

Introduction

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Moving to new premises. During lunch, the Finance Manager, Svend Petersen, discussed moving the company to new premises with the CEO, Peter Eriksen. Production was in need of space and much time and effort were wasted in the daily operations, simply because the workshops were inconveniently located and because of overloaded machining tools. In addition, both sales and development had expanded heavily in recent years.

"We spend a lot of time discussing our lack of space, but how do we do something about it?" Peter Eriksen asked. "There is no lack of proposals for what to do, e.g. to move part of the company to new locations, or to move the whole company; within our current municipality, or to our neighboring municipality, or perhaps to another region. The easiest thing would, of course, be that I alone made a decision. Then we could observe how many would like to move. But I do not want to take this approach."

"What about considering the issue of moving to new premises as a project?" asked Svend Poulsen.

"Perhaps this is a good idea. We already run several development projects. But what would it imply to define the issue of moving our company as a project? What do we have to consider to ensure that such a project really will be successful?"

Soft Ball. *Henning Larsen, the project manager of a product development project, called Soft Ball, was confused and bewildered. One of the best members of his project group had just informed him that a new competitor had introduced a new product on the market with the same features as Soft Ball was planned to have. And this was not the only problem. Recently, production engineers had suggested many changes to the engineering design – changes they claimed were improvements. If accepted, the development time would be prolonged with at least half a year.*

"The time has come to ask who, in fact, wants to see Soft Ball completed, and if it is even possible to reconcile the many conflicting objectives and requirements," Henning Larsen contemplated. He went to see the R&D manager for a meeting.

1.1 What is a project?

Working with projects represents a specific organizational form and working mode for solving complex and difficult tasks. A project takes its outset in a task that requires the formation of a unique organization and management. This is the notion of project that will be used in this book, but we are aware that, in practice, the notion is often used for both large and small tasks.

As a key feature, the project mode is oriented towards a given task. When we want to solve a task as a project, a project organization is established with sufficient authority, energy and acceptance from the parties involved. In this way, the project organization is temporary and geared to solve a complex task for which no known procedures or organizational forms exist.

As a consequence, some tasks are suited to the project working mode, while other tasks are solved more smoothly and efficiently by applying a different working mode. Examples of tasks appropriate for applying the project working mode include:

- Design, planning and erection of an apartment building
- Production of a movie or a theatre performance
- Development and pilot production of a new product
- Research and development

- Expeditions and explorations
- Health care campaigns
- Change of the present organizational structure
- Planning and construction of a major engineered facility
- Renewal of the production system in an industrial company
- Improvement of business processes in a public administrative unit
- Introduction of a new IT system.

The examples of projects represent a broad spectrum of tasks coming from different parts of society. It is fair to claim that they represent different project worlds. This suggests that we treat each project on an individual basis, seeking to identify its unique characteristics as a basis for planning and carrying out the project.

On the other hand, it is possible to identify some common features of tasks that are suitable for the project working mode:

- They are complex and especially contain many mutually interacting parts and elements and interactions between human beings, organizational units, technology and systems.
- They involve many development elements, because new solutions need to be developed and new directions explored.
- They lead to a result of significant size and importance, e.g. in terms of the number of people to be impacted, the time of operation (life cycle), as well as its commercial and economic consequences.
- They require multi-disciplinary contributions, i.e. persons with different professional backgrounds need to be involved in carrying out the project task.
- They require a joint organizational effort, in that several departments and functions, as well as companies, should provide knowledge, man hours, test and approval.
- They are subject to declared interests and pressure from several stakeholders, because the project solution will become a significant part of the daily life of groups of employees, sections and companies.
- They have a considerable size, e.g. in terms of man hours and expenses.

Even when tasks differ in terms of nature, the main focus is to create value for a group of individuals. In some cases, the task is to develop and produce a physical product that is offered to customers. In other cases, a group of people has to adopt a changed behavior, e.g. to improve hygiene or to achieve higher precision in deliveries to customers. In any case, the task is to create value for a group of persons.

The literature includes a number of definitions of a project, e.g.:

- *"A temporary effort to create a unique product or service."*
- *"A special set of coordinated activities with a defined start and end result, carried out by a special organization with the aim to achieve a specified goal at a given date and within a given budget."*
- *"An undertaking where human, material and financial resources are organized in a new way to carry out a unique task, with a specified goal, a deadline and a budget, aimed to achieve useful changes defined by quantitative and qualitative objectives."*

- *“A task oriented, specific organization and management that creates a meeting place, an arena, for the interested parties of the project and setting for project activities.”*

The notion of a project has spread to a large range of tasks. More routine tasks are also called projects, such as the erection of a house, the delivery and installation of a production facility, or the installation of a standard IT system. The project working mode can strengthen the managerial effort, but successful application depends on the reuse of defined and well-proven operating procedures and organizational structures, as well as of knowledge and experience. The application of the project mode for operational tasks supports a process-oriented approach that has become widespread in recent years.

In recognition of the variety of different projects, we suggest that a prefix be used to characterize a given project, e.g. to distinguish between exploration projects, development and renewal projects and repetitive delivery projects.

The counterpart to the project organization is the basic organization of the company, the participating companies, or operations. This organization seems suited for executing routine and repetitive tasks. This is, however, but one role of the ordinary organization. Other functions are to serve as owner of projects, to provide necessary competencies and resources to projects, and to act as receiver of the results of projects in the capacity of being one of the customers of projects.

In the following three sections, we will give a basic introduction to the world of projects by first presenting a model of generic elements to help you come to grips with a project and find out what it takes to work with a project task. Second, we will demonstrate that the world of projects spans a broad spectrum of quite different projects. Third, in recognition of the difficulty of comprehending the many aspects of a project, we will introduce four perspectives of a project, viewing a project from complementary angles.

After this introduction, we move on to discuss some key issues in section 1.5.

1.2 Five elements of a project – The five-by-five model

We have identified five generic elements that can be found in any project, and thus are necessary to address in order for a task to be solved as a project, cf. figure 1.01. Four elements identify the project’s interaction with essential parts of the project environment. Following a contingency approach, the project task (the top box) determines the basis of the project and the desired output; the environment sets conditions for the project and points to important interrelationships; stakeholders (interested parties) establish an ownership foundation for the project; and resources for the project are to be acquired from outside of the project.

The center box represents project management as the kernel of the planning and management effort. The five-by-five model emphasizes that a project is based on external needs and opportunities, that external actors (stakeholders) should approve the project, and that resources are supplied from the outside. Furthermore, the outcome of the project will eventually be delivered to stakeholders and environment of the project. This suggests that project management is about listening to the environment, establishing constructive interplay with interested parties (stakeholders), and motivating people to become part of the project organization.



Figure 1.01 The five-by-five project management model

The five-by-five model is the foundation for the concept of planning, organizing and managing a project that we will present in this book.

The project task

The following elements are included in the project task:

- *Need and benefit.* Why should a project be initiated and carried out? The point of departure for a project is a need, a necessity or a potential that is desirable to explore. How is the project positioned in an overall corporate strategic plan? Which benefit (utility) should the project contribute to the stakeholders, e.g. in terms of commercial benefit, operational, economic and service effects? What are the success criteria? Cost-benefit analysis. How to measure the outcome?

- *Content and extent of the project task.* Delimitation of the areas and issues to be included in the project, and description of what is excluded even if some stakeholders would want to see it included. Identification of uncertainties and complexity of the proposed scoping of the project.
- *Goals and products (outcomes).* In the early phases, the desired products (solutions) of the project are delineated; then, models, sketches and conceptual solutions are proposed and, later on, specified products are created. The conceptual solution may describe an attractive opportunity, a vision of a solution or particular desirable features of the solution, e.g. competitive advantage. Goals include the economic and resource scope of the project.
- *The implied change.* The project and its product will imply a change in business processes, the organization and system, competencies, performance measurement, and attitudes and values held by stakeholders, mainly those who are directly involved in producing, delivering and using the product of the project.
- *Time frame.* Deadline for implementation of the project and the date when desired business effects will appear. Considerations about challenges and uncertainties associated with meeting tight deadlines.

Interested parties – Stakeholders

The project environment includes stakeholders, whose contribution or acceptance is necessary for the realization of the project. Individuals, groups, sections and institutions want to see the project carried out and may be willing to contribute to this end. At the same time, persons and groups may find the project of minor importance and some may even want to oppose its realization. Therefore, it is essential to assess whether it will be possible to establish a stable coalition of stakeholders in support of a given formulation and scoping of the project and implied solution. We have identified five different roles that stakeholders may play. In a way, they represent types of stakeholders, although some stakeholders may play several roles:

- *Application and ownership.* To ensure acceptance and proper use of the project's products
- *Willpower and drive.* To legalize acceptance, to pave the way for the project, and to prioritize the project over other tasks
- *Contribution.* To provide knowledge, know-how and man hours, as well as financing
- *Formal approval.* To grant permission and authorization for the project and its solutions
- *General acceptance.* To consider the effects of the project and its products on society, the local community as well as the overall societal consequences.

Perhaps the mapping of stakeholders is the most important picture, because it includes a discussion of the basic needs and a 'selling' and 'buying' of solutions. Anchoring of the products of the project is addressed to ensure that the potential benefit be obtained. However, the mapping will indicate that the stakeholders do not share goals and wishes. A field of tensions exists, making it necessary to establish a mutual understanding and identification of an overall interest in carrying out the project. Power and influence should be identified and managed in the project.

The project environment

The environment represents relationships that the project needs to consider, but that basically cannot be changed. They determine the conditions for the project:

- Market potentials and limitations. Demand, competition, market trends, political conditions.
- Technological opportunities and limitations.
- Systems, parts and other products which the project's product must function with, as well as constraints set by other projects. Compatibility issues.
- Physical environment, e.g. space, rooms, and climate control, geography of multi-site operations.
- Norms and standards for the project work and for the products, e.g. environmental requirements for the project.

The project should be scoped, e.g. by drawing the line between the project and its environment, as well as the products of the project. Often, the external conditions will represent conditions for the project beyond the control of the project management. The project formulation and project plans should include a section called assumptions, to indicate that plans and even the project may have to be modified if conditions change during the project period. This suggests two types of activities for project management: 1) Monitoring of conditions that are beyond the control of the project management and call for modification of plans, and 2) influencing the conditions that may be altered to suit the project.

Resources

The project calls for competencies, i.e. the knowledge and know-how of individuals, groups and organizations, as well as information that may be provided. Manning of the project, therefore, is an important issue. Resources are also equipment, capabilities, machining tools and materials. And lastly, the project requires financing.

Procurement and utilization of resources constitute an essential issue for project work.

For the project management, it may be useful to distinguish between process resources to be employed for carrying out the project, and product resources to be built into the products of the project.

Project management

In this model, project management represents the overall planning, organizing and management of the project. It is characteristic of the project working mode that much effort is spent on determining how the project task is to be carried out. Often, it is simply necessary because many people are to be involved, and a large number of different activities are to be initiated simultaneously or in close interaction.

We have chosen to group project management in five different activities:

- *Lead and manage the project.* Setting the course and delivering the results. Control of quality, product economy, progress and work effort, and management of the people involved and the interaction with stakeholders. It includes developing appropriate management procedures and processes allowing for adjustments and changes on the way to ensure that the desired results are achieved.
- *Master plan and course of action.* Preparation of a master plan with the course of action, including structuring the project into subprojects, work packages, areas of effort, identify-

ing important issues of the project, and deciding on the rhythm of commissioning the single parts of the project's products. Definition of appropriate phases as well as main activities and milestones for each phase.

- *Organization and collaboration.* Design of a competent project organization with sufficient external authority to ensure that the project can be carried out independently of the remaining organization, and with a well-defined responsibility and authority allocation within the project. This also includes establishment of a competent project management, collaboration with parties involved, and effective communication aimed at developing an appropriate project culture and participant behavior, coherent activities, and quality and efficiency. Effective communication with stakeholders is also important.
- *Points of attention.* Critical and uncertain preconditions for the realization of the project and its success. They may include important and challenging new developments and changes, uncertainties with respect to the course of action and the organizational change process, and uncertainties associated with meeting due dates, budgets and the resource plan.
- *Learning.* Reflection on observed incidents and results to identify possible causes. Collective experiences should be discussed and used for formulating guidelines to be used later in the project or in proceeding projects.

1.2.1 A circular working mode

Traditional models of project planning assume a linear working mode, proposing a stepwise procedure for planning with pre-determined phases. Activities of one phase are supposed to be completed before entering the subsequent phase. Such an approach can only be employed in well-known project environments with little uncertainty and for specific, well-defined types of projects.

However, most projects face a great deal of uncertainties, especially at the beginning of forming a project. In addition, the complex nature of the project task suggests developing an overall vision of a new project and the way it will be carried out. This calls for a different approach than the linear working mode.

The five-by-five model supports a 'circular' planning process or, more correctly, a 'spiral' process. It is possible to start at each of the basic elements and to continue working with the other elements in repetitive circles, proposing ideas and asking questions until a coherent solution emerges. For example, a tentative idea about a project task may initiate an analysis of the possibility of obtaining support from key stakeholders and whether necessary resources could be provided. This analysis may lead to a revision of the project task, e.g. changing the scope, level of ambition, direction, or deadline, and may lead to a first planning effort to determine feasible courses of events. More and more elements are gradually included and more details are added, while mutual interdependencies of the elements are addressed. In this way, resources are ensured in quality and quantity in accordance with the scope and direction of the project task, at the same time as the expected end results are aligned with stakeholders' opinions, and the project plans seem realistic in view of the estimated uncertainties. Figure 1.02 shows how the five-by-five model can be used in a circular planning process.

A central feature of working with the five-by-five model in a circular process is a series of questions and answers. For example, if the planning team is addressing the project task and has decided to explore a given idea, a series of questions immediately arises, such as: Will it be pos-

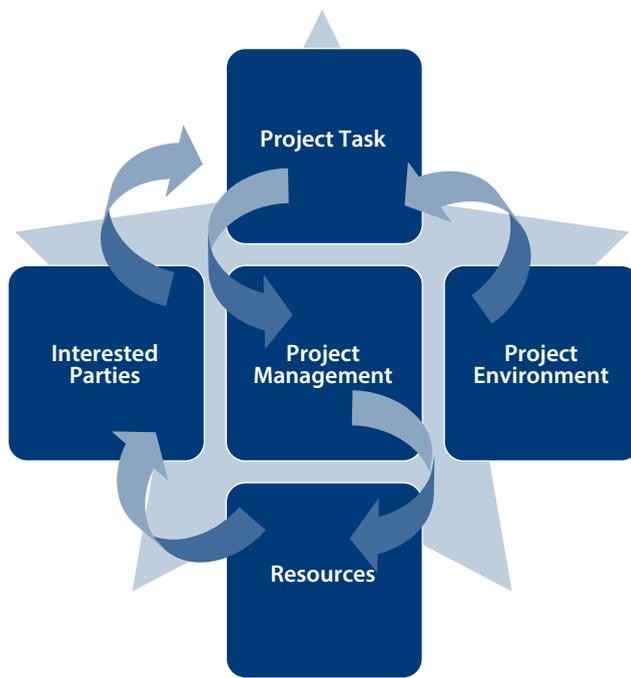


Figure 1.02 The planning process is circular

sible to gather support from stakeholders for the idea, is it realistic to implement the idea, will it be possible to provide qualified persons for the project? These questions suggest moving to one or more of the five elements in the model, giving rise to further planning efforts in these elements. In turn, this may lead to questions addressing the project task element. For example, stakeholders propose to alter the direction of the project and also to lower the level of ambition, if necessary. Or an analysis of how the project might be realized suggests that the length of the project be extended, while partial results may be obtained.

The question-and-answer dialogue between the five elements may spur creative thinking and stimulate development of new ideas. Furthermore, the proposed circular planning process using the five-by-five model allows for a ‘soft’ planning of a project in the very early phase where playing with ideas is encouraged. Through the question-and-answer dialogue, many ideas may be tried out.

Eventually, the dialogue will converge on a holistic conception of a feasible project – a project vision. If no convergence is possible, then perhaps it is not a good idea to initiate a project. The five-by-five model may also be useful during the project as a check of feasibility of the project plan, in view of changes taken place.

Switching between details and the whole

In a complex environment, it is easy to lose the breadth of view making it difficult to make reasonable decisions. Systems theory suggests two distinctly different approaches to deal with complexity, a holistic and an analytic (Riis, 1978). The first approach aims to create a holistic picture of the project goal and realization process; in our terminology, called a project vision. The other approach goes into details, and seeks to define subsystems and subtasks and to identify their

mutual interplay. The aim of this approach is to achieve a set of manageable subtasks and sub-systems that will, hopefully, lead to an appropriate solution to the overall project task.

Both approaches are necessary. Developing a beautiful vision does not suffice; it should also be possible to realize it. And similarly, it is not sufficient to solve all subtasks; they should constitute a holistic solution.

We will propose that the circular planning process interchangeably works at the detailed level and at the holistic level, thereby giving credit to both approaches to a complex environment.

In an industrial company selling larger engineered equipment, the department responsible for preparing new bids used a combination of a holistic and an analytic approach. When a request for a new order was received, a small group of employees studied the requirements and local conditions. After some initial discussion, they noted a total sum of the bid. Then, the group dug into details, analyzing all subsystems and obtaining offers from suppliers of key components. The many contributions were added to a new sum of the bid. The two results were compared which gave rise to a serious discussion that could explain any difference; for example, if they had forgotten some details, or if the location of the proposed equipment would cause special attention.

1.3 Many different projects

The five-by-five model includes generic elements that may be found in every project. However, the nature and content of each element will vary from project to project. It is difficult to identify types or groups of projects. Often, projects are characterized by their content, e.g. construction, IT, public or private. Instead, we will use the five-by-five model to illustrate the span of different projects by describing the nature of five distinctly different examples:

- Business development projects
- Company and organizational development projects
- Technically oriented repetitive projects
- Technically oriented development projects
- Projects in a political environment.

1.3.1 Business development projects

Examples are:

- Development of a new strategy for an institution or company
- Merger of two institutions or companies
- Exploration of a new strategic direction of doing business
- Development of a new public service, e.g. in the health and social sector
- Establishment of an emergency aid organization
- Implementation of an environmental policy
- Development and implementation of city infrastructure.

Project task

These projects aim to develop a new business idea and thus have strategic importance. They may be found in private as well as public organizations.

Often, the idea of a strategic move is conceived by the top management of a company or by one or more politicians of a public institution. It may be initiated either by a need to respond to a strategic or political pressure from the outside, or the management may have identified a new business opportunity. The initiators are tasked with securing sufficient support for the idea, e.g. by spelling out the vision and its implications.

Another important task is to concretize the idea to make sure that it does not violate current legislation and that it is technically feasible.



The major uncertainties are those we do not see!

Environment

In a dynamic world, both private companies and public institutions are subject to external calls for change. Some of them may be anticipated and may be handled by due diligence. Often, they require immediate response.

Stakeholders

There are many stakeholders and they have different background and interest. In a public institution, not only do various political parties voice their opinion; community organizations may also seek influence as well as unions. In addition, the administrative staff may have its own agenda. In private companies, the number and variety of stakeholders may also be large.

Resources

Many public institutions have a long tradition for exploring and implementing new business ideas by means of well-qualified staff. Some private companies have similarly built competences for developing new businesses. But many private companies rarely undertake such projects and therefore have to resort to external consultants.

Project management

The project begins with an exploration phase where business ideas are aired and selected ideas are concretized. In some organizations, developing a new business idea is not necessarily defined as a project, especially if the task is a case of emergency.

In other instances with no significant time pressure, a project organization is formed with a steering committee consisting of heads of the various departments and with a project group of selected staff. Other specialized staff may be involved on an ad hoc basis.

1.3.2 Company and organizational development projects

Examples are:

- Development of new working and business processes, e.g. Lean
- Quality improvement and development of quality awareness
- Competence development and training

- Reduction of absence due to illness
- Improvement of work environment
- Restructuring of the organization.

Project task

These projects are initiated with the aim to change working processes in the organization. This will also imply shifts in the behavior and attitude of employees. The primary focus is on implementing organizational changes and obtaining the desired effect, and the means are usually employed during the project. Sometimes, a project is initiated by a manager who is eager to pursue potential productivity gains, but underestimates the effort needed to obtain the employees' understanding and acceptance of the proposed changes.

The real objectives of the project may be vaguely formulated, thus giving rise to various interpretations. For example, employees may believe that reduction of staff is the primary objective, when management talks of a more flexible use of resources.

Environment

Attention is directed to the near environment, for example working processes, work environment, work practice, and company policies.

Stakeholders

Managers and employees directly affected by the project are the primary stakeholders. However, often, the effect of the project on customers and clients plays a significant role.

Resources

The project is carried out by means of the organization's own employees, often while they do their job in operations. Sometimes, external consultants and trainers are attached to the project.

Project management

The project is organized with a project manager and a small project group of internal employees. Other employees are involved in various work groups and task forces. The management group or a single manager serves as decision group for the project.

The project approach is stepwise changes following the phases of initiation, test, and adjustments. A standard model of change processes exists, but it is usually necessary to adopt a situational approach. Communication is an important activity for the decision group and project manager to ensure the understanding of the persons' involved. Change of behavior and attitude takes time. It is important that management maintains attention to the project.

1.3.3 Technically oriented repetitive projects

Examples are:

- Delivery and installation of a technical facility
- Delivery and installation of a standard IT system
- Erection of apartment houses, industry buildings and public institutions
- Building infrastructure

- Organization of events (exhibitions, conferences etc.)
- Production of a film and a theater performance.

Project task

Owners of such projects, i.e. those who are willing to pay for the result, initiate them because they identify a need, and by offering to fulfill this need, they create value for both end users and themselves. Usually, there is much focus on the end result (product) and project costs. Requirements for the product are defined early in the process in a so-called requirement specification, and solutions are mostly copied from or designed based on known elements and modules. In this way, there are a substantial amount of repetitions from project to project. However, to the end user, the product may hold several novel elements that should be, but are not always, addressed in the project.

Environment

Attention is most often directed to the physical environment of both the project and its product. It may include adjustment to norms and regulations, as well as interfaces with surrounding systems.

Stakeholders

Some interested parties represent environmental requirements, e.g. authorities and neighbors. Other stakeholders are interested in becoming suppliers to the project or part of the project. Suppliers are asked to submit bids with proposed solutions; they are introduced to the whole project, but focus primarily on their own subproject and own economy. End users are important stakeholders, but are seldom involved in the project process; not until after completion are they able to buy the product.

Resources

A characteristic of most of these projects is that the project owner only has few necessary competences and resources at disposal. Often, the project owner takes care of the project management. Resources and deliveries are provided by suppliers and consultants. In building and construction projects, the total product design and production is sometimes allocated to one company as a turn-key delivery.

Project management

Because major parts of the project are realized through a number of partial deliveries and by external suppliers, project management is often dominated by bidding, contract negotiations and contract management. Interfaces between deliveries give rise to much attention because risks of mistakes, defects and cost overruns often are caused by lack of proper interface management. Since the project holds many well-known elements, the project is divided into well-defined phases and decision points, often by means of a standard phase model. A critical point is the transition from the conceptual design phase to the costly detailed design and erection phase. To reduce uncertainties, realistic models and prototypes are used as well as data from previous projects.

If most of the project work has been outsourced to suppliers (engineers, construction, suppliers), the project management will typically include the general project manager (contract

manager) and technical managers for engineering, construction and installation as well as project administrative staff.

1.3.4 Technically oriented development projects

Examples are:

- Development and installation of new medical technology at a hospital
- Development and installation of a new IT system
- Development of a new production system with new technology
- Development of new technology.

Project task

Owners of such projects initiate them because of a need and a potential benefit. They view the project as an opportunity for economic growth and new business options. But the solution (product) needs to be created. Initial ideas or hypotheses will lead to outlines, sketches, prototypes and experiments with potential solutions before a sustainable solution is in sight. Often, parallel explorations are applied, such as technologies, product design, production system, logistic and sales, in an effort to reduce uncertainties.

The end users of the product may need to change their attitude and behavior considerably, which may imply difficulties of understanding and acceptance of the solutions.

Environment

Attention is directed towards the physical environment of the project and its product. It implies adjustments to norms and regulations as well as interfaces with other systems. Also, the market and competitive situation calls for attention.

Stakeholders

Some interested parties represent environmental requirements, e.g. sustainability. End users of the project's product are important interested parties, and so are actors in the value chain from the producer through distribution channels to the customer. There are several stakeholders, and it is the project owner's task to reconcile the various, and often conflicting, interests of stakeholders.

Resources

A characteristic of most of these projects is that the project owner only has few necessary competences and resources at their disposal. Often, the project owner takes care of the project management. Resources and deliveries are provided by suppliers and consultants. In building and construction projects, the total product design and production is sometimes allocated to one company as a turn-key delivery.

Project management

Because major parts of the project are realized through a number of partial deliveries and by external suppliers, project management is often dominated by bidding, contract negotiations and contract management. Interfaces between deliveries give rise to much attention, because risks of mistakes, defects and cost overruns often are caused by lack of proper interface manage-

ment. Although there are several uncertain, novel elements, the project is usually divided into well-defined phases and decision points, often by means of a standard phase model. This may give rise to several iterations with back loops.

A critical point is the transition from the conceptual design phase to the costly detailed design and erection phase. To reduce uncertainties, realistic models and prototypes are used. The notion of agile project management applies a circular approach to overcome initial uncertainties.

If most of the project work has been outsourced to suppliers (engineers, construction, suppliers), the project management will typically include the general project manager (contract manager) and technical managers for engineering, construction and installation as well as project administrative staff. In product development projects where the project owner's organization plays a major role, the project manager often takes a more active role in the management of the project in all phases.

1.3.5 Projects in a political environment

Examples are:

- Investigation of the performance of a public service
- Restructuring of the schools in a municipality
- Relocation of a company
- Development of a corporate strategy
- Restructuring of the organization and management of public institution.

Project task

Such projects may be initiated by a recognized need for doing something, either by the institution or company, or by customers or clients. Or a project may be started because managers want to demonstrate action or improve their own position. There are openly expressed motives as well as hidden, and activities include both means to overcome identified problems and actions aimed at preventing the project from being realized.

Usually, the political pressure tails off when a decided solution has been announced. But the subsequent realization and implementation process may be quite cumbersome and require many resources.

A compromise is often the result as an indication of what was politically feasible. It may be possible to sell the solution to stakeholders by pointing out the fingerprints of each stakeholder. However, when the solution is to be implemented, it may be difficult to administer and to sell it to the public.

Environment

Attention is directed towards the business and the political environment as well as competing initiatives.

Resources

The owner of the project (company or institution) carries out major parts of the project, often supported by external consultants. External experts are often used to provide good arguments

for a solution favored by the management. Also, hearings among interested parties are arranged, and opinion makers are asked to take part in public discussions.

Stakeholders

The primary stakeholders are affected employees, customers and citizen. In public projects, politicians and the press are also important stakeholders.

Project management

Characteristically, these initiatives are managed by line managers and negotiations take place at management level. The project organization (working group or committee) provides data, prepares presentations and proposals, and organizes the internal and external communication. The project manager's ability to feel a shift of the political mood and the personal relationship between actors is an essential ingredient.

In the beginning, strategic and tactical thinking are predominant, e.g. positioning, canvassing support and proponents, testing of sustainability and realism, negotiations and compromising deals, and appropriate timing of events.

The forming of coalitions and alliances plays a major role, and it is important to be prepared to react to stakeholders' opinion and actions.

1.3.6 Summary of the spectrum of different projects

Above, a spectrum of different projects is presented. The two major types are often connected; for example, a delivery project is used as part of an internal project in the customer company. Nevertheless, there is a need for a situational approach identifying the specific situation of a project task. This will be addressed in chapter 2.

1.4 Four perspectives of a project – The project portrait

We have developed a model that identifies four complementary perspectives of a project (Riis & Mikkelsen, 1997), respectively:

- A technical perspective
- A business and entrepreneurial perspective
- An organizational perspective
- A political perspective.

The technical perspective is concerned with satisfying the technical constraints and requirements necessary for completion of the project and the attainment of its objectives. Attention is focused on the technical specification, work-breakdown structure of technical activities, as well as on interfaces

with surrounding systems and installations. General approaches and methods exist, such as general problem solving and decision-making, engineering design and systems theory. And within the various technical disciplines, there are analytical methods, models and theories capable of offering consistent explanations, in addition to well-established

When you are surrounded by crocodiles, you forget that your aim was to drain the swamp.



professional practices. A general challenge within this perspective is to identify where the project task is particularly complex and where the greatest uncertainties lie.

The business and entrepreneurial perspective looks at the importance of the project task in terms of its utility value, benefit and costs. It is often difficult to reconcile the various wishes and requirements, and to estimate the consequences and impact of a given solution to the project. Relevant theories include economic calculation and budgeting, finance, risk assessment and strategic management. The latter provides an understanding of positioning the project on the market place, and may include development of a business model for the project. Attention is focused on clarifying and visualizing the benefit of the project, and to justify the cost of the project, e.g. within the framework of a business plan.

The organizational perspective looks at the persons who will be involved in and affected by the project, and their mutual interaction within the context of formal organizational structures and processes. Organization theory contains a rich collection of theories and methods to better understand the behavior of individual organizational members, groups and the entire organization. In particular, the perspective can provide insight into the difficulties that are likely to arise when a group of specialists are to work together and find a common solution. Furthermore, the perspective draws attention to the difficulties of creating a common understanding and acceptance of implied organizational changes. Individual and collective learning as well as knowledge sharing also may benefit from viewing the project from this perspective.

The political perspective looks at the stakeholders (interested parties) of the project and potential and real conflicts of interests. They have different expectations to their involvement in the project and to the results. Hence, it is often necessary to form a coalition of stakeholders to ensure realization of the project, and to ask the question: Who wants to see the project completed and under which terms? Methods for stakeholder analysis provide insight into a different type of rationality which the project is based on, and into the political processes that may occur. Attention is focused on identifying relevant stakeholders and on assessing their interests, their potential contribution to the project and their reward, as well as their attitudes, power and expected level of activities. As the assumptions of the project may change as it progresses, so may stakeholders' expectations.

Fortunately, a coherent set of theories, methods and working modes exists for each perspective, offering insight into and approaches to follow the specific point of view of the perspective.

The four perspectives represent complementary views, and altogether they provide a comprehensive understanding of a complex project situation, cf. figure 1.03. However, the four perspectives are interdependent. For example, a visible and comprehensible business concept of a project may facilitate persuading stakeholders to support the project. Development of innovative technical ideas and solutions may be stimulated in a flexible organization. In projects with a high degree of exploration of novel paths, an organizational learning approach may prove successful, suggesting a stepwise progression allowing for adjustments during the project. Drawing on the interaction between the perspectives suggests appropriate activities for the project stemming from the various perspectives.

The four complementary aspects

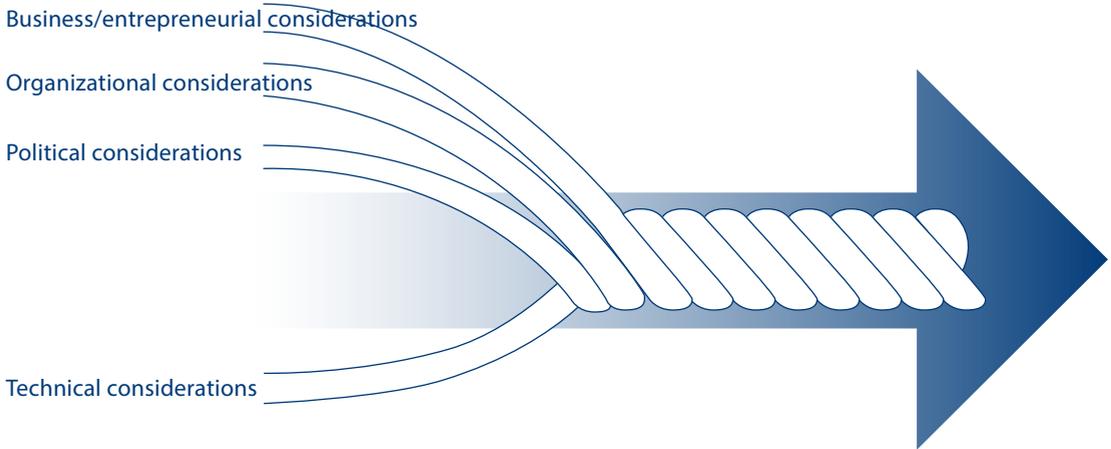


Figure 1.03 Four complementary perspectives

An analysis of the four perspectives may provide an overall understanding of what would make a project difficult to carry out. In appendix 1, we propose a simple tool to identify the challenges of a project early on in its conception. We call this a portrait of the project, as it indicates the areas in which the project group should expect to meet the greatest difficulties and thus should be prepared to spend most of its attention, time and energy on. There are several examples of project management following a traditional technical perspective in planning and executing a complex project only to discover in the middle of the project that stakeholders call for much attention, and that adopting an organizational perspective earlier on would have overcome much of the resistance experienced.

The four-perspective model will be used in chapter 3 for planning a course of action, in chapter 4 to decide who should be involved in the project and which role they should play, and in chapter 7 for identifying areas of attention for controlling the project.

1.5 Discussion of project management issues

The chapter so far has given a basic introduction to the world of project by first briefly discussing what a project is. Second, we presented a model of generic elements aimed to help us come to grips with a project and find out what it takes to work with a project task. And we demonstrated that the world of projects spans a broad spectrum of quite different projects. Third, we presented four complementary perspectives that together could help us understand what it is all about, called a project portrait.

With these models, the reader has a good foundation for continuing to the next chapters. However, some readers may have generated some questions that they want to discuss, or their experience with projects encourages them to adopt a more differentiated view of the issues of project management.

Narrow sight

- The project has a beginning.
- The project has an end.
- Deadline and budget to be kept.
- The project has an organisation.
- Allocated resources should be utilized.
- The project has a visible goal.
- The project has borderlines.
- The defined task has to be done.
- Uncertainty should be reduced.
- The project is temporary and extraordinary.
- The elements of the project should be managed.
- Keep focus on the task.

Broad sight

- The project has a past.
- The project has a future.
- Deadline and budget should match the task.
- The project has interested parties.
- The competent resources should be found.
- The project has several goals - some not foreseen.
- The project interfaces should be identified and managed.
- The right problem should be solved.
- Uncertainty should be exploited.
- The project will change the company.
- The project whole should be managed.
- Coordinate with other projects.

Methods to get broader sight

- Describe the project mission.
- Identify interested parties and their interest in the project.
- Define project success criteria.
- Identify adjoining areas and interfaces.
- Examine connections/interfaces..
- Check all assumptions.
- Check risks and uncertainties.

Figure 1.04 Narrow and broad visions

In the following, we will discuss a number of issues that may provide a deeper appreciation of the many facets of project management, hopefully resulting in a richer background for applying the models of this chapter.

1.5.1 Different projects – Different working modes

As was demonstrated in section 1.3, the world of projects includes quite a large number of different projects. This suggests that the working mode chosen for a project should take note of the specific project task.

The nature of the task as point of departure

The task orientation of the project working mode implies that the nature of the specific task at hand is taken as point of departure for planning and managing the project. For example, the nature of the task could reflect the technical content, the degree of innovative development, the extent of complexity and uncertainty, potential conflicts of interest, the nature of organizational change issues, the need to reconcile compatibility considerations with the environment, and the knowledge and know-how required and available to solve the project task.

To a large extent, the nature of the task will determine the choice of approach for carrying out the project, among other things the breakdown of the overall project into subprojects, the

design of the project organization and the choice of management and planning methods and systems. A contingency approach, thus, underlies the project working mode.

Another aspect of the task orientation is that the need for competencies and energy derived from the project task in fact determines the resources and effort that should be provided for the project. Instead of being forced to use whatever resources are available at the start of the project, the task orientation helps identify the needed qualifications. This suggests that the search for knowledge and know-how outside of the project organization and the company is often an important project activity.

It is not always easy to define the project task, as emphasized in figure 1.04. Sometimes, goals cannot clearly be defined, there may be many stakeholders with conflicting interests, and parts of the environment may be unknown. However, the task orientation implies that much attention is given to understand the project task so as to be able to define and specify the project task. As a consequence, the following chapters will address this topic.

In chapter 2, we will propose methods of analyzing a project task with particular focus on uncovering any complexity and uncertainty.

The project deals with future conditions

Perhaps needless to say, a project is concerned with changing the future. However, it is worth to note some of the difficulties involved. First, a solution should remedy a future situation, and this often requires a great effort to let users imagine conditions for their future day-to-day life that are different from the present situation. Implicitly, today's daily life is guided by tacit rules and a mindset and tradition that have been developed over years. It is useful to notice that users may understand features of a new system, but may struggle accepting that they also have to change their habits and mindsets. Visualization has become an important part of carrying out a successful project.

Second, the future will entail events and conditions that are different from those anticipated. Dealing with uncertainties and even unforeseeable events, thus, becomes an integral part of project management.

We have observed some trends in the nature of project tasks:

- *Projects have become more complex and comprehensive.*
- *There is increased emphasis on creating a holistic solution and on synchronizing many parts.*
- *There are greater turbulence and innovative elements – making planning difficult.*
- *Projects rely on critical resources.*
- *There is a need for a novel approach to the classical models of course of events.*
- *The environmental dynamics call for rapid projects.*

In chapter 9, future trends and challenges will be discussed in greater detail.

Basic models and a situational approach

In this book, we intend to deal with a dilemma: on the one hand, to apply a situational approach that takes the specific project situation as point of departure and, on the other hand, to identify a few generic elements to be found in every project. We will pursue this by applying a multitude of means. As we have already done, basic models will be introduced as a basis for discussing general principles. Examples will illustrate differences in the issues and

the proposed solutions. In addition, we will discuss conditions for the various project types. But it is not possible to capture the richness of details that characterizes a specific project task. Therefore, it will be up to the reader to identify features of own project task and to give the basic models a specific content.

A company project model?

Typically, a company will apply the project working mode for a broad spectrum of tasks. Even within a given functional area, such as product development, several types of project tasks exist, each with specific features; for example, development of a new generation of a product, adjustment of the product program to new components, addition of new functionalities to existing productions, or introduction of modules and platforms across products. However, the need to master several types of project tasks is not always reflected in the procedures developed in the company for carrying out projects. Often, projects are expected to be managed by means of the same project management model with a well-defined set of phases, guidelines for organizing the project and control procedures. It is a challenge for many companies and public institutions to develop differentiated management systems capable of supporting planning and implementation of a broad assortment of project tasks.

This draws attention to a dilemma between, on the one hand, using pre-fixed procedures and templates to ensure uniformity and routine and, on the other hand, being able to improvise in light of the specific nature of the project task and the incidents experienced in carrying out the project.

Basically, the aim to develop a project model in a company or institution with defined phases, project organization and procedures for project planning and control is twofold: to provide a supportive frame for carrying out the project effectively and efficiently, and to increase collective learning and sharing of experience. It is our impression that the latter objective receives only modest attention.

Project perspectives (views)

In the discussion of what can make a project difficult, we introduced four perspectives, each of which gives a picture of the project. They emphasize the technical, business, organizational and political aspects, respectively. We have found it useful to define only a limited number of pictures to capture significant features of a project. However, other authors have introduced more perspectives. For example, in his book on Images of Organization, **Morgan (1986)** deals with eight views of an organization, i.e. machines, living organisms, brains, cultures, political systems, psychic prisons, as mutually interdependent force fields, and as a means of dominance. And **Cohen & March (1974)** introduce eight perspectives of an organization. By viewing a project from one of Morgan's images or March & Cohen's perspectives, a new insight into the project and its environment may be obtained. **Turner & Müller (2003)** introduce six ways of viewing a project, i.e. as a production unit, a temporary organization, a change, a resource-consuming unit, surrounded by uncertainty, and as an effort lead by a project manager entrusted the project task by the overall project head.

Best practice as goal or point of departure?

According to our experience, the five basic elements of a project that was introduced in the five-by-five model (figure 1.01) capture central issues of project management. But it is open for discussion whether other elements should have been given higher attention. It is not so much a question of whether everything should be included, because they should, rather a prioritization of factors and elements. The five basic elements can be evaluated from a systems approach. The objectives and goals are included in the project task; the external conditions capture the environment; and the means that we want to employ are represented by the project management element. In addition, we have identified the persons, groups and organizations (stakeholders) that will impact the other elements.

The five-by-five model represents the set of functions that we associate with project management and project planning and control. Compared with traditional project planning and control focusing on quality, time and costs, our model adopts a much broader view of what should be included in any planning and control effort; for example, the definition of the project task and the attention to stakeholders right up front.

This book includes a series of selected tools and methods, ‘good practices’, guided by the five-by-five model. No standard set of techniques and methods exists, and it is probably best this way. However, it is up to the individual manager to look for appropriate tools from different sources. We believe that different approaches and models and project managers’ pursuit of excellence will enrich and develop the area of project management.

In the project management professional community and in the literature, project managers will meet a variety of ‘answers’ to what constitutes good project management practice, in the form of manuals and bodies of knowledge. For example, most textbooks on project management have taken large construction projects as their point of departure, emphasis being on network planning techniques and planning and control of time and costs. For many years, this has dominated the general understanding of what is the kernel of project management. In particular, the American society Project Management Institute (PMI) has been dedicated to defining the knowledge that may constitute the essence of project management, denoted as the Project Management Body of Knowledge. Later on, the British Association for Project Management has defined its conception of the core elements of project management in its APM BOK. The European association IPMA has also contributed to the discussion of what constitutes project management in its Competence Baseline.

To achieve an overview and for inspiration, in Appendix 1.2, we have prepared a review of these contributions to the functions of project management. In addition, we will include the structure of PRINCE2.

A comparison of these models will indicate the preferred types of projects as well as different conceptions of project management. We note a gray area between project management functions and general management functions and company management functions, such as marketing, product development, operations, purchasing and logistics. This suggests a view of the environment of a project that is broader than the narrower project management body of knowledge.

A broad basis for practice

In our view, a well-defined theoretical foundation of the project working mode does not exist. Instead, the project management community includes an extensive set of practical methods, tools and models, and best practice is in reality the knowledge foundation for many project managers.

The literature has contributed to a broad spectrum of approaches. The technical perspective has been the outset of books on specific types of projects, such as product development, IT systems development, production development, offshore and construction, cf. **Rolstadås (1997)** and **Munk Madsen (1996)**. Organization theory has contributed in several areas, and some researchers view the project organization as the most essential part of the project working mode, cf. **Andersen (2005)**. They focus on two areas: 1) studies of multi-disciplinary cooperation for solving operational and development tasks, and 2) studies of organizational change. With respect to the latter, researchers have studied continuous improvements as well as innovation and radical changes. An interesting part of the literature focuses on changes in a political environment with many stakeholders, cf. **d'Herbement & César (1998)**.

Competencies of project management

It is remarkable that these associations in particular, but also a number of companies seek to promote project management as a profession. As a consequence, they spend much effort on defining a set of functions, models and methods that are claimed to constitute project management, the so-called Body of Knowledge. As mentioned, we do not find a comprehensive project management theory behind these models; rather they seem to be based on 'best practice' and clearly originate from technical and IT projects. Associations also put much effort into measuring professionalism in the form of certification programs for project managers and maturity models for companies. We find that the effort to promote project management is acceptable in many respects, if one is aware of the built-in tendency to define one best way of doing project management. Incidentally, there is no proof that application of the Body of Knowledge leads to project success. Rather, the reasonable and experience-based decisions and behavior of project managers and project participants is the dominating factor leading to success. Some scholars of project management have encouraged project managers to apply a broad spectrum of management and planning methods and to seek innovative approaches, and that such innovative and situational behavior should be praised rather than sticking to compliance with best practice.

Dreyfus & Dreyfus (1986) offer insight into the acquisition of competencies as a process in five steps: novice, advanced beginner, competent, proficient and expert. The novice and advanced beginner start to acquire skills through systematic instruction with focus on training in well-defined procedures and the use of simple tools. The competent and proficient persons are capable of carrying out tasks in a more situational and experimental manner. The effort to develop an organization's maturity and the competencies of individual project participants has typically focused on the novice and advanced beginner. In view of Dreyfus & Dreyfus' model, competency development should not stop there, but use best practice as a point of departure for developing proficient and expert project managers, allowing for intuition and experimentation.

A public service organization implemented a comprehensive change of its major product program and service to its customers. A relatively large project organization with several user representatives worked

for a long time to develop business processes and a new IT system. They were proud of their results; however, difficulties occurred during implementation. It turned out that the users were dissatisfied with the system and found that it was more complicated and time-consuming than expected. An evaluation of the situation led the project group to realize that it had given the users a futuristic picture of the way in which the system would operate in the day-to-day situations. It was not made clear to the users that a demanding running-in period would be required. Nor was it made clear that the system assumed new information from the customers and that it would take an extra effort to input these data into the system. Finally, the project group realized that the commissioning task was very comprehensive. For example, the users should familiarize themselves with a new IT system, at the same time as new business processes and a new dialogue with customers were introduced. It could have been spread over several phases, in which case the IT system should have been designed in a different way.

1.5.2 Creating value in a political environment

The starting point for initiating a project is a need and possibility to create value, either by solving a problem or exploiting a potential. However, the project is carried out in a political environment with many interested parties.

Emphasis on creating value and utility

A project will produce a solution representing the product of the project and its direct output. The utility of the project is obtained by users and buyers of the product. In this way, the solution of the project constitutes a means of achieving the intended value and utility. In the process of the project, the product will be defined, and it becomes a target of the project to realize the specified product within a given time frame, budget, amount of resources and quality level. Often, much attention is paid to obtaining the direct product of the project at the expense of caring for the ultimate utility for users.

Implementation is included

As the ultimate goal is to obtain the desired utility effect, the project should be defined so as to include the whole implementation. It is not enough just to prepare a report or deliver a system. It must be brought to operate for a period of time to experience the organizational and economic consequences. A project, thus, should early on be marked by a focus on making decisions that have a direct impact on achieving the desired utility. The necessary organizational change process should be considered as an integral part of the project task and should be included in the early planning of the course of action of the project. Likewise, the project should not be declared completed until the desired effects in operations have been obtained, or at least until it has been demonstrated that the expected utility for the company will be realized eventually. This means that transfer from the project organization to the unit responsible for operations is part of project management.

The task as a unified whole

Given that a project task implies design of different systems and adoption of different disciplines and perspectives, management of the project will require adopting a holistic view and a coordinated effort. For example, developing a new product can be defined so as to include the product itself, the necessary production system, sales and marketing system, and service system as part of

the overall project. In some instances, it turns out that the project also may include development of a new business model.

A unified approach may also imply that a project is defined to include a product's value chain from the company via its distribution unit to retail companies and further on to end users.

Limited in time

A key feature of a project is that it is limited in time. In some tasks, this is evidenced by clearly defined due dates; for example, the launching of a new product at the annual exhibition of the industry, or carrying out test production before the peak season. But in other cases, an effort has to be made to define appropriate due dates, e.g. by dividing a large organizational development initiative into a series of theme-based phases, or by viewing the introduction of a new product as the launch of a series of product versions over a period of time. In these cases, the project working mode is used to make the task limited in time. However, it implies a discussion of how to do it and attention to the period after completion of the project. Chapter 3, section 3.4.3 will continue the discussion of when a project starts and when it finishes.

Political environment

Ordinarily, the notion of 'goal-oriented' is associated with projects. The project working mode implies that a project has a purpose. It should lead to results. However, as already mentioned in section 1.2, a project is embedded in a political environment with a number of interested parties, often with conflicting interests. It is therefore relevant to ask who would be interested in seeing the project carried out, and who would be against the project. Inspiration for this viewpoint may be drawn from part of the organization theory. **Cyert & March (1963)** were the first researchers to consider an organization as resting on a coalition of different stakeholders. Each stakeholder is defined as a person or an organizational unit that contributes to the organization in the form of ideas, suggestions, work effort, service, raw material and components, capital etc. In return, a stakeholder is rewarded by means of salary, opportunity for self-realization, products, prestige etc. The survival of the organization depends on the extent to which a coalition can be formed among a major part of the stakeholders who experience that their individual reward exceeds their contribution.

This coalition model can easily be applied to a project. As already mentioned, a project has many stakeholders with different interests, and the model has been used to identify and analyze stakeholders' interests in seeing the project realized. Such a stakeholder analysis delineates the 'political' foundation for a project and may be used for planning the course of action of the project, as well as its organization and management attention areas. The coalition or stakeholder model represents an alternative way of looking at a project to that implicitly underlying the rational, goal-oriented mindset. However, we need both viewpoints, as each of them provides useful insight.

In many projects, it is not just a matter of listening to stakeholders and adjusting the project to their wishes and interests. Usually, a substantial part of managing the project task involves influencing stakeholders to understand the vision of the project and the need for a concerted effort to obtain common project goals. It may also imply influencing stakeholders to think and act differently. The attitude of stakeholders towards the project may be unstable, because of necessary

changes in the expected project results, a realization that the project is moving in a different direction than what was originally perceived, or a change in the stakeholder's own environment that may call for special attention. In addition, mutual interaction among stakeholders may make it difficult to manage the decision-making processes of the project.

As indicated, stakeholders' interests may conflict, and it is not easy to find a way of reconciling opposing goals and expectations. This suggests that a vision for a project be developed. This should be used to mirror the interests and expectations of each stakeholder to see if it is possible to identify a coalition of stakeholders who somehow would support the execution of a project with the outlined vision. The project vision may form the basis for defining common goals and plans. However, the coalition model implies that such goals and plans are only good and valid as long as the coalition of stakeholders' approves of them. Management attention to the force field of stakeholder interests is thus a key issue in the project-working mode.

Said about stakeholders:

-
- They view the world from their own perspective.
 - They can change opinion and attitude during the project.
 - They may be difficult to influence.
 - They have an unpredictable learning mode and way of comprehension.
 - They do not represent a homogeneous group.
 - They are rather busy taking care of their own tasks.
 - They would like to formulate, determine and manage their own changes.
 - In other words, general human characteristics.

(Source: Annette Zobbe, Project Chief, Rail Net Denmark)

1.5.3 The project as part of a change process

To a varying extent, every project will imply organizational changes, e.g.:

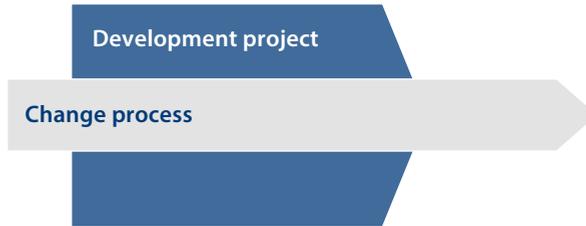
- A technical project will require training of operators of the new facility, to ensure that quality and productivity are achieved quickly.
- A new IT system, e.g. to support business processes in a public institution, will imply the introduction of new working modes and mindsets in order to fulfill the potential.
- A new product, e.g. a camera or television set, will include new functionalities that will require sales personnel to acquire new knowledge and require new manuals for users.
- Improved knowledge sharing in an international firm will imply a large number of employees to be involved in identification of problems, development and implementation of new solutions.

Figure 1.05 illustrates three different ways in which a project may be related to changes in surrounding organizations.

The top model rests on the notion that the project task is to deliver a system or a product, and that the receiving organization has the task of securing appropriate introduction to operation and of obtaining satisfactory benefits. This situation frequently applies to delivery of engineered facilities. Previously, this situation was the prevalent notion of the role of a project in the literature.



The project will deliver solutions and implementation support. The user organization is responsible for implementation and use, and realization of benefits and values.



The change process starts before the project, and the project emerges from there. The project embraces development of solutions and parallel change activities as well. The change process continues after the project, until satisfactory benefit is obtained.



The change is the governing task. One or more projects are practical means for delivery of solutions and for change execution.

Figure 1.05 Three types of relationship between a project and organizational change

The second model assumes that a project originates from a desired change in a company or institution. As a consequence, activities associated with organizational changes are considered part of the project. Examples are IT systems and product development.

The third model emphasizes that value and benefit are achieved by change processes in the operational units, while part of the change is managed as a project. Examples include introduction of Lean principles in a company or public institution, and knowledge sharing in business processes.

As illustrated, the three models apply to different organizational change situations. Several studies of the success rate of projects in the private and public sector indicate that most projects (more than 70 per cent) may be considered as a technical success to the extent that the products delivered are OK. However, studies also show that less than half of the projects obtained the desired operational and business benefits. This points to a need for more attention to the change process and its management. It seems that often the first model is selected, although the change situation points to the second or third model.

As is the case for the technical aspects of a project, organizational change processes also make use of methods and established practice. Therefore, persons who are experienced in change pro-

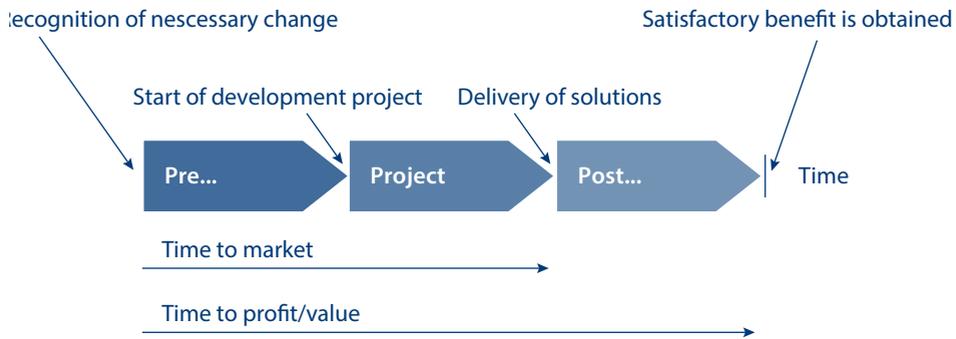


Figure 1.06 The total elapsed change process

cesses should be associated with the project, especially with respect to communicating with interested parties. We find that management of change is part of the project manager’s job, but it should be carried out jointly with managers of the operational units where changes will take place.

The models in figure 1.05 suggest a new view of the contemporary request for tempo, quick response to new external conditions and rapid implementation of the project. ‘Time-to-market’ is a frequently used slogan and is interpreted as the time from project initiation until a ready-to-use solution is delivered. Figure 1.06 shows that the time rather should be measured from the time it is realized that a change is necessary and until the benefit has been obtained. One may talk of ‘Time-to-profit/benefit’. Thus, it is not sufficient only to speed up project execution. Rather, the total elapsed time span should be short. Experience indicates that the pre-project often is surprisingly long, and that the time from installation until the desired utility has been obtained may be longer than the project itself.

The notion of change management is dealt with in several books that, however, seldom include project management. Change management may address issues at the company level, i.e. management of a company’s pro-active adjustment to external changes. But change management may also be viewed at the project level, i.e. management of the change that the project is part of. In this book, we will use the latter meaning.

1.6 Overview of this book

A management approach

In this book, we will adopt a management approach, i.e. we will be concerned with how it is possible to define a project, to plan and implement an appropriate course of action, and to establish and manage an organized interplay for carrying out the project task. In this effort, we will continuously keep in mind the desired project results and allow for necessary adjustments in view of external changes, new insight gained and shifts in stakeholders’ expectations. To be effective, the management approach should draw on existing knowledge of how individuals, groups and organizations behave.

We will present a comprehensive set of models, methods and tools central to project management. But they are not meant to represent a complete set. As already pointed out, we find it important to be selective and critical to methods, and to encourage an innovative approach to managing the human, organizational and technical processes that form the basis for carrying out a complex task. Therefore, we will encourage readers not only to draw on project management literature, but to make use of the rich sources in the various disciplines relevant for projects.

Planning, organizing and managing

In this chapter, we have introduced two basic models for dealing with projects in the light of complexity and uncertainty. We have proposed a circular working mode for planning a project by using the five-by-five model and a switching between details and the whole. This will form a basis for the remaining chapters and appendices. And we have introduced four perspectives of a project to form a portrait of the project and the project task.

Chapter 2 will address defining the project task, including the expected value creation, and provide methods for analyzing the project task. Furthermore, the chapter will present a framework for forming the project including its content and scope. A framework for planning a project has been developed and will be presented in the appendix 2.

Chapter 3 will focus on planning the course of action of a project, taking four generic processes of a project as point of departure. Various models of course of action will be presented.

Chapter 4 discusses how to organize a group of people, sections, departments and companies around a project execution. The project organization holds special challenges, e.g. by being temporary, having participants working on the project on part time on loan from other functions, and by being placed in a force field of stakeholders with different expectations. Special attention is needed to make the project organization function quickly and effectively.

It is, however, not sufficient to establish a formal organization structure for a project. Cooperation between project participants is also important. This topic will be dealt with in chapter 5. Among other things, a model for cooperation in and around a project will be proposed, the so-called 5C model (cooperation, coordination, coherence, communication and control).

Chapter 6 will address management aspects of projects. The uncertainty and complexity of a project task raises some essential questions about the content of project management. Some project managers use methods and techniques in such a way that they only serve as a project administrator and practical coordinator. Project management is more than that. A project manager must be personally involved and should adopt a broad approach to managing the project.

As will be discussed in chapter 6, project management entails five management tasks:

- Manage the development and implementation of project results, i.e. to develop an integrated product of the project and to bring the results into play with desired utility
- Outward-looking management, i.e. to interact with the project's stakeholders, e.g. the customer, the commissioning manager, users and official agencies
- Inward-looking management, i.e. to manage project teams and team members, suppliers and consultants
- Resource management, i.e. to provide competencies for the project, workforce, facilities, money etc.

- Project management, i.e. planning and controlling the course of events as well as project quality, activities, time, resources, economy, documents etc.

Maneuverability

A key topic of project management is maneuverability, i.e. to identify and make use of means of controlling the project. This will be discussed in chapter 7. Good planning takes note of recognized uncertainties and seeks to build in decisional flexibility, e.g. preparedness, buffers and alternative action plans, in both plans and the project product. And good management also implies acknowledging reality when preconditions change and acting promptly accordingly, even when actions require postponement and redesign.

Project management and management of multiple projects

This book will primarily deal with a single task and the formation and implementation of a project for carrying out this task. But often the project task is part of a larger task, or there are strong interrelations to other projects. Management of multiple projects will be the topic of chapter 7. It is possible to distinguish between two ways in which a project can be connected to another project:

- A project portfolio represents a collection of projects with individual goals and due dates; for example, a portfolio of product development projects or software development projects. They are interrelated because they contribute in various ways to the company's business development, and they may draw on the same resources and facilities. A project portfolio exists for a long time, while projects are terminated.
- A program is a coherent and organized set of initiatives aimed to meet strategic goals. For example, a program for company competency development, development of a new product program or development of a new business area. A program may include a broad spectrum of activities, some of which are defined as projects. A program is closed when its mission has been achieved.

As will be discussed in chapter 8, projects can be interrelated in several ways:

- *Common goals.* Even if projects address separate tasks and are complementary, they can contribute to the same goals. For example, development and implementation of a wage system, production processes, a planning and control system, and competency development of employees will all contribute to making a company's production system more competitive.
- *Joint resources.* Parallel product development projects may need to draw on the same key persons, share the same equipment or use common components and software.
- *Competency development and knowledge sharing.* Most effort in a project is concentrated on carrying out the specific project task. However, lessons learned during the project might be useful for other projects.

These interdependencies require an overall planning of the total number of projects in selected areas. Even though this book will focus on the individual project, it may be relevant to familiarize yourself with some of the key issues associated with a multi-project situation.

Chapter 9 will conclude this book by presenting development trends in project management and challenges for future projects, continuing the discussion in the historic exposition in section 1.6.

The structure of this book

Each chapter will present a number of models aimed at providing a broad understanding of the issues of the topic. In addition, a spectrum of solutions will be offered and attention areas identified. Short case examples will serve to show how it is possible to work with the topic in practice and also to illustrate the broad spectrum of project tasks and corresponding solutions that are included in the project working mode.

While the chapters primarily aim to provide understanding and insight, in tool sheet A2.1, we will present a planning model for working with a project, serving as a framework for planning, managing and controlling a project.

An appendix is associated with each chapter, containing a number of tool sheets with the aim of providing specific tools and techniques for the reader's work with own projects. Each tool sheet follows the same format, starting with a presentation of aim, background and application areas of the method. Then, the content of the method is presented, followed by attention areas when applying the method. The methods may be applied to obtain a better understanding of interrelationships within and around the project, as well as to develop appropriate solutions.

1.7 Exercises

1. Take outset in the short case description "Moving to new premises" in the introduction of the chapter. Which elements in the five-by-five model would be different for this project compared to the other development projects in the company?
2. Take outset in the brief case description of "Soft Ball" in the introduction of the chapter. Discuss the present situation and identify key issues to be addressed, e.g. by using the portrait model or one of the four basic models. What would you propose be done?
3. Consider a project that you are engaged in. How could you use the five-by-five model for a circular planning of the project?

1.8 References

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