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Diplomarbeit

# Analysis of the requirements for the technical support during the entire Project Life Cycle at an IT-based service provider and the variations to International Project Management Standards

ausgeführt zum Zwecke der Erlangung des akademischen Grades eines
Diplom-Ingenieurs
unter der Leitung von

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Ich habe zur Kenntnis genommen, dass ich zur Drucklegung meiner Arbeit unter der Bezeichnung

**DIPLOMARBEIT**

nur mit Bewilligung der Prüfungskommission berechtigt bin.

Ich erkläre weiteres an Eides statt, dass ich meine Diplomarbeit nach den anerkannten Grundsätzen für wissenschaftliche Abhandlungen selbstständig ausgeführt habe und alle verwendeten Hilfsmittel, insbesondere die zugrunde gelegte Literatur genannt habe.

Weiters erkläre ich, dass ich dieses Diplomarbeitsthema bisher weder im In- noch im Ausland (einer Beurteilerin/einem Beurteiler zur Begutachtung) in irgendeiner Form als Prüfungsarbeit vorgelegt habe und dass diese Arbeit mit der vom Begutachter beurteilten Arbeit übereinstimmt.

Wien, Dezember 2008 _____

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# Abstract

In the first instance the given diploma thesis deals with the Project Life Cycle at an IT-based service provider. Along with the implementation of a new project management software tool the requirements within the individual project phases of the Project Life Cycle are analysed. Afterwards this Project Life Cycle is compared and benchmarked with international project management standards. Those are firstly the standard of the American “Project Management Institute” and secondly of the European “International Project Management Association”.

Furthermore the applied PM software tool is evaluated with respect to the analysed requirements along the Project Life Cycle.

# Kurzfassung

In erster Linie beschäftigt sich die vorliegende Diplomarbeit mit dem Projektlebenszyklus bei einem IT-Dienstleistungsunternehmen. Anhand der Einführung eines neuen Projektmanagement-Softwarewerkzeuges werden die Anforderungen an dieses während der einzelnen Projektphasen analysiert. Des Weiteren behandelt diese Arbeit den Vergleich des analysierten Projektlebenszyklus mit zwei der gängigen Projektmanagement Standards. Zum einen mit dem Standard des amerikanischen „Project Management Institute“ und zum anderen mit der europäischen „International Project Management Association“.

Darüber hinaus wird das zu implementierende PM Softwarewerkzeug gemäß den, entlang des Projektlebenszyklus analysierten, Anforderungen im Projektmanagement und Projektportfoliomanagement mit diesen gegenübergestellt und bewertet.

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# List of Abbreviations

| | |
|---|---|
| BSC | Balanced Scorecard |
| CPM | Critical Path Method |
| C&S | Campana & Schott |
| DIN | German Institute for Standardization |
| e.g. | for example (lat. exempli gratia) |
| et al. | and others (lat. et alii) |
| EVA | Earned Value Analysis |
| GPM | German Project Management Society |
| HR | Human Resources |
| i.e. | that is (lat. id est) |
| IEC | International Electrotechnical Commission |
| ICB | International Competence Baseline |
| incl. | including |
| IPMA | International Project Management Association |
| ISO | International Organization for Standardization |
| IT | Information Technology |
| MPMM | Method123 Project Management Methodology |
| MS | Microsoft |
| MS Project | Microsoft Office Project Professional 2007 |
| NASA | National Aeronautics and Space Administration |
| NPO | Non Profit Organisation |
| PERT | Programme Evaluation and Review Technique |
| PM | Project Management |
| PMBOK | Guide to the Project Management Body of Knowledge |
| PMI | Project Management Institute |

| | |
|---|---|
| PMIS | Project Management Information System |
| PMO | Project Management Office |
| PMP | Project Management Professional |
| PMQ | Project Management Quarterly |
| PPM | Project Portfolio Management |
| PWA | Microsoft Office Project Web Access |
| R&D | Research and Development |
| SQL | Structured Query Language |
| vs. | versus |
| WBS | Work Breakdown Structure |

*"Success depends on previous preparation, and without such preparation there is sure to be failure."*

Confucius (551 - 497 BC)

# Chapter 1

## 1 Introduction

The beginning of project management is often associated with the construction of the massive Egyptian Pyramids or the Great Wall of China. (Burke, 14) Though the project management we speak of today started in 1902, when Henry Gantt (1861-1919) designed the bar chart of the same name. After World War II the National Aeronautics and Space Administration (NASA) came up with a number of current project management tools like PERT[1], WBS[2] or CPM[3] during the 1950s and 1960s. At the same time the Project Management Institute and the International Project Management Association were established.

Since the late 1970s computers found their way into project management. The first PC-based project management software tool was the Harvard Project Manager, a planning software package launched in 1983. (Burke, 26) At the present day there are several solutions for IT-based project management software tools on the market which normally include time and resource planning or task management. (Foth, 163) A study conducted in 2005 by the University of Bremen in association with the GPM found out that 97% of the 304 interviewees used a software tool in project management for time management, whereas only 43% were using a PM software tool for the management of requirements. (Meyer, 9-10)

### 1.1 Motivation

A medium sized company usually has to cope with a high number of projects that need to be handled parallel. For the sake of cost these businesses aim to optimise their resource usage in an efficient way. One possibility for the more effective resource usage is the implementation of a project management software tool such as “Microsoft Office Project Server 2007” (Microsoft 2008a). Those software-based project management applications build the foundation for project planning and can help companies and project managers to organise and coordinate their projects. The need for IT-based support is growing in line with the complexity and amount of project

[1] Program Evaluation and Review Technique
[2] Work Breakdown Structure
[3] Critical Path Method

information to be processed. (Motzel et al., 52) Benefits of using project management software tools are among others the fast and correct calculations, the capacity to process large projects with more than 10 000 activities and tasks, and better quality of reporting. (Burke, 324-325)

According to a study by the Austrian Gallup Institute in 2007 around 70% ($n_1$ = 270; $n_2$ = 481)[4] believe that the importance of project management will increase for their organisation in the future whereas the other third thinks it will stay the same. (Gallup, 10, 40)

Therefore this thesis points out the potential of project management software tools to support the project management during the entire Project Life Cycle. Thereto each phase of the Project Life Cycle at an IT-based service provider is watched separately to analyse to what extent the communication, organisation and control of the project's progress can be improved with technical support such as PM software tools.

## 1.2 Company Profile

This diploma thesis was written during a six-month internship at the company Campana & Schott Realisierungsmanagement München GmbH. Campana & Schott is one of the leading management consultancies for project management. It was founded 1992 by Dr. Christophe Campana and Dr. Eric Schott and has currently six offices in German speaking countries, one office in Paris and about 150 employees. They can possess over 500 successfully completed projects and their customers span all sectors and industries, for example *ABB; Accenture, Allianz, BMW, Bombardier, Coca Cola, Daimler, Deutsche Bank, EADS, Hewlett Packard, Infinion, Lufthansa, MAN, Nokia, ÖBB, OMV; Philips, Porsche, PricewaterhouseCoopers, SAP, Siemens, Telekom Austria, UBS, Wien Energie...*

Campana & Schott provides management and technology consulting services and can build on a long-standing experience in the areas of project management and process optimisation. The methodological approach ranges from management and technology consulting to strategy implementation and deployment of customized software products. C&S is a competent partner for any and all topics related to project management. (Campana & Schott 2008)

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[4] The study was divided into a telephone poll and an online survey. Hence $n_1$ refers to the number of telephone interviewees and $n_2$ refers to the number participants from the online survey.

Due to this completed internship it was possible for the author to combine the knowledge from literature with the practical experience from the projects he was involved.

## 1.3 Structure of this thesis

This paper is organised in three parts. The first part covers the basic definitions of project management and portfolio management and consists of Chapter 2 and Chapter 3 respectively.

Part 2 is the analytical part and spans from Chapter 4 to Chapter 6. Therein the Project Life Cycle at an IT-based service provider is analysed (Chapter 4) and compared with the international project management standards according to the PMI (Chapter 5.2) and the IPMA (Chapter 5.4). At the end of Chapter 5 the evaluation of the applied software tool with respect to the analysed requirements is outlined (Chapter 5.6). Chapter 6 deals with the project portfolio specific requirements on the PM software tool.

The last part forms Chapter 7 and provides guidelines on how to implement a project management software tool in a company including the required general conditions.

This thesis concludes with a resume in Chapter 8.

# Chapter 2

## 2 Project Management Basics

This Chapter covers the definitions of the keywords as well as explanations in further details. Hence it provides the basic knowledge of project management for the following thesis.

### 2.1 Fundamental Terms

#### 2.1.1 Project

The word project is used ubiquitously in our linguistic usage. In nearly every part of our life some kinds of ventures take place, which are mistakenly counted as a project. Therefore according to Wieczorrek/Mertens and others a venture has to comply with a number of attributes to be counted as a project. (Wieczorrek/Mertens, 7; Patzak/Rattay, 19)

In accordance with DIN 69901[5] *a project* (from the Latin word proicere = to plan, to project (verbatim: to throw something forward)) *is an intention with defined resources to achieve an appointed aim in a given time.* (DIN 69901) It also characterises of being basically a one-time intent. (Köhler, 1-2)

The International Organization for Standardization (ISO) defines a project as a *"unique process, consisting of a set of coordinated and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including the constraint of time, cost and resources"*. (ISO10006:2003(E), 2)

According to the Project Management Institute (PMI) "*A project is a temporary endeavor undertaken to create a unique product, service or result.*" (PMBOK, 5)

The International Project Management Association (IPMA) states "*projects are complex, mostly new, risky and important for the organisations undertaking the projects. They are goal-determined tasks, since the objectives for the deliverables, the deadlines, the resources and the costs are agreed upon between the project owner and the project team. Furthermore projects can be perceived as organisations. In*

[5] Deutsches Institut für Normung e. V. (German Institute for Standardization)

*comparison to the relatively permanent structure of the permanent organisation (such as divisions, business units, departments), projects can be seen as temporary organizations.*" (PMA 2005, 9)

From the several definitions we can conclude that overall a project is based on the following characteristics: (Wieczorrek/Mertens, 8)

- a defined problem
- limited in time
- exhaustible resources
- distinguishable from routine tasks of a company, i.e. more complex
- unique and new; i.e. innovative
- high risk
- often crucial for the existence or at least growth of a company

Hence from this definitions and characteristics we can derive the features of a project. The aim of a project is to create something novel, unitary and beneficial. The venture is unique, novel and transient, which creates urgency and uncertainty. To achieve the set goals the plan (managing the project) has to be goal oriented, staged and flexible. The table shows the features of a project. (Turner, 5)

| Goal | Features | Pressures | The plan |
|---|---|---|---|
| Unitary | Unique | Uncertainty | Flexible |
| Beneficial | Novel | Integration | Goal oriented |
| Change | Transient | Urgency | Staged |

Table 1: The features of projects (Source: Turner, 5)

### 2.1.2 Project Management

"*Project management is the application of knowledge, skills, tools and techniques to project activities to meet project requirements. Project management is accomplished through the application and integration of the project processes initiating, planning, executing, monitoring and controlling, and closing*". (PMBOK, 8) The project processes according to the PMI are further explained in Chapter 5.1.1.

The International Project Management Association defines project management as "*a business process of the project-oriented organisation. The project management begins with a project assignment and ends with a project approval. It contains the sub-processes project start, project co-ordination, project controlling, project crisis*

*management and project close-down."* (PMA 2005, 10) These sub-processes are related to one another and are described in more details in Chapter 5.3.

Managing a project includes:

- Identifying requirements
- Establishing clear and achievable objectives
- Balancing the competing demands for quality, scope, time and cost
- Adapting the specifications, plans, and approach to the different concerns and expectations of the various stakeholders[6] (PMBOK, 8)

The aim of project management is to achieve the set goals of the project. Preferential there are three dimensions of goals: financial, temporal and performance-related. The latter one needs to be maximised whereas the others should be minimised. They are in balance, thus a change in one parameter could affect the others. For example, the quality of an output of a project depends on the time and the money you are willing to spend. They can be illustrated with the "magic triangle" of project management.[7] (Burke, 22; Tuner, 8-9; Verzuh, 12)

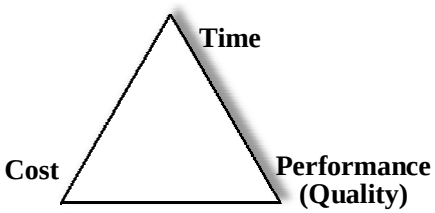


Figure 1: Traditional magic triangle of project management

Those three constraints also are part of the "Turner's 5". According to Turner's holistic approach there are five functions of project-based management. These are the scope of work, the project organisation and the three constraints quality (= performance), costs and duration (time) (Figure 2). The size of the circles in the figure below reflects the importance of the first two functions whereas the other three agree with the magic triangle. (Turner, 7-8)

According to Turner the project scope and project organisation are the essential functions of project management and influences the three constraints time, cost and quality. These relationships are represented by the arrow flowing from scope through

[6] The stakeholders of a project are illustrated in Chapter 2.5
[7] The magic triangle is also referred to as "triangle of forces" or "triple constraint" of project management.

organisation to the other three functions as well as by the lines that link scope and the constraining factors directly. (Lee-Kelley et al. 584)

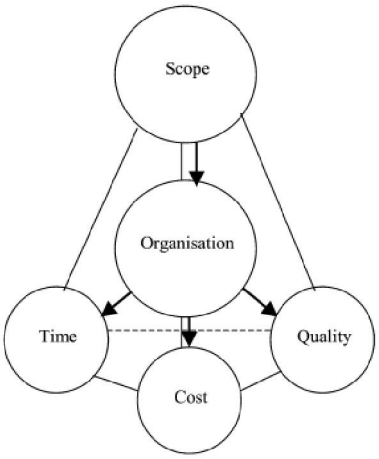


Figure 2: Turner's 5 (Source: Lee-Kelley et al., 584)

Scope management of a project can be defined as the function of ensuring that enough, but not more than necessary, work is undertaken to deliver the project's purpose successfully and comprises of three key elements. These are: (1) the amount of work done is adequate and there is no unnecessary work done (2). Also the work done has to deliver the stated business purpose (3). (Turner, 93) The principles of scope management are managing a project through a work breakdown structure, focus on results as well as balance objectives and levels of ambition. You should also keep it simple. (Turner, 94)

From the project scope the project organisation is derived and defined. Project organisation structures are further described in Chapter 2.6. Once the organisation is set, the project team can determine the timeframe and budget of the project. The purpose of the organisation is to marshal adequate resources (human, material and financial) of an appropriate type to undertake the work of the project and handle the constraints to deliver its objectives successfully. (Turner, 124)

## 2.2 Types of Projects

The classification of projects into project types enables the analysis of the type-specific challenges and potentials for project management. Projects can de distinguished by: (Gareis 2003, 76-81; PMA 2005, 9)

- Industry
- Location
- Objective

- Level of concreteness
- Level of repetition
- Ownership
- Duration
- Relation to the organisation's processes

With a differentiation on an industry level (e.g. construction, engineering, IT[8], pharmaceutics, NPO[9]...) the project team members need special skills and competences according to the business field. Therefore industry-specific jobs can occur (e.g. IT-project manager).

The location of the project execution can be domestic or foreign. In case of a foreign project specific qualifications need to be ensured. This could be the mobility of the team members, adequate language skills, information about the different culture to avoid culture clash, or coordination of possible time shift.

According to the objective, projects can be based on customer relationship, products and markets, infrastructure or are personnel or organisational oriented. (Gareis 2003, 77)

With regard to the level of concreteness, the main differentiation for projects is between concept and realisation. Other levels are for example: survey, re-launch or maintenance.

Projects can be one-time or repetitive. A one-time project is sometimes also called pioneer project. (Patzak/Rattay, 20-21) In the building industry there are often repetitive projects. This means that the projects have a similarity, hence they demand less creativity. Thus some of the project documents can be standardised. (Gareis 2003, 78)

The determination of the ownership into internal/external is based on the customer. External projects have an external customer, who pays for a service. On the other hand internal projects are targeted to solve an internal problem. (Gareis 2003, 78)

The duration of projects can be short- (6-12 weeks), middle- (3-6 months) or long-term (7- 12 or more months). (Gareis 2003, 78-79)

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[8] Information Technology
[9] Non Profit Organisation

When it comes to the relation of organisational processes, it is differed between primary (e.g. tender preparation), secondary (e.g. marketing campaign) and tertiary projects (e.g. introduction of new IT software). (Gareis 2003, 79)

## 2.3 Project Life Cycle

### 2.3.1 Definition and scope

*"Project managers or the organization can divide projects into phases to provide better management control with appropriate links to the ongoing operations of the performing organization. Collectively, these phases are known as the Project Life Cycle."* (PMBOK, 19)

Another approach for the Project Life Cycle comes from Patel and Morris. *"The life cycle is the only thing that uniquely distinguishes projects from non-projects."* (Patel/Morris, 52) They also state that the Project Life Cycle comprises the phases through which the project will evolve and that it is absolutely fundamental to the management of projects. (Patel/Morris, 52)

The Project Life Cycle defines the beginning and the end of a project. This is useful to clarify that a project has actually finished. (Gardiner, 27)

*"A project phase is a defined time period which can be differentiated from other phases by its objectives and contents."* (PMA 2005, 36) Those phases are different for each project; however, they can be grouped and standardised for certain groups of projects (e.g. IT projects). Completing and approving one or more deliverables characterises a project phase. A deliverable is a measurable output, for example a feasibility study or product prototype. (PMBOK, 20) The event that usually separates two project phases is called a milestone. Milestones are either externally determined points with a given progress or self defined events by the project team. (Patzak/Rattay, 27)

Most experts agree that the Project Life Cycle consists of four phases (Burke, 28), although there are models with a different number of phases (e.g. 3, 5)[10]. The number of phases depends also on the type of the project. (Patzak/Rattay, 161) These phases are often denoted differently, but overall there are several similarities. Each model consists of a starting phase, one or more implementation phase(s) and a closing phase.

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[10] Jenny recommends three phases for smaller projects and five phases for bigger projects. (Jenny, 67)

Sometimes the Project Life Cycle is extended beyond these traditional phases to include operations, maintenance and logistics. Even disposal and replacement can be implied. In this case the term “Total Life Cycle” or “Product Life Cycle” should be used for clarification. (Gardiner, 27) The product life cycle combines the Project Life Cycle and the operation life cycle. (Burke, 39-41) The relationship between Project Life Cycle and Product Life Cycle is given in Figure 3.

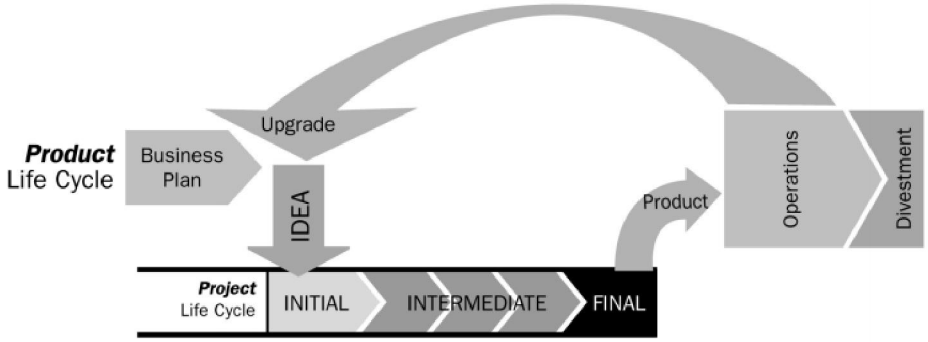


Figure 3: Relationship between Product and Project Life Cycle (Source: PMBOK, 24)

### 2.3.2 Common Characteristics

Most Project Life Cycles share a number of common characteristics. (Gardiner, 30; PMBOK, 20-21)

- Normally phases are sequential and are usually defined by some form of technical information transfer or technical product handoff.
- Cost and staffing levels are low at the beginning and end of the cycle, while the peak level is during the implementation phase(s).
- The level of uncertainty, thus the risk of failure has the highest rate at the start and decreases progressively as the project continues.
- The stakeholder’s ability to influence on the characteristics of the final project output and the final costs are high at the beginning and decline during the following phases while the cost of changes increases with the level of project progression.
- The organisational needs vary with the different phases. The initiation and definition phase requires creativity and problem solving whereas in the execution and control phase the emphasis is on turning carefully laid plans into reality. Therefore controlling and rapid decision making are the prevailing needs.

Figure 4 illustrates these common characteristics and shows typical gradients along the Project Life Cycle.

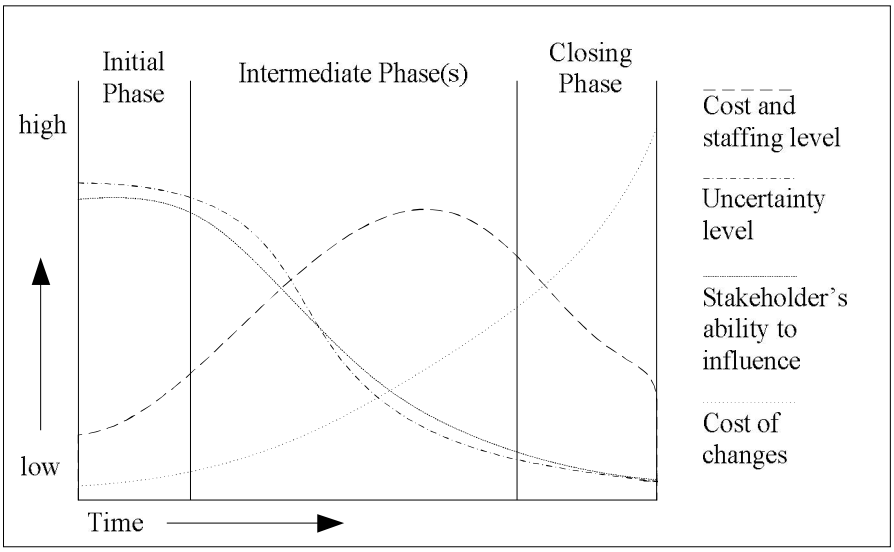


Figure 4: Typical gradients of common characteristics across the Project Life Cycle

The managing of information between the different phases of a project is vital to effective project management. Each phase has its own aims and objectives and the change from one phase to another is usually combined with some sort of technology transfer or handover, such as requirements to design or design to manufacturing. Therefore the output from one phase becomes the input of the following. The different phases are strongly interdependent and each phase can be usefully informed by consulting with staff of the other phases. Different people with varying skills might be involved within the project phases. "However, project management works best if information is available and able to flow freely between all phases at all time, not just at the end of a phase". (Gardiner, 31)

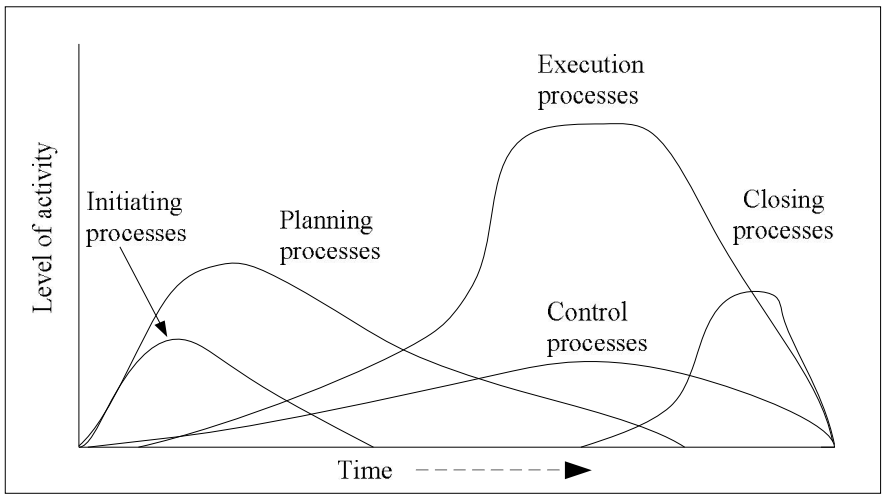


Figure 5: Information flows in a project (based on: Gardiner, 31)

### 2.3.3 Standard Project Life Cycle (4 phases)

Exemplarily described is the model with four phases because it is the most common and gives a good idea on the individual characteristics of each phase. For the sake of completeness, the perceptions from the PMI and IPMA are mentioned, but are described in further details in Chapters 5.1 and 5.3 respectively.

The names of the phases are referring to Gardiner (Gardiner, 27-30) and those in brackets refer to Burke (Burke, 28).

1. Initiation and definition (Concept and Initiation Phase)

This is the initial phase of a project, which begins with the project idea. The project idea may be generated internally or externally (Egan, 7) and starts the project by establishing a need or opportunity for the product, service or facility. (Burke, 28) In the next step scoping activities are performed to bound the project scope and define the interface between deliverables that are included in the project and those that are not. Conducting a feasibility study also takes place during this phase of the Project Life Cycle. This report provides vital information to help the organisation to decide whether a project idea should be realised or not. (Gardiner, 27-28) On acceptance of the proposal the project moves to the next phase. (Burke, 28)

2. Planning and development (Design and Development Phase)

The second phase uses the findings and guidelines of the earlier conducted feasibility study to design the product and outline the build-method. (Burke, 28) Major decisions have been taken on the design of the project end products and how to obtain them. That is the project strategy which will be used. (Gardiner, 29) Hence the focus during this phase is the planning, development, realisation and introduction of the project end product. According to Gardiner (Gardiner, 29) there are three essential elements in this phase:

- The creation of all the required plans to support the project
    - Scope management plans
    - Work plan and timeline
    - Resource and budgetary plans
    - Procurement plans and contract strategy
    - Risk management plans
    - Quality management plans
    - Document management plans

    - Project control plans, including project closure and handover
    - Human resource management plan
- The mobilisation and organisation of the resources required for the project
    - People
    - Equipment
    - Materials
    - Knowledge
    - Power
    - ...
- The establishment of an infrastructure to support those resources and ensure that effective communication can be maintained across the network of project stakeholders

The planning work done in the implementation phase is effectively money in the bank, which decreases the risk of the project manager having to operate offhand when the project execution develops unexpectedly. (Gardiner, 29)

3. Execution and control (Implementation or Construction Phase)

The next phase implements the product according to the baseline plan developed in the previous phase. (Burke, 28) In this phase of the Project Life Cycle the rate of expenditure is the greatest when the sponsor expects to see project deliverables arriving on time that meet or exceed expectations. As a project progresses, new information and a better understanding of the client's circumstances can lead to requests of change, some inevitable, some desirable, which have to be considered. Project management is about managing expectations and delivering an end result consistent with these expectancies. Certainly there is a need to control over any changes to project plans during the entire phase. (Gardiner, 29)

4. Closure (Commissioning and Handover Phase)

This is the closing phase of a project and represents the project end. It is characterised by the closing of the project budget so that no more money can be spent on the project. This phase also comprises the completing of the documentation and administration requirements of the project, including any final payments to contractors and suppliers. At handover, the finished product is delivered to the care, custody and control of the owner. (Gardiner, 20) This confirms that the project has been implemented or built and terminates the project. (Burke, 28) The phase also enables formal project evaluation,

which aims to review performance and identify "Lessons Learned" [11], which include best practices and mistakes. (Gardiner, 30)

Figure 6 provides an overview on the project phases and the related actions and deliverables.

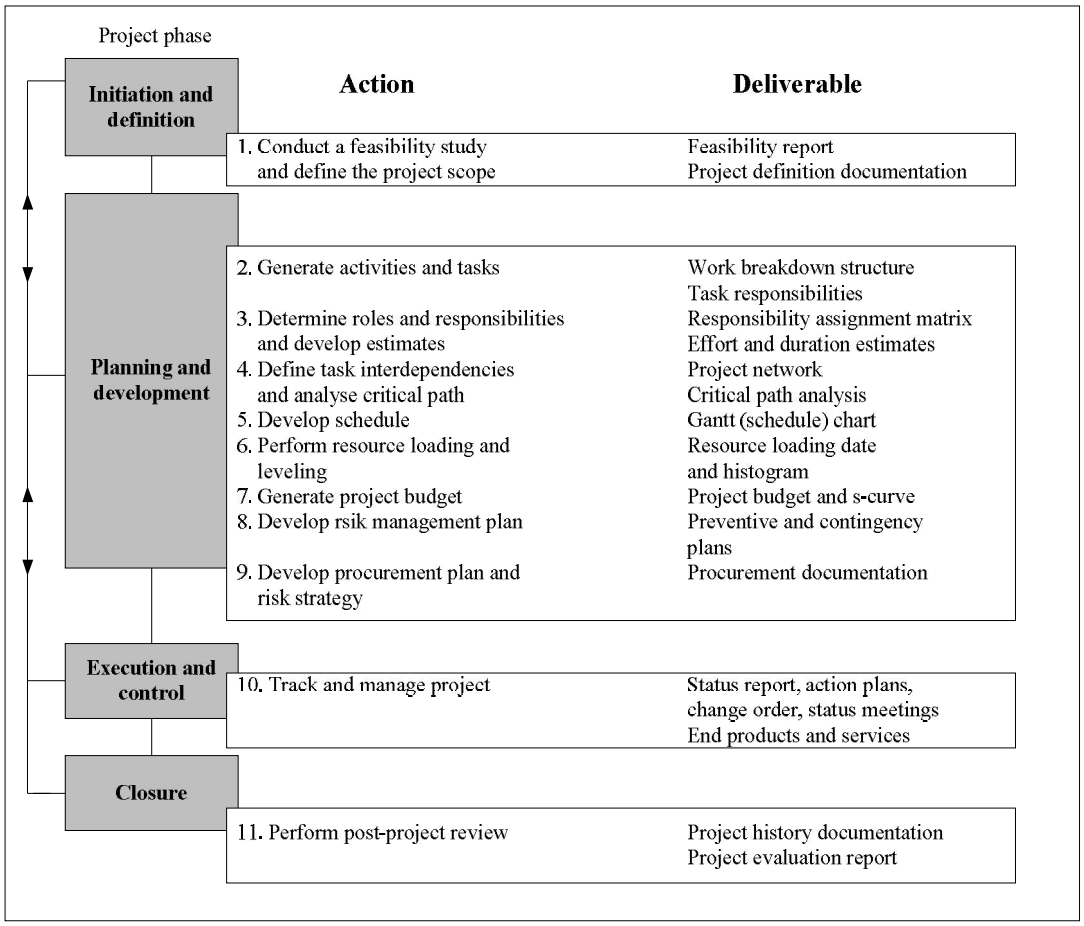


Figure 6: Project Life Cycle, showing phases, actions and deliverables
(based on: Gardiner, 28)

These phases can be in sequence or there can be some overlap between them. This can occur because in some projects a later phase may be started before the completion of a previous phase. Hence several phases of the project are proceeding parallel. This is called "fast tracking" and reduces the duration of a project and therefore the costs. (Burke, 32; Gardiner, 32) In general fast tracking projects need additional communication, feedback and management control to maintain consistent and satisfactory output quality. Otherwise there might be confusion, uncertainty or expensive rework if something goes wrong. (Gardiner, 33) Figure 7 gives a comparison of the two types of Project Life Cycle progression.

[11] Lessons learned is the information gained from the process of performing a project. They may be identified at any point. This project record can help future operations. (PMBOK, 363)

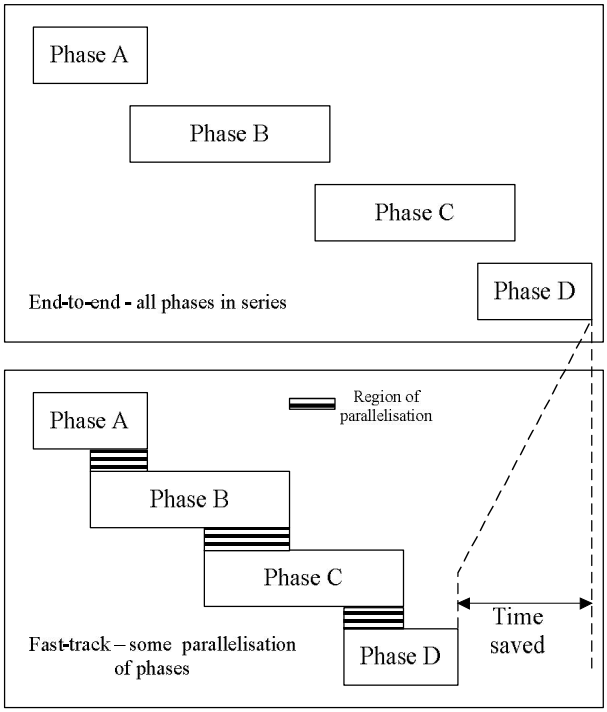


Figure 7: Project phases in series vs. Fast Tracking (based on: Gardiner, 32)

## 2.4 Project Management Life Cycle

Project management can be divided into four different phases. (Gareis 2003, 74; MPMM) Additionally Patzak/Rattay state that usually there is more than one execution phase and these execution phases are separated by project coordination phases. (Patzak/Rattay, 25-27) A coordination phase can be seen as a project re-planning phase.


Figure 8: Project Management Life Cycle (based on: MPMM)

1. Project Initiation

Project Initiation is the first phase of the project management life cycle and essentially includes starting up the project. Defining the purpose and scope of the project, documenting a business case, conducting a feasibility study, documenting the terms of reference, appointing the project team and setting up a Project (Management) Office are some of the tasks within this phase. (MPMM)

2. Project Planning

The Project planning phase takes place after the Project has been defined and has the objective to plan the project in further details. The project roadmap is set by creating the following plans: project plan, resource plan, financial plan, quality plan, acceptance plan, communications plan and procurement plan. (MPMM)

3. Project Execution

With a clear definition of the project and a suite of plans, the execution phase of the life cycle starts. In this phase the deliverables are physically built and presented to the customer for acceptance. During the deliverables construction process a series of management processes apply to monitor and control the proper output of the project. (MPMM)

4. Project Closure

Once all the deliverables have been produced, the project is ready for closure. The closure phase involves releasing the final deliverables to the customer, handing over project documentation to the business, communicating project closure to all the stakeholders and conduct post implementation review to identify the project success and note any lessons learned for future projects. (MPMM)

Table 2 summarises the four project management phases and lists the related key steps.

| Phase | Project Initiation | Project Planning | Project Execution | Project Closure |
|---|---|---|---|---|
| **Key steps** | • Develop a Business Case<br>• Undertake a feasibility study<br>• Establish the Terms of Reference<br>• Appoint a Project Team<br>• Setup a Project Office<br>• Perform Phase Review | • Create a Project Plan<br>• Create a<br>  • *Resource*<br>  • *Financial*<br>  • *Risk*<br>  • *Quality*<br>  • *Acceptance*<br>  • *Communications*<br>  • *Procurement*<br>*Plan*<br>• Contract the Suppliers<br>• Perform Phase Review | • Build Deliverables<br>• Monitor and Control<br>• Perform:<br>  • *Time*<br>  • *Cost*<br>  • *Quality*<br>  • *Change*<br>  • *Risk*<br>  • *Issue*<br>  • *Procurement*<br>  • *Acceptance*<br>  • *Communications*<br>*Management*<br>• Perform Phase Review | • Perform Project Closure<br>• Review Project Completion |

Table 2: Key steps of the project phases (based on: MPMM)

It is important to understand that the project management life cycle and the Project Life Cycle are not the same. The life cycle of project management refers to the development phases a project can go through. These phases are determined by the nature of the project (e.g. construction project, IT-project) whereas the Project Life Cycle stays the same for all projects. (Egan, 4)

## 2.5 Roles in Projects

There are several stakeholders in a project. A stakeholder could be an individual or organisation that is actively involved in or maybe whose interests are affected by the project. The dependence can also be contrary so that the project is influenced by one or more parties. (PMBOK, 25-26)

The key stakeholders on every project are (Burke, 44-45; PMBOK, 26):

- (Project) Originator: The person who suggests the project.
- Performing Organisation/Project Owner: The company/person whose strategic plan creates the need for the project.
- (Project) Sponsor: The person or group that provides the financial resources.
- Project Manager: The person responsible for managing the project.
- Customer/User: The person or organisation that will use the project's product.
- Project Team (Members): The group that is performing (e.g. plan, organise, implement, control) the work of the project.
- Influencers: Not directly related people/groups that can influence, positively or negatively, the project.
- Project Management Office (PMO): see Chapter 2.6.5

## 2.6 Project Organisation Structure

The organisation structure of a project defines the reporting structures, processes, systems and procedures of the project. There is no perfect organisation structure, each type has its advantages and disadvantages. (Gardiner, 126)

### 2.6.1 Traditional structure

The traditional organisation structure has survived for more than two centuries, but the rapid change of technology and recent business changes forced the development of a new structure. About fifty years ago a company could survive with only one or two product lines and therefore the basic model was sufficient. (Kerzner, 102) The traditional or functional organisation structure is based on the subdivision of product lines or disciplines into several departments. The hierarchy is vertical, that is top-down. The main advantage is the short and well established communication within the department. (Burke, 288)

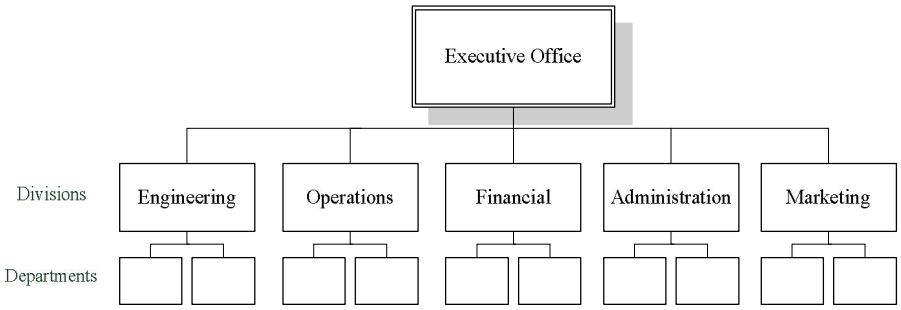


Figure 9: Traditional (functional) organisation structure (based on: Kerzner, 102)

### 2.6.2 Line-Staff structure

From the traditional structure the organisations derived that control of a project must be given to the personnel who are focused on the project completion. Therefore the project management position has to be separated from any colliding influences. (Kerzner, 109) This is done in the line-staff organisation structure. The position of the project management is an administrative department with the purpose of project coordination while the team members are within their usual line structure. (Wieczorrek/Mertens, 26)

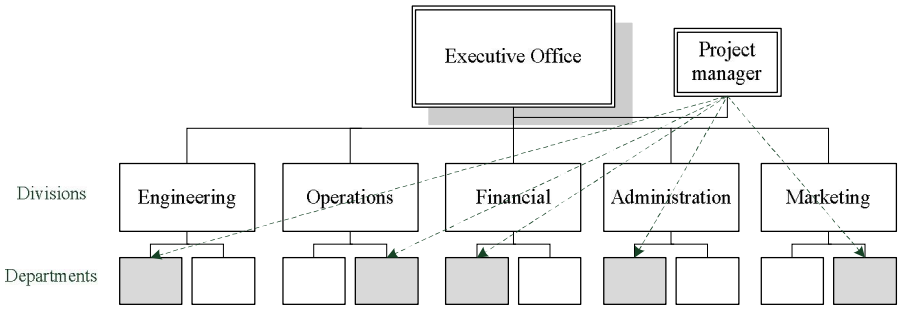


Figure 10: Line-Staff or influence organisation structure (based on: Kerzner, 110)

### 2.6.3 Pure Product (Projectised) structure

The pure product organisation develops a division within a division for the duration of the project. In a projectised structure team members are often collocated from different departments. The project managers have a lot of independence and authority. (PMBOK, 29) On the other hand the cost for maintaining the organisation is a big disadvantage. (Kerzner, 111)

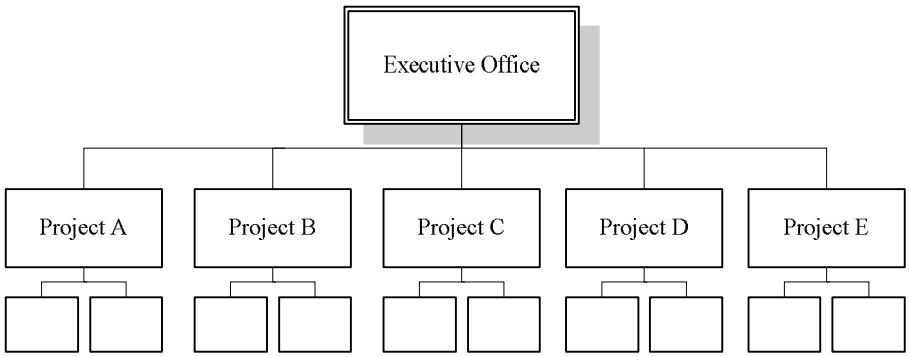


Figure 11: Pure product (projectised) organisation structure (based on: Kerzner, 111)

### 2.6.4 Matrix structure

The matrix organisations structure is a combination of the pure functional and the projectised organisational structures. The intention is to combine the advantages from these two organisational forms. The existing organisation of the company maintains and is amended with the matrix structure. The matrix structure is ideal for "project-driven" organisations such as construction or building companies. The employees stay in the functional hierarchy and are assigned to the project manager during the project duration. (Wieczorrek/Mertens, 29-30)

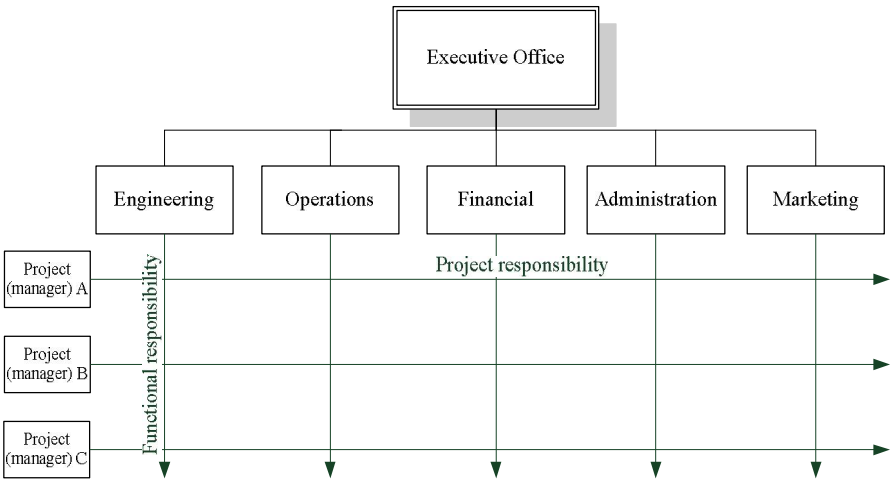


Figure 12: Matrix organisational structure (based on: Kerzner, 113)

Within the matrix structure there are a number of variants mainly influenced by the distribution of power (authority). (Burke, 290; PMBOK, 30)

- Weak matrix (As in the functional structure the project manager is more of a coordinator than a manager)
- Strong matrix (As in the projectised structure the project manager has a lot of authority and can have full-time administrative staff)

- Overlay (balanced) matrix (The balanced matrix structure recognizes the need of a project manager, but does not provide the project manager with full authority)

It is not necessary for a project to keep the same organisational structure during the entire Project Life Cycle. For example for the initiation phase of a project the influence structure can work best while during the closure of the project a form of matrix structure may be more suitable. (Wieczorrek/Mertens, 32)

Table 3 gives an overview about the influences of the organisation structure with respect to several characteristics of a project.

| Organization Structure / Project Characteristics | *Functional* | *Matrix* | | | *Projectized* |
|---|---|---|---|---|---|
| | | **Weak Matrix** | **Balanced Matrix** | **Strong Matrix** | |
| Project Manager's Authority | Little or None | Limited | Low to Moderate | Moderate to High | High to Almost Total |
| Resource Availability | Little or None | Limited | Low to Moderate | Moderate to High | High to Almost Total |
| Who controls the project budget | Functional Manager | Functional Manager | Mixed | Project Manager | Project Manager |
| Project Manager's Role | Part-time | Part-time | Full-time | Full-time | Full-time |
| Project Management Administrative Staff | Part-time | Part-time | Part-time | Full-time | Full-time |

Table 3: The organisational structures influences on projects (Source: PMBOK, 28)

### 2.6.5 Project Management Office

A project management office (PMO) is part of the permanent organisation of a company. (ICB, 15) It is an organisational unit to centralise and coordinate the management of projects. A PMO can also be referred to as a “programme management office”, “project office” or “programme office”. (PMBOK, 17) Its roles are typically to provide support, set standards and guidelines for project managers of the different projects or programmes and collects project management data from the projects. (ICB, 15) The projects managed by the PMO may or may not be related by others than being managed together. The project management office focuses on the coordinated planning, prioritisation and execution of projects that are tied to the parent organisation’s or client’s overall business objectives. (PMBOK, 17)

## 2.7 Project Management Standards

Project management standards include all methodologies and canons that help a company to ensure the quality of the planning, improve the communication and the information flow for a project and display the activities and results of a project in a uniform way. Therefore they provide corporate and regional overlapping project team's access to consistent project management methodologies and concepts. These standards also simplify the comparability and measurability of project results, the usage of experiences and guarantee a high quality level due to efficient planning and controlling methodologies. (Patzak/Rattay, 474-475; Presseanzeiger)

There are several national and international project management standards, of which the following are important: (Gareis 2003, 75; GPM InfoCenter)

- ISO 10006 (incl. ICB of the IPMA)
- IEC 62198 Project Risk Management
- PMMM - Project Management Maturity Model
- PMBOK of the PMI
- ANSI Norm – American National Standards Institute
- PRINCE2 of OGC – the UK Office of Government Commerce
- PROPS of Ericsson

From all these standards the one from the IPMA is the leading European PM standard whereas the PM standard of the PMI is dominant in North America. (Hunger, 31)

Due to the fact that this thesis just refers to the standard of the Project Management Institute as well as the standard of the International Project Management Association only those two organisations are explained in further details.

### 2.7.1 The Project Management Institute (PMI)

The Project Management Institute was founded by five volunteers in 1969. After recognition of their foundation through "Commonwealth of Pennsylvania USA" the organisation started their operation officially. In the same year the first "PMI Seminars & Symposium" was held in Atlanta, Georgia.

At the end of the 1970s the PMI had far over 2 000 members. This number increased during the 1980s. At the same time a code of honours was established as well as the first certification examination for "Project Management Professional" (PMP) was

conducted. Also the first PMI PM-standard with the title "PMQ Special Report on Ethics Standards and Accreditation" was published.

In 1990 there were about 8 500 members by PMI and from three years later the annual member grow rate was at 20%. PMI also set up a homepage on the World Wide Web and published the Project Management Standard: "A Guide to Project Management Body of Knowledge" (PMBOK). (PMI Chapter Austria)

Currently the PMI has more than 250 000 members in over 170 countries and nearly 265 000 certified Project Management Professionals.[12]

### 2.7.2 International Project Management Association (IPMA)

The International Project Management Association is one of the world's leading non-profit project management organisations. The IPMA represents 45 national project management associations on an international level.

In order to increase the recognition of the profession the association also certifies project managers, awards successful project teams and individuals and provides a number of project management publications.

The beginning of the IPMA was in 1965 when a group of innovative people created a forum for project managers to network and share information. This was the foundation of the first project management association.

Since then the IPMA has grown rapidly. With 40 000 members in almost 40 countries it has become an international network for project management societies throughout the world. The IPMA has developed the world's leading project management certification programme. (IPMA.ch)

[12] http://www.pmi.org/aboutus/Pages/About-PMI.aspx, 22.07.2008

# Chapter 3

## 3 Portfolio Management Basics

A project-oriented organisation simultaneously performs a number of projects and programmes. Hence they hold a portfolio of projects and programmes. This portfolio becomes more complex with the increasing number of projects and programmes. On one hand the number and size of the projects are constantly changing, on the other hand varying strategic alliances are established and relationships to the different social environments of the different projects and programmes are managed. (Gareis 2002, 1)

### 3.1 Project Portfolio

A project portfolio is an amount of projects, which are coordinated concertedly. This is done to increase the benefit for the company compared to an independent coordination of each project. Therefore it is recommended to bundle projects which (Patzak/Rattay, 402):

- are similar
- have manifold connections (same resources, standards, tools ...)
- result combined in synergies and potentials

The Project Management Institute defines *"a portfolio is a collection of projects [...] and/or programs [...] and other work that are grouped together to facilitate the effective management of that work to meet strategic business objectives. The components of a portfolio are quantifiable; that is, they can be measured, ranked and prioritized"*. (PMI 2006, 4)

The projects or programmes may not necessarily be interdependent or directly related. They are brought together for the sake of control, coordination and optimisation of the portfolio in its totality. (ICB, 13) A portfolio reflects the investments a company has made or is planning to make. Within the portfolio priorities are identified and decisions on resources are made. Figure 13 illustrates the relationships of the different components in a portfolio.

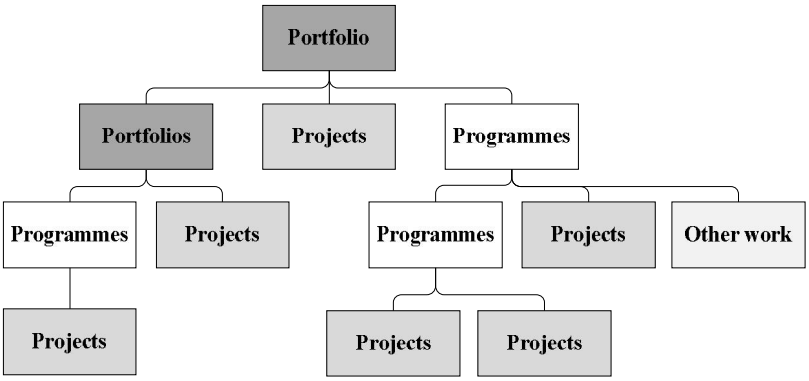


Figure 13: Portfolio Relationships (based on: PMI 2006, 5)

## 3.2 Programme

A programme is a collection of projects grouped together to get advantage from their combined management. The combined management generates benefit not available from managing them individually. (PMBOK, 16) Programmes are usually larger than projects and come to an end when the sponsoring organisation terminates the programme and all projects within the programme are completed. (Rosenau/Githens, 7) In contrast with project management the programme management is the centralised coordinated management to achieve the programme's strategic objectives and benefits. (PMBOK, 16)

The following table gives an overview about main issues and differences of projects, programmes and portfolios.

| | **Project** | **Programme** | **Portfolio** |
|---|---|---|---|
| **The goal of a** | is to produce deliverables | is to achieve strategic goals | is to coordinate, optimise and align with strategy |
| **Vision and strategy** | are related trough the business case of a project | are realised by a programme | are aligned to and monitored in the portfolio |
| **Business benefits** | are largely excluded from a project | are largely included in a programme | are largely excluded from the portfolio |
| **Organisational change** | is often excluded from a project | is usually included in a programme | is excluded from the portfolio |
| **Time, costs** | are defined in the business case and are manageable in the project | are roughly defined within the strategy; are broken-down to individual projects within the programme | are based on priorities and strategic targets in the portfolio |

Table 4: Overview of projects, programmes and portfolios (based on ICB, 14)

## 3.3 Multi-Project Management

Multi-Project Management characterises a general term for:

- Planning and controlling of all projects within a company
- Coordination of the projects with regard to the content
- Project selection according to individual and strategic aspects
- Organisational coordination of concurring resources
- Co-design of the organisational corporate framework (Adler/ Sedlaczek, 116)

In literature the terms multi-project management and portfolio management are often used equally, although newer publications assume that portfolio management is a part of multi-project management. They especially refer to the necessity of building a specific organisational and operational structure. (Kunz, 19) Lomnitz partly agrees with this because in his opinion a multi-project manager can manage either all projects or just related ones (i.e. a portfolio). (Lomnitz, 8-9) Multi-project management distinguishes from programme management by the time constraint of the management practices. According to Kunz the programme management has a time limit with the completion of the programme and followed by dissipating the temporary management structure. In contrast there is the multi-project management which is a continuous control process and is closely connected with the management board of the company. (Kunz, 20)

## 3.4 Portfolio Management

*"Portfolio management is the centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs and other related work, to achieve specific strategic business objectives*".(PMI 2006, 5)

The purpose and value of portfolio management is to assure that resources and employees are not overloaded and projects which are vital for the business success are fostered. Another important aspect is to systematically use synergies and knowledge over all projects. (Patzak/Rattay, 403-404)

There is a difference between portfolio management and programme management. Programme management includes the definition and coordination of all projects and tasks to accomplish the strategic business aims. On the other hand portfolio

management involves the tasks to identify dependencies among the projects, distribute scarce resources and use lessons learned. (Patzak/Rattay, 403)

Portfolio management includes (Rosenau/Githens, 7; Gardiner, 98):

- Setting priorities across all projects (prioritisation of projects within the portfolio)
- Allocating recourses amongst the projects, including project managers and project participants
- Project selection and deletion
- Understanding that projects are different and need different approaches
- Evaluation and optimisation of the portfolio based on the portfolio's value, balance and fit

### 3.4.1 Portfolio Evaluation

The aim of portfolio evaluation is the evaluation of each and every object (project, programme) for comparability reasons within the portfolio. This is done by using a set of criteria (e.g. productivity, growth, risks) associated to various business concerns. (PMI 2006, 62) The evaluation itself can be done by (PMI 2006, 63-65):

- *Scoring model comprising weighted key criteria*
  They are used to evaluate each component that is normally assigned with a weighting in percentage. Every component gets a score from a defined range (e.g. 0-10). The score times the weight gives the value for the component.
- *Graphical representations*
  Several graphical representations may be used to illustrate the component's relationship such as histograms, pie charts or line charts.
- *Expert judgement*
  This method is often used to assess the inputs needed to compare the components and is applied to any technical and management details during this process.

### 3.4.2 Portfolio Selection

According to Bonham a project portfolio selection is the periodic activity involved in selecting a portfolio, from available project proposals and projects currently underway. He also states that the organisation's stated objectives should be matched in a desirable manner without exceeding available resources or violating other constraints. (Bonham, 16) In the selection process the information from the scoring model received during

portfolio evaluation is complemented and/or validated. These selected projects move on to further prioritisation. (PMI 2006, 65-66) Portfolio selection involves the simultaneous comparison of a number of projects on particular dimensions to obtain a desirability ranking of the projects, of which the highly ranked ones are selected for the portfolio. (Archer/Ghasemzadeh, 4) Selection techniques are amongst others:

- *Human resource capacity analysis*

  According to the PMI this analysis must be conducted to understand the capacity of the organisation to source and execute the selected projects. Internal resource capacity must be measured and external resource availability has to be established to have a complete picture. The resource capacity is a limiting factor to the number of selected projects.
- *Financial capacity analysis*

  This analysis must be conducted to understand the capacity of the organisation to finance the selected projects. Internal financial capacity must be measured and external financial availability has to be established to have an entire overview. The financial capacity is a limiting factor to the number of selected projects.
- *Asset capacity analysis*

  The aim of the asset capacity analysis is to understand the physical needs of the organisation to support the selected projects. This analysis has to be done by asset types to understand the constraint generated by certain asset limitations.
- *Expert judgement*

  This method is often used to assess the inputs needed to compare the components and is applied to any technical and management details during this process. (PMI 2006, 66)

### 3.4.3 Portfolio Prioritisation

The selection of projects should be top-down from the business and should (almost always) only be adopted if they deliver the organisation's objectives. Furthermore there have to be adequate resources available to ensure timely and efficient project results. Usually there are insufficient resources (money, people and materials) to fund the entire portfolio; therefore projects have to be signed with priorities to select projects which are most beneficial (e.g. strategically, financially) for the organisation. (Turner, 43)

Such prioritisation techniques are for instance:

- *Weighted ranking*

  In this case, prioritisation usually involves the simple ranking of components due to their assigned values. Each component is ranked from high to low (or low to high) according to pre-established criteria. A ranking can consist of one or more criteria.

- *Scoring techniques*

  These are the numerical methods that are used to consolidate ranked components within each category (e.g. criteria).

- *Expert judgement*

  This method is often used to assess the inputs needed to determine how to prioritise components and is applied to any technical and management details during this process. (PMI 2006, 67-68)

### 3.4.4 Portfolio Balancing

Another major goal of portfolio management is to create/ maintain a balanced portfolio. First and foremost the portfolio should be balanced with the company's needs and what the company is capable to achieve. Balancing capability and need generally results in defining the best that can be achieved with the limited resources available, rather than attempting to find the perfect solution. (Bonham, 19)

# Chapter 4

## 4 Analysis of the Project Life Cycle at an IT-based service provider

In the following Chapter the Project Life Cycle at an IT-based service provider is analysed with respect to the applied software tool. The analysis is based on the requirements for the implementation of Microsoft Office Project Server 2007 at this company. Furthermore the Project Life Cycle is contrasted with the international project management standards from the IPMA and the PMI in the following Chapter.

Due to legal restrictions it is not possible to name the analysed company or to describe in further details but the company provides IT-based services (e.g. IT operations, security services) and is one of the leading companies in Austria and Europe in its market. It is a subsidiary enterprise of a company in the banking and finance sector. The headquarters is situated in Vienna and they have several branches, mainly in Eastern Europe. Overall the company employs about 1 300 people and operates around 700 projects per year.

Chiefly the analysis is based on documents (e.g. specification, project handbook) from the company, which the author is not allowed to reference.

Figure 14 gives an overview about the four phases of the standard Project Life Cycle and analysed project management areas with distinctive requirements on the PM software tool.

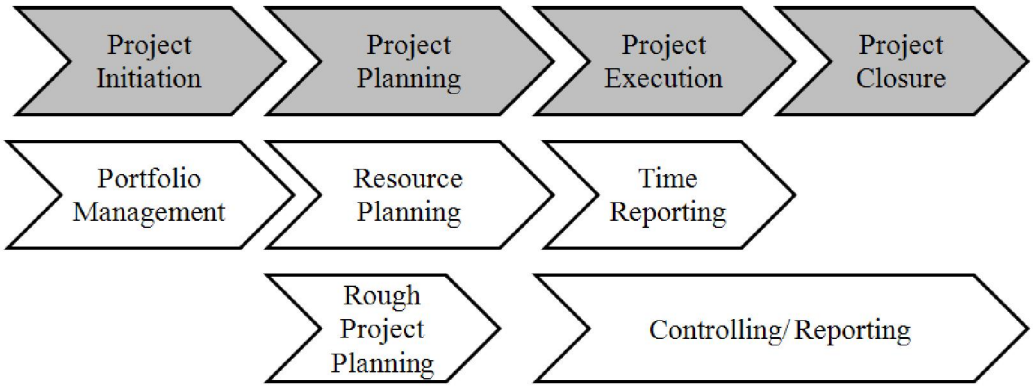


Figure 14: Project Life Cycle at an IT-based service provider

## 4.1 Project Initiation

The initiation phase is the foundation for every project and emphasizes on these four tasks: evaluation and analysis of the requirements, development and selection of possible alternatives, classification of a project and creation of a project proposal. (Wieczorrek/Mertens, 55)

In this case the initiation phase starts with the project idea or project proposal respectively and lasts till the decision (approval/rejection) about the project idea or project proposal. However some of the typical tasks at project start are not included in this phase such as project planning or resource assurance. The initiation process can be single- or double-stage, dependent on the project type. Internal projects, projects from special divisions within the company are double-stage whereas for customer projects and interim projects a single-stage initiation process is sufficient.

The aims in this initiation phase are to distinguish between the various types of projects, to define a rights concept and to enable an overview about the projects in different stages. Programmes are initiated equally to projects and can be optionally assigned with the tag programme in the initiation form.

The initiation process takes place in three generic steps: project idea, concretion (if necessary) and decision.

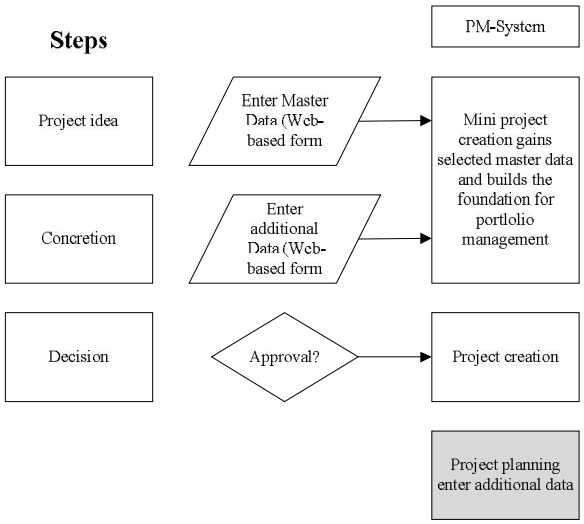


Table 5: Initiation phase overview

The data acquisition for the project idea/ proposal is done by an individually generated, web-based form according to the project's standards. An exemplary project idea for an internal project is given in the appendices A and B. A project proposal for an internal project is attached in appendix C. The person who creates the project is the project

originator. Some of the fields are mandatory and some fields are optional (also of the project's master data[13]). The project number assignment is done automatically and enables a differentiation between the several project types (installation projects, line effort, maintenance projects and project ideas (incl. Presales)[14]). Project ideas are assigned with a temporary number that becomes permanent after the project has been approved. If a concretisation (e.g. scope, feasibility study) is necessary additional data has to be entered. After that these filled-out forms need approval to proceed to the next phase. Therefore a Project Portfolio Board Manager, who has the sufficient rights to decide about a project's progression, is automatically notified to do so. There are several possibilities to choose from for the project status but he has to be select "project approved for effort tracking" to release the project. If there is no need for an effort collection the option "project approved" can be selected. The approval step is the second stage of the initiation process. Thus is does not apply for projects with a single-stage initiation process; generally their status is "approved".

Table 6 gives an overview on the process of the initiation phase.

| Task | Responsible Person (role) | Generated with |
|---|---|---|
| Create new project idea | Employee (Project team member) | Web-based form |
| Concretise project idea | Employee (Project team member) | Web-based form (suited to the project type) |
| Generate project proposal | Employee (Project team member) | Web-based form (suited to the project type) |
| Decide over the project | Project Portfolio board manager | Workflow support for the approval process |
| Modify project idea | Employee (Project team member) | Addition/changing data in existing web-based form |

Table 6: Process of the initiation phase

[13] Project master data is static data (i.e. no change over time) and identifies, characterises and classifies the project, for example the project name, project number or project type.
[14] Presales are a marketing instrument and take place before the project assignment is generated. They usually include estimations of expenses for the potential customer.

Functional requirements for the project management software tool within this phase:

- Project-specific templates for the generation of different project types
  - Standard project
  - Outsourcing projects
  - Migration projects
  - Software development projects
  - Administrative projects
  - Quality assurance projects
  - Interim projects
- Creating a project idea and generating a “mini-project”
- Modifying the “mini-project” and saving it as a project
- Alerting the responsible person to approve/reject the project
- Rights system for the individual persons

## 4.2 Project Planning

In this next phase the project planning processes take place.

Some of the aims in this phase are:

- To create/change the work breakdown structure
- Assigning the tasks with information (e.g. resources, start and finish date)
- Group tasks to summary tasks
- Define standard work schedule
- Assurance of resources

The project master data is transferred into the project plan from the previous initiation phase. Some of the fields from the template cannot be transferred automatically and have to be entered manually. From all projects only the ones with the assigned status “approved for effort collection” are handled in this phase. The other approved projects are not allowed to be modified and therefore cannot be assigned with information.

In spite of the fact that projects are usually initiated in the previous phase it should also be possible to create a new project during project planning due to special circumstances.

### 4.2.1 Rough Project Planning

In the next step it comes to the rough project planning. A project manager who is in charge of the project has to be assigned. Also the project scope, project objectives, project framework, project budget, project schedule and project organisation have to be determined. After that, a first rough project plan is generated. In this project plan the most important dates, milestones[15] and budgets are entered. (Wieczorrek/Mertens, 61)

The Kick-Off meeting is the beginning of the detailed project planning. In this meeting the first project plan is revised and the parameters (e.g. budget, risks[16]) are modified if necessary. Also the goals for the end of the planning phase are determined. After that the project is split into work packages with assigned due dates and responsible project team members are allocated. Milestone planning is reviewed and changed if necessary and/or additional milestones are generated. Furthermore the project team members are assigned with tasks and work packages as well as the tasks are assigned with costs and efforts.

Functional requirements for the project management software tool:

- Planning of (summary) tasks (incl. effort, cost, duration, dates, changing of cost rate (from a given day)) during the project phases
- Planning of programmes
- Allocating resources
- Requesting resources (if necessary)
- Recording of actual work performed (time recording)
- Monitor project progress
    - Comparison of the actual and target values for dates, cost and efforts
    - Earned Value Analysis[17]
- Offline working
- Finish tasks and projects
- Rights system for individual persons and groups

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[15] A milestone is a special task with the duration of "0". It signalises a significant point during project execution, mostly an intermediate result. (Patzak/Rattay, 93)

[16] Suggestions for risk factors are listed in appendix E.

[17] The Earned Value Analysis (EVA) is a controlling technique to monetarily evaluate the progress (Earned Value) at a particular point in time. The earned value is defined as planned costs for the actual work performed and can be derived on the basis of work packages. (PMA, 48)

Table 7 gives an overview about the different user groups and their individual rights.

| | |
|---|---|
| Project Portfolio Board Manager: | • Create/change project portfolios by modifying project master data<br>• Revise risk-benefit analysis for a project and therefore the rating<br>• Define/change dependencies between projects<br>• Define/change a project's priority<br>• Modify the project's status |
| Project Manager: | • Request and assign resources<br>• Start and finish tasks<br>• Finish projects<br>• Create project views<br>• Create reports<br>• Define dates for EVA |
| Division Manager: | • Able to view all projects to which a resource of the division is assigned |
| Department Manager: | • Able to view all projects to which a resource of the department is assigned |
| Group Manager: | • Able to view all projects to which a resource of the group is assigned |
| Project Team Member: | • Able to view all involved projects |
| Administrator: | • Has all read/write rights |

Table 7: Rights concept for different user groups

### 4.2.2 Resource Planning

All employees' information is gathered in the human resources (HR) system of the company. From this information the resources are initially created within the project management software tool. To keep the system up-to-date a synchronisation on a daily basis is performed. Furthermore is a creation of each cost unit from the organisation structure obligatory, which are also synchronised every day. Additional resources can be created manually. External resources (incl. interns and trainees) are created manually through the administrator of the project management software.

Each resource is automatically assigned with individual costs (except external resources). Because this information is confidential only users with sufficient rights have access (from group managers and upwards). This information may change over time so it can be modified. Therefore a log-file[18] saves changes made in the history. The capacity data for a resource is gained from the HR system and can vary from 20 to 38,5 working hours/week due to the fact that the employees can have different employment contracts. With these values as well as holidays the resource calendars are derived and generated automatically. Data about planned vacation, illnesses ... is obtained on a daily basis and integrated into a separate project plan so that resources are over-allocated and can manually be reassigned in times of absence.

Additionally there is the possibility to create several resource profiles for a resource to cover special skills.

The goals for resource management are:

- Representation of resource capacities and allocation of resources
- Identification of overbooked and free resources
- The responsible person (e.g. group manager) has to assure resources

Table 8 summarises the tasks during this phase shows the related responsibilities.

| Task | Responsible Person |
|---|---|
| Import/modify resource data | automatically |
| Manually create/change resource data | Administrator |
| Accept/reject resource requests | Group Manager, Department Manager |
| Plan tasks | Group Manager, partly Department Manager |

Table 8: Process of resource planning

Functional requirements for the project management software tool:

- Automatically creation of all resources
- The resource planning has to be date-based. Therefore defined milestones and finish dates have to be maintained in spite of changing to the resource planning
- There has to be a function which enables/disables overbooking of resources

[18] A log-file is an automatically generated protocol, that saves particular or all process activities on a computer system. http://www.itwissen.info/definition/lexikon/logfile-Log-Datei.html, 25.11.08

- The resource planning is based on a weekly schedule but there has to be the possibility to plan on a daily and/or monthly and quarterly basis
- The resources have to be updated and synchronised on a daily basis
- Employees who have left the company have to be set inactive (not deleted)

## 4.3 Project Execution

This is the phase in which the execution of the project plan takes place. With the project execution the reporting and controlling processes begin. As described in the following the aims of reporting are amongst other things to keep the management informed about changes. The controlling process begins with the setting of an initial baseline. A baseline is an original copy of the project plan at a given time for the sake of comparing changes of actual data with the target data.

### 4.3.1 Time Reporting

The aims of time reporting are:

- High level of quality and actuality
- Less operating expense

Each project team member is assigned with tasks and has to report the actual data for work/ time every day. Therefore he logs in into a web-based administration tool and has an overview about all the assigned tasks in the current week. For each task there is a field to input the time in hours with two decimal places. An additional field enables comments for the related entry.

The software application obtains the working hours/day from the HR system and this is used as orientation for each day. If the sum of the time entries is lower than the system value the background of the time entry field becomes red to signalise missing entries. Holidays and weekends are shaded gray, yet they can be filled with data.

After entering and saving data the entries are marked for reviewing and are automatically sent to a supervisor for approval. The project manager or resource manager checks the entries and gives approval or rejection. If approved, the release date is saved. In the latter case a notification is sent to the employee with a comment from the responsible person. Moreover it is possible to change the value at a later time. According to overtime there is the following procedure. Whether overtime is allowed or not is determined for every project individually. If so and the sum of all entries at a

given workday exceeds the number obtained from the HR system the status “overdue” is displayed. Overtime needs a special verification.

The functional requirements for the project management software tool are:

- Time reporting has to be on a weekly basis
- The input for time reporting is hours/day

### 4.3.2 Reporting

For the analysis of project data from the project planning tool there is an evaluation portal. The data basis for this portal comes from the planning tool data and time reporting and is refreshed daily. There are two different types of reports available, predefined and individual. The predefined reports can only be filled out. In contrast to persons with sufficient rights can create new reports. Such reports are created with a report-wizard and can contain all data from the portal’s data basis. In both types of reports the authorities for viewing are defined. Besides that special departments (e.g. finance controlling) have the right to read all reports. Persons, who maintain and create new reports, have the read/write permission for all reports. Standard users have the right to create own reports and release them.

Each user can choose from those reports that he has access to in a menu as well as all choose between all or individual projects. Normally the evaluation of a project is displayed on a timeline over the whole duration but you can select years, months, weeks and days. There is also the possibility to display finished projects due to a selection criterion (current, finished).

The functional requirements for the project management software tool are:

- The evaluation of the project reports has to be centralised and enables efficient monitoring and control over projects
- Both predefined and individual reports have to be provided
- User rights system to control access specific reports
- Creation/changing of reports has to be flexible
- Export of reports into Microsoft Office compatible file types

## 4.4 Project Closure

The closing phase describes the last phase of the Project Life Cycle. The purpose is to reflect "Lessons Learned" and best practices to apply in the future. Therefore the project team's performance is made transparent for the project owner to reveal strengths and weaknesses along the Project Life Cycle. Feedback is collected from involved persons and summed up in the project review afterwards. At the end a final project meeting is set up to discuss about the project outcome, recommendations for future projects or the like. The end of the project closure frames the administrative close out. The project information is archived and the project's infrastructure and team members are released for new projects.

Functional requirements for the project management software tool:

- Finish all tasks (progress = 100%)
- In case of programmes – finish all projects (progress = 100%)
- Archive "Lessons Learned"

## 4.5 General requirements

Besides the phase-specific requirements there are a number of other requirements that need to be met along the entire Project Life Cycle.

- Rights concept for the user of the system (see Chapter 4.2)
- Individual project templates and reports for different project types (see Chapter 4.1)
- Visualisation of the projects with a Gantt chart and WBS (at least 10 levels of structuring)
- Easy and intuitive handling of the system (e.g. Drag & Drop[19], shortcuts)
- Export of files into established Microsoft file types (e.g. MS Excel, MS Word)
- Offline working
- The programme's performance has to be state-of-the-art

[19] Drag & Drop is the ability to move objects (e.g. icons) by means of manipulating a mouse. It is a very intuitive operation and makes computers easier to use for a large number of people. http://www.linfo.org/drag-and-drop.html, 26.11.08

# Chapter 5

## 5 Contrast of the Project Life Cycle with international Project Management Standards

This Chapter addresses the comparison of the analysed Project Life Cycle at an IT-based service provider with international project management standards. These standards are the Project Management Body of Knowledge (PMBOK) by the Project Management Institute (PMI) as well as the International Competence Baseline (ICB) of the International Project Management Association (IPMA). Both of these standards are acknowledged internationally. Currently the ICB is the most important European PM standard to provide uniform terms. (Cronenbroeck, 226) However the ICB does not describe procedures or methods, nor does it recommend any but specifies the qualifications (altogether 44 competences) for the project manager to handle a project. (Gabriel/Knöpfel, 8) The PMBOK is based on experiences of project managers from all over the world to create a wide span of methods and processes for project work. (Cronenbroeck, 226) It is a dictionary not a training tool (Egan, 6) and gives no information on the qualifications needed by a project manager. (Gabriel/Knöpfel, 8)

### 5.1 Project Life Cycle model according to the PMI

#### 5.1.1 Process Groups

The Project Management Institute does not provide a phase concept for project management. It uses the term “process groups” to refer to stages or phases of a Project Life Cycle. (Egan, 5) According to the PMI there are five process groups to describe the nature of a project (PMBOK, 38):

1. Initiating Process Group
2. Planning Process Group
3. Executing Process Group
4. Monitoring and Controlling Process Group
5. Closing Process Group

Although they sound familiar to the phases of the Project Life Cycle it is important to know that Project groups are not project phases! Large or complex projects may be separated into distinct phases or sub-projects, all the process group processes would normally be repeated for each phase or sub-project. (PMBOK, 41) Therefore the term

"Project Life Cycle" is misleading in the PMI terminology, because it is neither a perpetual series of events nor the sequence of events fixed rigidly. (Egan, 3) Figure 15 shows the relationship of the Project Life Cycle phases and the project process groups. As you can see all project process groups can occur in a single phase.

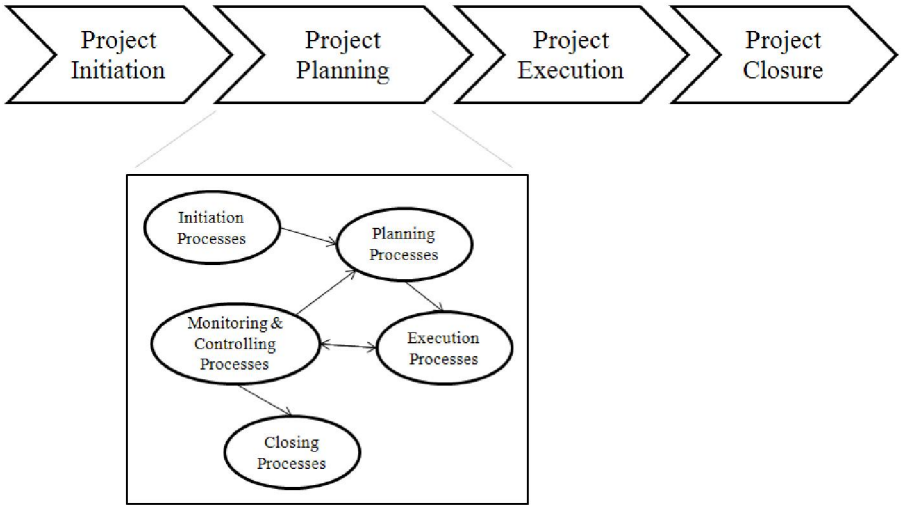


Figure 15: Relationship of the Project Life Cycle and the project process groups

1. Initiating Process Group

The initiation process group consists of the processes that facilitate the formal authorisation to start a new project or project phase. Clear descriptions of the project objective are developed and documented. This usually contains a basic description of the project scope, the deliverables, the project duration and a forecast of the resource usage. (PMBOK, 43) If not already assigned the project manager will be nominated. Initial assumptions and constraints will be documented and captured in the project charter. After approval the projects officially becomes authorised. (PMBOK, 44)

| | |
|---|---|
| 1. Develop Project Charter | 2. Develop Preliminary Project Scope Statement |

Table 9: Processes within the Initiation Process Group (Source: PMBOK, 45)

2. Planning Process Group

The planning process group is used by the project management team to plan and manage a successful project for the organisation. This process group helps to gather information from various sources and develop the project management plan. Processes within this group identify, define and mature the project scope, the project cost, the project schedule. Due to the fact that those factors are interdependent the processes done within this process group are repeatable. The progressive detailing of the project management plan is often called "rolling wave planning" and indicates the iterative and

ongoing planning process. (PMBOK, 46) The project team should involve all appropriate stakeholders, depending on their influence on the project, for the project planning. Therefore they have to create an environment in which stakeholder can contribute appropriately. Since the feedback process cannot continue indefinitely, procedures are set to determine when the planning effort ends. These procedures depend on the nature of the project and the project environment. (PMBOK, 46)

| | |
|---|---|
| 1. Develop Project Management Plan | 12. Quality Planning |
| 2. Scope Planning | 13. Human Resource Planning |
| 3. Scope Definition | 14. Communications Planning |
| 4. Create WBS | 15. Risk Management Planning |
| 5. Activity Definition | 16. Risk Identification |
| 6. Activity Sequencing | 17. Qualitative Risk Analysis |
| 7. Activity Resource Estimating | 18. Quantitative Risk Analysis |
| 8. Activity Duration Estimating | 19. Risk Response Planning |
| 9. Schedule Development | 20. Plan Purchases and Acquisitions |
| 10. Cost Estimating | 21. Plan Contracting |
| 11. Cost Budgeting | |

Table 10: Processes within the Planning Process Group (Source: PMBOK, 48-55)

3. Executing Process Group

The aim of this process group is to complete the work defined in the project management plan to accomplish the project's requirements. The project team has to decide which of the processes are required for the team's specific project. This process group involves coordinating people and resources as well as integrating and performing the activities of the project in accordance with the project management plan. It also addresses the scope defined in the project scope statement and implement approved changes. (PMBOK, 55)

| | |
|---|---|
| 1. Direct and Manage Project Execution | 4. Develop Project Team |
| 2. Perform Quality Assurance | 5. Information Distribution |
| 3. Acquire Project Team | 6. Request Seller Responses |
| | 7. Select Sellers |

Table 11: Processes within the Execution Process Group (Source: PMBOK, 56-58)

4. Monitoring and Controlling Process Group

The monitoring and controlling process group consists of the processes to perform project execution so that potential problems can be identified in a timely manner and corrective action can be taken, if necessary, to control the execution of the project. The key benefit is that performance is measured and observed regularly to identify deviations from the management plan. This process group also includes controlling

changes and recommending preventive action in anticipation of possible problems. Besides monitoring and controlling the work being done within a process group, it also monitors and controls the entire project effort. In multi-phase projects the process group provides feedback between the phases in order to implement corrective or preventive actions. (PMBOK, 59)

| | | | |
|---|---|---|---|
| 1. | Monitor and Control Project Work | 7. | Perform Quality Control |
| 2. | Integrated Change Control | 8. | Manage Project Team |
| 3. | Scope Verification | 9. | Performance Reporting |
| 4. | Scope Control | 10. | Manage Stakeholders |
| 5. | Schedule Control | 11. | Risk Monitoring and Control |
| 6. | Cost Control | 12. | Contract Administration |

Table 12: Processes within the Monitoring and Controlling Process Group (Source: PMBOK, 61-65)

5. Closing Process Group

The closing process group includes all processes used to formally terminate a project or a project phase and begins when the deliverables have been accepted. (Egan, 8) This process group verifies, when completed, that the defined processes are completed within all the process groups to close a project (phase) and establish that the project (phase) is finished. (PMBOK, 66) The closing process also ensures that an organisation learns from its experience. (Egan, 8)

| | | | |
|---|---|---|---|
| 1. | Close Project | 2. | Contract Closure |

Table 13: Processes within the Closing Process Group (Source: PMBOK, 67)

### 5.1.2 Knowledge Areas

The Project Management Institute divides the management processes within the process groups into knowledge areas. These are areas of expertise and specialisation. (Egan, 6) All in all there are nine different knowledge areas (PMBOK, 9-11):

1. Project Integration Management

Project integration management includes all tasks needed to indentify, combine, define, and coordinate the processes and project management over all process groups. (PMBOK, 77)

2. Project Scope Management

It comprises all processes and activities required to ensure that the project includes all but not more of the work required to successfully complete the project. The primary concern is defining and controlling of what not to include in the project. (PMBOK, 103)

3. Project Time Management

The aim of this knowledge area is to accomplish timely completion of the project. (PMBOK, 123)

4. Project Cost Management

Project cost management is about the planning, estimating, budgeting and controlling of costs so that a project can be completed within the approved budget. (PMBOK, 157)

5. Project Quality Management

Quality management includes the processes of the organisation needed to determine quality policies, objectives, and responsibilities to ensure that the project will meet the needs and quality level stated. (PMBOK, 179)

6. Project Human Resource Management

This knowledge area consists of all processes and activities that organise and manage the project team. The project team is comprised of the people who have assigned roles and responsibilities. Team members should be involved in much of the project's planning and decision making. The type and number of project team members often changes as the project progresses. (PMBOK, 199)

7. Project Communications Management

Project communication management helps to ensure timely and appropriate generation, collection, distribution, storage, retrieval and ultimate disposition of project information. Therefore it provides the critical links among people and the necessary information for successful communication. (PMBOK, 221)

8. Project Risk Management

Project risk management consists of all processes concerned with conducting risk management planning, identification, analysis, responses, and monitoring and control on a project. The objectives are to increase the probability and impact of positive events and to decrease the occurrence of events adverse to the project's aim. (PMBOK, 237)

9. Project Procurement Management

This knowledge area contains the processes to acquire or purchase the products, services or result needed outside the project team to perform the work. There are two perspectives of procurement as the organisation can be both, buyer and seller. It includes the contract management and change control processes required to administer contracts or purchase orders. (PMBOK, 289)

The following table gives an overview about the project process group's processes and their mapping to the related knowledge areas.

| Process Group / Knowledge Area | Initiation | Planning | Execution | Monitoring and Controlling | Closing |
|---|---|---|---|---|---|
| **Project Integration Management** | Develop Project Charter<br>Develop Preliminary Project Scope Statement | Develop Project Management Plan | Direct and Manage Project Execution | Monitor and Control Work<br>Integrated Change Control | Close Project |
| **Project Scope Management** | | Scope Planning<br>Scope Definition<br>WBS Planning | | Scope Verification<br>Scope Control | |
| **Project Time Management** | | Activity Definition<br>Activity Sequencing<br>Activity Resource Estimating<br>Activity Duration Estimating<br>Schedule Development | | Schedule Control | |
| **Project Cost Management** | | Cost Estimating<br>Cost Budgeting | | Cost Control | |
| **Project Quality Management** | | Quality Planning | Perform Quality Assurance | Perform Quality Control | |
| **Project Human Resource Management** | | Human Resource Planning | Acquire Project Team<br>Develop Project Team | Manage Project Team | |
| **Project Communications Management** | | Communications Planning | Information Distribution | Performance Reporting<br>Manage Stakeholders | |
| **Project Risk Management** | | Risk Management Planning<br>Risk Identification<br>Qualitative Risk Analysis<br>Quantitative Risk Analysis<br>Risk Response Planning | | Risk Monitoring and Control | |
| **Project Procurement Management** | | Plan Purchases and Acquisitions<br>Plan Contracting | Request Seller Responses<br>Select Seller | Contract Administration | Contract Closure |

Table 14: Mapping of the Project Management Processes to the Project Management Process Groups and the Knowledge Areas (based on: PMBOK, 70)

## 5.2 Contrast of the analysed Project Life Cycle with the Process Groups and Knowledge Areas

In practice the project management processes of the five project process groups can overlap and interact with each other and with the processes in the other knowledge areas. (PMBOK, 270) Therefore it is not always possible to link the analysed processes with the ones according to the PMI in a unique way.

### 5.2.1 Project Initiation Phase vs. Process Groups and Knowledge Areas

The analysed initiation phase lasts from the generation of the project idea or project proposal till the approval/rejection of this document. Further this project phase can be divided into the five process groups. Both of the tasks "Develop Project Charter" and "Develop Preliminary Project Scope Statement" in the initiation process group reflect the generation of the project proposal and project idea. This is generated with the use of a project management information system[20]. (PMBOK, 86) In the latter case the preliminary project scope statement[21] is created along with the concretion process.

The next process group consists of the processes for the project planning. Due to the fact that there is no proper planning during this analysed phase it can be summarised that all planning activities are done sketchily. These are in particular the ones from the knowledge areas project scope management, project time management, project cost management and project risk management. The processes of the knowledge area project procurement management happen if the project type is an outsourcing project (performing company = buyer) or an external project (performing company = seller).

The execution processes take place along the entire phase but chiefly during the concretion of and the decision about a project idea or project proposal. The same applies to the monitoring and controlling process group. The Project Portfolio Board Manager has to review and control the project data. He is the responsible person and decides over a project's future. This decision is part of the closing process group. The "Close Project" process also establishes the procedures to coordinate activities needed to verify and document the project deliverables. (PMBOK, 100) In case of an approval the project idea or proposal becomes the Project Charter[22]. If the project idea/proposal

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[20] Project management information system in the PMI terminology refers to PM software tool.
[21] A preliminary project scope statement is a detailed at what exactly the project is expected to deliver. At this point there is little or no discussion of how – just what and why. It may have constraints (e.g. completion date) included. (Egan, 7)
[22] The project charter formally authorises a project. Along with the project scope statement and the project management plan they build the three major documents of a project. (PMBOK, 76)

is rejected it may be adapted and therefore needs to reprise all project process groups again. (Egan, 3)

### 5.2.2 Project Planning Phase vs. Process Groups and Knowledge Areas

The project planning phase at the IT-based service provider starts with the generation of the project plan, which is called the project management plan according to the project integration management knowledge area of the PMI. As in the analysed case no rough planning processes take place along with the initiation phase these processes also occur at the beginning of this phase. The Project Charter developed in the previous phase becomes the main input for this phase. Hence the process “Develop Preliminary Project Scope Statement” can be seen as the rough project planning process and is combined with the processes from the planning process group for all nine knowledge areas.

After the rough planning the detailed planning takes place and spans over all knowledge areas. Beginning with the Kick-Off meeting (communications management), in which the first plan is revised (most of the knowledge areas’ processes within the monitoring and controlling process group) and the project plan is generated (planning process group) with a PMIS. The resource planning is covered by the knowledge area project human resource management and its related processes. During large and complex projects it is often necessary that a project has to return to planning level several times. Therefore the Project Life Cycle can become very complex with multiple repeats of planning and even initiating processes. (Egan, 3)

The process “Monitor and Control Work” is performed to monitor project processes associated with initiating, planning, executing and closing. Preventive or corrective actions are undertaken to control the project performance. (PMBOK, 94) In the analysed planning phase a continuous monitoring is operated to guarantee the quality of the outcomes according all knowledge areas. The closing group processes determine the end of this phase and initiate the execution phase by delivering the project (management) plan. Thus it ends when the entire project has been completed on paper. (Egan, 7)

### 5.2.3 Project Execution Phase vs. Process Groups and Knowledge Areas

Execution cannot begin until there is a project plan (Egan, 8) and consists of the processes used to complete the work defined in the project (management) plan to accomplish the project's requirements and objectives. (PMBOK, 55)

In the analysed case the monitoring and controlling process group goes along with the execution process group. For example during the execution phase the team members are assigned with work packages[23] (information distribution) according to the project (management) plan as well as reporting is performed to the project manager in reverse direction (performance reporting). The aim of the information distribution is to give the project stakeholders access to the needed information in a timely manner. (PMBOK, 221)

Other monitoring and controlling processes (e.g. scope control, schedule control, quality control) help to keep an eye on the project (management) plan in the particular knowledge area and manage actual changes when they occur. That is that a change in the project plan is necessary Therefore processes from the planning process group are included the execution phase which have to be executed and monitored afterwards. (Egan, 3) At the end of this phase processes from the closing process group happen to document the project deliverables from this phase and finish all tasks from this phase.

### 5.2.4 Project Closure Phase vs. Process Groups and Knowledge Areas

Due to the fact that this is the last phase of the project the closing processes not only terminate all tasks and work packages of this phase but the project itself. (PMBOK, 100) Within this phase mainly processes from the process groups "Monitoring and Controlling" as well as "Closing" proceed. The process group "Closing" includes tasks from the project integration management as well as project procurement management knowledge areas. The first knowledge area is about terminating all tasks and activities, document the project's final outcome and gather lessons learned. The latter one involves administrative activities, such as closing contracts of the project. Thereby the contract terms and conditions can prescribe specific procedures for contract closure.

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[23] A work package is the smallest unit within the WBS and has a start and finish date. In Microsoft Office Project terminology it is called a task.

## 5.3 Project Life Cycle model according to the IPMA

First of all the IPMA divides the project context with regard to contents, schedule and a social context. Through the definition of the project start and the close-down events a project is limited in respect to time; there exists a pre- and a post-project phase (see Figure 16). An information transfer from the pre-project phase into the project itself is necessary. (PMA 2005, 18) A form based on the standard project handbook of PMA to document these phases is attached in appendix D.


Figure 16: Project Time Context (Source: PMA 2005, 18)

On the basis of the fact that the analysed service provider has to carry out several different types of projects Figure 17 compares the theoretical model with the more practical project environment models according to Patzak/Rattay that apply to the analysed IT-based service provider. (Patzak/Rattay 62-65),

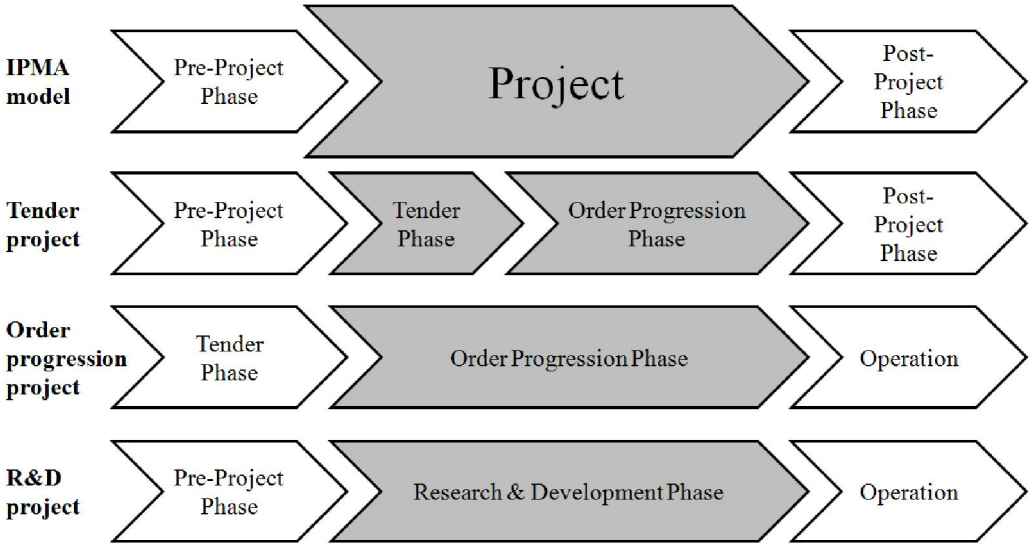


Figure 17: IPMA model compared to project environment models according to Patzak/Rattay

As you can see the pre-project phase is denoted differently in the models. If you compare the tender project with the order progression project once the tender phase is within the project limits, the other time it is equal to the pre-project phase. This is because in a tender project there is usually a conditional offer or an open order made, which has to be dealt with. Therefore the tender phase complies with the initial phase of the Project Life Cycle. If the organisation gained the tender the order progression can start. Otherwise the project is terminated. (Patzak/Rattay, 62-63) In contrast to there is

the order progression project. The offer made from the project sponsor is normally unconditional. The responsible department (e.g. sales department) passes the offer to the department which is responsible for the progression of the order. This is the actual project start, hence the tender phase equates to the pre-project phase. (Patzak/Rattay, 63-64) The shaded phases represent the phases within the project itself. They can be further subdivided into more appropriate project phases (see Chapter 2.3).

These shaded phases correspond with the project management process. The IPMA divides the project management process into the following sub-processes which are related to one another. Five of them are mandatory whereas project marketing is an optional sub-process. (PMA 2008, 10-11)

1. Project start
2. Project co-ordination
3. Project controlling
4. Project marketing
5. Project crisis management
6. Project close-down

Figure 18 shows the relations of the project management sub-processes along with the progression of a project.

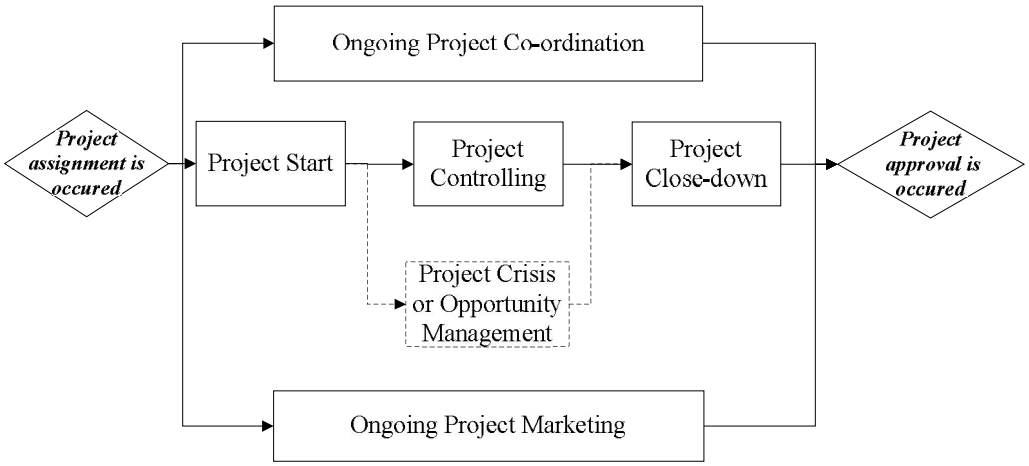


Figure 18: Project management sub-processes (based on: PMA 2008, 12)

1. Project Start Process

Project start is one of the sub-processes of project management. Its objectives are the transfer of information from the pre-project phase into the project, the agreement on project objectives, the creation of project plans, the design of a project organisation, team building, project development as well as the establishment of the project as a social system. Also the planning of risk measures to avoid and prepare for crisis. Furthermore the project context relationships (often called “Big Project Picture”) are designed. The execution of initial project marketing takes place and the project management documentation for project start is created. (PMA 2008, 10)

2. Project Co-ordination Process

The objectives of project co-ordination are the continuous ensuring of project performance and adequate information distribution for the project team members and representatives of relevant environments as well as the continuous support for the completion of individual work packages. Project co-ordination begins with the project assignment, ends with the project approval and includes: successive evaluation of the (intermediate) results of work packages, consecutive communication between the project manager and the project team members and the project owner, continuous forming of relationships to relevant environments, disposition of project resources and ongoing project marketing. (PMA 2008, 10)

3. Project Controlling Process

Project controlling has the aim to analyse the project status, the construction of the “Big Project Picture”, the agreement and/or undertaking of directive actions, the further development of project organisation and the project culture. It also includes changing project objectives, creation of progress reports, redesigning the project context relationships and executing project marketing actions. The project controlling process takes place many times during the performance of a project. It begins with the project initiation and ends when the project performance report has been filed. (PMA 2008, 11)

4. Project Marketing

Project marketing increases management attention and ensures, via corresponding forms of communication, the acceptance of project results. Even good results with regard to content will lead to project failure, if they are not accepted. Project marketing also fosters the project’s organisations identification with the project itself and is a project management task which must be fulfilled in all sub-processes. If project

marketing requires a lot of time and cost-intensive measures it makes sense to plan work package exclusively dedicated to this task. Materials might include folders, newsletters ... (PMA 2008, 11)

5. Project Crisis Management

Within this process a project crisis, a project opportunity or a project phase transition are managed. Project crisis and project opportunity occur without warning. Project crises form an existential threat the project and often have surprising causes. In the context of project start and project controlling it is possible to develop scenarios to identify potential project crisis and so responses to this project crisis can be planned. To deal with a project crisis, a specific process must be undertaken. The objectives of this particular process are to secure the progress in the project and limit possible damage to the project. The process of dealing with a project crisis begins with the definition of the crisis and ends when the end of the crisis has been communicated. (PMA 2008, 11)

6. Project Close-down Process

The aims of this sub-process are the planning and completion of remaining project tasks, emotional closure, project evaluation, dissolving the project team and the (eventual) payment of project bonuses as well as documentation of the actual state. Besides that the planning for the post-project phase happens and the creation of project close-down reports, the transfer of information to the permanent organisation and to other projects, the dissolution of the project environment relationships and the closing of the project marketing actions take place. Project close-down starts with its initiation and finishes with the approval of the project by the project owner. (PMA 2008, 12)

## 5.4 Contrast of the analysed Project Life Cycle with the IPMA

### 5.4.1 Initiation Phase

The initiation phase starts with the generation of the project idea and lasts till the approval/rejection of this project idea, yet some typical tasks at project start do not take place (see Chapter 4.1). Therefore the initiation phase of the analysed Project Life Cycle represents the pre-project phase according to the IPMA. In the pre-project phase the project is defined in a temporal, factual and social aspect. This happens by creating the project start event (e.g. project proposal) and/or the project objectives. Therefore methods from the PM sub-process "Project Start" take place in the pre-project phase to develop drafts of project documents. (PMA 2008, 16) These documents help to define and evaluate the project context in three different ways: with respect to time, object and social matters. (PMA 2008, 16) After approval of the project idea/ proposal the project moves to the next phase. The transition to the next phase is in the scope of the sub-process project crisis management. In case of rejection, the project idea/proposal gets terminated.

### 5.4.2 Planning Phase

Along with the beginning of the planning phase the planning processes start. First of all the project information from the pre-project phase is the foundation for the project assignment, hence for all planning activities. The transferred information is edited and completed and the Kick-Off workshop is held to roughly plan the project (see Chapter 4.2). These processes from are all the PM sub-process "Project Start". The aim of project planning is to guarantee the quality of the project's outcome and so they reflect the sub-process "Project co-ordination" as well. Proper project co-ordination ensures the communication and information distribution between all parties concerned. Moreover processes for project marketing happen to use adequate communication techniques to obtain the acceptance of the internal and external project environment[24]. After completing all planning tasks the project moves forward to the execution phase which is part of the project crisis management sub-process.

[24] The project environment consists of the numerous stakeholders and players that have an input or are affected by the project (see Chapter 2.5). Hence the project environment directly affects the project and it should be managed. Projects are not carried out in a vacuum; they are influenced by a wide range of stakeholders and issues. (Burke, 6)

### 5.4.3 Execution Phase

During the execution phase the previously planned tasks are implemented. The communication processes fall in the sub-process project co-ordination and with the sub-process project controlling they build the main processes within this phase. Project controlling takes place several times (e.g. based on a due date) along with the project's progression. Therefore the project reporting activities are also comprised with these two sub-processes. Most of these tasks can be done with PM software tools, which provide various advantages. (PMA 2008, 40) If discrepancies of the actual data and the target data are detected corrective actions have to be developed. The PM sub-process "project crisis management" deals with this issue. Especially during a crisis project marketing processes are very important. This sub-process ensures the acceptance of the management and fosters the identification of the project team with the project. Sometimes not a crisis but an opportunity for the project is identified. In this case also the project crisis management sub-process is designated to handle and use this potential. (PMA 2008, 11) Again the transition from the execution phase to the closure phase falls in the sub-process project crisis management.

### 5.4.4 Closure Phase

In the last phase of the Project Life Cycle the closing processes happen. Thus the sub-process "Project close-down" is the predominant PM sub-process. Besides that the ongoing sub-processes project co-ordination and project marketing are executed. The main objectives are to finish all tasks, document the lessons learned from the project and dissolve the temporal project infrastructure.

## 5.5 Analysis of the differences between the models from the PMI and the IPMA

First of all, both of these models understand project management as the primary process for handling projects, which contains a number of sub-processes. (PMA 2008, 10; PMBOK, 37)

With respect to the phase model for the Project Life Cycle there are several differences. The Project Management Institute does not provide a phase model and organises the project management process in five project process groups. Again these process groups contain processes which are further subdivided into categories, known as knowledge areas (see Chapter 5.1). Overall there are five process groups and nine knowledge areas and collectively they comprise of 44 management processes (see Figure 15).

The International Project Management Association distinguishes between the pre-project phase, the project and the post-project phase. To carry out a project the IPMA speaks of the project management process, which begins with the project assignment and ends with the project approval. (PMA 2008, 10) The IPMA divides the process of project management into five essential PM sub-processes and optional sub-processes, for example project marketing (see Chapter 5.3).

Compared in a direct way both standards have a holistic approach, but the sub-processes of the IPMA model are overall arranged chronologically. Whereas in the model according to the PMI the project process groups can be (and usually are) found in every phase of the Project Life Cycle. With respect to content the process groups and the sub-processes are pretty much the same. For example the knowledge area “Project Integration Management” which occurs in every process group equals the ongoing sub-process “Project Co-ordination Process” according to the IPMA.

## 5.6 Evaluation of the applied PM software tool with regard to the Project Life Cycle at an IT-based service provider

Current software tools support the project management processes during the Project Life Cycle in nearly all areas of project work (Motzel et al., 52). In the analysed case the implemented software tool is a project management solution developed by Microsoft. The platform builds the Microsoft Windows SharePoint Services 3.0 (optional: Microsoft SQL Server) combined with the Microsoft Office Project Server 2007. Based on this platform there are two front-end applications: Microsoft Office Project Professional 2007 (MS Project) and Microsoft Office Project Web Access (PWA) (see Figure 19). The first application is a powerful project planning tool and provides capabilities for project managers whereas the second one is a web-based tool for all project team members to access project information. (Microsoft 2008b)

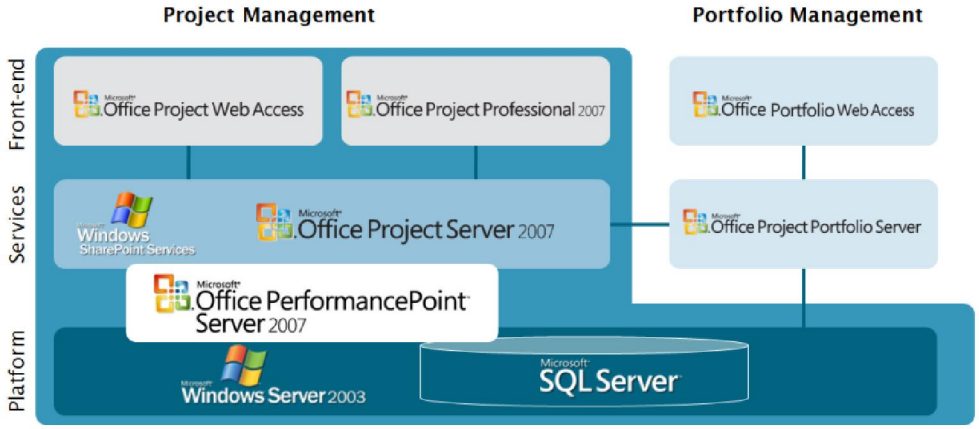


Figure 19: Microsoft Office Project Server architecture (Source: Campana & Schott)

The Project Life Cycle starts the project idea or project proposal. These documents can be easily generated with the proposals function in the PWA. Yet in the analysed case the project idea is generated with an individual form (appendix B) because the functional range for the project proposal function in Microsoft Office Project Web Access is not sufficient. Therefore the project idea needs to be generated with Microsoft Office Forms Server 2007.

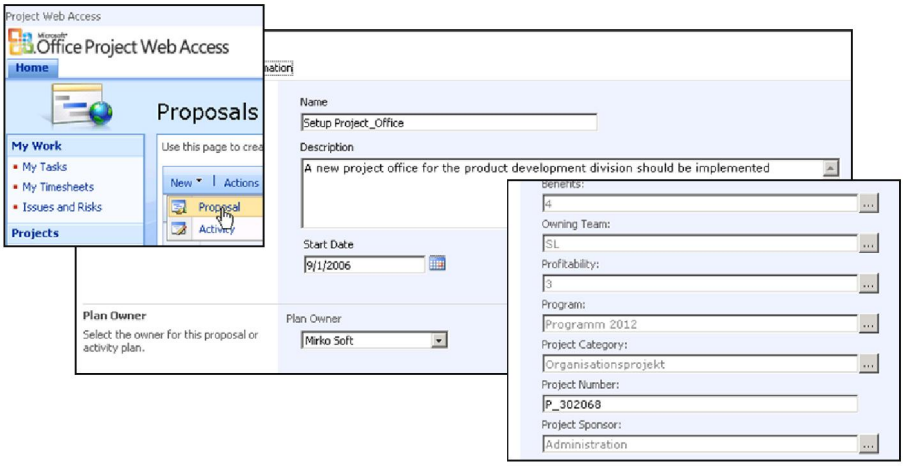


Figure 20: Generate a project proposal in PWA

The Project Portfolio Board Manager is notified about the creation of a new project idea and after the approval by the project manager the project idea becomes a project on the Project Sever automatically. Once the project idea is approved the project moves from the initiation to the planning phase. This is the beginning of the planning processes. The project manager has access to the project and can start with the project planning in MS Project. This software tool provides features for the project manager to cover the knowledge areas according to the PMI. First the project master data has to be provided. The work breakdown structure is established and resources and costs are assigned to the tasks. Verzuh recommends a six-step process for the planning with project management software tools. These steps are (Verzuh, 104-141):

1. Build a work breakdown structure
2. Identify task relationships
3. Estimate work packages
4. Calculate initial schedule
5. Assign and level resources
6. Develop a detailed budget

Further explanations on how to plan a project with MS Project are not part of this diploma thesis but exemplarily can be read in Holert (Holert, 31-72). Programmes are displayed as master projects and contain the related projects. The figure below gives you an idea how a project is displayed in MS Project.

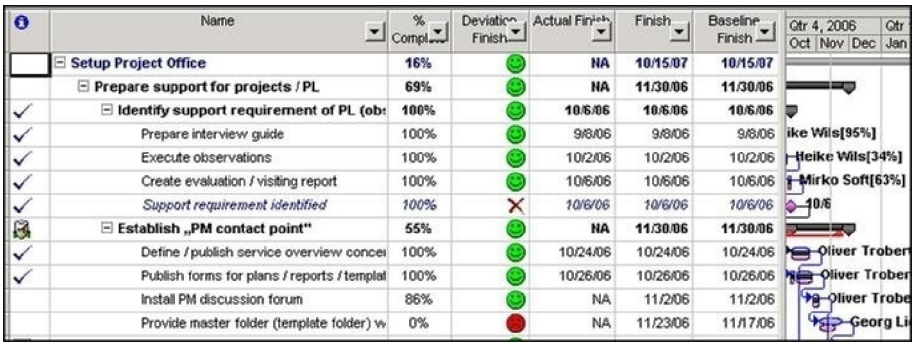


Figure 21: Project planning and controlling with MS Project (Source: Campana & Schott)

Along with the project execution the information flow increases rapidly (see Figure 5). This is due to the interaction of all persons involved within the project. With MS Project Server 2007 each project team member has an overview about the assigned tasks from the project manager due to his individual PWA account. Figure 22 below gives an example of the "My Tasks" menu in PWA. By default MS Project assumes that all tasks will be completed. If not all tasks can be progressed (e.g. scheduling conflict) some of them can be deleted or re-assigned. (Holert, 96-99) To each of these tasks a progression rate and/or a value of actual work can be allocated on a daily basis as well as additional work and expense and/or risks. Delays of start or finish dates are also handled within this menu. (Holert, 106-117)

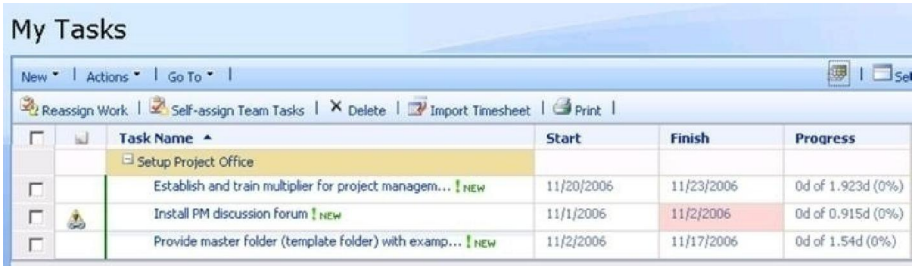


Figure 22: My tasks in Project Web Access (Source: Campana & Schott)

These reporting functions help the project manager to keep the overview over the project's progress and resources. The project manager can see status reports from all projects and tasks he is involved and has the possibility to group and/or to filter the information. It is also possible to refresh the project plan automatically with ongoing new information. According to the communications management the distribution of information within the project can occur in two ways. Project data can be communicated easily (e.g. among others via E- mail (push-principle)) as well as each team member of the project can set individual alerts and notifications (pull-principle).

The monitoring of the workflow can be done with the help of baselines to compare the actual and the target data. Graphical indicators can be used for better clarification. Furthermore costs of projects and tasks can be controlled and examined.

It is also possible to check the availability, usage and workload of certain resources. The combination of MS Project and Project Web Access guarantees an easy coordination and collaboration and therefore and effective resource management. (Microsoft 2008c)

During the closure of a project tasks can be terminated so that resources cannot report effort on these tasks. Furthermore the project manager can verify if all deliverables have been achieved successfully. Lessons learned can be stored in various forms (e.g. Wiki-Sites[25]).

[25] A wiki (Hawaiian word for fast) is a collection of web pages that can be edited by a group. http://iws.cit.cornell.edu/iws2/technology/techinfo.cfm#CP_JUMP_3088, 30.10.2008

# Chapter 6

## 6 Analysis of the Portfolio planning at an IT-based service provider

The foundation of the data for the project portfolio management is created during project initiation and project planning. Due to this concretisation process there is no need for a special modification of the project data to be used for the portfolio planning.

At the moment portfolio planning takes place with the help of a Microsoft Excel file. This is not unusual as the study conducted by Meyer results in the same way: Microsoft Word- and Excel-checklists are predominant. Some of the companies that use Office applications for capturing the project ideas don't deploy software tools or do not even select and prioritise their project ideas. (Meyer, 13)

At the analysed service provider the portfolio planning shall be operated with the implementation of the new software tool. The aims for the project portfolio management are:

- The strategic project controlling over all projects within the company
- Project evaluation and approval/stop
- Project (re)prioritisation
- Assurance of resources
- Decision for escalation
- Monitoring/support during project escalation
- Generating the project portfolio for the following year

For the portfolio planning of projects there has to exist a number of additional roles. Besides the available roles within project management there are the following portfolio management specific ones:

Project Portfolio Board Manager:

- Create/change project portfolios by modifying project master data
- Revise risk-benefit analysis for a project and therefore the rating
- Define/change dependencies between projects

| | |
|---|---|
| | • Define/change a project's priority<br>• Modify the project's status |
| Project Portfolio Team Member | • They can see portfolio reports released by the Project Portfolio Board Manager |

All the project ideas and project proposals are sent to a Project Portfolio Board Manager for approval. If this is the case a project idea/proposal becomes part of the portfolio. The projects within the portfolio are evaluated with respect to cost benefit, links to other projects,

The following table shows the processes for portfolio planning and the related responsible roles:

| Task | Responsible Person |
|---|---|
| Create/modify project portfolios | Project Portfolio Board Manager |
| Modify cost benefit analysis to change a project's evaluation | Project Portfolio Board Manager |
| Define/modify dependencies between projects | Project Portfolio Board Manager |
| Define/modify a project's priority | Project Portfolio Board Manager |
| Report on project portfolios | Project Portfolio Board Manager |

Table 15: Process of project portfolio management

Due to legal restrictions it was not possible for the author to gain insight on PPM-specific documents to analyse the portfolio planning. Therefore in the next Chapter the Campana & Schott best practices model for project portfolio management is described to provide understanding.

## 6.1 Campana & Schott best practices model for Project Portfolio Management

The process model of Campana & Schott for project portfolio management is based on the Standard for Portfolio Planning from the Project Management Institute. Its hierarchic structure covers three levels (see Figure 23). The primary processes are initiation, selection and planning as well as controlling. The next level contains the sub-processes and level three comprises the process steps for each sub-process.

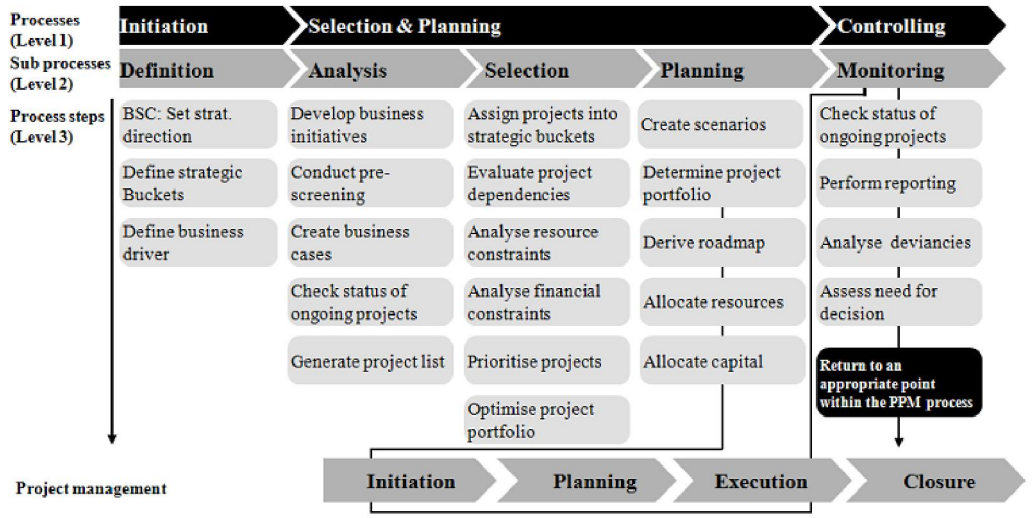


Figure 23: Campana & Schott PPM processes model (Source: Campana & Schott)

Project portfolio management starts with the definition process. The balanced scorecard (BSC)[26] and the business drivers are defined. Also the strategic buckets have to be designated. For every goal of the company there has to be one strategic bucket. The budget of the company is afterwards allocated into the strategic buckets with regard to the weight of the goal assigned to the strategic bucket.

With all this information obtained the analysis, selection and planning of the projects within the portfolio can begin. The results of the BSC are analysed and thereof the business initiatives are derived. These business initiatives build the foundation for the possible projects. The next step is to conduct a pre-screening where a pre-selection is done with the help of checklists followed by the creation of project proposals (or business cases). Besides the new projects the status of the ongoing projects has to be monitored and finally a list is generated with all projects is generated.

[26] The balanced scorecard is a tool to derive clearly-defined measures from a company's vision and to monitor them along with the execution.

The selection process starts with the allocation of the projects from the project list into to eligible strategic buckets. Every project is evaluated for dependencies to other projects and resource plus financial constraints are identified. Afterwards the evaluated projects are prioritised. This iterative process serves to optimise the project portfolio (see Chapters 3.4.1 to 3.4.3).

The next part comprises the portfolio planning in the narrower context. With respect to project management these tasks go along with the initiation phase. First of all different business scenarios are created. With these scenarios a number of different project combinations can be illustrated and evaluated with given numbers. Therefore a scenario not only contains project choices but provides also information on the impact on the company. From these scenarios the project portfolio is determined and a roadmap is derived. This roadmap is the schedule for the project portfolio and includes the start and finish dates of all projects. Furthermore resources and capital is assigned to each project.

The last of the primary processes is the controlling process. Similar to the project management processes the status of the projects within the portfolio is monitored and reporting is performed. With comparisons of target and actual data it is possible to analyse deviancies. If this variances exceed a certain number there is usually need for decision how to proceed with the portfolio (e.g. reprioritise the projects).

## 6.2 Evaluation of the applied software tool with regard to the Project Portfolio Planning

Primarily Microsoft Office Project 2007 is a project management software tool whereas Microsoft provides a project portfolio specific software application with Microsoft Office Project Portfolio Server (see Figure 19). For this reason MS Project can handle multiple projects but has quite a limited functionality when it comes to selection and prioritisation of projects within a portfolio. (Microsoft 2008d)

For instance it is possible with MS Project to create a master project (which equals a programme) to group various projects into one master project within the portfolio. Also cross-project resource management can be done with MS Project. Therefore according to the Campana & Schott PPM processes model above (Figure 23) only the process steps “derive roadmap”, “allocate resources” and “allocate capital” can be properly operated with MS Project.

For the project team members the Project Center (Figure 24) in Project Web Access enables an overview about all projects.

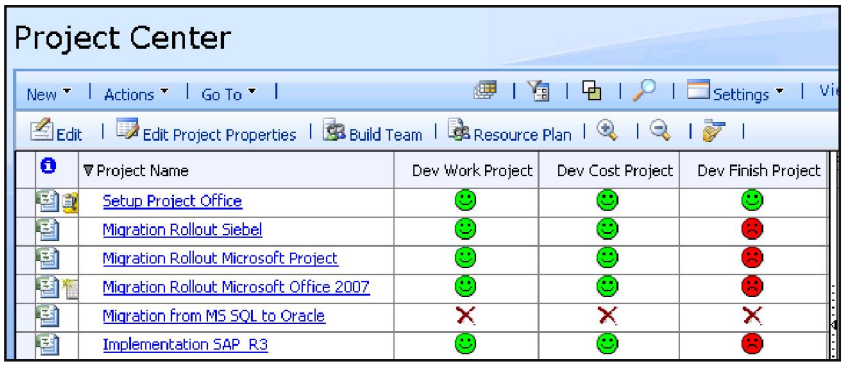


Figure 24: Project Center in PWA (Source: Campana & Schott)

With respect to the functional requirements from the IT-based service provider (see Chapter 6) it must be said that it is not possible to implement all the required features solely with MS Project.

The reason is incorrect planning because the analysed company did not align their requirements with the functionality of the implemented PM software tool. Therefore their feature requests exceeded the functional scope of MS Project. Hence the technical support for project portfolio management could not be realised completely.

# Chapter 7

## 7 Definition of a procedure model to implement a PM software tool to support the Project Life Cycle

The following Chapter conduces to the understanding of how to implement a software-based project management tool properly. The PMI defines PM software tools as a class of computer software applications specifically designed to aid the project management team with planning, monitoring and controlling the project, including: cost estimating, scheduling, communications, collaboration, configuration management, document control, records management, and risk analysis. (PMBOK, 369) There are numerous PM software tools available on the market[27] so you have to be aware of your needs and requirements. The selection process for project management software usually includes a requirements analysis, the establishment of a catalogue of target and assessment criteria, a feasibility study, the pre-selection and assessment of all relevant alternatives, the decision-making process and finally the introduction of the new software. (Motzel et al., 52)

A study of the University of Bremen and the GPM identified six criteria for the requirements on PM software tools which the interviewees had to evaluate with numbers from one (no impact) to five (high impact). These criteria and their medians are (Meyer, 15-16):

1. User interface 4,39
2. Time for implementation 3,66
3. Service features 3,63
4. Product price and follow-up costs 3,56
5. References 3,54
6. Neutrality to operating systems 2,66

Noticeable is that the value of usability is higher than the one for the price. This fact goes along with the most mentioned factor for the success of implementation, handling. An easy to use software tool fosters the acceptance of the employees. (Meyer, 16-17) This also reflects in the reason for not implementing a PM software tool. The

[27] The following link gives an overview about a number of different project management software tools that are proprietary as well as open-source applications. http://pmqs.de/index.php?topic=library&command=software, 29.10.2008

complexity of the system was the most named as well as long training duration was the third most mentioned factor. (Meyer, 26) According to this study the neutrality to operating systems is the least important.

For the implementation of a project management tool Burke recommends four basic implementation methods which are related to each other and can be used on their own or in combination: (Burke, 329)

- **Pilot System**: A pilot system is essentially a mini version of a large project's management system. The pilot project is used to carry out a heuristic development process to dispose all occurring troubles. Ideally it should be used on a small project alongside the old computer system, so that if there are any problems the manager can quickly switch back to the old system.
- **Parallel Systems**: The organisation operates the new management system and old management system at the same time. This doubles the management work load effectively, but if there are any troubles with the new system the old management system is always available as a backup. This method is preferable by companies who could not risk having their system down for an unknown period of time (e.g. hospitals)
- **Phase-in/ Phase-out**: This method uses a slice by slice approach, implementing the new project management system in one section at a time. That is getting one section up and running and moving on to the next part afterwards. The big advantages is allowing the project team to set their own pace and keep control of the changes so that they will only have to address a small area rather than the whole system in case there are any problems.
- **Cut Off (or: Big Bang)**: As the name indicates this is the harshest and most rigid method. The approach is to change from the old system to the new management system overnight. The advantage is that there are no additional costs of running two systems parallel and the new system is up and running quicker. On the other hand there is the risk of failure for the new system with all its associated lost production costs. This model should only be used if you are confident the new management system will work first time without any significant debugging.

In practice implementation tends to be most effectively achieved using a combination of all the different methods listed above as well as the using the one that is most suitable to the management system and your management style. (Burke, 329)

Leading project management consultancies such as Primas Consulting, the Project Group or Campana & Schott proceed widely similar on the implementation of a new project management software tool at an organisation. (Primas Consulting 2008; The Project Group 2008) Figure 25 shows the best practices model of Campana & Schott for the implementation of a new project management software tool[28].

It has to be said that the implementation of a project management software tool can solely support an existing project management. Therefore knowledge and skills of project management are crucial factors for the launch of PM software tools. (Meyer, 17) The software will not tell you what decisions to make or how information should be interpreted, but it will speed up data processing if the information system has been well designed. "*You need to beware of mistaking the tool for the solution.*" (Burke, 323)

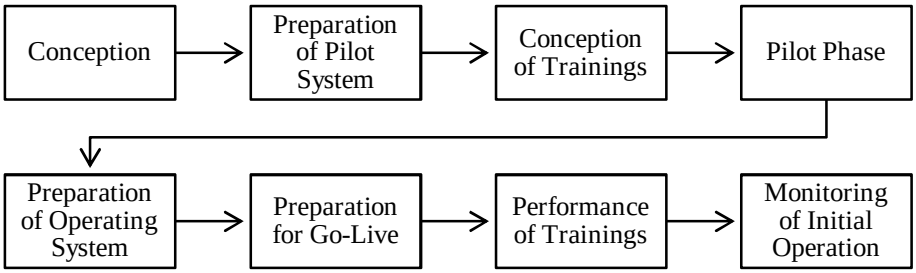


Figure 25: PM Software implementation - Campana & Schott best practices model

The first step "Conception" has the aim to analyse and document the existing project management and project portfolio management processes as well as an early concept for the PM software tool. This is usually done within workshops where the needs of the customer are aligned with the functional scope of Microsoft Project Server 2007 and finally the concept is consolidated.

In the next step "Preparation of the Pilot System" the installation of MS Office Project Server 2007 is prepared and executed. Afterwards the configuration processes take place. This comprises for example the setup of the roles and their according rights. The performance of system tests ensures the operational reliability. Along with these activities the concept for the training is generated. That is the schedule for training is defined and a user guide and exercises for the handling of the Project Server are drafted.

[28] Campana & Schott exclusively implements Microsoft products. Therefore the author will use Microsoft specific terminology to describe this model; although the procedure model can also be used for different software products.

During the "Pilot Phase" ample tests are held with the pilot system. The pilot user are trained for the new system and coached the whole time. Change requests[29] from the users have to be collected, evaluated and performed if necessary. The end of this phase is accompanied by the "Preparation of the Operating System". Thereby the Project Server infrastructure is installed and the migration of the pilot system takes place. Additional change requests have to be considered and executed. System tests are performed to guarantee the pursued quality. This is followed by the "Preparation for Go-Live[30]" in which the operational concept is created and the support structures are established. Trainings are planned and the system documentation is finalised. In the end the roll-out[31] of Microsoft Office Project Server 2007 is planned and scheduled.

With the "Performance of Trainings" the remaining users are introduced and trained to the new project management software tool. These trainings have to be conducted role-specifically. Therefore it is necessary to subdivide the trainings for project managers, project team members, executive managers and administrators. The performance of trainings is one of the most important success factors for a software implementation. According to Meyer the most mentioned reason for failure of the implementation of a PM software tool was the lack of knowledge because normally no trainings were held. (Meyer, 17-18)

Along with the roll-out and later the Go-Live of the system the "Monitoring of the Initial Operation" happens. This comprises additional user coaching, provision of user support as well as maintenance of the system and the collection and evaluation of other change requests.

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[29] A change request is a request to expand or reduce the project scope, modify polices, processes, plans, costs or revise schedules. Request for change can be direct or indirect, internally or externally generated, contractually mandated or optional. Only formally documented requested changes are processed and only approved ones are implemented. (PMBOK, 353)

[30] The Go-Live (or Going Live) marks the point of going productive for the system; hence the establishment within the regular business. (Steinweg/Fedtke, 172-173)

[31] The roll-out denotes the productive launch of the system at the customer. (Steinweg/Fedtke, 172)

# Chapter 8

## 8 Resume

All in all the technical support for project management is almost always a project management software tool. These tools can provide an increase in productivity if they are well suited and implemented correctly. Therefore the requirements for the tool have to be clearly defined and aligned with the functional scope of the PM software tool(s). In the analysed company this was partly not the case so that some of the requirements for portfolio planning could not be met by the implemented software tool. The users also have to understand and be able to apply the principles and techniques of project management to make the most of your PM software tool because a PM software package alone does not make a project manager. Also the different implementation strategies have to be considered and from them the company's most suitable one(s) should be selected.

A crucial factor is the usability of the software tool as the employee's acceptance relies upon. Hence the application should be easy and intuitive to use. Furthermore appropriate trainings have to be held along with the implementation process to instruct and train the user to the new system.

One the PM system is implemented it can support and assist the project manager and project team during the entire Project Life Cycle and in all areas of the project management process. According to the PMI there are the five project process groups that can recur in every phase of the Project Life Cycle. The processes of these groups can be further assigned to nine knowledge areas. The IPMA divides the project management process into five essential and additional sub-processes. With respect to scope they partly overlap with the PMIs process groups but usually do not reiterate with each phase.

According to the author PM software tools will gain importance within an organisation in the future due to the various benefits. The centre point will shift from single project management to project portfolio management and these software tools will become an integrated part of a company's computer systems. Therefore it is vital for businesses to know how to cope with the implementation of these software tools.

# References

**Adler, Anna; Sedlaczek, Ralf:** Multi-Projektmanagement, Portfolioplanung und Portfoliocontrolling in: Schott, Eric; Campana, Christhophe (Hrsg.): Strategisches Projektmanagement, Springer, 2005

**Archer, Norm; Ghasemzadeh, Fereidoun:** An integrated framework for project portfolio selection, International Journal of Project Management Vol. 17, 1999

**Bonham, Stephen:** IT Project Portfolio Management, Artech House, 2004

**Burke, Rory:** Project Management: Planning and Control Techniques, 5th Edition, Burke Publishing, 2006

**Campana & Schott:** Corporate profile of Campana & Schott, www.campana-schott.com/en/corporate-profile/index.html, 29.08.2008

**Cronenbroeck, Wolfgang:** Handbuch Internationales Projektmanagement, Cornelsen, 2004

**DIN 69901:** Deutsche Norm für Projektwirtschaft und Projektmanagement, Beuth-Verlag, Berlin, 1987

**Egan, Brian Denis:** An Introduction to PMI's Project Life Cycle, 2006, http://www.esimez.ipn.mx/fonseca/material_bibliografico/articulos/An_Introduction_to_PMIs_Project_Life_Cycle.pdf, 22.07.2008

**Foth, Egmont:** IT Projektmanagement in: PIK – Praxis der Informationsverarbeitung und Kommunikation, Band 26, Nr.3 Juli – September, 2003

**Gallup Institut:** Einstellung zu Projektmanagement in österreichischen Unternehmen, Telefon und Online Umfrage, Karmasin Marktforschung, Österreichisches Gallup Institut, Wien, 2007

**Gabriel, Peter; Knöpfel, Hans:** Standards und Zertifizierungen im Projektmanagement, AWK Focus Seminar – 27. + 29. Oktober 2008, http://www.awk.ch/pdfs/awk_fokus_22_presentation.pdf, 25.11.08

**Gardiner, Paul:** Project Management: A Strategic Planning Approach, Palgrave MacMillan, 2005

**Gareis, Roland:** Happy Projects!, Manz Verlag, 2003

**Gareis, Roland:** Professional Project Portfolio Management, Project Management Group, Wien, 2002

**GPM InfoCenter:** The Project Management Homepage for Universities and Sciences: Project Management Standards, http://www.gpm-infocenter.de/EngPMStandards/ InternationaleStandards, 22.07.2008

**Holert, Renke:** Microsoft Office Project 2007 – das Profibuch, Microsoft Press, 2007

**Hunger, Marko:** Erfahrungssicherung in IT-Projekten, 1. Auflage, Vieweg + Teubner, 2005

**International Organization for Standardization:** Guidelines for Quality Management in Projects (ISO10006:2003(E)), Genf, 2003

**International Project Management Association:** IPMA Competence Baseline (ICB), Version 3.0, 2006, http://www.ipma.ch/Documents/ ICB_V._3.0.pdf, 18.07.08

**International Project Management Association:** History of the IPMA (IPMA.ch), http://www.ipma.ch/about/Pages/History.aspx, 22.07.2008

**Jenny, Bruno:** Projektmanagement in der Wirtschaftsinformatik, vdf Hochschulverlag der ETH Zürich, 2001

**Kerzner, Harold:** Project Management: A Systems Approach to Planning, Scheduling and Controlling, John Wiley & Sons, 2001

**Köhler, Peter:** PRINCE 2, Springer Verlag, Berlin Heidelberg, 2006

**Kunz, Christian:** Strategisches Multiprojektmanagement: Konzeption, Methoden und Strukturen, 2nd Edition, DUV, 2007

**Lee-Kelley, Liz; Loong, Kin:** Turner's five functions of project based management and situational leadership in IT projects, International Journal of Project Management Vol. 21, 2003

**Lomnitz, Gero:** Multiprojektmanagement – Projekte erfolgreich planen, vernetzen und steuern, 2. Auflage, Moderne Industrie, 2004

**Meyer, Mey Mark:** Stand und Trend von Softwareunterstützung für Projektmanagement-Aufgaben, Studie der Universität Bremen in Kooperation mit GPM, 2005, http://www.pm-software.info/empirie.html, 11.11.2008

**Method123 Project Management Methodology (MPMM):** Project Management life cycle, http://www.mpmm.com/project-management-methodology.php, and http://www.method123.com/project-lifecycle.php, 25.07.2008

**Microsoft (2008a):** Microsoft Office Project Server 2007 product overview, http://office.microsoft.com/en-us/projectserver/HA102032191033.aspx, 03.09.2008

**Microsoft (2008b):** Microsoft Office Enterprise Project Management solution overview, http://office.microsoft.com/en-gb/epmsolution/HA101656441033.aspx, 28.10.2008

**Microsoft (2008c):** Microsoft Office Project Server 2007: Top 10 benefits, http://office.microsoft.com/en-gb/projectserver/HA102052311033.aspx, 28.10.2008

**Microsoft (2008d):** Microsoft Office Enterprise Project Management Solution overview, http://office.microsoft.com/en-gb/epmsolution/HA101656441033.aspx, 17.11.08

**Motzel, Erhard; Pannenbäcker, Olaf:** Projektmanagement Kanon – Der deutsche Zugang zum Project Management Body of Knowledge, GPM, Roderer Verlag, 2002

**Patel, Mitesh; Morris, Peter:** Guide to the Project Management Body of Knowledge, Centre for Research in the Management with Projects, University of Manchester, Manchester, 1999

**Patzak, Gerold; Rattay, Günter:** Projektmanagement – Leitfaden zum Management von Projekten, Projektportfolios und projektorientierten Unternehmen, 4. Auflage, Linde, 2004

**Presseanzeiger:** Projektmanagement-Standards spielen für Unternehmen eine immer größere Rolle, http://www.presseanzeiger.de/meldungen/wissenschaft-forschung/255180.php, 05.09.2008

**Primas Consulting:** IT-Project Management Support, http://www.primas.at/?n=298, 29.10.2008

**Project Management Austria (PMA):** PM Baseline, Version 2.3 Englisch, 2005, http://debian.p-m-a.at/docs/pm_baseline_en.pdf, 18.07.08

**Project Management Austria (PMA):** PM Baseline, Version 3.0, 2008, http://debian.p-m-a.at/download/download%202009/pm%20baseline%203%200.pdf, 10.10.08

**Project Management Austria (PMA):** Standard Project Handbook, Version 2.7, http://debian.p-m-a.at/docs/StandardPHBv27_englisch.pdf, 22.10.2008

**Project Management Institute – PMI Chapter Austria:** http://www.pmi-austria.org/Content.Node/ueberpmi/geschichte_en.php, 22.07.2008

**Project Management Institute:** A Guide to the Project Management Body of Knowledge (PMBOK), 3rd Edition, Newtown Square, PA, 2004

**Project Management Institute:** The Standard for Portfolio Management, Newtown Square, PA, 2006

**Rosenau, Milton; Githens, Gregory:** Successful Project Management: A Step-by-Step Approach with Practical Examples, John Wiley & Sons, 2005

**Steinweg, Carl; Fedtke, Stephen:** Management der Software-Entwicklung, 6. Auflage, Vieweg + Teubner, 2005

**The Project Group:** Implementations of Microsoft Project Solutions, http://www.theprojectgroup.com/E/imple/epm_leistungen_e.html, 29.10.2008

**Turner, Joseph:** The Handbook of Project-based Management, 2nd Edition, McGraw-Hill, 1999

**Verzuh, Eric:** The Portable MBA in Project Management, John Wiley & Sons, 2003

**Wieczorrek, Hans; Mertens, Peter:** Management von IT-Projekten, Springer Verlag, Berlin Heidelberg, 2007

# Appendices

# Appendix A:

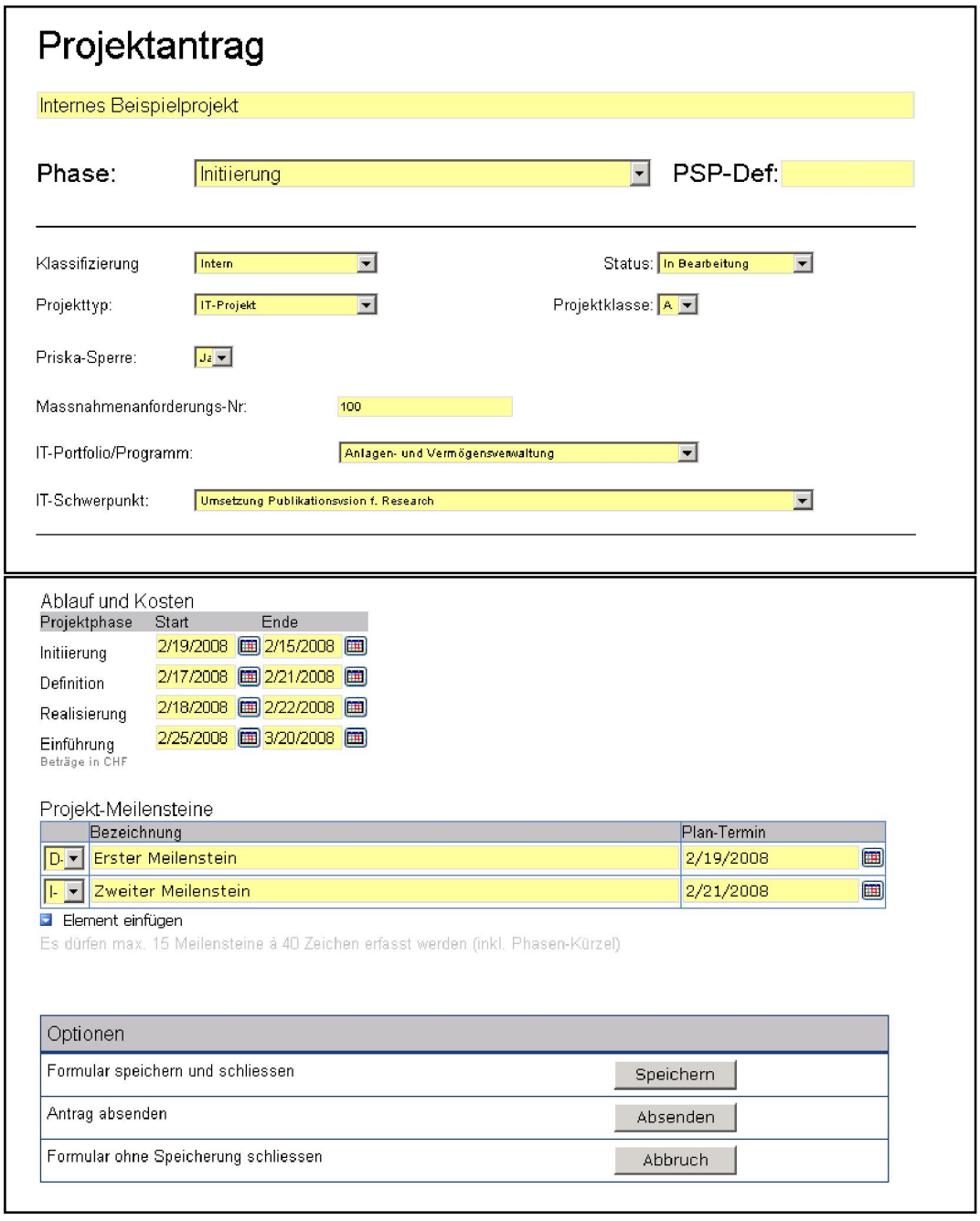



Figure 26: Example for a project proposal form (internal project)

# Appendix B:

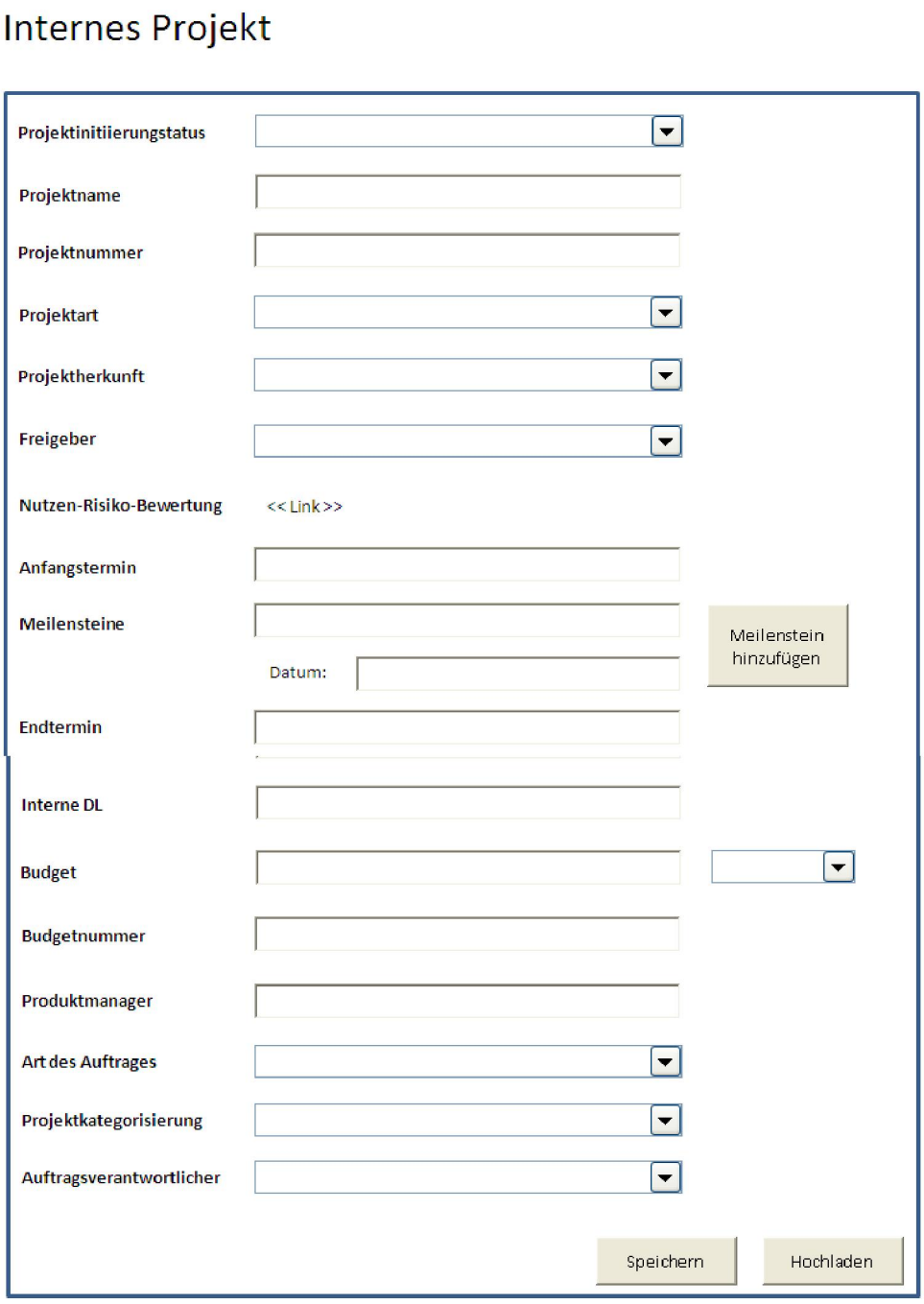
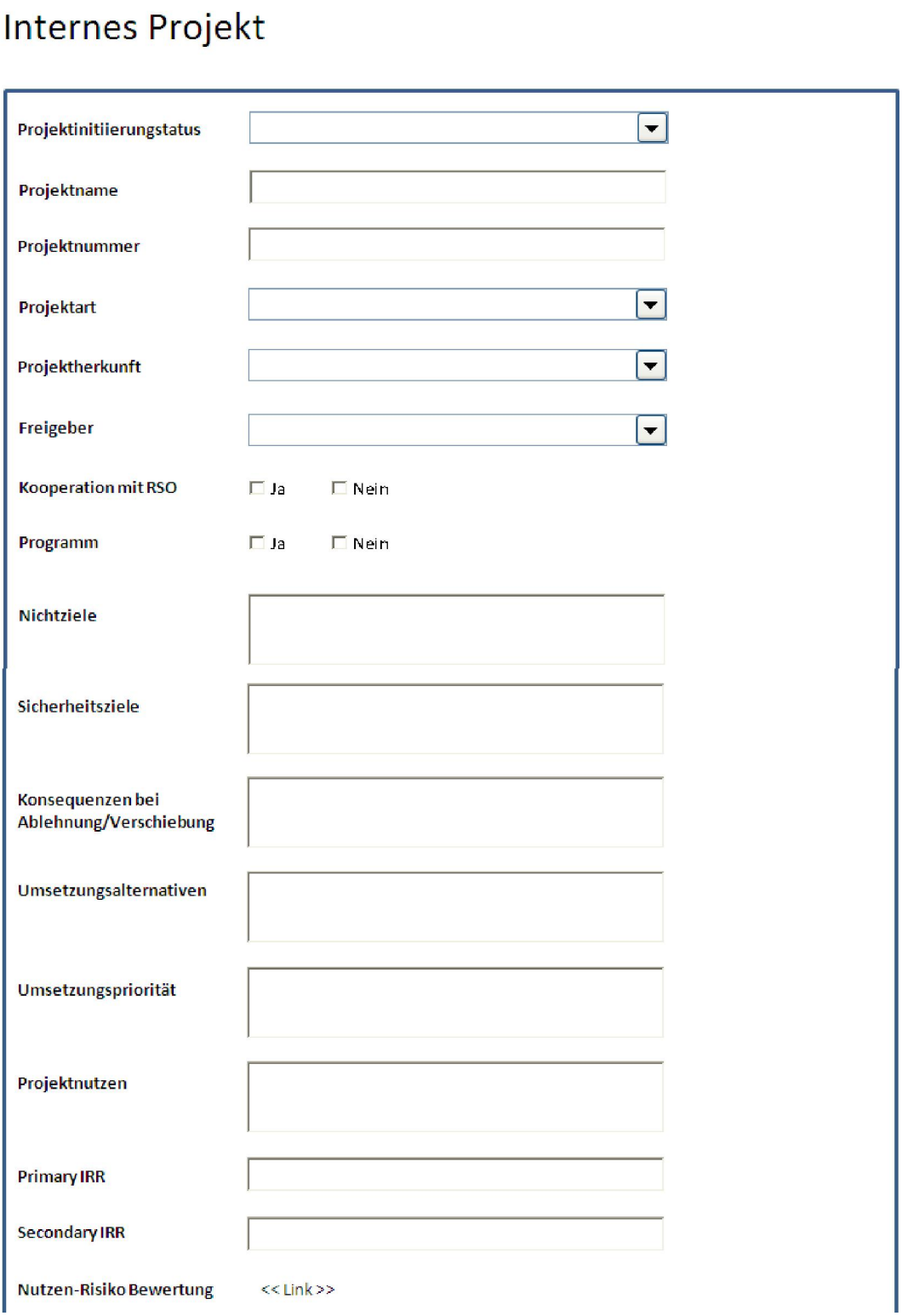



Figure 27: Example for a project idea form (internal project)

Appendix C:


Internes Projekt
Projektinitiierungstatus
Projektname
Projektnummer
Projektart
Projektherkunft
Freigeber
Kooperation mit RSO
Ja
Nein
Programm
Ja
Nein
Nichtziele
Sicherheitsziele
Konsequenzen bei Ablehnung/Verschiebung
Umsetzungsalternativen
Umsetzungspriorität
Projektnutzen
Primary IRR
Secondary IRR
Nutzen-Risiko Bewertung
<< Link >>

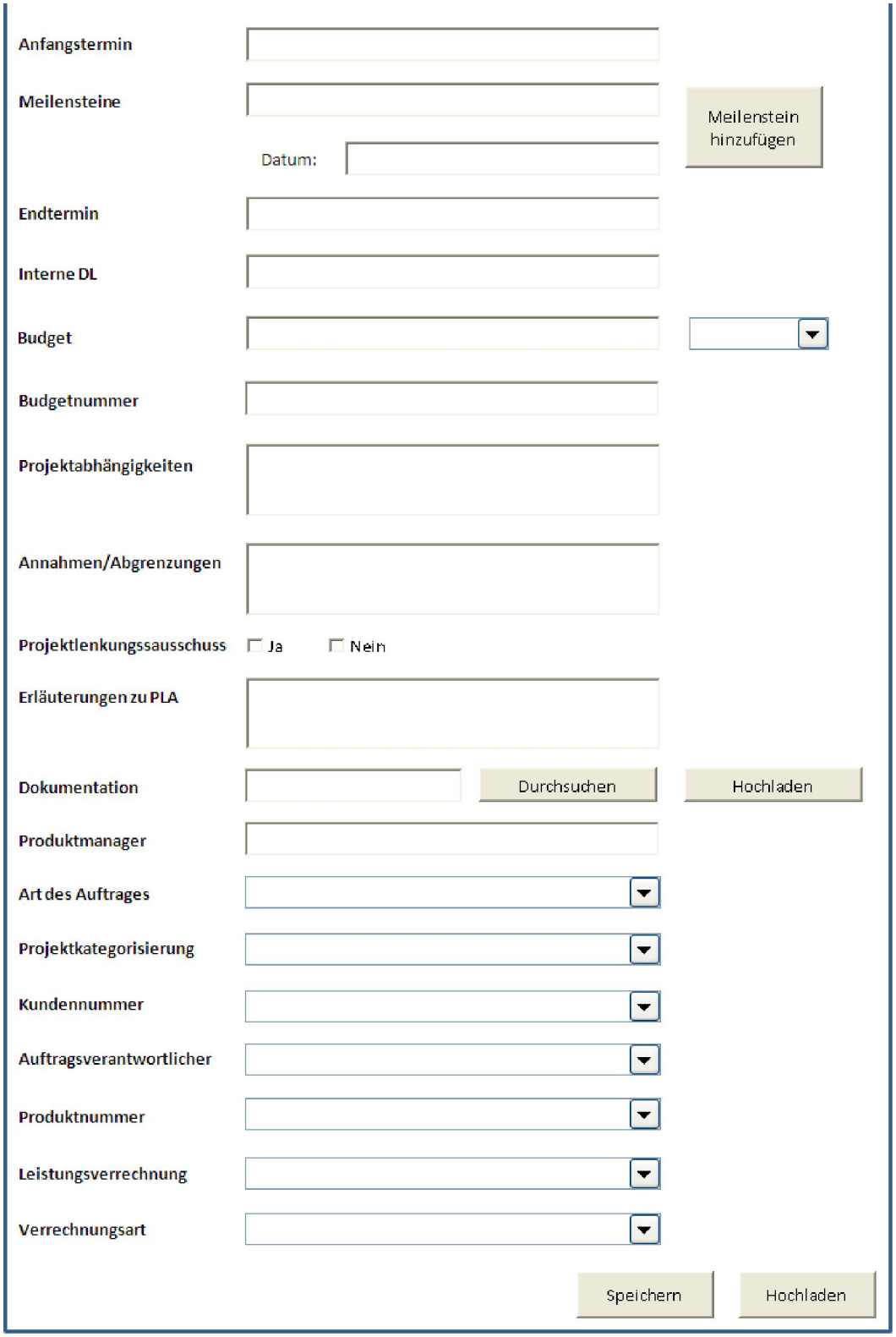



Figure 28: Example for a project proposal form - internal project

# Appendix D:

| <Project name><br><Project no.> | DESCRIPTION OF PRE- AND POST-PROJECT PHASE |
|---|---|
| **1) Pre-project phase** | |
| *What triggered the project?*<br>• <br>• <br>• <br>• | |
| *Relevant documents for the project ("Minutes", ... ONLY documents and no content necessary)*<br>• <br>• <br>• <br>• | |
| *Experience from similar projects*<br>• <br>• <br>• <br>• | |
| **2) Post-project phase** | |
| *What will happen after the project has ended? (Follow-up activities, further projects ...)?*<br>• <br>• <br>• <br>• | |

Figure 29: Description of Pre- and Post-Project Phase (Source: PMA Project Handbook)

# Appendix E:

## Possible risk factors:

| | |
|---|---|
| PROJEKTDEFINTION<br>• sehr großer Projektumfang<br>• sehr komplexe Anforderung<br>• unklar definierte Anforderungen<br>• kein oder unzureichend definiertes Projektziel<br>• keine, unzureichende oder veraltete Dokumentation bestehender (Teil)Systeme<br>• unklare Schnittstellen<br>• Anzahl der Schnittstellen<br>• Abhängigkeit von anderen Projekten<br>• unklare Projektrollen<br>• keine oder unklare Projektabgrenzung<br>• laufend Änderungen des Funktionsumfanges<br>• unklare oder enge Terminvorgaben<br>• kein oder unklares Abnahmeverfahren | ORGANISATORISCHE RAHMENBEDINGUNGEN<br>• Projekt hat Auswirkung auf Organisation<br>• keine Qualitätssicherungsprozesse vorhanden<br>• Einführung eines neuen Systems<br>• Ersatz eines laufenden Systems<br>• Übergabe an Bereitstellung und Betrieb unklar<br>• Einsatz nur zu bestimmtem Zeitpunkt möglich<br>• Einsatz nur unter bestimmten Voraussetzungen möglich<br>• viele Kunden<br>• hoher bürokratischer Aufwand<br>• Lieferschwierigkeiten seitens Lieferanten<br>• mangelnde Qualität seitens Lieferanten |
| PROJEKTUMFELD<br>• Projektleiter leitet mehrere Projekte<br>• Verfügbarkeit des Projektteams (Teammitglieder in mehreren Projekten)<br>• Anzahl beteiligter Mitarbeiter<br>• Anzahl beteiligter Abteilungen<br>• neues Projektteam<br>• Teammitglieder kennen einander nicht<br>• neue Firmenmitarbeiter im Projektteam<br>• Urlaubszeiten in Projektlaufzeit<br>• hohe Abhängigkeit von externen Projektmitarbeitern (Fremdfirmen, Mitarbeiter des Auftraggebers, ...)<br>• Mitwirkungspflicht des Kunden (mangelnde Mitarbeit, Zeitverzug)<br>• Ausfall wichtiger Projektmitarbeiter (key player)<br>• Fremdsprachigkeit | TECHNISCHE RAHMENBEDINGUNGEN<br>• Umsetzung auf bestehender Technologie/Infrastruktur<br>• erstmaliger Einsatz neuer Werkzeuge/Techniken<br>• Einsatz neuer Programmiersprache<br>• neue bzw. keine Standard-HW<br>• neue bzw. keine Standard-SW<br>• neues Betriebssystem<br>• Zusammenspiel neuer Komponenten nicht erprobt<br>• Einsatz unausgereifter Technologien<br>• Anzahl der Schnittstellen<br>• Anzahl der Applikationen<br>• Abstimmung SW/HW auf Systemanforderungen - viele Anpassungen notwendig<br>• Projektteam hat keine/geringe Kenntnisse über neue Werkzeuge/Technologien<br>• Schulung der Teammitglieder notwendig<br>• Einarbeitung der Teammitglieder notwendig<br>• keine oder unzureichende Verfügbarkeit SW/HW zum Entwickeln<br>• keine oder unzureichende Verfügbarkeit SW/HW zum Testen<br>• fremde Betreiber |

| PROJEKTMETHODIK | SYSTEMKOMPLEXITÄT |
|---|---|
| • kein oder unzureichender Projektplan<br>• keine oder zu wenige Meilensteine<br>• keine oder unzureichende Dokumentation<br>• Qualität Fachkonzept<br>• kein oder unzureichendes Projektcontrolling seitens Projektleitung<br>• späte Einbindung Qualitätssicherung<br>• späte Berücksichtigung Sicherheitsaspekte<br>• mangelnde Kommunikation<br>• keine oder unzureichende Projekt-Jour-Fixes | • Forderung einer hohen Systemverfügbarkeit<br>• Übernahme eines Altdatenbestandes<br>• Einsatz vieler unterschiedlicher Technologien<br>• Forderung einer hohen Datenqualität<br>• (externe) Abhängigkeiten zu anderen Systemen |
| **WIRTSCHAFTLICHE RAHMENBEDINGUNGEN** | **SICHERHEITSTHEMEN** |
| • unklare Budgetierung<br>• unklare Verrechnung<br>• wirtschaftliche Situation/ Bonität der Lieferanten<br>• wirtschaftliche Situation/ Bonität des Kunden<br>• keine oder unzureichende rechtliche Absicherung gegenüber Kunden im Kundenvertrag<br>• keine oder unzureichend abgesicherte Verträge mit Lieferanten<br>• unklare Verträge<br>• Pönalen/ Schadenersatz<br>• Probebetrieb | • Sicherheitsanforderungen des Kunden nicht oder unzureichend erhoben<br>• Sicherheitskonzept nicht erstellt<br>• keine Abnahmekriterien für Sicherheit vorhanden<br>• Fehlen adäquater SLAs, insbesondere für Sicherheitsthemen<br>• Verbreitung/Diebstahl vertraulicher Informationen<br>• Fälschung/ Manipulation von Informationen<br>• Verletzungen von gesetzlichen Bestimmungen: Datenschutz, BWG, Urheberrecht, Signaturgesetz,…<br>• extern bewirkte Sicherheitsverletzungen (Hacking…)<br>• Schädliche Software (Viren, Würmer, Trojaner,…)<br>• Notfallvorkehrungen nicht getroffen<br>• Ausfall bzw. Unterbrechung der Verfügbarkeit von Hardware/ inadäquate Hardware<br>• fehlerhafte/ inadäquate Software bzw. Schnittstellenfehler |

Figure 30: Suggestions for possible risk factors

Abbreviations:

BWG Bankwesengesetz

HW Hardware

SLA Service Level Agreement

SW Software