in this process.

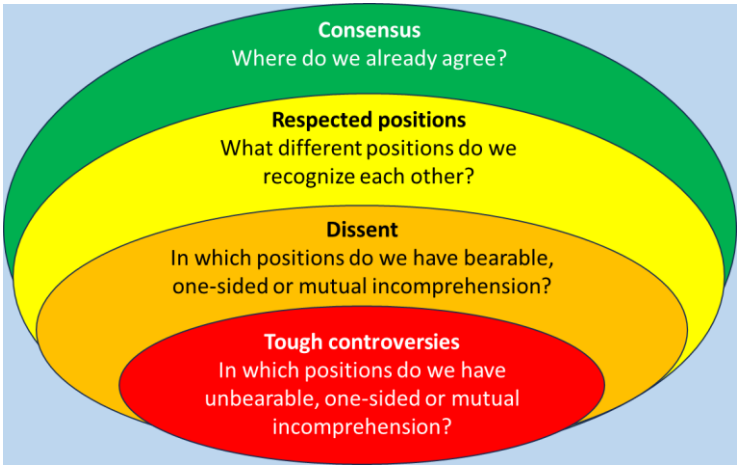


Figure 74: Conflict Analysis

However, if you get into a downward spiral with a conflict or other things happen inside and/or outside the project that no longer seem to be controllable, a **project crisis** can come up.

„Crisis can be a productive state. You just have to take away the aftertaste of catastrophe.“
Max Frisch (1911-1991)

Typical **symptoms and signals** herald the project crisis and you should notice them early on and react accordingly. Crisis symptoms and signals include increased conflicts, actionism, destructive behavior, misbehavior, frequent mistakes, absenteeism, fluctuation, constant changes, and much more. If these occur frequently, a crisis is to be expected.

The word **crisis** is used in a very inflationary way. But at what point can we speak of a crisis? By definition, a crisis is a state of (perceived) hopelessness. So from the moment you think that nothing works anymore and you don't expect a solution anymore, you are in a crisis.

In times of crisis, **tighter leadership** is usually required. Unless the crisis was caused by too tight leadership. In particular, the project manager must

- on the one hand, keep calm,
- on the other hand, defend the team externally and at the same time challenge it internally,
- Make clear decisions, communicate and enforce them,
- move forward with assertiveness and courage and lead the project out of the crisis.

„Difficulties bring talents to light that would lie dormant under more favorable conditions."
Quintus Horatius Flaccus (65-8 BC), Roman. Writer

„Problems are opportunities to show what you can do."
Duke Ellington (1899-1974), American composer

The alternative of **cancelling the project must also** be weighed up again and again. However, this has consequences not only for the project, but also for follow-up projects. Thus, leading out and surviving the project crisis and a self-confidence strengthened from it are an important experience for future projects for all those involved.

During the project crisis, it must also be decided whether the project work should be continued or interrupted during the fight against the crisis. A **project interruption** can be caused by the project manager as well as the overarching management committees as well as by the client. In this context, this is referred to as a **suspension**.

„Just when the caterpillar thought its life was over, it became a butterfly." **Spanish proverb**

Checklist Conflicts and Crises

• Team members are trained in conflict behavior.	
• Conflicts are detected early and dealt with in a solution-oriented manner.	
• A list of potential internal and external mediators is available.	
• There is clear crisis communication.	
• There is a plan B for big risks.	
• The project manager has a concept for her behavior and leadership style in a project crisis.	

8.8 Managing opportunities and risks

„It's not about what happens to you in life,
but how you react to it.“ **Epiklet (50-138)**

The success of a project is also determined in particular by whether and how the project manager creates and exploits the opportunities and avoids the risks or reacts to them when they occur. Therefore, you should carry out a structured **opportunity and risk management** . It is about knowing the opportunities and risks at an early stage and actively identifying them. For opportunities, measures are considered in advance on how to recognize them or even find them or bring them about and use them when they occur. In the case of risks, the first thing to do is to look for ways to prevent, reduce or transfer them to third parties in advance. If these preventive measures are not sufficient, then you should have developed a plan B in advance, at least for the bigger risks, which can be implemented immediately if the risk occurs.

Opportunities and risks are directly related to the project objectives because they have a positive or negative influence on the degree of achievement of the project objectives. In contrast to target situations, which can be worked out or brought about, the occurrence of opportunities (positive effects) and risks (negative effects) can only be influenced or controlled to a very limited extent. Opportunity and risk management is therefore much more a reaction planning to the occurrence of - usually external - events.

The **opportunity management process** can include the following steps:

- Identify potential opportunities
- Assess the probability of occurrence and potential benefit,
- Consider measures for active inducing,
- Plan measures to take advantage of opportunities at entry,
- Observe identified opportunities and identify new opportunities that have not been identified in advance

***Figure* 75** shows an example of an opportunity portfolio. The examples mentioned quickly make it clear how difficult it is sometimes to differentiate between objectives (are worked out) and opportunities (occur or do not occur). The further to the right and up a chance is positioned, the bigger it is. The size and color of the circles can symbolize additional information.

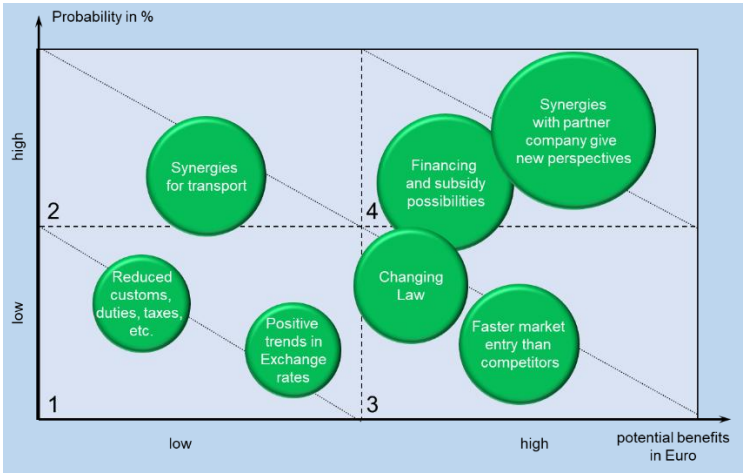


***Figure 75:** Example of an opportunity portfolio*

„In the event of a shipwreck, it is too late to learn to swim."
Danish proverb

The **risk management process** can include the following steps:

- Identify risks,
- Assess probability of occurrence and potential damage in the event of occurrence,
- Eliminate, reduce or transfer risks to third parties,
- Insure risks,
- Plan actions to deal with the biggest risks upon entry (have a Plan B),
- Observe identified risks and identify new risks at an early stage that have not been identified in advance

Identifying and managing risks is a team task of several experts. Each team member has a different perspective due to their initial discipline and experience. This is the only way to record and assess as many risks as possible. In **risk workshops**, at least the first three steps of risk management are carried out together.

„An opportunity never knocks twice. That is the sad truth.
And if we postpone things until the next day,
that day may not happen."
Gloria Estefan (born 1957), American composer Singer

Risk checklists can be used **to determine the opportunities and risks** . They support the search primarily with experience from past projects. It helps not to overlook one or the other risk. However, you should try to identify all risks and must

always think about possible risks for each project that are not yet included in the checklist.

Risk measures should be **as preventive as possible** so that the risk cannot occur in the first place or its probability of occurrence is reduced. **Corrective measures**, on the other hand, counteract the consequences of the risks that occurred.

Figure 76 shows an example of a risk portfolio. It can be used synonymously with the opportunity portfolio. For both representations, it is also true that the exact position of the circles is less important than having the opportunities and risks on the 'radar screen' at all and not simply forgetting them.

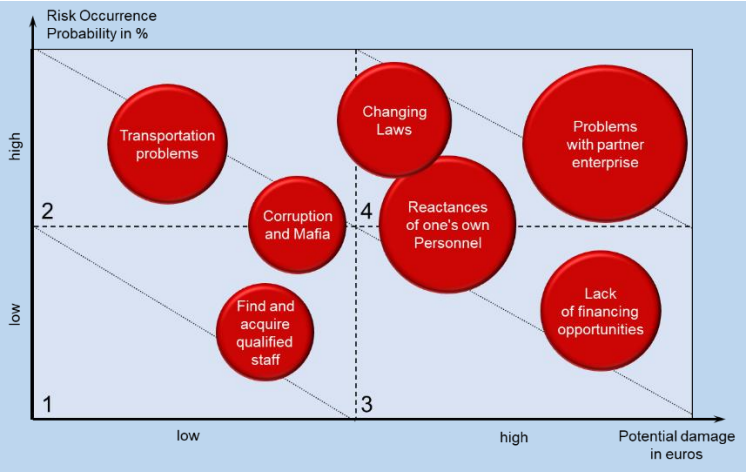


Figure 76: Example of a risk portfolio

The risks can also be listed in a **risk table**. A particular advantage is that the **risk value** can be easily calculated from the columns probability of occurrence and potential damage

(corresponding to the axes of the risk portfolio). Not all risks can be assessed **quantitatively**. In these cases, a **qualitative risk assessment** should be used or both options should be combined. A **risk response plan** can be integrated into this table or maintained separately.

Checklist Opportunities and Risks

• Opportunities and risks are managed in a structured and targeted manner.	
• All team members are aware of the opportunities and risks of the project.	
• All team members have clear rules of conduct in the event of an opportunity or risk (e.g. Risk Response Plan).	

8.9 Ensure project management quality

It is most obvious in **quality management** (QM), but it applies to all methods and tools of project management: You always have to sow the seeds first and can only harvest later! Since this procedure is laborious, attempts are made again and again to omit such activities in order to achieve the result as immediately and as easily as possible. Killer arguments, such as "this only costs unnecessary time and money" should always be answered with the question of what it will ultimately cost if we don't do QM.

The **quality of project management** can be divided into **two areas of responsibility.** On the one hand, it is about how to adapt and apply the given project management of an organization in the current project. On the other hand, it is about optimizing the project management of an organization as a whole. The quality assurance of the project result can also be included here, but is more of a task of project controlling.

Specifications for project management in an organization are contained in particular in quality management manuals, process descriptions or project management manuals. The consistent application of these requirements is of particular importance. On the one hand, the processes, tools, templates, etc. in it are tailored to the project implementing organization and should therefore be effective and efficient tools for successful project work.

On the other hand, consistent application protects against criticism. As long as everything goes well in the project, no one outside the project will ask themselves whether the project manager and the project team are using the specifications consistently. But if something goes wrong with the project, then you are better protected from any criticism if you have consistently followed all the guidelines. If you haven't done it, then the criticism gets an additional force.

An organization's project management should also be constantly improved. Continuous improvement in small steps should already take place within a project. Major optimization measures are being carried out across projects (see Section 9.3). The topic of **maturity models is also** explained there.

„The biggest enemy of quality is haste."
Henry Ford (1863-1947)

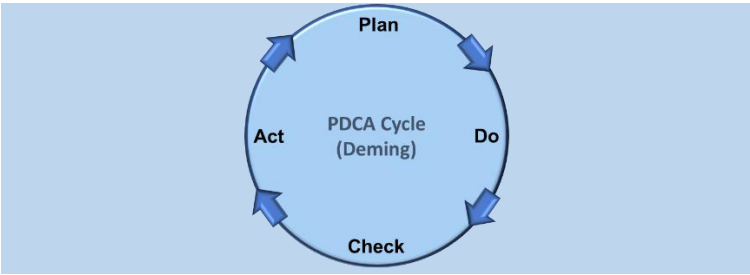
Quote

Important **instruments in securing and optimizing project management quality** are:

Tool

- Continuous improvement process (CIP), e.g. PDCA cycle or DMAIC cycle
- TQM, EFQM Model, Project Excellence Model
- Kaizen and Lean Management
- Reviews, Retrospectives, Lessons Learned, Audits
- Six Sigma

The **CIP** should be applied at every level by every person involved. It is a matter of constantly reviewing the procedure and the results and implementing small improvements immediately. Among the most well-known tools are the **PDCA cycle** (see ***Figure 77***) and **DMAIC** (Define → Measure → Analyze → Improve → Control → Define → usw.).



Level D

Figure 77: *PDCA cycle according to Deming*

A **project audit** is a tool that is used more for external project assessment of compliance, etc. Of course, audits can also be carried out within the project, if necessary, also in preparation

for an external audit. A project manager should manage her project in such a way that it can survive an audit at any time. Thus, an audit is not only a reactive, but also a preventive quality tool. This also includes **reviews** and **retrospectives** as tools of Agile project management (see Section 5.3) as well as **lessons learned workshops**, which are part of results-oriented project management (see Chapter 7).

Total **Quality Management** (TQM) and the EFQM Business Excellence Model of the European Foundation for Quality Management (EFQM) are basically company-wide and thus cross-project. In the 1990s, German Project Management Association (GPM) developed the Project Excellence Model (PEM) basing on EFQM model , which initially refers to individual projects, but also contributes to the optimization of project management as a whole (see more in Section 9.3).

Kaizen and **lean management** are two comprehensive management approaches that are very interwoven, working with a conglomerate of the same or similar principles and tools. Organizations and their processes are to be structured, focused, simplified, streamlined, etc., among other things, in order to become more effective, efficient and faster.

The tools include, for example, the **5 S checklist**:

- **Seiri** = establish order
- **Seiton** = every item in the right place
- **Seiso** = cleanliness
- **Seiketsu** = personal sense of order
- **Shitsuke** = discipline

Other tools are e.g. **poka yoke** (standardized "foolproof" mechanism), where the sequences are so clear that you can't get them wrong, and the **5 times why technique**, where an answer is accompanied by a *why?* until one has arrived at the core of the truth. Six **Sigma** can also be used as a quality tool in projects. However, since this statistical method is based on detecting small deviations in large quantities, it is more suitable for large projects. A **quality map or quality checklist** that monitors the consistent application of the project's quality management activities is also particularly helpful.

Failure Mode and Effects Analysis (FMEA) is often used, especially in technical areas. The aim is to identify and analyze possible errors in advance in order to prevent them.

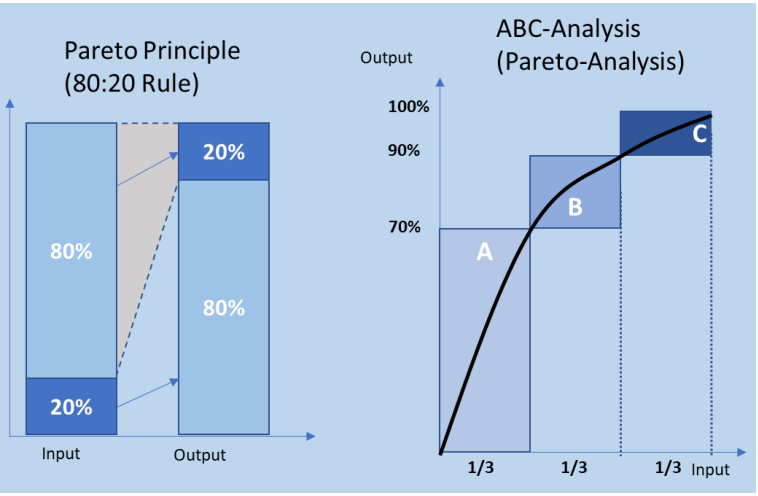


Figure 78: Pareto Principle and Pareto Analysis

A rather universal tool, which above all supports the correct focusing, is the **Pareto analysis** or **ABC analysis**. The Italian economic researcher Pareto has recognized that a small part of an input quantity can have a large output and vice versa. With the Pareto analysis, you can divide the input quantities according to ABC categories and thus concentrate on the more effective things. ***Figure 78*** shows the connections and an **example**: With 33% of the customers (input size) we achieve 70% of the profit (initial size). These are the most important customers (A-customers).

Project Management Quality Checklist

• There is a clear concept on how the quality of project management is to be secured and improved.	
• The team members know the tools for quality management in projects.	
• All team members know the rules of conduct for quality assurance.	
• The team members are given the appropriate freedom for quality assurance measures.	

9 Cross-project Tasks

The processes and activities described so far in this book focus on the management of a single project. But the success of a single project also requires different cross-project measures.

Less experienced project managers should rather concentrate on their own project, which will already challenge them sufficiently. Advanced project managers can demand and support the cross-project measures at the same time. In principle, as the maturity of an organization's project management level increases, it is desirable to form appropriate institutions or bodies that are responsible for cross-project management. These can be, for example, project portfolio managers or PM offices.

9.1 Implement project management

If an organization only carries out very isolated projects, individual project management is certainly sufficient. Smaller projects are managed more intuitively and larger projects can get external support if needed. However, as soon as an organization repeatedly carries out projects and the number and size or complexity of the projects increases, the first step should be to standardize the basic features of project management. In this context, we are talking about the **implementation of PM.** Since the number of projects and thus of the project economy has been rising steadily for decades in absolute terms and in relation to other economic activities, and hardly any industry

is not affected by this, almost every company should implement project management at least to the extent that certain standards make work easier for everyone and better secure it.

This **standardization of PM** can include many individual measures, such as:

- Coding / numbering of projects
- Centralized repository (cloud/sharepoint) for project data
- Default folder structure in the file repository and nomenclature for file names
- Predefined milestones for each project
- Predetermined phases with minimum activities for each project
- Specification and/or templates of individual processes and tasks, such as project selection
- Specification and/or templates of individual tools, such as opportunity or risk portfolio
- Reporting requirements and/or templates: Who reports what to whom and how often with which predefined reporting templates?
- Developing a Project Management Handbook (see the following section)

However, implementing PM also means carrying out the appropriate **personnel development** and creating a **PM culture** . The standards that have been built up must be trained, exemplified and demanded, as well as constantly developed and optimized.

The implementation of project management should itself be declared as a project and introduced in an exemplary manner. A typical mistake in practice is when the implementation is to take place "just on the side".

The **following aspects have proven to be effective** as an implementation strategy:

- Definition as a project or multiple projects with an overall project management strategy
- Use of motivated and experienced project personnel (multipliers)
- Step-by-step approach with quick wins to convince stakeholders of the benefits of project management.
- Test runs with pilot projects
- Development of a project management manual (see the following section)
- Training of project personnel
- If necessary, certification of project personnel, also as a motivational incentive
- Don't start with the introduction of project management software and think that everything will take care of itself.

Once a first stage of the project management introduction has been reached, the further development process can already begin in order to steadily increase the level of maturity in project management (see Section 9.3).

When introducing and optimizing project management, it is of elementary importance to know and take into account the **structures and processes of the core organization** and to

adapt to them as far as possible or to adapt them to the requirements of project management.

When introducing PM, one also repeatedly encounters the statement that PM would not help. Therefore, active communication of the **central question 'Why should PM be introduced at all?'** of particular importance. In addition to general studies that prove the success of project management, lists of benefits of project management are also helpful. The following arguments can be included:

- Standardized procedure reduces coordination and communication efforts
- in a holistic view, small subtasks are worked on
- High flexibility and responsiveness through permanent overview of the whole
- work is done directly on the matter in a problem- and result-oriented manner
- Same understanding of common objectives
- clear interfaces of responsibility among institutions and individuals, organizationally and legally
- Clear contact points for all activities
- Organized and standardized flow of information
- Effective response to emerging risks and problems
- Learning from past projects
- Information is also available in the event of staff absences

Furthermore, **general or organization-specific project examples** can be named. In addition to a large number of disastrous construction projects, there are also a lot of showcase projects

under construction, such as the Empire State Building or the reconstruction of Dresden's Church of Our Lady or Notre Dame in Paris.

The effect of good project management shows ***Figure 79***. It prevents both early starts ("doer syndrome") with uncoordinated procedures and endless planning loops ("planner syndrome") that are never implemented.

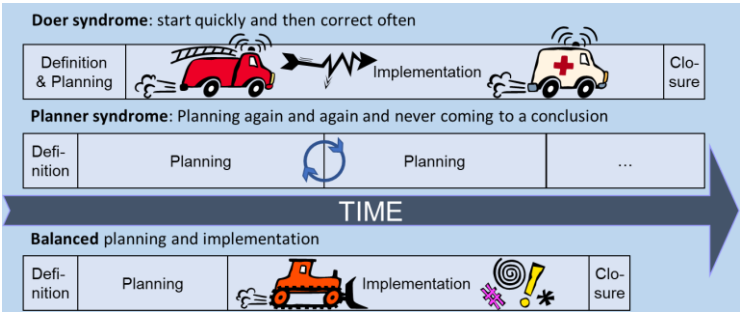


Figure 79: The Impact of Good Project Management

Checklist Project Management Implementation

• The implementation of project management is itself set up as a project.	
• Measures to standardize project management have been identified, evaluated, prioritized.	
• An implementation plan of the measures to standardize project management is available.	
• An implementation strategy for the measures to standardize project management is available.	
• Employees are actively involved.	

9.2 Developing a Project Management Handbook

The development of **project management manual** (PM-HB) is closely linked to the introduction of project management. On the one hand, a PM-HB is intended to provide support and orientation to the project staff, but on the other hand, it is also intended to provide guidelines for project management in order to make the project work more effective, efficient and safe overall.

A **PM-HB** is not to be confused with a **project manual**. The project handbook, also known as a **project file**, is a purely project-related document that provides important information about the specific project. The PM-HB regulates specifications for all projects of an organization and is therefore cross-project.

Important **advantages of a PM-HB** are in particular:

- Ensuring the minimum project management standard
- Easier comparability, better monitoring, easier profit between projects through uniform approach
- The wheel is not reinvented again and again, such as new templates
- Orientation and safety for project staff
- Referenz für professionelles Projektmanagement

However, these advantages can only be realized if the PM-HB is not only present, but also known and actually 'lived'. In this respect, the development of a PM-HB should also be carried out as an independent project. The strong involvement of stakeholders and especially future users is an important

success factor. Furthermore, the following aspects and requirements for the PM-HB should be taken into account:

- The PM-HB should not be too large under any circumstances; only a manageable PM-HB is actually used in practice
- it should be clearly structured; the sequential project flow should be divided into individual steps and always treated according to the same, simple structure, such as what needs to be done?, why?, how? And with what?
- if possible, a limit of one page per step should be set.
- It should be easy to use
- it should always be developed from the user's point of view, so that only really necessary measures are specified and no unnecessary 'project management' arises.
- it should definitely create and provide concrete working tools, such as templates, checklists, templates, examples, etc

The PM-HB should also define the requirements for project management on the basis of the **project types** and **project categories** or **Regulate project classes**. Depending on the type and scope of the project as well as other criteria, different minimum requirements should be placed on project management. For every project, only as much as necessary, i.e. as little project management effort as possible, should be made.

First of all, the division into **project types** should be made. Many organizations at least differentiate between internal and external projects. Furthermore, it can be divided into capital-

intensive (investment projects), creative (research and development projects) and more staff oriented (IT projects and organizational projects). Depending on the type of project, project management must also provide different priorities.

„Practice should be the result of reflection,
not the other way around.“ **Hermann Hesse (1877-1962)**

The **project categories** (**project classes**) can be divided into the size classes A, B, C and D projects, for example, whereby the sizes should be measured and determined with different **quantitative and qualitative criteria**. These may include, in particular:

- Project budget
- Effort (e.g. in person-months or days)
- Duration
- Existing experience
- Number/Grade of Risks
- etc.

Levels should be defined for each criterion. If a criterion reaches the next higher level, the entire project should be elevated to this category. Ultimately, however, there should still be enough **flexibility** that a project is assigned a different category than the one identified, e.g. by reasoned decision of the client or steering committee.

„Immovable principles are like blinkers (for horses to prevent it seeing sideways).“ **Deng Xiaoping (1904-1997)**

Project **categorization** (project classification) has predominantly advantages and is therefore highly recommended. However, an unwanted momentum can also develop. Some project managers define their project highly, so that they get a higher category and thus personal importance. Other project managers define their project down, so that they have to use as little project management as possible and get little attention.

When **introducing Scrum** in an organization, you should make sure that the given terms and processes are used consistently and understood uniformly by everyone. The development team has to pay attention to the content specifications of the product owner. Even if the CEO tries to intervene directly and differently, the product owner must first be informed or questioned. An internal or external Agile Coach can provide appropriate support here.

Project Management Handbook Checklist

• The advantages of a PM-HB for the specific company have been analysed and communicated.	
• The requirements for the PM-HB have been determined.	
• In the PM-HB, a distinction is made between project types and categories in order to provide standardized and tailor-made specifications and solutions.	
• Despite the standardization, the PM-HB also offers sufficient corridors to be able to find tailor-made solutions for each individual project if required.	

9.3 Optimization of project management

Project management can be streamlined in a variety of ways. On the one hand, the projects can provide tips for **optimization** that arise from the application of specifications in PM-HB, lessons learned workshops, retrospectives, revisions, etc. This could be understood as a **bottom-up approach**. An important basis for this is quality management in projects, e.g. with the **PDCA cycle** (see Section 8.9 and esp. ***Figure 77***). It is important to keep asking and motivating the teams to provide appropriate feedback to the central office for the organization's project management (PMO).

On the other hand, the optimization of project management can **be initiated across projects**. So it would have **a top-down** effect on the projects. Examples of this are **benchmarks** with other organizations, **further training measures**, **introduction of PM software** or **general optimization activities**.

Furthermore, the evaluation of one's own project management at both the organizational and project level is a very effective way to optimize. The IPMA International Project Management Association offers, for example: **Assessments, certifications and awards at the organisation, project level and individual level**.

A **regular comparison** of one's own project management with current standards, reference books, articles in relevant trade journals, congresses, etc., can also lead to optimization measures.

A comprehensive tool for PM optimization is the **Project Excellence Model (PEM).** It evolved from the EFQM model in the 1990s. While the EFQM model refers to entire organizations or organizational units, the PEM considers a single project. However, the findings usually contribute to optimization measures of project management as a whole. The PEM is a mature basis for project evaluations for the Project Excellence Award. Organizations and individual projects can use the open model to conduct self-assessments and thus analyze and implement strengths and potential for improvement, as well as conduct **project benchmarking**.

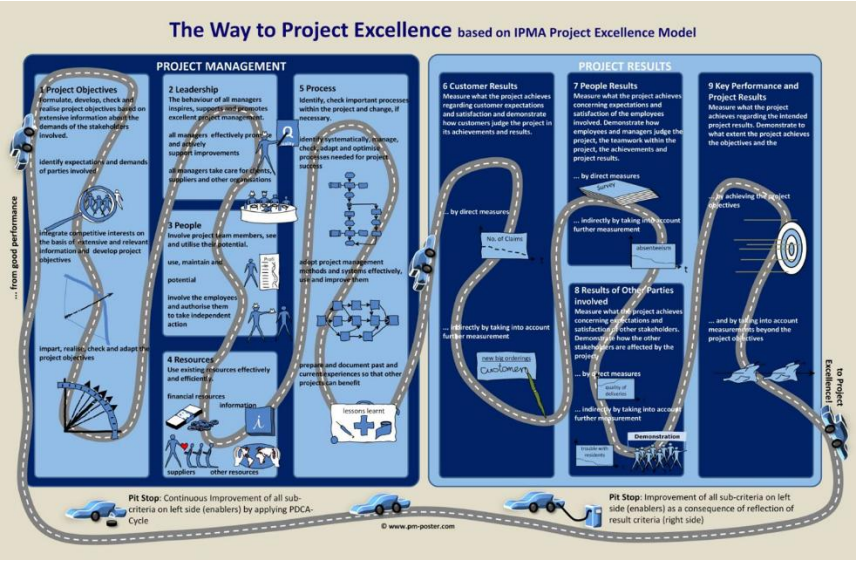


Figure 80: *The path to Project Excellence by Thor Möller*

On the basis of the PEM, Thor Möller developed and published the **path to Project Excellence in 2010** (see ***Figure 80***,

Download www.pm-experten.de/#xl_xr_page_downloads). In this process, a project goes through the nine main criteria of the model over the entire life cycle and implements a CIP and reflection cycle.

Another way of determining the status and further developing one's own project management are the so-called **maturity models**. In order to meet a stage of development ("maturity"), certain criteria must be met. Starting at the lowest development level, you check which corresponding criteria have already been met and which have not yet been met, implement them and thus move on to the next development stage. On the one hand, maturity models are very popular, but on the other hand, climbing a subsequent stage of development is far underestimated by most people and many give up in between. Furthermore, it is associated with special consequences if you want to maintain a degree of maturity once you have achieved. The danger of creating a "bureaucratic monster" that inhibits more than it helps is considerable. ***Figure 81*** shows an example of a graphical maturity assessment.

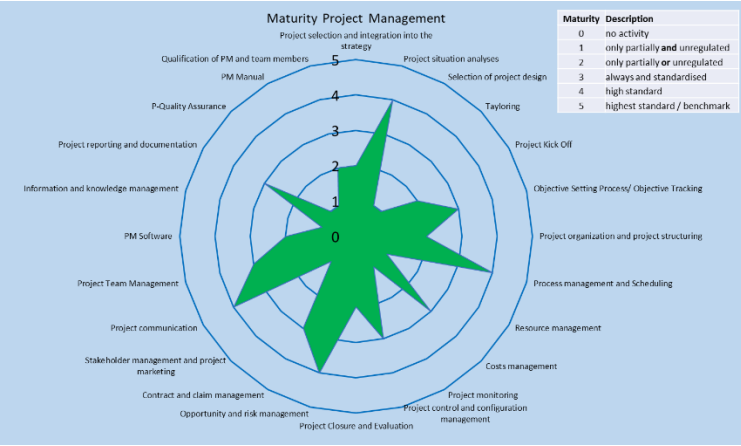


Figure 81: *Example of a maturity assessment*

In Agile project management, reviews and retrospectives are regularly scheduled. Another important approach to optimization is the **DevOps** method. This is about improving software during development (Dev = development) and operation (Ops = operations) by developers and operators working together to develop the product, especially after the MVP. DevOps seeks to achieve a cohesive development of culture, processes, and tools. In practice, many approaches to DevOps as well as entire IT packages, such as Azure DevOps from Microsoft, have already been created.

Checklist for optimizing project management

• There is a basic concept for optimising project management, which is updated regularly.	
• The concept offers continuous and regular measures as well as projects with larger improvement projects.	
• Evaluations and audits of individual projects and the PM system take place regularly.	
• The concept actively involves the stakeholders. The benefits are clear to everyone involved, so everyone is happy to contribute improvement measures.	

9.4 Mission, Vision, Strategies and Projects

„You don't discover new continents without having the courage to lose sight of old coasts.“ **Andre Gide (1869-1951)**

The **mission** describes the contribution an organization should make. The **vision** defines a picture of the future of the organization, which is to be pursued within a defined period of time. From both, strategies for implementation are developed. The **strategies** of an organization and its projects should be closely linked. Projects either ensure the continued existence or progress of an organization or lead to revenue.

Projects are our bridge to the future! **Thor Möller (*1968)**

Only selected projects should take place in each organization. Depending on the orientation of the organization, there are of

course different focal points. ***Figure 82*** shows an overview of a possible **project mix**.

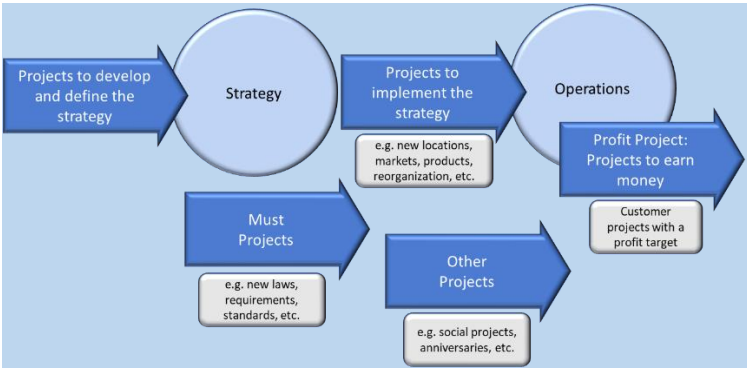


Figure 82: *Which projects should take place*

Figure 82 shows that a strategy development should first take place. This takes place over one or more projects and is also updated again and again via **strategy development projects**. The resulting **vision** includes **strategies**, which should be implemented through projects. The resulting operational business can include projects on behalf of customer that generate income (**profit projects**). At the same time, **must-do projects** are carried out that are absolutely necessary due to legal provisions, environmental requirements, etc. Furthermore, **other projects**, e.g. anniversaries or projects with a social background, etc. can be pursued. ***Figure 83*** presents the different project backgrounds in tabular form.

	Strategy projects	Profit Projects	Must-do projects	Other projects
Description	Projects for the development and implementation of the strategy	Projects to earn money	Indispensable projects due to legal regulations, etc.	Projects with social or indirect benefits
Examples	M&A, product development, organisational development, etc.	Projects on direct customer behalf	Implementation of new laws, regulations, environmental conditions	Social projects, anniversaries, etc.
Benefits / contribution	Strategic contribution to the organization	Financial contribution (positive cash flow) to the organization	Existential contribution to the continued existence of the organization	Social or indirect benefit like image enhancement, etc. for the organization

Figure 83: *Different project backgrounds*

„A dream is essential if you want to shape the future."
Victor Hugo (1802-1885)

Starting from the vision, strategies are defined, which in turn are implemented through projects. In order to define the right **project mix** and have an overview, a **project roadmap** should show which projects need to be carried out and when in the

next few years in order to achieve the strategy (see ***Figure 84***). Nowadays, a time perspective of five years is common for visions.

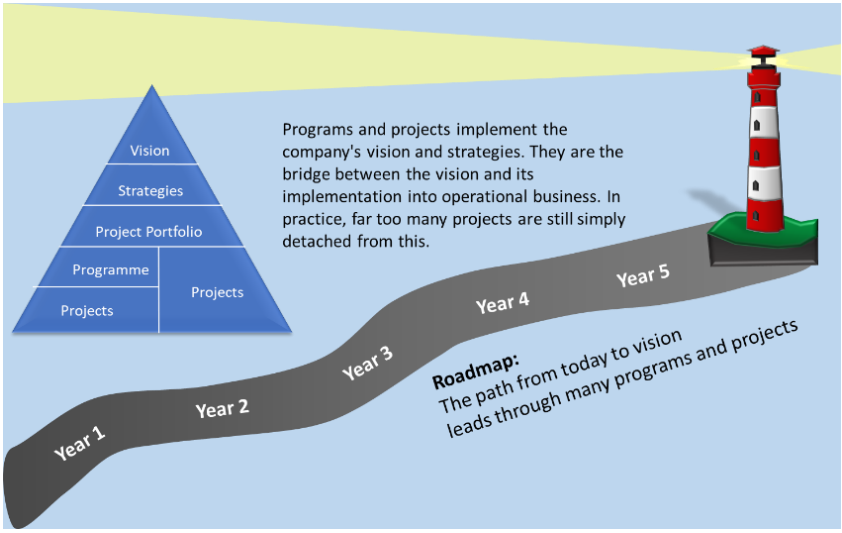


Figure 84: *From vision to project roadmap*

„Those who do not have a vision can neither fulfill great hopes nor realize great undertakens."
Woodrow Wilson, U.S. President (1856-1924)

However, a **project roadmap** should not only include the projects for strategy implementation, but all projects. If you present all already known projects of the next few years in a bar plan (see ***Figure 85***), this makes it easier to see, among other things, in which periods of time the organization might already be too burdened with projects or even overloaded (see Section 9.5).

Figure 85: *Project roadmap (excerpt)*

„The future belongs to those who recognize the possibilities before they become obvious.“ **Oscar Wilde (1854-1900)**

Quote

Strategy implementation is usually carried out with multi-project management (see next section). Alternatively, or additionally, i.e. hybrid, the **Objectives and Key Results** (OKR) method can also be used here (see also Section 10.1).

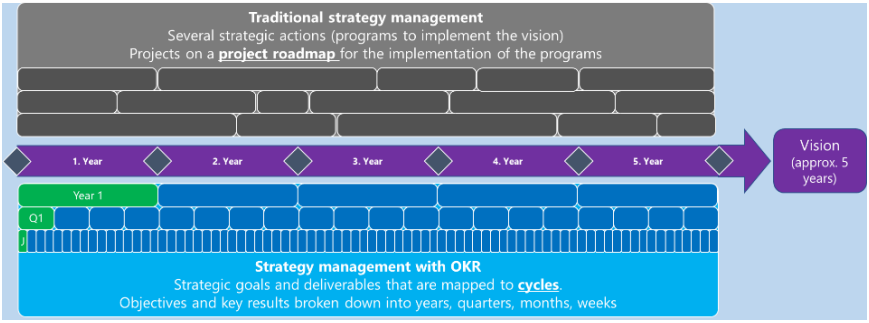


Figure 86: *Example time structure in OKR*

OKR can be thought of as an agilization of strategy execution because it applies the mindset of agility to manage the implementation of strategies. The main focus is on time orientation instead of content orientation, the creation of granular units, the greatest possible transparency, etc. In particular, time

orientation is decisive. The roadmap is not developed with individual projects, but time slices. A 5-year vision is given large outcome targets for each individual year. The first year is then defined more precisely with rough quarterly specifications. Then you set the specifications for the first quarter on a monthly level and refine the first month, which can also be divided into weekly goals. ***Figure 86*** symbolizes this subdivision (Roadmap above, OKR below).

Company | OKR 20XX CW01 | 14.05.2025

20XX		% fulfilled
Annual Objective A	Key results	0%
Annual Objective B	Key results	0%
Annual Objective C	Key results	0%
Annual Objective D	Key results	0%
Q1		**% fulfilled**
Quarterly Objective A	Key results	0%
Quarterly Objective B	Key results	0%
Quarterly Objective C	Key results	0%
Quarterly Objective D	Key results	0%
January		**% fulfilled**
Monthly Objective A	Key results	0%
Monthly Objective B	Key results	0%
Monthly Objective C	Key results	0%
Monthly Objective D	Key results	0%
CW01		**% fulfilled**
Weekly Objective A	Key results	0%
Weekly Objective B	Key results	0%
Weekly Objective C	Key results	0%
Weekly Objective D	Key results	0%

Template OKR engl.xlsx | OKR Master: Full Name | page 1 from 1

Figure 87: Example for Excel Template OKR

Figure 87 shows an example of a simple template for OKR with Excel. Depending on the lowest unit (month or week), a new spreadsheet should be used for each time period. There are a

variety of xls templates for OKRs on the Internet. Alternatively, there are also a lot of IT applications for OKR.

Strategy and Projects Checklist

• Mission, vision, strategies and projects are closely linked in the organization.	
• A project roadmap shows the path to strategy implementation and vision achievement.	
• A project mix offers the optimal mix of projects for strategy implementation, must-have projects, profit and other projects.	
• Alternatively or in addition, OKRs are defined.	

9.5 Multi-project management

In the past, individual project management was completely sufficient. Projects were rather the exception. Nowadays, the proportion of projects is significantly higher in almost all organizations. However, this also means that the projects permanently tie up a lot of capacity and capital, and the sum of the risks across all projects could jeopardize the continued existence of the entire organization. In addition, projects can also benefit greatly from each other, e.g. through joint purchasing or joint developments.

Multi-project management (MPM) is the umbrella term for the cross-project management of a collection of projects. The bundling of several projects can be a portfolio or a program. While in a **program** the projects pursue a common, usually

strategic goal, **portfolios** can include projects and also programs that pursue very different objectives, but e.g. rely on the same pool of resources.

Similar to the introduction of project management, you have to defend the meaningfulness of MPM again and again and show the benefits. The following **advantages** that can be achieved through MPM offer arguments:

- Only projects that **make sense for the organization are selected** (strategy contribution, positive cash flow, must-have projects or social projects). See also flowchart for project selection in **Figure 5**.
- A good **mix of projects** is selected to ensure the short-, medium- and long-term existence of the company.
- Only as many projects are carried out at the same time as the organization can handle at all points in time (**finances, capacities and risks**).
- Projects are timed in such a way that **there are as few major bottlenecks or underutilization as possible**.
- Projects are processed according to **company-wide priorities (prioritization**).
- Cross-project **financing and risk management** takes place.
- There is a cross-project **allocation of resources**.
- Poorly performing projects are **recognized** and **promoted more quickly or canceled more consistently** instead of them slowly silting out and being forgotten at some point.
- Projects can **cooperate**, e.g. through joint developments, instead of reinventing the wheel again and again. Example:

Introduction of AI technologies at various points in a company.

- Projects **learn faster** from other projects and **benefit from each other**, economies of scale (e.g. in joint purchasing) can also be used.
- MPM avoids that projects are from **hindering each other**.

A common problem is the overload of organizations with too many projects, so that hardly any project can be done properly due to endless troubleshooting (see ***Figure 88***). If you dance at too many weddings, you won't dance properly at any of them.

Figure 88: *if you start too much, you won't finish anything*

An ecosystem works best when it is balanced. As soon as a one-sided overload occurs, it can tip over. A pond or aquarium should therefore always contain a maximum of as many fish as the amount of water and the overall system can tolerate (see ***Figure 89***).

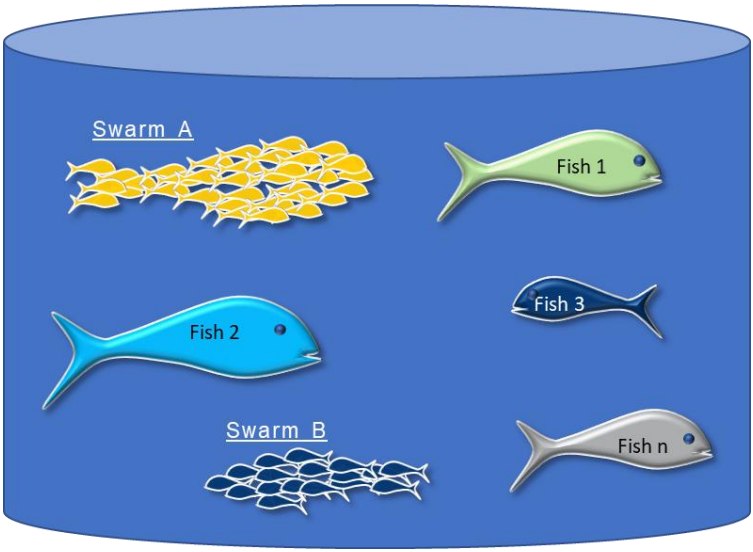


Figure 89: *Balanced ecosystem*

If you transfer this "law" from nature to an organization, then you can conclude that an organization should only carry out as many projects at the same time as it can tolerate. Unfortunately, however, organizations are increasingly being grafted into projects and it can lead to the collapse of individuals, projects or parts or the entire organization. With a healthy number of projects, new projects should only be started if existing projects are completed or cancelled at the same time, thus freeing up capacity for new projects (see ***Figure 90***).

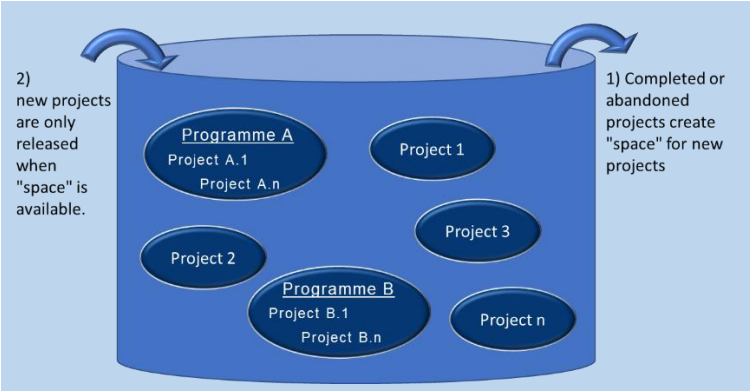


Figure 90: *Balanced project portfolio*

However, this overall view is not yet sufficient for the MPM. To ensure healthy overall utilization over long periods of time, the projects and programs included in the portfolio must be reasonably distributed across all levels in the portfolio.

So if you look at the individual stages of project progress in a portfolio, then a project should only move to the next stage if another project has previously left this stage. So you have to start with the advanced projects and complete them consistently in order to create free capacity for follow-up projects (see ***Figure 91***).

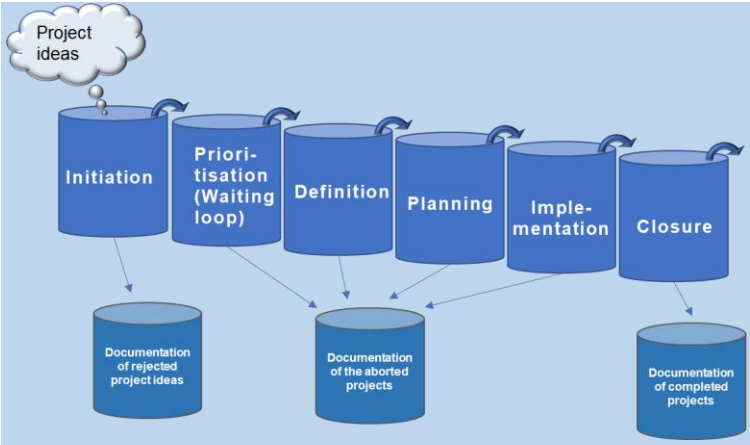


Figure 91: *Stages in project portfolio*

In a holding loop (prioritization), the approved projects remain "on hold" until free capacities are created in order to be able to start only then. ***Figure 92*** shows a balanced **MPM pipeline**. Here it can be seen at a glance that projects and sometimes also programs are included in each level. If it were not balanced, then at times many and sometimes few projects would be completed and it would lead to strong fluctuations in capacity utilization.

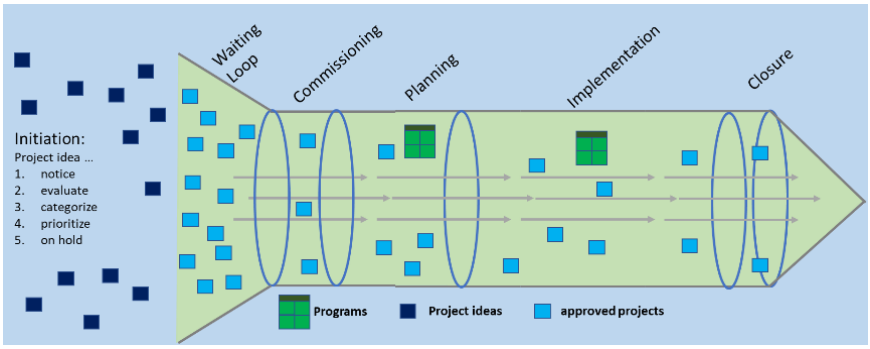


Figure 92: *Balanced MPM pipeline*

For large projects or **multi-project situations in Agile project management** with Scrum, for example, **Scaling Scrum** or **Nexus**. However, these practices apply to large-scale projects or programs, not project portfolios. The cross-project Scrum process and the roles behind it are adapted accordingly. A special feature of this is that although there can be several development teams and Scrum Masters, there can only be one Product Owner. Accordingly, there is only one product backlog and one overarching DoD in total, as well as only one sprint review per cycle. All other process steps, such as Sprint Planning, Daily Scrum, Sprint Retrospective, etc.) are carried out on the one hand at project level per development team and across projects with a so-called integration team. Other very popular scaling of Agile approaches are **Scaled Agile Framework (Safe)** and **Large Scale Scrum (LeSS).** The basic principle of these approaches is always the same. In a kind of swimming lane principle, all teams involved produce the required results of the current iteration in parallel at the same start and end time

(cycle). With the transition to Agile organizations, **Atlassian's** Spotify Agile Model is gaining popularity.

Checklist Multi-Project Management

• The advantages of the MPM are known and communicated.	
• The MPM ensures a 'balanced ecosystem' without prolonged over- or under-utilisation of employees.	
• The MPM ensures that the total funding across all projects cannot jeopardize the organization as a whole.	
• The MPM ensures that the risks taken together across all projects cannot endanger the organization as a whole.	
• The MPM ensures mutual benefit of the projects, such as economies of scale, cooperation in the development of individual modules, etc.	
• The MPM ensures a balanced PM pipeline.	

9.6 Establish a project management office

A **project management office** (PMO) is a permanent organizational unit that supports, coordinates or even leads project management as a whole as well as multi-project situations, and also provides operational assistance for individual projects. A PMO can therefore be described as the **headquarters for the PM**.

A certain amount of project work within the organization is required for a PMO to be worthwhile. A PMO will then support the projects and continuously develop the maturity level of the PM. The wide range of services of a PMO consists primarily of optional tasks, such as standardizing, creating, monitoring, controlling, optimizing, facilitating, etc., which can be assigned to the PMO permanently or temporarily. The characteristics of PMO are therefore very diverse in practice.

PMOs are often confused with a **project office** . However, there are significant differences here. A project office or **program office** is a temporary organizational unit that provides support exclusively for a specific project or program and only exists for its duration. A PMO, on the other hand, is cross-project and permanent.

With its comprehensive range of services, a PMO can bring significant **benefits** to a single project or program and the entire organization. A PMO supports **operational project management**, i.e. individual projects or programs, among other things, by:

- Provision of standards for the PM (structures, processes, tools and templates)
- Content-related support, such as selection of PM approach, design of kick-offs or definition of goals
- Support of project controlling, e.g. benchmarks
- Training, further education and coaching of project staff
- Support in conflicts, e.g. facilitation / mediation

- Creating a link between projects so that they benefit from each other, e.g. joint development or purchasing
- Operational support, such as the facilitation and documentation of important meetings

Furthermore, a PMO can bring many advantages for **strategic and multi-project management** . It can, among other things:

- Prioritize the projects and programs and coordinate project portfolio management.
- support in the selection of projects, e.g. through feasibility studies and cost-benefit analyses.
- Perform cross-project resource allocation, financial management, and risk management.
- Find and use economies of scale (e.g. in purchasing).

The diverse potential **responsibilities of a PMO** can relate to three focus areas: controlling, monitoring and supporting. Many of the tasks serve at least two focal points. ***Figure 93*** assigns typical tasks of a PMO to these three focal points. Which of these tasks should be performed by a PMO and with what intensity must be analyzed and decided individually for each organization. A very small PMO might only do one or two tasks, a comprehensive PMO could do almost all of the above tasks.

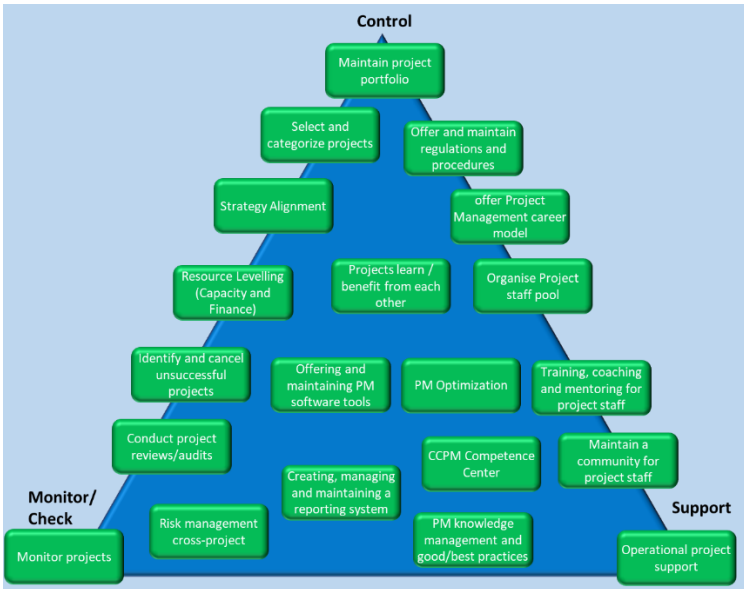


Figure 93: *Possible tasks of PMO*

On the part of the organization and projects, a PMO is often subjected to unrealistic requirements. It should not disturb and cost nothing, but in particular it should take over all unpleasant things and serve as the general culprit in the event of a project failure. A PMO is usually not perceived as a profit center, but rather as an unpopular troublemaker in project work. Therefore, PMO leaders must constantly defend themselves and affirm their raison d'être. A PMO often feels like a "*piggy in the middle*" (see ***Figure 94***).

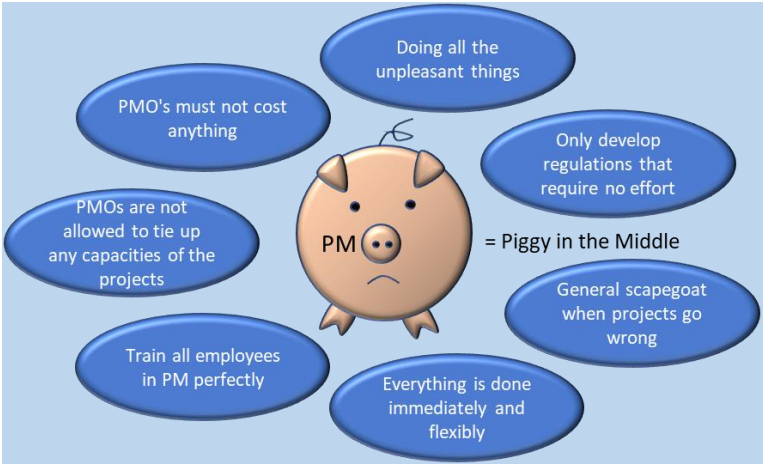


Figure 94: *The PMO as Piggy in the Middle*

The **introduction of a PMO** is a special challenge and must be understood as a project itself. There are many things to consider. The following **tips for implementing a PMO** are a selection:

- It is essential to have a clear mandate from the company's management.
- Setting a clear vision.
- A step-by-step introduction seems useful.
- Working with pilot projects.
- A lot of information and education.
- Communicate the benefits (compared to the effort) again and again.
- Integrate project managers and teams.
- Create real advantages through facilitation, conflict resolution, knowledge transfer, etc.

- Create tangible solutions for project managers and teams.
- Project managers and teams must feel relief.
- Quick wins should emerge.
- Integrate workers council.
- Don't create too much administration, but set an example of focus.
- Don't want everything too fast and right away.
- Do not intervene in the operational project business, but only support.
- First introduce the system and then the software.
- Always ask the question: "What does no PMO actually cost?"

An important argument for a PMO is the relief of leaders and project managers. By centralising MPM and PM tasks, both leaders (organisational management) and project specialists (project management and staff) are relieved of administrative activities, so that they can concentrate much more on their substantive work (see ***Figure 95*** and ***Figure 96***).

Figure 95: *Distribution of tasks without PMO*

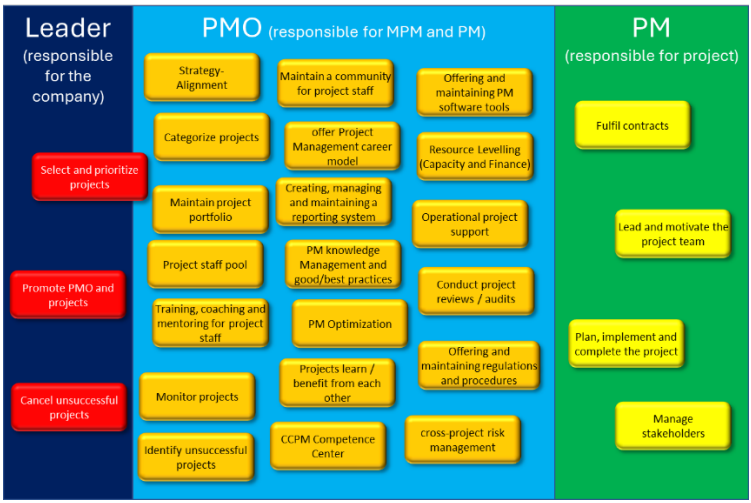


Figure 96: *Relief potential through a PMO*

A PMO as a PM headquarters is a management task that requires a wide range of skills. ***Figure 97*** shows a big picture of PMO competencies that can be available and offered in a comprehensive form of a PMO.

Figure 97: *Big Picture PMO Competencies*

Project Management Office Checklist

• Vision for the PMO	
• Clear mandate from the company's management	
• The benefits of a PMO are well known and communicated.	
• A tailor-made concept for the design of the PMO is available.	
• The tasks and non-tasks of the PMO are defined and known in the company.	
• There is a sound introduction or further development concept for a PMO.	

9.7 Career Models and Certification

„An investment in knowledge still yields the best interest rates.“ **Benjamin Franklin (1706-1790)**

„There is only one thing that is more expensive in the long run than education: no education.“ **John F. Kennedy (1917-1953)**

Many organizations offer **two basic career paths in particular**, the **management career** or **professional career**. Both paths offer excellent opportunities and are not mutually exclusive. Collaboration or even management of projects offer an excellent opportunity to prove oneself or to stand out and develop further or even to change paths.

„Train or lose!"
Jimmy Connors (*1952), American Tennis player

„Those who always do what they can already do will always remain what they already are.“ **Henry Ford (1863-1947)**

Since the share of project management as a whole and in almost all organizations is steadily increasing and gaining in importance, more and more organizations are also offering the career via **project management as a third career path**. The development path can go from project team member to sub-project management to project management of small, medium-sized and larger projects and on to program management to project portfolio management. Likewise, stations can also be part of the PMO with roles ranging from PM assistant to PM controller, PM auditor, PM coach and PM trainer to PMO

management. Of the individual levels, a change to a management career in particular is realistic and usually also desired. Project managers get to know almost all functions of organizations and the necessary leadership activities as well as working under enormous pressure and are therefore very well suited for higher management positions.

"If you give a man a fish, he will have a single meal.
If you teach him how to fish, he will eat all his life."
Kwan Tzu (300 BC) Chinese philosopher

The **certification of project professionals** can give an orientation based on development stages. The individual certification levels and directions of the major providers of project management certifications provide not only the organization itself, but also the employees with an orientation about its state of development. In addition, a certificate is a proof of competence and a reference to the outside world. It motivates employees and can be placed as an incentive.

Among the important **certificates** are in particular the certificates of (see also Section 0):

- IPMA and its member associations
- PMI
- Prince2
- PM^2 von der EU
- Scrum (via two different paths: Scrum Alliance or Scrum.org)

Each **certificate** has its own focus. In this respect, it is not easy to choose the right certificate. You have to analyze well what

you really need and which certificate suits it best. Typical criteria are: intentions and goals of the certification, predominant approach in one's own organization or with customers, time required, costs. You can either concentrate on the same approach as your colleagues or consciously differentiate yourself with a different approach ("exotic").

An institution or person who only presents and recommends one approach as the best is dubious. The certificate must meet the requirements of the organization or the candidate, and each certificate has corresponding focuses and strengths.

In-house training is usually worthwhile for five or more people. This reduces the participation costs per person as well as travel costs and travel times. And in-house training can be adapted to the needs of the organization.

Checklist Project Management Career Models

• The employees are constantly being developed in project management.	
• Projects are an integral part of career development.	
• Employees have the opportunity to develop their careers through projects.	
• There is the possibility for employees to be certified in project management.	
• Certificate checks of several organizations are made possible in order to be able to find tailor-made certifications for each department or individual.	

9.8 Digitization in project management

Of course, **digitization** also influences project management. It offers a large number of opportunities for effective and efficient project work. On the other hand, new dangers also arise, e.g. through data loss, manipulation, theft, etc. on previously unknown scales.

IT support in projects can be diverse. It ranges from the application of normal office software to collaboration platforms to PM software as freeware to professional PM software solutions. The Covid 19 pandemic also led to a boom in software for holding conferences and trainings as well as collaboration software. In addition, applications with **artificial intelligence (AI) are increasingly** being introduced. For project management, e.g. **Business Intelligence (BI),** intelligent ChatBots, Co-pilot, ChatGPT, etc. offer many support options from content and knowledge generation, to analysis, reporting and logging to project marketing. BI is particularly useful in automated reporting (see Section 8.5) in order to achieve enormous savings potentials. AI will dramatically change project management, as it does in the business world as a whole.

The **use of generative AI** is already widespread and can save an enormous amount of time. But generative AI does not replace creativity and the creation of real innovations, because it combines what already exists at best, but does not really create something new. And innovative solutions are central requirements for projects. Generative AI can therefore create solid design solutions in a first step, but these must then be led

to mature solutions by human expertise and intelligence. Simply copying and pasting generative AI solutions would therefore not be intelligent, but stupid.

„The most dangerous thing about technology is that it distracts from what really makes a person tick, from what he really needs.“ **Elias Canetti (1905-1994)**

The lowest basis is the use of common **office software**. Nowadays, a large part of written correspondence is still done via email programs. The largest number of textual documents, such as contracts, etc. are created with a word processor, presentations with a presentation program and tables, calculations, checklists, etc. with a spreadsheet program. Oral correspondence, even with several participants, can also be carried out digitally, e.g. via Internet conference systems. A spreadsheet can also be used to display original project management methods, such as a bar chart, earned value analysis, burndown charts, etc. However, this quickly reaches its limits for these purposes.

For this reason, even at a fairly low level of maturity, the additional use of special **project management software** (PM-SW) is recommended. There are many hundreds of providers and solutions for this, ranging from fairly easy-to-use freeware to professional and comprehensive, but also quite expensive offers.

In order to ensure the **availability of data** for all project participants, data storage on a central server or in the cloud is indispensable today. However, this also requires a well-thought-out

rights concept that regulates exactly who has which access rights. Otherwise, significant problems can quickly arise due to data loss, manipulation or theft. Of course, the data must also be protected from access by third parties.

Collaboration software, such as Microsoft Teams, **has made a strong development boost**. For each project, a temporary team or Teams channel can be defined, which has its own digital area (Sharepoint) with data, communication and tools (apps). This is particularly helpful in projects with cross-organizational collaboration. In addition, email communication can be significantly reduced. Due to the increasing integration of Microsoft products, MS Teams is increasingly being used as a PM-SW. Apps integrated with MS Teams such as MS Planner (see ***Figure 98***), One Note, ToDo, Outlook, etc. offer comprehensive solutions for project management.

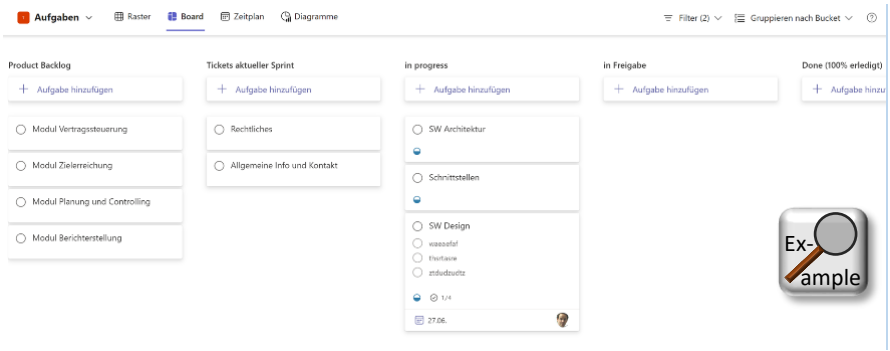


Figure 98: *Kanban Board by MS Planner in MS Teams*

Especially when working with **virtual teams**, i.e. regionally strongly distributed teams, the digital tools mentioned are suitable. However, digital communication and collaboration as

a whole should always be supplemented by personal communication. The requirements for leadership and communication are considerably higher with virtual teams.

For some years now, the **Internet, especially social media and AI,** have opened up many other possibilities. These can be used primarily for analyses, reporting, internal and external communication, and much more. (see Section 8.3).

„If they digitize a shitty process, then you get a shitty digital process.“ **Thorsten Dirks (*1963)**

The **implementation of PM software** is always a separate project and cannot be done on the side. In addition, it is particularly important to first have a certain amount of substance and initial experience in project management in order to better know what you really need. With the selection and introduction of PM software, many adjustments, standardizations and optimizations of project management can certainly take place in parallel.

A frequently chosen path in practice is to try to introduce project management at the same time as purchasing PM software. From the author's point of view, this is not expedient and involves too many risks. Experience has shown that failure is highly likely to occur. Project management should always be introduced first in order to then find and introduce an optimally suitable PM software.

A manufacturer-independent and thus neutral platform for the selection of PM-SW including practical tips for selection and introduction is provided by the website www.pm-software.info.

For further in-depth study, reference is also made to a corresponding PM software study.

An outlook on the future of digitization in project management ventures the Section 10.1.3.

Checklist Digitization in Project Management

• There is a clear concept for the digitization of project management and is updated regularly.	
• The concept has been communicated and the implementation is constantly being driven forward.	
• Data protection, data availability and data backup are indispensable components of the concept.	
• The digitization of project management also supports virtual teamwork.	
• The employees are supported and further developed with regard to the digitization of project management.	

9.9 International Project Management

„Inside and outside, dare and win." (Buten un binnen, wagen un winnen."), **Otto Gildemeister (1823-1902)**

International project management involves **many additional challenges** for project managers and project team members. These include language barriers, cultural differences, time differences, different legal systems, among others. In principle, it can be assumed that the additional international aspects can significantly increase the effort and duration of projects. In

addition to the skills required to manage a project at regional or national level, there are also many demands on project personnel.

Additional aspects of international project work can be clustered into the following areas in particular:

- political
- economical
- technical
- legal
- organisatorisch
- cultural
- sprachlich
- social

The **political situation** in other countries can differ considerably and have corresponding consequences for the project. Things that are taken for granted in one's own country no longer have to be given. On the other hand, other things may be fixed that are not usually present in one's own country. Political stability also varies from country to country. This is especially important if elections take place during the project period. Operationally, e.g. appropriate entry regulations must also be taken into account.

Economic factors are the systems and structures in place in the target country and, in turn, their stability. In particular, inflation and currency fluctuations can have consequences for the project. However, the situation on the labour market as well as

different economic development systems and mutual economic agreements must also be taken into account as a rule.

There is also a wide range of **technical aspects**. Technical standards, the type and reliability of the power supply, the effects of climatic conditions such as heat, cold, humidity, are just a few examples. In addition, the question arises as to whether technical services can be offered at all and what quality they have.

The **legal differences** can have significant consequences for the project in just as many ways. Different legal systems and structures as well as different legal interpretations and possibilities for enforcing law may exist. Of course, safety regulations as well as regulations for occupational health and safety and environmental protection, etc. can also vary. The choice of contract language alone is an important strategic decision.

Additional **organizational challenges** are especially present in transport, travel and meetings. Transports take longer, cost more and have to take into account regulations such as customs regulations. Travel times of people are longer and must observe entry requirements, possibly vaccinations, etc. Meetings may have to take place with translations. When scheduling synchronous sessions, time differences must be taken into account.

Cultural manifestations can also be particularly influential. Above all, they are not as easy to determine and measure as the aforementioned aspects. Internationally deployed employees should have a basic sensitivity to intercultural conditions

and also have special knowledge of the specific country. The latter can be found relatively easily on the Internet under the search term "Doing business in ..." to find. But be careful: You should never think too much in stereotypes here either. The best way to gauge the value of cultural guides is to read a guide "Doing business in (your own country)".

The **linguistic points** to be considered in international projects include, in particular, the definition of the contractual and working language. Since every translation contains interpretations and can never be done one-to-one, considerable differences can arise here. Translations could be instrumentalized by a project party. However, the agreement on a third language (usually English) also leads to additional costs and additional problems compared to national projects. The entire communication is much more demanding in international projects due to language differences.

Finally, there are the **social aspects** to consider. Own travel and work abroad leads to additional burdens on oneself and your family. But guests from abroad should also be looked after and entertained in the evenings and on weekends. In the case of virtual collaboration, telephone or internet conferences can sometimes take place at night, early in the morning or late in the evening due to time differences.

The individual aspects and the resulting competence requirements are not further deepened in this book, but reference is made to the relevant literature on the topic of international project management and the corresponding special interest

groups on international project management e.g. at IPMA or national associations.

A number of institutions can be used to **obtain basic information** about the respective target countries. These include, in particular,:

- For e.g. Germany: GTAI Germany Trade & Invest (www.gtai.de) is a institution of the Federal Republic of Germany for foreign trade and location marketing. The website also contains links to other relevant institutions.
- Ministries at federal and state level
- Embassies and consulates
- Chambers of Industry, Commerce and Crafts
- International institutions, such as EU, EFTA, NAFTA, ASEAN
- House oy your country in the target country/region
- KfW (Kreditanstalt für Wiederaufbau), EBRD European Bank for Reconstruction and Development), World Bank
- Trading houses for the target country or region
- Business associations in the sector concerned

Most organizations exist both in their own country and in the destination country, so that there are often two institutions with different perspectives, e.g. your country's embassy in the target country and the embassy of the destination country in your country.

Checklist for international project management

• The international aspects of the project work are known and taken into account.	
• For international projects, corresponding additional expenditure of time and money is calculated.	
• The employees are constantly developed in terms of international and intercultural work.	
• There are working time concepts that regulate the handling of time differences as well as international travel and stays.	
• Longer international assignments are closely linked to the career planning of the candidates.	
• For returnees after longer absences, concepts and support for reintegration are available.	

10 PM and current Megatrends

The megatrends of digital transformation and sustainability determine our lives and our future more than ever. There is a special connection to project management because it is not only influenced by these megatrends like pretty much everything else in our lives, but is itself an influencing factor on these megatrends. The major challenges of digital transformation and sustainability are solved and/or implemented in programs and projects. For this reason, this chapter provides a small introduction as well as an exemplary approach to the connection between PM and the megatrends.

10.1 Project Management and Digital Transformation

The megatrend of **digitization** and **digital transformation** presents us with enormous challenges and is a key success factor for the future viability of organizations and people. Those who follow the trend can win; those who do not follow the trend will perish.

This section begins by describing the difference between digitization and digital transformation and then provides exemplary procedures for planning and implementing digitization strategies in its main part. Finally, there is an outlook on the future of digitization in project management.

10.1.1 Digitization and digital transformation

Especially in combination with project management, the distinction between digitization and digital transformation is important.

Digitization is the process of transforming information from analog to digital formats as well as the implementation of digital technologies from a technical point of view.

Digital transformation, on the other hand, is the transformation of organizational units to higher levels of maturity of digitalization, especially in structures, processes, tools, process models, etc. through process optimization, standardization, organizational development, personnel development, cultural development, etc. In addition to the technical aspects, organizational and human concerns play a decisive role here.

10.1.2 Managing Digital Transformation

Digitization strategies should be implemented in the form of a **program with its own vision**. The three main steps are the analysis of the initial situation, the vision and objective setting and the determination of the path. All three steps take into account the dynamic environment and must be reviewed and updated on a revolving basis – at least annually. ***Figure 99*** shows an overview of the three main steps.

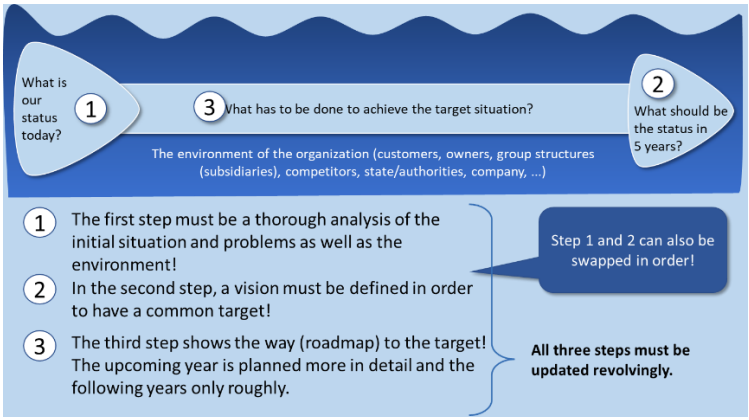


Figure 99: *The three main steps of strategy implementation*

Due to the massive scope for an organization, digitalization officers often ask the **question of where to start and how to proceed**. A **top-down and bottom-up strategy** is recommended. First, the frame must be specified from above (Top Down), and then related solutions must be processed from below within the frame (Bottom Up). As with a mosaic or puzzle, you often start with the frame and while it is being made, you are already working on the first sub-areas, which enable quick success. It is important that the sub-areas always fit into the frame and the overall picture (size/proportion, shape and colour), i.e. that technically speaking, the necessary interfaces to the other sub-areas work (see ***Figure 100***).

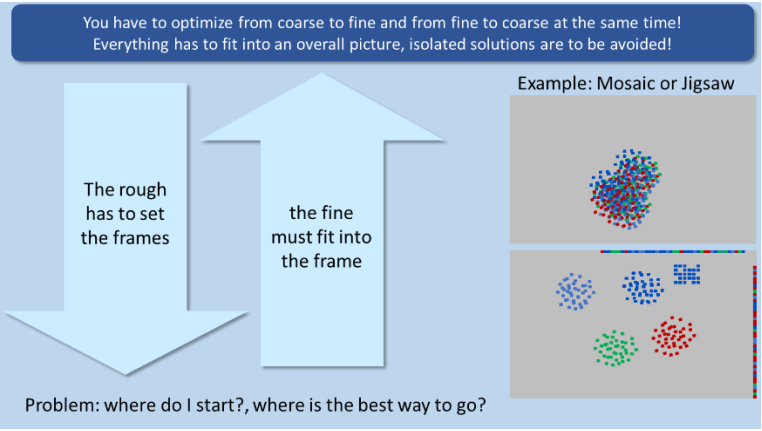


Figure 100: *Top Down and Bottum Up Strategy*

The corresponding **levels** must also be observed. The top level provides the framework, the middle level plans and monitors the implementation of the strategy, and the lowest level implements the measures (see ***Figure 101***).

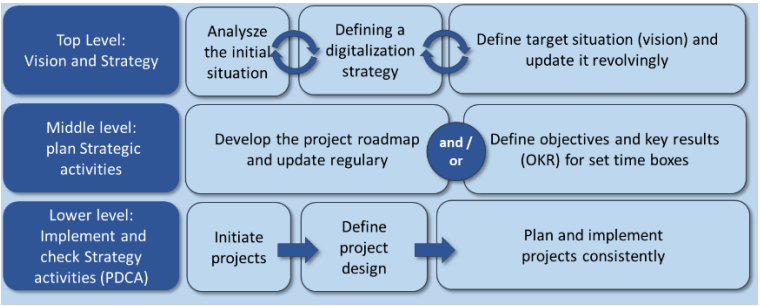


Figure 101: *Different tasks of each level*

In order to ensure a regular review of the objective and the procedure, a **revolving approach** is necessary. Existing plans

have to be reconsidered and revised again and again. This can be managed in a **cyclic phase model** (see ***Figure 102***).

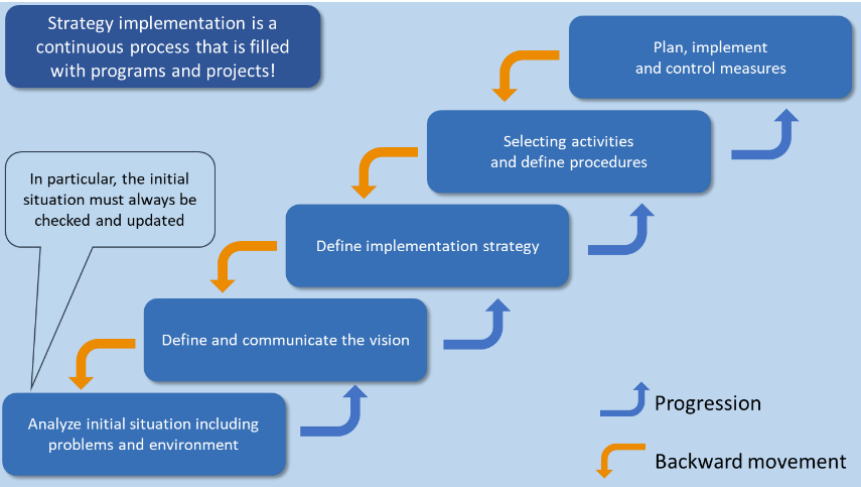


Figure 102: *Cyclic phase model*

The strategy implementation procedure can be hybrid, i.e. in a **combination of a project roadmap and the OKR method** (see Section **Fehler! Verweisquelle konnte nicht gefunden werden.**). The combination of the two ways of thinking is not entirely trivial. For example, projects must be worked on in parallel, which on the one hand are results-oriented, Agile or hybrid and on the other hand follow a roadmap that is managed in terms of content or time. ***Figure 103*** represents this schematically.

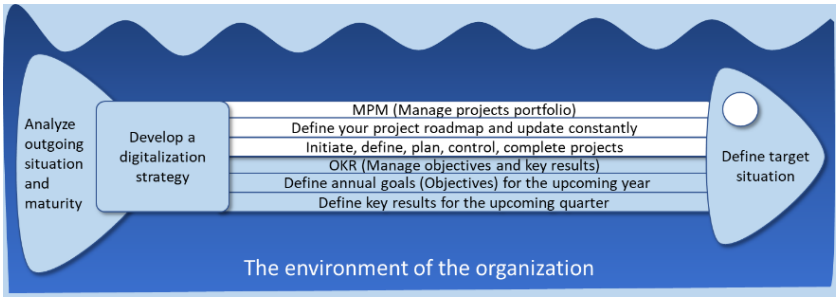


Figure 103: *Example of digitalization with hybrid PPM*

This **hybrid project portfolio management (PPM)** can also be controlled with a **Kanban board**. The example in ***Figure 104*** shows the parallel processing of the two different approaches. The upper track is timed in terms of content and the lower one in times spans (iterastions).

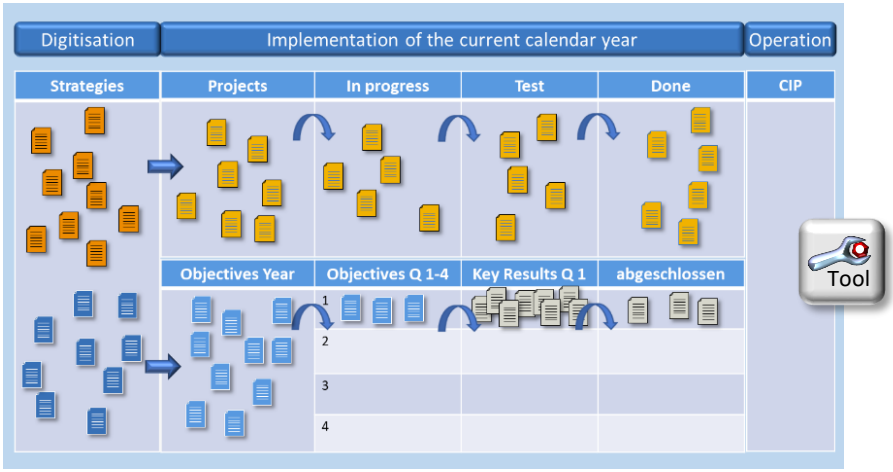


Figure 104: *Hybrides Kanban-Board auf Portfolio-Ebene*

When it comes to digitalization, the focus is often on the technical challenges. However, the **importance of people** must not be neglected in digitization. For the following reasons, humans should play a central role:

- Technology is usually more advanced than humans.
- The demands of people are usually more diverse.
- People are less calculable than technology.
- People's demands are often not rational. Example: Controlling collects even more data, but in the end nobody needs it.
- It doesn't work without, but only with the employees.
- Many people are afraid of digitization and can thus get into a downward spiral (vicious circle). This must be prevented.

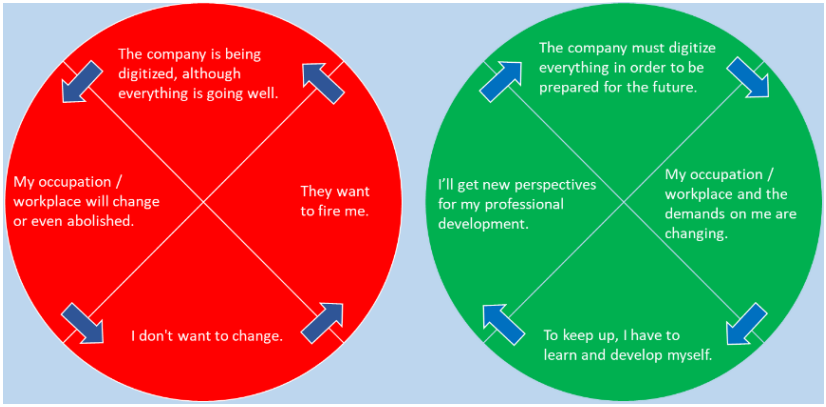


Figure 105: *Digitization of the employee perspective*

Some people see change as an opportunity, others as a threat (see ***Figure 105***). In order to be able to accompany employees in a more targeted way in the digital transformation, they can

be divided into groups. This can result in the following groupings, for example:

- **Multipliers**: Drivers who see opportunities for themselves in digitization.
- Opponents because they are **afraid of being overwhelmed**.
- Opponents because they are **afraid of rationalization**.
- Opponents because they are **afraid of transparency**.

The multipliers can be used to get positive support. You have to take away the fears of the opponents and motivate them to undergo digital transformation. This is a difficult and lengthy process, but necessary if you don't want to lose these employees. It is important that you do not take them by surprise, but really convince them. Experience has shown that it will unfortunately not be possible to take all employees with you on the journey of digitization. Other, socially acceptable solutions must be found for these employees.

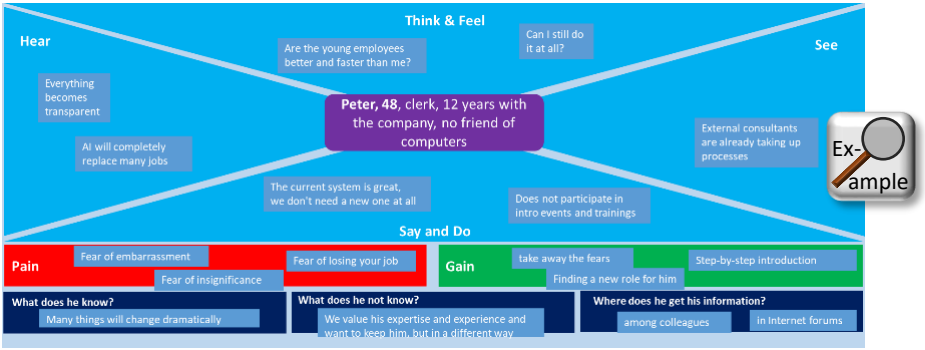


***Figure 106:** Example Empathy Map in Digitization Project*

Figure 106 shows an example of a completed empathy map.

The measures required in addition to the technical requirements are therefore diverse. They can be divided into three areas: **organizational, personnel and cultural development** (see ***Figure 107***).

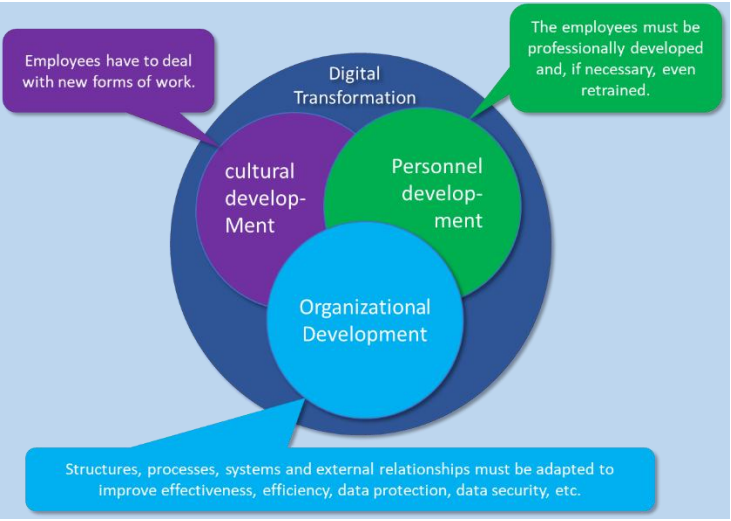


Figure 107: *Requirements for digital transformation*

There are **many ways to take away people's fears**. It is important to meet them where they are and to go on the journey of digitization together with them. **Regular orientation workshops** with employees can lead to exchange ideas and aim for different objectives. Among other things, you can always point out the advantages for each individual employee, such as the concentration on essential / important tasks, more flexibility, the possibility of working from home, and much more. It can also be shown how diverse we all already use digitization in our private lives. After all, it is a **paradox when people use the**

digital world extensively in their private lives, but shy away from it in the professional world. The digital traces left behind by the mass of the population entail enormous risks for every single person. Nevertheless, the majority in the private sector is extremely careless about digitization. This is where all employees of an organization have the enormous opportunity to learn as much as possible from digitization in their professional environment in order to make better use of digitization in their private lives and to better protect themselves as individuals.

There are a variety of measures for **personnel and cultural development**. These include, among others:

- Trainings
- Talks
- Communication
- Active project work
- Team building
- Pilot projects
- Building models and prototypes together
- Carry out customer experience journeys
- Cross-departmental collaboration

All of this must be designed individually for each organization.

10.1.3 Scenario: digitized PM

The topic area 'Digitizing Project Management' based on the current possibilities is part of Section 9.8. This scenario develops a **forecast about the digitized project management of the**

future. The central question here is what digitized project management **could look like** from about 2030 to 2035.

It can be assumed that hardware and software will continue to develop rapidly in the coming years. The **bottleneck** of development lies less in the technical than in the organizational, human and legal framework conditions. It is precisely in these aspects that special progress must be made. To achieve this, IT must be much **more intuitive** and **secure** to use in the future. It must **specify standard solutions** and still provide sufficient room for **flexible and individual procedures** without reducing **ergonomics, accessibility and safety**.

Digitized project management could look like this in this time: Project management software (PM-SW) will provide **much more extensive functions** and thus accompany and inform the project manager and each team member as well as the other project participants more comprehensively. **All** relevant processes and encounters take place in **a** digitally fenced area with several rooms and all relevant information is also available and secured here. It must be ensured that all actors receive only the information they need.

The protagonists' encounters take place hybrid in a **metaverse**, a digital world with a focus on social encounters, i.e. a **virtual replica of reality**. Personal meetings and digital encounters have thus merged and analogue or digital participation can be selected by each person depending on the situation. Through the constant digital encounter, these can be documented just as easily. Minutes are also created by machines.

Evaluations as well as written and verbal communication are largely automated by **business intelligence and chatbots.** Machines are increasingly exchanging basic information about projects directly.

10.2 Project management and sustainability

Considering **sustainability** affects the continued existence not only of individual organizations, but of the entire world. Actually, the realization that we as humans are destroying the world has existed for over 50 years, at the latest with the references to the **limits of growth by the Club of Rome in 1972**. But even decades later, environmentalists were still seen by many as cranks. It is only in recent years that awareness of the environment has increased in the economy and among broad sections of the population. It must be clear to every individual that this is not only about the continued existence of their own organization and thus their own job security, but about saving the world.

Sustainability should pursue three main objectives: economic efficiency, environmental protection and social justice. Internationally, the abbreviation **3P** is often used for **Profit, Planet, People**.

A **special but rarely mentioned success factor** in project management is the motivation of stakeholders to behave in a certain way. Sustainability is on everyone's lips and everyone thinks it is important. But if one's own behavior is to be changed or one's own sinecures sacrificed in favor of

sustainability, then sustainability suddenly seems frighteningly unimportant. The experience from project management can start here to really motivate people to behave sustainably and also to make project management sustainable. The really open secret is not to name sustainability as a reason for a change in behavior, but to design the change in behavior in favor of sustainability in such a way that the individual sees advantages for himself.

The requirements for project management to improve sustainability can be grouped as follows: the **implementation of projects must be more sustainable**, **the project results must be made more sustainable from the outset**, and **more projects** must be implemented to increase sustainability within and outside one's own organization (see ***Figure 108)***.

Figure 108: *Requirements for the PM to improve sustainability*

This section first presents possibilities in these three requirement areas. Finally, it presents a tool for measuring and optimizing sustainability, which Thor Möller has been using in his projects since the beginning of 2021 and has been optimizing ever since. Finally, a big picture by Thor Möller shows an overview of the possibilities of sustainability in project management.

10.2.1 Making project results more sustainable

Project results are often used for many years in a post-project operational phase. Therefore, they must be developed from the outset in such a way that they can be used as sustainably as possible in the operating phase. In terms of profitability, this should already be a matter of course today and should be taken into account in a **business case** and optimized over the entire life cycle. In addition to profitability (**profit**), the other two aspects of sustainability (**planet** and **people**) must also be included in the business case. Furthermore, it must be possible to return the project results to the cycle after the operating phase with as little residue as possible (cradle to cradle principle).

Overall, the following aspects must be considered, among others:

- Promote longevity (avoid disposable products)
- Reduce resource consumption
- Reduce emissions
- Using renewable energies

- Avoid unnecessary transport
- Avoid unnecessary printouts
- Observe the Supply Chain Act
- Promote conscious global or regional sourcing and seasonal purchasing
- Accept „green“ suppliers only
- Adhering to the Cradle to Cradle principle
- Avoid packaging waste
- Ensuring structured disposal

10.2.2 Implementing projects more sustainably

The scope of project work has been growing steadily for decades. Thus, projects already account for a significant share of economic output and thus have a corresponding influence on sustainability. Therefore, we have to carry out our projects ourselves in a more sustainable way. Because projects are "temporary companies", the same **measures** apply here as for organizations. These include, among others:

- Don't always reinvent the wheel
- Observe the Supply Chain Act
- Promoting social justice
- Ensuring equality and equal treatment
- only accept "green" suppliers
- do not accept dishonest customers
- Using renewable energies
- Regional and seasonal purchasing
- Avoid unnecessary transport

- Avoid unnecessary business trips
- Proper lighting, heating and ventilation of offices / rooms
- Turn off unused devices/PCs
- Avoid unnecessary printouts
- Avoid / reduce meat and fish consumption
- do not use plastic cups
- Avoid packaging waste
- Ensuring structured disposal

10.2.3 Carry out sustainability projects

In most cases, implementing sustainability means project work. The possibilities for sustainability projects are manifold and can amount to several objectives at the same time. If the strategy is geared towards sustainability, sustainability programs that coordinate the individual sustainability projects across the board are more recommended (see Sections **Fehler! Verweisquelle konnte nicht gefunden werden.** and 9.5). The UN's 17 **Social Development Goals (SDGs)** and the establishment of an **environmental management system (EMS)** can provide guidance here. **Project ideas for implementing sustainability** can be:

- Comply with sustainability laws and regulations
- Carry out projects on the 17 SDGs
- EMS introduced and, if necessary, also certified
- Promote longevity (do not offer disposable products)
- Introducing the Cradle to Cradle principle
- Improving pay equity

- Observe the Supply Chain Act
- Use renewable energies (e.g. PV systems)
- Optimize fleet and route planning
- Abolishing / reducing meat and fish consumption
- Implementing environmentally friendly lighting concepts
- Promote green roofs, bee colonies, etc.
- Dismantling soil sealing
- Avoid packaging waste
- Ensuring structured disposal
- Etc.

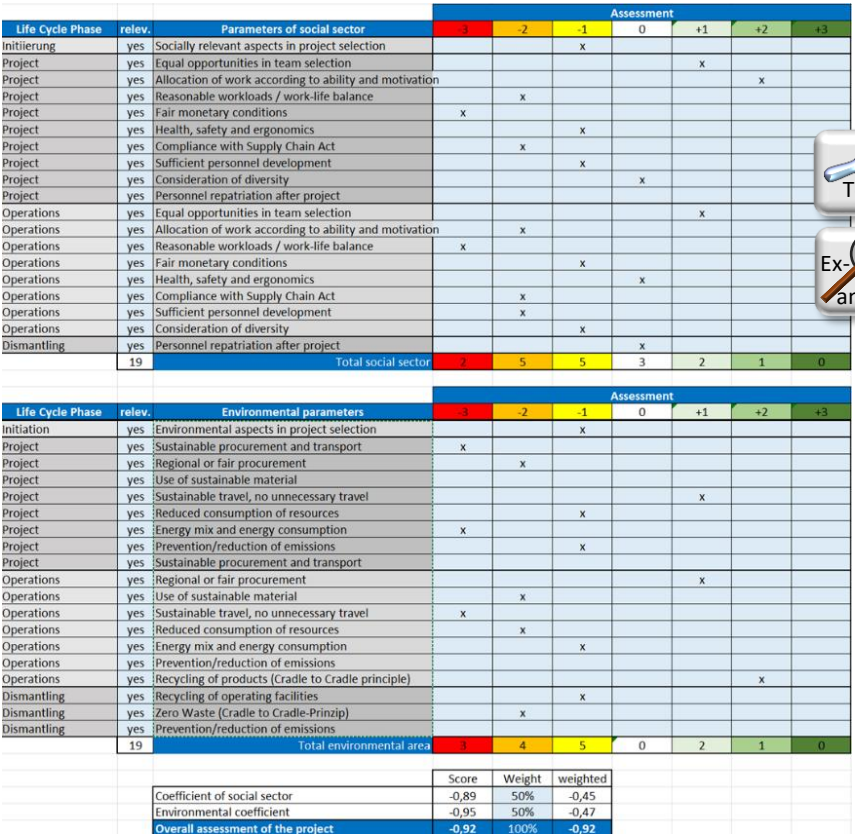
10.2.4 Tool for sustainability in PM

In order to meet the enormous responsibility of today's society for **Social and Environmental Responsibility (SER),** projects and portfolios must be measured and improved with regard to these parameters. The goal must be to ensure that as many projects as possible and, in summary, the project portfolio of an organization have a **positive social and environmental balance** .

For a structured approach to measuring and improving the sustainability of projects and project portfolios, Thor Möller has developed a tool and has been using it since the beginning of 2021. **The aim of the tool** is to provide a pragmatic, intuitively applicable and cross-industry solution that generates **the greatest possible impact to improve the sustainability of all project activities of an organization with little effort**. The tool is called **SEMPER.** The term stands for **Social and**

Environmental Management of Projects and Portfolios to Enhance everyones Responsibility.

The first step is to **evaluate the individual projects**. Approximately 20 to 30 parameters regarding sustainability - divided into the life cycle phases: initiation, project, operation and dismantling - are queried. The rating per parameter is based on a seven-point scale from -3 to +3. The parameters can be weighted differently. The result is two coefficients, one for the social and one for the environment, which are combined to form an overall index for the respective project (see ***Figure 109***).



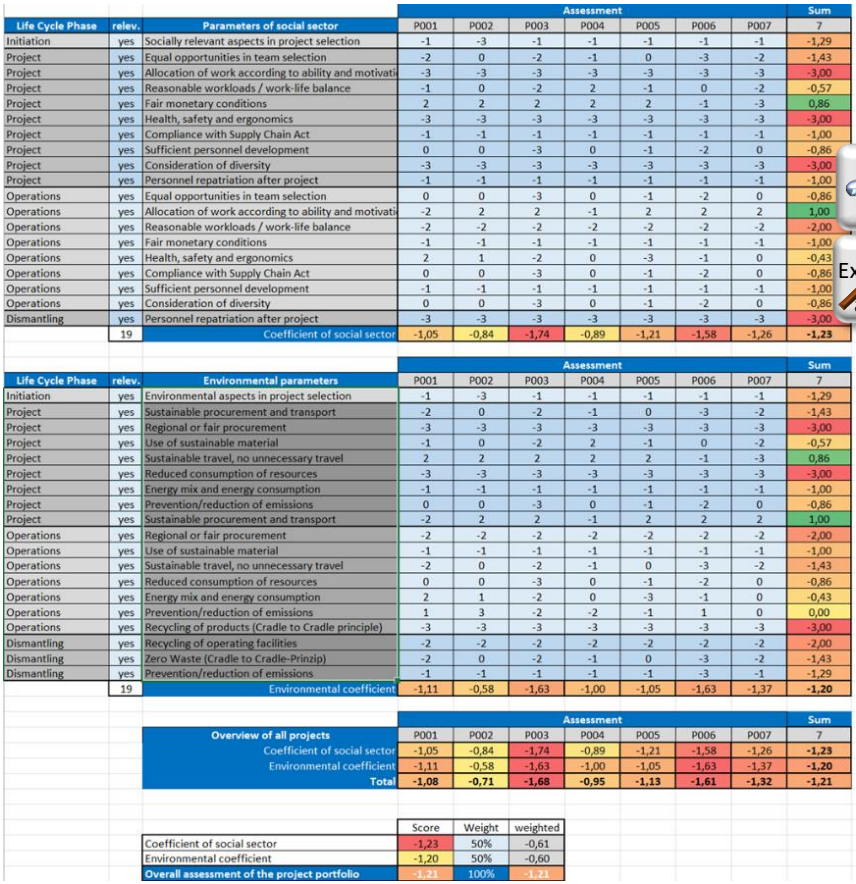
			Assessment						
Life Cycle Phase	**relev.**	**Parameters of social sector**	-3	-2	-1	0	+1	+2	+3
Initiierung	yes	Socially relevant aspects in project selection			x				
Project	yes	Equal opportunities in team selection					x		
Project	yes	Allocation of work according to ability and motivation						x	
Project	yes	Reasonable workloads / work-life balance		x					
Project	yes	Fair monetary conditions	x						
Project	yes	Health, safety and ergonomics			x				
Project	yes	Compliance with Supply Chain Act		x					
Project	yes	Sufficient personnel development			x				
Project	yes	Consideration of diversity				x			
Project	yes	Personnel repatriation after project							
Operations	yes	Equal opportunities in team selection					x		
Operations	yes	Allocation of work according to ability and motivation		x					
Operations	yes	Reasonable workloads / work-life balance	x						
Operations	yes	Fair monetary conditions			x				
Operations	yes	Health, safety and ergonomics				x			
Operations	yes	Compliance with Supply Chain Act		x					
Operations	yes	Sufficient personnel development		x					
Operations	yes	Consideration of diversity			x				
Dismantling	yes	Personnel repatriation after project				x			
	19	Total social sector	2	5	5	3	2	1	0

			Assessment						
Life Cycle Phase	**relev.**	**Environmental parameters**	-3	-2	-1	0	+1	+2	+3
Initiation	yes	Environmental aspects in project selection			x				
Project	yes	Sustainable procurement and transport	x						
Project	yes	Regional or fair procurement		x					
Project	yes	Use of sustainable material							
Project	yes	Sustainable travel, no unnecessary travel					x		
Project	yes	Reduced consumption of resources			x				
Project	yes	Energy mix and energy consumption	x						
Project	yes	Prevention/reduction of emissions			x				
Project	yes	Sustainable procurement and transport							
Operations	yes	Regional or fair procurement					x		
Operations	yes	Use of sustainable material		x					
Operations	yes	Sustainable travel, no unnecessary travel	x						
Operations	yes	Reduced consumption of resources		x					
Operations	yes	Energy mix and energy consumption			x				
Operations	yes	Prevention/reduction of emissions							
Operations	yes	Recycling of products (Cradle to Cradle principle)						x	
Dismantling	yes	Recycling of operating facilities			x				
Dismantling	yes	Zero Waste (Cradle to Cradle-Prinzip)		x					
Dismantling	yes	Prevention/reduction of emissions							
	19	Total environmental area	3	4	5	0	2	1	0

	Score	Weight	weighted
Coefficient of social sector	-0,89	50%	-0,45
Environmental coefficient	-0,95	50%	-0,47
Overall assessment of the project	**-0,92**	100%	**-0,92**

Figure 109: *Tool SEMPER: Project Evaluation (Simulation)*

In the second step, the project evaluations are then added to a **portfolio valuation** and an **overall index for the portfolio** is calculated from them (see ***Figure 110***). In addition to the tabular evaluations, the tool provides various **graphical evaluations** and forms of radar diagrams, histograms, etc.



			Assessment							Sum
Life Cycle Phase	**relev.**	**Parameters of social sector**	P001	P002	P003	P004	P005	P006	P007	7
Initiation	yes	Socially relevant aspects in project selection	-1	-3	-1	-1	-1	-1	-1	-1,29
Project	yes	Equal opportunities in team selection	-2	0	-2	-1	0	-3	-2	-1,43
Project	yes	Allocation of work according to ability and motivati	-3	-3	-3	-3	-3	-3	-3	-3,00
Project	yes	Reasonable workloads / work-life balance	-1	0	-2	2	-1	0	-2	-0,57
Project	yes	Fair monetary conditions	2	2	2	2	2	-1	-3	0,86
Project	yes	Health, safety and ergonomics	-3	-3	-3	-3	-3	-3	-3	-3,00
Project	yes	Compliance with Supply Chain Act	-1	-1	-1	-1	-1	-1	-1	-1,00
Project	yes	Sufficient personnel development	0	0	-3	0	-1	-2	0	-0,86
Project	yes	Consideration of diversity	-3	-3	-3	-3	-3	-3	-3	-3,00
Project	yes	Personnel repatriation after project	-1	-1	-1	-1	-1	-1	-1	-1,00
Operations	yes	Equal opportunities in team selection	0	0	-3	0	-1	-2	0	-0,86
Operations	yes	Allocation of work according to ability and motivati	-2	2	2	-1	2	2	2	1,00
Operations	yes	Reasonable workloads / work-life balance	-2	-2	-2	-2	-2	-2	-2	-2,00
Operations	yes	Fair monetary conditions	-1	-1	-1	-1	-1	-1	-1	-1,00
Operations	yes	Health, safety and ergonomics	2	1	-2	0	-3	-1	0	-0,43
Operations	yes	Compliance with Supply Chain Act	0	0	-3	0	-1	-2	0	-0,86
Operations	yes	Sufficient personnel development	-1	-1	-1	-1	-1	-1	-1	-1,00
Operations	yes	Consideration of diversity	0	0	-3	0	-1	-2	0	-0,86
Dismantling	yes	Personnel repatriation after project	-3	-3	-3	-3	-3	-3	-3	-3,00
	19	Coefficient of social sector	-1,05	-0,84	-1,74	-0,89	-1,21	-1,58	-1,26	**-1,23**

			Assessment							Sum
Life Cycle Phase	**relev.**	**Environmental parameters**	P001	P002	P003	P004	P005	P006	P007	7
Initiation	yes	Environmental aspects in project selection	-1	-3	-1	-1	-1	-1	-1	-1,29
Project	yes	Sustainable procurement and transport	-2	0	-2	-1	0	-3	-2	-1,43
Project	yes	Regional or fair procurement	-3	-3	-3	-3	-3	-3	-3	-3,00
Project	yes	Use of sustainable material	-1	0	-2	2	-1	0	-2	-0,57
Project	yes	Sustainable travel, no unnecessary travel	2	2	2	2	2	-1	-3	0,86
Project	yes	Reduced consumption of resources	-3	-3	-3	-3	-3	-3	-3	-3,00
Project	yes	Energy mix and energy consumption	-1	-1	-1	-1	-1	-1	-1	-1,00
Project	yes	Prevention/reduction of emissions	0	0	-3	0	-1	-2	0	-0,86
Project	yes	Sustainable procurement and transport	-2	2	2	-1	2	2	2	1,00
Operations	yes	Regional or fair procurement	-2	-2	-2	-2	-2	-2	-2	-2,00
Operations	yes	Use of sustainable material	-1	-1	-1	-1	-1	-1	-1	-1,00
Operations	yes	Sustainable travel, no unnecessary travel	-2	0	-2	-1	0	-3	-2	-1,43
Operations	yes	Reduced consumption of resources	0	0	-3	0	-1	-2	0	-0,86
Operations	yes	Energy mix and energy consumption	2	1	-2	0	-3	-1	0	-0,43
Operations	yes	Prevention/reduction of emissions	1	3	-2	-2	-1	1	0	0,00
Operations	yes	Recycling of products (Cradle to Cradle principle)	-3	-3	-3	-3	-3	-3	-3	-3,00
Dismantling	yes	Recycling of operating facilities	-2	-2	-2	-2	-2	-2	-2	-2,00
Dismantling	yes	Zero Waste (Cradle to Cradle-Prinzip)	-2	0	-2	-1	0	-3	-2	-1,43
Dismantling	yes	Prevention/reduction of emissions	-1	-1	-1	-1	-1	-3	-1	-1,29
	19	Environmental coefficient	-1,11	-0,58	-1,63	-1,00	-1,05	-1,63	-1,37	**-1,20**

	Assessment							Sum
Overview of all projects	P001	P002	P003	P004	P005	P006	P007	7
Coefficient of social sector	-1,05	-0,84	-1,74	-0,89	-1,21	-1,58	-1,26	**-1,23**
Environmental coefficient	-1,11	-0,58	-1,63	-1,00	-1,05	-1,63	-1,37	**-1,20**
Total	**-1,08**	**-0,71**	**-1,68**	**-0,95**	**-1,13**	**-1,61**	**-1,32**	**-1,21**

	Score	Weight	weighted
Coefficient of social sector	-1,23	50%	-0,61
Environmental coefficient	-1,20	50%	-0,60
Overall assessment of the project portfolio	-1,21	100%	-1,21

Figure 110: *SEMPER Tool: Portfolio Evaluation (Simulation)*

To **improve the coefficients**, goals are defined at project and portfolio level and measures for implementation are planned and tracked. The goals and activities are also documented and tracked in the corresponding file. Regular re-evaluation of projects and the portfolio can now show improvements in the

coefficients and indices. The improvement of the overall index for the portfolio should therefore be achieved through a more sustainable approach. In addition, however, it is also possible to bring about an improvement in values through **compensation projects** that have a positive social and/or environmental balance.

After several years of using the tool, **significant improvements in sustainability have already** been implemented. The tool has thus proven its effectiveness. **For example**, team appointments have been transferred from the push to the pull principle, disposable cleaning agents have been converted to reusable systems, catering services for all events are only vegetarian and plastic-free, use of LED technology on 3,000 m2 of work space, etc. The tool leads to considerable motivation for earlier and more consistent action as well as sensitization and active thinking of all those involved. This also applies to **compensation projects**. Examples include voluntary programs for the training and certification of refugees and various integration projects for refugees, the establishment of a citizens' online dialogue in rural areas and the initiation of a project for Germany's first carbon-free paint shop.

However, due to the **subjectivity of the evaluations**, a cross-organizational evaluation does not seem to make sense for the time being. This requires further development of the tool that leads to cross-organizational, uniform assessment variables, weightings and evaluations.

Figure 111: Big Picture Sustainability in PM

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Regardless of how many projects you have already done yourself or participated in, or whether it is the very first one. You have been given a project and are supposed to implement it as well as possible as a project manager.

With this guide, you'll start a journey through your project. It accompanies you step by step with procedures tested in practice from the project idea to the many stumbling blocks to the sound conclusion. During the course of the project, it provides many practical hints that make project work easier and help to take advantage of opportunities and avoid mistakes.

This book provides beginners with pragmatic approaches. Advanced can gain a lot of impulses for their project work and gain an overarching understanding. More in-depth topics also offer a lot of potential for expanding project management in one's own organization.

Furthermore, it offers valuable learning tips for candidates for Level D certification of the IPMA according to the ICB4 standard as well as for Agile PM certificates.

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