

MANAGEMENT BY PROJECTS: SPECIFIC STRATEGIES, STRUCTURES, AND CULTURES OF THE PROJECT-ORIENTED COMPANY

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COMPANIES FOCUS INCREASINGLY ON PROJECTS

Projects Are Instruments to Cope with Complexity

Due to dynamic markets, new environmental and technological developments, and changes in paradigm, companies have to cope with new challenges and potentials (Fig. 1.1). In order to deal with an increasingly complex business environment, companies increase their complexity. Strategic business units are established, autonomous groups and quality circles are organized, and projects, as temporary organizations, are defined to perform unique and complex tasks.

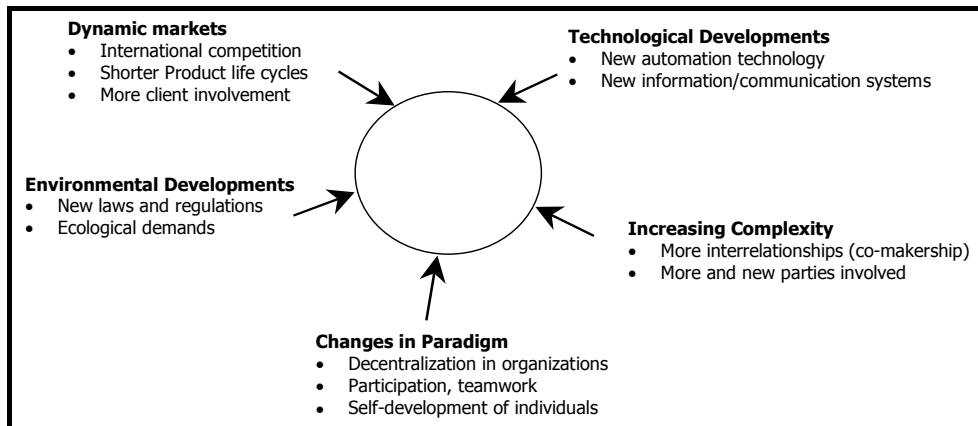


FIGURE 1.1 New challenges and potentials for companies.

The Project-Oriented Company Performs Different Types of Projects Simultaneously

In addition to the traditional contracting and research and development projects, new types of projects such as strategic planning and marketing and organizational development are undertaken. These new project types have specific characteristics:

- They have no external project owners and are therefore considered "internal" projects
- They are socially complex, as their results often have an immediate impact on the strategies, structures, and cultures of the project-performing company
- They are relatively small in size (100 to 500 work packages, duration of 1 year or less, cost of almost 1 million U.S. dollars). But they often employ heavy internal human resources.
- They are innovative and unique and not "repetitive", that is, standard technologies and procedures cannot be applied.
- In the early phases their objectives are often not determined precisely.*

In addition to the traditional project-oriented industries, such as construction, engineering, and electronic data processing, manufacturing, banking, tourism, and even administration turn to projects. From an inspection of Fig. 1.2 it becomes obvious that the "new" Project-Oriented Company performs small and large projects, internal and external projects, and unique and repetitive projects to cope with new challenges from a dynamic business environment.

* For the concepts of open, temporary, and concrete projects see Briner et al.¹

Characteristics	From	To
Industry	Construction, engineering, EDP	Construction, engineering, EDP, manufacturing, banking, insurance, tourism, administration
Contents	Contracting, R&D, investments	Bidding, contracting, R&D, strategy planning, marketing, public relations, personnel development, organization development, investments
Size	Few large projects	Many small and large projects
Ownership	External projects	Internal and external projects
Experience	Repetitive projects	Repetitive and unique projects

FIGURE 1.2 New types of projects in new industries.

The Project-Oriented Company has specific strategies, structures, and cultures to manage single projects as well as the network of projects performed simultaneously. It is characterized by having an explicit project-management culture: applying project-related incentives, presenting projects as temporary organization structures in the corporate organization charts, and documenting the project orientation in the corporate mission statement.

Management by Projects - the Central Management Strategy of the Project-Oriented Company

An increasing number of companies is resorting to projects. But projects cannot only be considered as tools to solve complex problems. Projects are a new strategic option for the organizational design of companies.

Management by Projects is the central management strategy of the Project-Oriented Company.² By starting, performing, and closing down projects, Project-Oriented Companies try to achieve a dynamic balance, which is intended to ensure the continuous development and the survival of the company.

By explicitly applying management by projects as a management strategy the following organizational objectives are pursued:

- Organizational flexibility (projects as temporary organizations)
- Delegation and decentralization of management responsibility (lean organizations)
- Organizational integration (cooperation between different departments)
- Quality assurance (holistic project definitions)
- Goal orientation in the problem-solution process (projects as goal-determined tasks)
- Acceptance of project results (because of project team building and marketing)
- Continuous organizational learning and development through projects

Management by projects also allows pursuing personnel objectives. Different leadership approaches such as management by objectives, management by delegation, and management by motivation can be operationalized and integrated by projects. Project functions include motivation and personnel development. Membership in a project team is attractive, because projects allow one to perform new tasks, promote teamwork, allow autonomy, require creativity, support feedback, and offer new opportunities after the project ends. Individual learning is promoted by projects because of the complexity of the tasks and the clearly defined project objectives.

Further, management by projects has a marketing dimension. Sometimes project-management know-how can determine the "unique selling position" of a company, and project-management services can be marketed to in-house and external clients. By performing more and more projects as a way of doing business, companies implicitly apply management by projects. But only the explicit application of management by projects allows taking advantage of the benefits described.

The conscious application of management by projects as a management strategy will require certain adjustments in the company structures and culture, such as the following considerations:

- Adjustments in the organization and communication structures
- Development of new role perceptions of base organization and project personnel
- Development of new personnel planning methods (flexible, multiple job assignments)
- Issuance of new personnel qualifications (redundancy and variety)
- Provision of integrative measures (corporate vision and strategy, project-management culture)
- Acceptance of the autonomy, complexity, and dynamics of projects

THE PROJECT-ORIENTED COMPANY HAS A LEAN AND FLEXIBLE ORGANIZATION

Projects Are the Basic Structural Elements of the Project-Oriented Company

Traditionally the organizational structure of a company is designed to perform routine tasks in the most efficient way. The organization has to provide orientation to the company's personnel regarding the distribution of responsibilities, and it has to ensure stability and continuity in the relationships between the company and its supply and demand markets. In companies with little project orientation, projects are applied in addition to the traditional hierarchical line organization. By carrying out projects, these companies become flatter and more flexible (Fig. 1.3) because the spans of command are widening and the number of hierarchical levels is decreasing. More flexibility is created because of the potential to define and dissolve temporary project organizations.

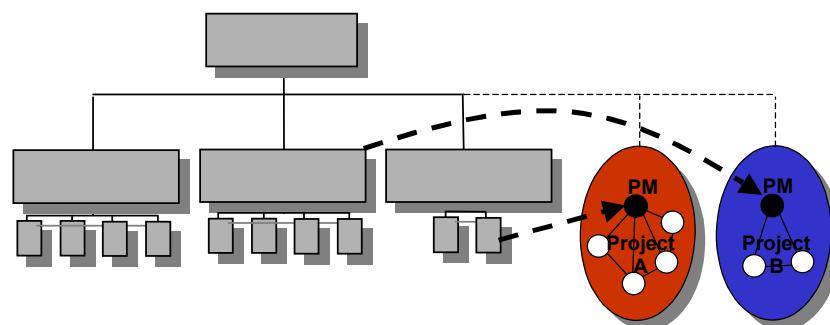


FIGURE 1.3 Flattening of organizational structure through projects.

In lean organizations one-dimensional supervisor-subordinate relationships are replaced by wider spans of communication. This requires a new communication quality. On the one hand, less time can be spent for operational directives, so a more strategic, visionary leadership approach is needed. On the other hand, new communication technologies can be applied.

Companies with high project orientation develop flexible networklike organizational structures. An example of a networklike structure is shown in Fig. 1.4. Many organizations can be perceived similarly if informal structures and projects are made visible and are formalized.

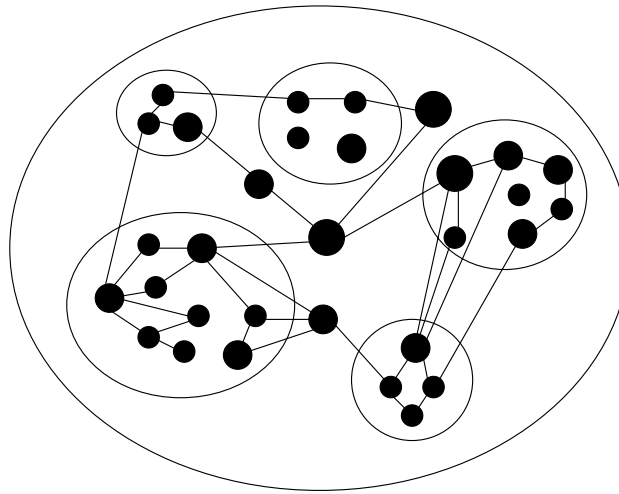


FIGURE 1.4 Networklike structure of an organization.

The extent of project orientation of a company's organization cannot be measured in absolute figures, but it can be looked at as a position on a continuum between a hierarchical line organization and a flexible networklike organization. The relationship between routine and project work determines the positioning of the company on that continuum. There is no optimum position between a line organization and a networklike organization. Each position has its functionality. But it can be observed that there is a trend toward flatter and more flexible structures.

The engineering company Fluor Daniel "uses project management as a way of conducting its business and, of late, as a way of improving its internal operations.... Fluor Daniel is able to conduct its business effectively in a decentralized, networked organizational atmosphere."³

The Project-Oriented Company Requires New Integrative Organizational Structures

The more projects a company performs simultaneously, the more differentiated becomes its organization and the higher becomes its management complexity. This complexity results from the complexity of the individual projects as well as from the dynamic relationships between them.

In order to support the successful performance of projects the organization requires integrative structures such as strategic centers, project steering committees, project resource pools, and centers of project management excellence. Many of these integrative structures are communication structures rather than organizational units.

There is a tendency of the functional departments of Project-Oriented Companies performing repetitive projects to develop into resource pools. The resource pool members are experts who are responsible for their project work. The resource pool manager is not responsible for the project work of the pool members. His or her responsibility consists in assigning pool personnel to the projects and ensuring that enough qualified personnel is available for the projects. Further he or she is responsible for the development and application of working standards and work ethics.

"Traditional departments serve as guardians of standards, as centers of training and the assignment of specialists, they won't be where the work gets done. That will happen largely in task-focused teams."⁴

Projects performed simultaneously by a company can be perceived as a network of projects. Networks of projects are specific organizational structures of Project-Oriented Companies. By considering networks of projects as management objects the differentiated structures of the Project-Oriented Company are complemented by new integrative structures (Fig. 1.5).

Project Management Is a Basic Management Qualification in the Project-Oriented Company

In order to perform projects successfully, personnel management in the Project-Oriented Company has to meet specific requirements. To fulfill roles in the base organization and project roles, such as (internal) project owner, project manager, or project team member, managerial skills as well as functional skills are required. As most employees get involved in projects, project management becomes a basic management qualification and is no longer a specific expertise of a few project-management experts. Especially in small and medium-sized projects one person often takes on the roles of project manager as well as project team member (Fig. 1.6). Such multirole assignments offer synergies on the one hand, as integrative functions can be performed, and (interrole) conflicts on the other. Because of varying project assignments, the planning of personnel resources needs to be done as zero-based budgeting. Quantitative and qualitative peaks in the work load often are managed by employing leasing personnel or by contracting work to external consultants or suppliers. Maybe in the future agreements with regard to personnel cooperation between companies within the same industry will become standard. Job descriptions in the Project-Oriented Company need to be flexible as project assignments vary. Project work has to be an explicit element of general job descriptions

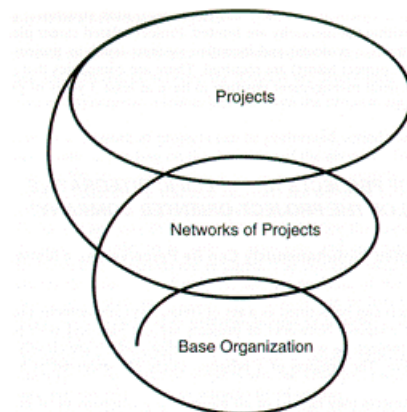


FIGURE 1.5 Structures of the Project-Oriented Company.

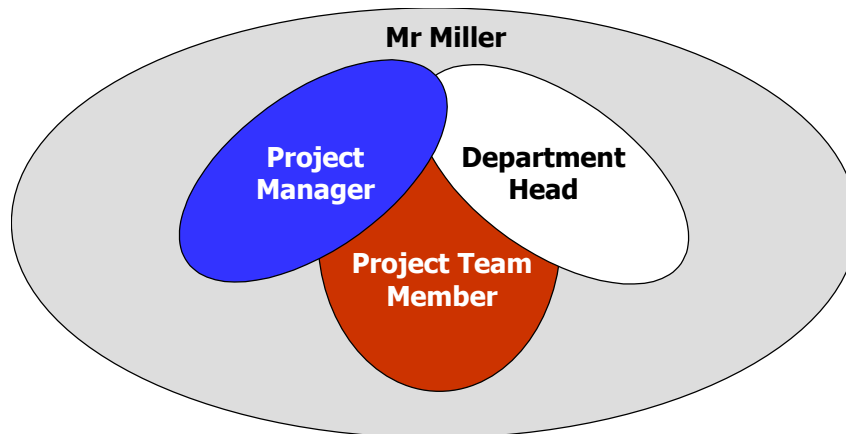


FIGURE 1.6 Multirole assignments in the Project-Oriented Company.

As the Project-Oriented Company has flat organization structures, possibilities for advancement within the hierarchy are limited. Project-related career plans (such as assignments to attractive projects) and incentive systems (such as project premiums, job rotations within project teams) are required. There are companies that require persons pursuing a general management position to have at least 3 years of project-management experience.

NETWORKS OF PROJECTS ARE SPECIFIC INTEGRATIVE STRUCTURES OF THE PROJECT-ORIENTED COMPANY⁵

Projects Performed Simultaneously Can Be Perceived as a Network of Projects

Networks of projects can be defined as a set of (relatively) autonomous projects being closely or loosely coupled. Networks of projects are not identical with programs. A program includes projects as well as a number of actions which are closely coupled by a common objective. The projects of a program might be perceived as a network of projects.

Networks of projects may consist of all projects of a company or of groups of different project types, such as contracting projects, acquisition projects, and research and development projects. The number of projects considered in a network of projects, their objectives and volumes, as well as their progress statuses vary. Start-ups and closedowns of projects lead to a dynamic network structure. On the other hand, networks of projects are stable since the types of projects considered, the types of relationships that exist, and the forms of communication applied in the network are relatively constant.

It is the objective of managing networks of projects to optimize the results of the overall company and not the results of individual projects. There might be conflicts of interest between the objectives of specific projects and the overall company objectives.

When managing networks of projects, in addition to internal objectives, external objectives are also pursued. If, for example, different projects are performed for the same client, the long-term, client strategies and the basic client relationships need to be coordinated. If different projects use the same supplier, the general purchasing conditions may be optimized. Decisions regarding the start-up and closedown of projects are required, priorities have to be set among projects, and competitive and synergetic relationships between projects have to be identified and managed.

Managing Networks of Projects Requires a Formal Network Analysis

To decide whether or not a new project should be started, its benefits and costs have to be analyzed, and it has to be determined whether the company can cope with the additional project. A sound decision cannot be based on an isolated analysis of a single project but requires the consideration of the project as an additional element in the existing network of projects. The impact of closing down a project (such as transferring results and learning experiences of a project to other projects, new availability of resources) must similarly be related to the overall project portfolio.

In an analysis of a network of projects:

- A holistic view of the projects and their relationships is generated.
- Similarities and differences between the projects are determined.
- Competitive and synergetic relationships between the projects are recognized.

An analysis of a network of projects can be performed periodically - once a month or every other month, depending on the dynamics of the network. To better understand and communicate the complex structures of networks of projects, different types of analyses (contents, schedule, or resource analysis) and different forms of presentations (listings, portfolios, network graphs, bar charts, or tables) may be applied.

The bases for the analysis of a network of projects are the documentations of the individual projects. In order to be able to aggregate and compare the project data, common documentation standards are required. The contents analysis of a network of projects includes the grouping of projects and an analysis of the relations between them. In a listing of projects the projects of a network can be listed and differentiated by project types, such as internal or external, unique or repetitive, domestic or export, small, medium-sized, or large (Fig. 1.7).

Project number	Project title	Internal or external	Unique or repetitive	Domestic or export	Small, medium, large	Contents
Org. 01	Office organization	Internal	Unique	Domestic	Large	Organization
Org. 02	EDP decentralization	Internal	Unique	Domestic	Large	Organization
...
R&D 01	Development of product A	Internal	Repetitive	Domestic	Medium	R&D
Mark. 01	Joint venture	Internal	Unique	Export	Medium	Marketing
Mark. 02	Acquisition of airport	Internal	Repetitive	Domestic	Small	Marketing
Contr. 01	Equipment factory	External	Repetitive	Export	Large	Contracting
...	...					

FIGURE 1.7 Listing of projects.

Further, projects can be described by different relational criteria. Relevant criteria for the coordination of networks of projects are, for example, project volume, project progress status, priority of project, or attractiveness of project.

Projects can be related to each other in a graph of the portfolio of projects. Portfolios can be developed for combinations of different criteria, such as profit and risk (Fig. 1.8).

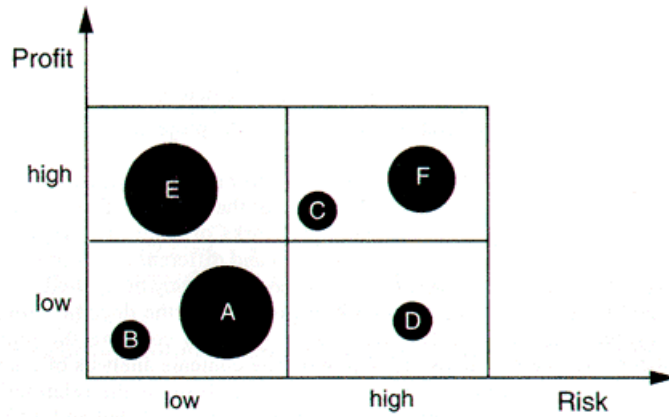


FIGURE 1.8 Graph of portfolio of projects.

For repetitive projects, such as research and development or contracting, progress milestones can be standardized. The progress status of each project can be determined and documented in progress charts. Then data from consecutive control dates can be related to each other (Fig. 1.9).

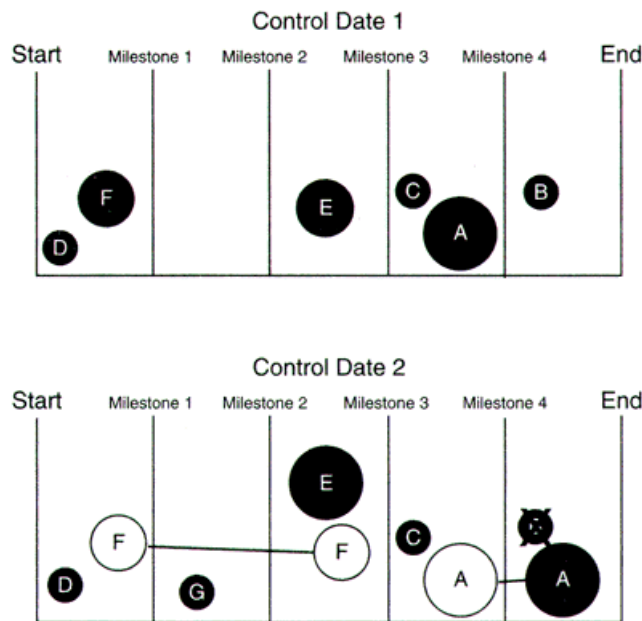


FIGURE 1.9 Progress charts of projects.

Interdependencies between projects can be presented in a graph of a network of projects (Fig. 1.10). Groups of projects can be formed and relationships between projects can be drawn and qualified. The qualification of competitive and synergetic relationships can be documented. (For example, if project A is successful, project D is jeopardized; certain results of project C are required to proceed with project B; project E and project F require the same scarce resource.)

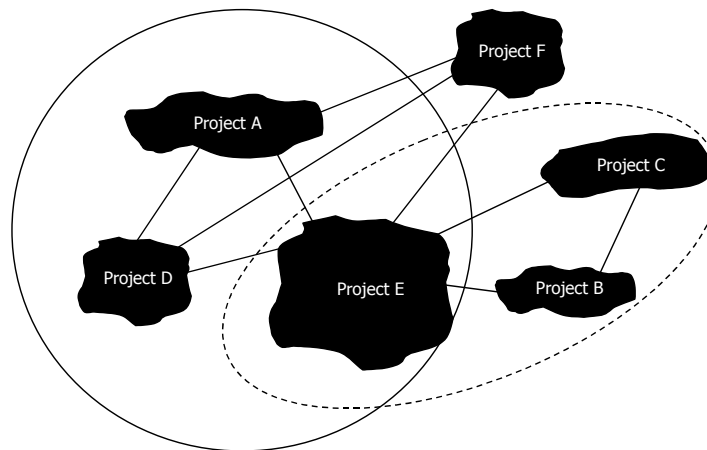


FIGURE 1.10 Graph of a network of projects.

It is the objective of the schedule analysis of projects to represent the durations and timing of the projects and to document important schedule dependencies between projects. The durations and the timing of the projects can be documented in a bar chart. Dates of milestones of projects which have to be achieved in order to proceed with other projects can be documented in a milestone list.

A resource analysis has to be performed when different projects require the same scarce resources. Traditional resource planning methods (multiproject management) are based on the critical path method (CPM) or precedence schedules. The assignment of the scarce resources is done at the activity level of the CPM schedule.

Often CPM-based resource planning is not applicable in projects because:

- The required level of detail for CPM planning and controlling is too high.
- A CPM schedule exists only for parts of a project.
- CPM scheduling is not applied at all in a project.

If no CPM plan exists, more global methods for resource planning based on rough estimates of the resource demands per period are required.

The explicit performance of the preceding analyses of a network of projects creates a new quality of information. Based on the analyses, the following measures can be applied to coordinate a network of projects:

- Redefining project objectives
- Changing project priorities
- Changing personnel assignments
- Leveling risks between projects
- Starting new projects
- Closing down projects
- Transferring know-how between projects

Social Networks (of Projects) Have Formal and Informal Communication Structures

In order to fulfill analysis and coordination functions, networks of projects require specific communication structures. To a certain extent the management of networks of projects can

be considered as a top-management responsibility, and it can be institutionalized by establishing a steering committee of projects or a controller of projects. In steering committees of projects, managers of the base organization and key team members of the different projects should be represented. Networks of projects can be perceived as social networks, which basically function because of existing informal communication structures. To promote these networking characteristics:

- Different roles in different projects can be assigned to the same person.
- Exchange-of-experience meetings between projects can be organized.
- Internal project presentations can be performed.

The application of general EDP-based project documentations, the promotion of self-organization processes in and between projects, the permission of horizontal communications, and the information of project team members about project strategies and company strategies are important communication tools in networks of projects. With regard to EDP-based planning and controlling tools for the management of networks of projects, very little support is available. As mentioned, project-management software packages offering resource planning modules base this feature on CPM schedules, which often do not exist. Furthermore, in risk analysis, cluster analysis, and simulations a demand for EDP support still exists.

THE CULTURE OF THE PROJECT-ORIENTED COMPANY NEEDS TO AGREE WITH ITS STRATEGIES AND STRUCTURES

The Project-Oriented Company Is Characterized by the Existence of a Project-Management Culture

The culture of an organization can be defined by the set of values, norms, and patterns jointly developed and accepted by the members of the organization. The culture can be analyzed by observing the capabilities of the members of the organization as well as its artifacts, such as the corporate design and the handbooks.

In the continuously changing structures of Project-Oriented Companies an explicit cultural orientation is required to integrate projects into the company. By communicating the company's vision, mission, policies, and rules, management gives the orientation with regard to decision making and sets limits for self-organization (in projects).

An important "subculture" of Project-Oriented Companies is the project-management culture, that is, the different communication forms, roles, techniques, documentation standards, and leadership styles specifically applied in projects. The self-understanding of a Project-Oriented Company can be communicated internally and externally in the company's mission statement (Fig. 1.11).

§ 1: We are a project-oriented company.

We establish projects for the performance of complex tasks of small, medium and large volume. Our project management culture is developed continuously. We apply project management methods and procedures according to specific project requirements.

FIGURE 1.11 Central paragraph in the mission statement of a Project-Oriented Company.

There Is No "One and Only" Project-Management Approach

In the past Project-Oriented Companies have been performing large external projects successfully. When managers experienced in traditional project management now perform new project types, many realize that the management methods applied are no longer appropriate. For the successful performance of different projects differentiated project-management approaches are required.

Projects with an external project owner are usually more formalized than internal projects. Also external projects usually have a higher priority within the company than internal projects. So the access to company resources is handled differently. The larger a project, the more attention it will get in a company. The integration of the project manager into the company organization depends, among other factors, on the project scope. The higher risk of large projects usually requires more sophisticated controlling methods and a comprehensive project documentation.

Further there has to be an adequacy between the complexity of a project and the complexity of project management. Very complex projects might ask for very flexible (and therefore complex) organization structures but nonsophisticated scheduling techniques, which provide holistic information and allow easy adaption (Fig. 1.12). A high project complexity asks for explicit teamwork, which provides the required variety and creativity to solve complex problems. Teamwork is also specifically required for unique projects. Unique projects might be more attractive for team members than repetitive projects.

Furthermore, different project-management approaches might be applied in different project phases. Project phases can be differentiated by contents, such as engineering, procurement, or construction, or by processes, such as start-up, performance, or closedown. Different phases require different roles. (For example, the site manager plays a specific role in the construction phase.) Different planning methods may be appropriate in different phases (such as the bar chart for the engineering and procurement phase and the precedence diagram for the construction phase). On the other hand different leadership functions have to be performed in different process phases of a project (such as providing orientation in the start-up phase, giving feedback in the closedown phase).

It is strategic project-management function to decide on the appropriate management approach, which must be functional for the specific project phase. The decision has to be reflected upon and adapted when the project situation changes.

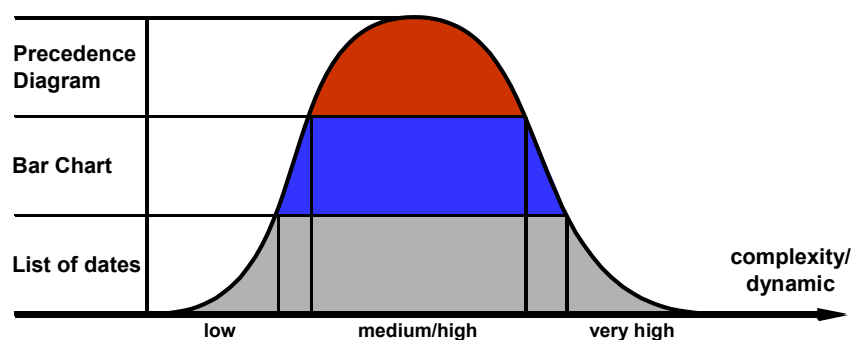


FIGURE 1.12 Application of scheduling methods according to project complexity.

The Project-Management Culture Needs Continuous Development

The extent to which an explicit project-management culture exists in a company can be evaluated by observing cultural elements, such as the number of representatives of project-management know-how, the applied project-management methodology, the available project-management infrastructure, and the existence of specific project-management values and rules (Fig. 1.13).

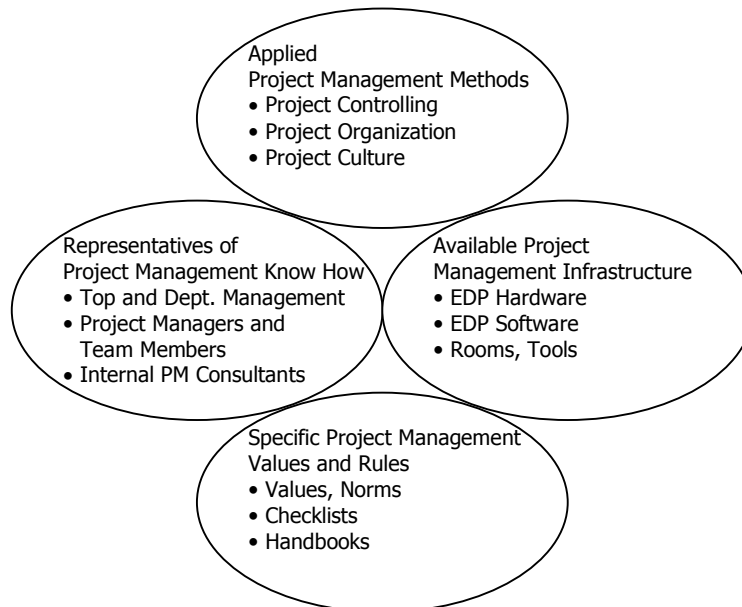


FIGURE 1.13 Elements of the project-management culture.

The different cultural elements in project management are subjected to continuous evolution. Approaches to developing the project-management culture in a company are:

- Performance of project-management training
- Performance of project-management pilot projects ("training on the project")
- Involvement of external or internal project-management consultants to moderate project workshops and support project management
- Implementation of project-management software
- Standardization of the project-management methodology in project-management manuals

The demand and the potential for standardization in project management by developing standard work breakdown structures, defining standard milestones, and determining standard structures for project handbooks depend on the relationship between repetitive and unique projects. The greater the number of repetitive projects performed by a company, the more potential there exists for standardization. But there exists also the risk of losing the benefits of project work by standardizing too much and not allowing for appropriate autonomy and creativity in projects.

THE PROJECT-ORIENTED COMPANY HAS A GLOBAL PERCEPTION OF PROJECTS

Projects Can Be Perceived as Social Systems

Projects are tasks with specific characteristics. They are complex, relatively unique, risky, and important for the project-performing company. Project objectives are determined regarding scope of work, schedule, and budget, and are agreed on between the project owner and the project manager or the project team. Projects require a specific project organization. The performance of interrelated tasks involves different functional disciplines and asks for an explicit organizational design.

Projects can be perceived as social systems with distinct boundaries, with the ability to learn and to self-organize. A project can be considered as a (relatively) autonomous social system with a specific structure and culture. Elements of the project structure are, for example, project-specific roles and communication forms, project phases, and milestone dates. The set of values and the behavior patterns shared collectively by the project team, the project name and logo, and the form of the project documentation determine the project culture. The explicit development of project values is an important project-management instrument, as the values give orientation to project team members in all their actions and decisions (Fig. 1.14).

By the definition of project boundaries a project is clearly differentiated from its environment. On the other hand, a project can only be understood in its context. The project context comprises the decisions and actions made in the preproject phase, the consequences expected in the postproject phase, and the relationships between the project and its environment.

- Significant in contents and socially stimulating
- Tradition-minded and future-oriented
- Science and practice, mind and body
- Professional and innovative
- (Learning) experience and chance

FIGURE 1.14 Central values of an organization project of Congress.

A Holistic Definition of Project Boundaries Ensures Project Quality

A holistic definition of the project boundaries has to consider all tasks that are closely coupled as being part of the project. If tasks interrelating closely are not considered part of the project, the project performance will suffer. For example, a product development project should not just include the engineering, production planning, and pilot production tasks, but also the interrelated marketing, financing, and organization activities required to launch the new product successfully. Or an investment project might not just consider the engineering, procurement, construction, and commissioning tasks, but it might also define the interrelated personnel recruiting and development activities as well as the required organizational development activities as being part of the project in order to start up and operate the new plant successfully.

Along with the holistic definition of the project tasks goes the comprehensive definition of the project organization. All parties required to ensure the quality of the project work and the acceptance of the project results need to be involved. To be effective as a project team, the team members need to provide know-how capital, decision capital, and networking capital (Fig. 1.15).

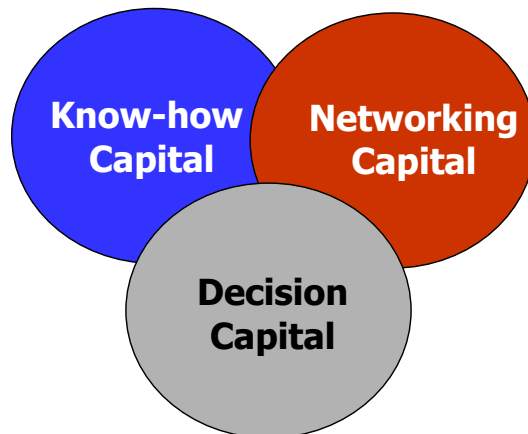


FIGURE 1.15 Composition of the project team.

The Mission of a Project Depends on Its Context

A systemic perception of a project differentiating the system from its environment promotes the explicit consideration of the project context. A comprehensive context analysis is the basis for strategic project decisions. In the analysis of the contents dimension of the project context the relationships between the project and the overall company strategies are considered. It has to be analyzed which company strategies initiated the project and how the project contributes to the achievement of the company strategies (Fig. 1.16). Furthermore, competitive and synergetic relationships between the project and other projects of the company have to be analyzed.

The analysis of the time dimension of the project context includes the analysis of events, decisions, and stakeholder relationships of the preproject phase and the analysis of expected consequences of the project in the postproject phase.

In a project environment analysis the social context of a project can be analyzed.*

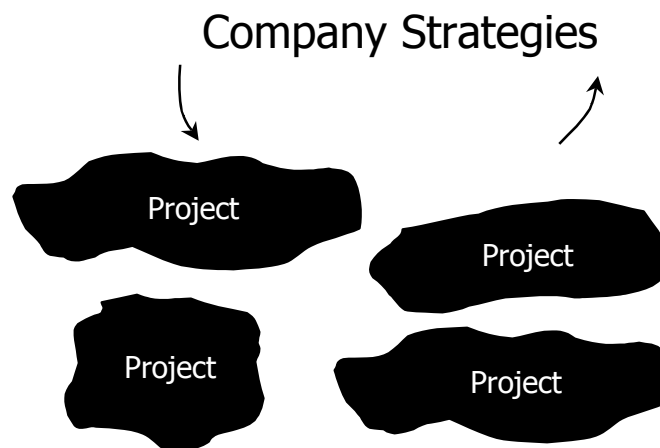


FIGURE 1.16 Relationships between projects and company strategies.

* This is a further development of the stakeholder analysis.⁶

The "relevant social environments" are defined, and the relationships between the project and each environment can be described by the definition of mutual expectations. Conflicts and potentials in the relationships can be identified, and strategies for the successful management of each individual relationship can be developed.

A relational project understanding, emphasizing the relations between a project and its relevant environments, permits reacting successfully to changes in a dynamic project environment (Fig. 1.17). Relevant project environments (such as users, suppliers, departments of the base organization) are supply and demand markets for a project. The project's relationships to these markets can be actively managed.

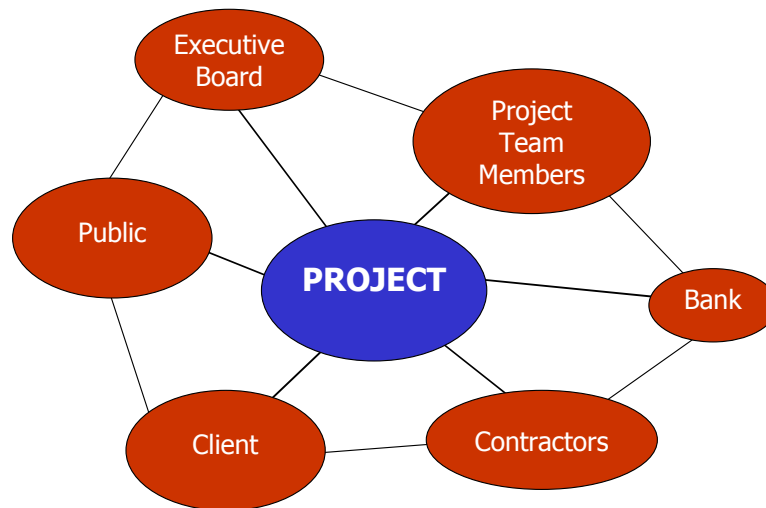


FIGURE 1.17 Interrelationships between a project and its relevant environments.

A SYSTEMIC-EVOLUTIONARY PROJECT-MANAGEMENT APPROACH CREATES NEW POTENTIALS FOR SUCCESSFUL PROJECT PERFORMANCE

Project Management Has a Strategic and an Operative Dimension

Important operative project-management functions are planning and controlling the scope of work, the project schedule, and the project resources and costs, managing project personnel, defining project roles and communication structures, and developing project-specific values, norms, and rules (Fig. 1.18).

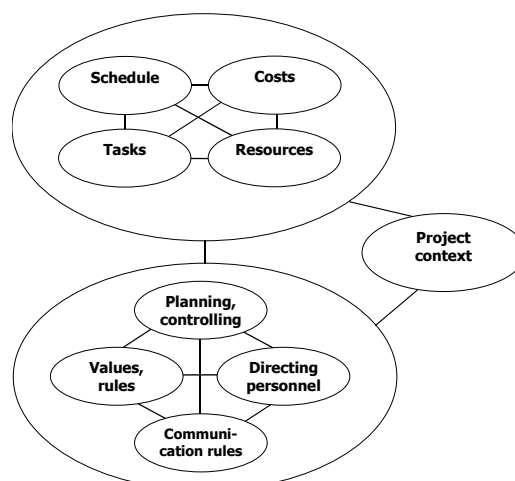


FIGURE 1.18 Functions and objects of consideration of project-management.

Project management has to relate to the project and to the project context, that is, to activities and decisions before the start of the project, to consequences of the project after the end of the project, and to relations to relevant social environments and to other projects. The explicit consideration of the project context is strategically oriented. Further, the selection of key project personnel and the selection of project-management methods adequate for the specific project under consideration are strategic project-management decisions.

Projects Require an Explicit Organizational Design

A project is created by its definition, it exists, and it gets dissolved. This temporary social system requires appropriate organizational designs during its life cycle. The traditional project organization models, the matrix project organization, the pure line project organization, and the influence project organization, were developed for companies structured in a line organization form, performing repetitive projects. In these models project-specific roles, especially the roles of project manager, project team member, and superior of a project team member, are defined, and varying formal authorities regarding the initiation of work, the disposition of resources, the control of work package quality, and the control of schedule and cost are assigned to these roles (Fig. 1.19). Depending on the extent of formal authority assigned to the project manager, these project organization models are differentiated.

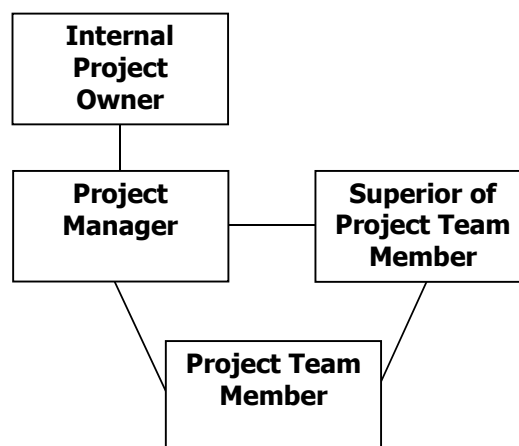


FIGURE 1.19 Project roles.

For companies performing different project types and applying resource pool concepts, new project organization models are required. Project-related roles need to be redefined. The role of superior of a project team member often no longer consists in performing work package control functions but, as resource pool manager, only includes the responsibility for the disposition of pool members. The responsibility for the quality of the performance of the work package lies with the project team member or with the overall project team. For internal projects the explicit definition and performance of the role of internal project owner are required. Basic functions and responsibilities of the internal project owner are:

- Specification of a project's goals and strategies
- Assignment of the project manager and of key team members to a project
- Provision of an appropriate project infrastructure
- Information about the relationship between the project and the company's strategies
- Information about relationships between the project and other projects

- Determination of standards for project reporting and project documentation
- Conflict settlement, strategic decisions, and feedback to the project team
- Project marketing within the company and versus external environments

The role of the internal project owner can be performed either by an individual or by a group (such as a project steering committee).

When designing a project organization, a relational definition of the project roles is required. The expectations regarding the authority and responsibility of the project manager have to be in accordance with the expectations versus the other role players. For example, the decision authority of the project manager has to be related to the decision authorities of the internal project owner, the project team members, and the project team.

In designing project communication structures different project meetings having different objectives, different partners, and different frequencies have to be defined (such as project owner meetings and project team meetings). Further the timing of project workshops has to be decided (such as project start-up, workshop, project status workshop, and project closedown workshop). For the solution of complex problems teamwork is required. So in the project team-building process the objective must be to optimize the capabilities of the overall project team instead of minimizing the capabilities of individual team members. The adequate balance between redundancy and variety in the qualifications and cultures of the project personnel has to be found.

Considering the multirole assignments in projects, the multiple communication relationships between project team members, and the extent of teamwork, projects can be perceived as flat and networklike organization structures. Project organizations are dynamic. According to phase-specific demands the project structures have to be adapted.

Project Planning and Controlling Permits Constructing the Big Project Picture

The work breakdown structure and the time, cost, and resource plans are project models. By applying different planning methods, different points of view are taken with regard to a project. By combining these project models, a global project picture can be generated. Such a multimethod approach allows interrelating the contents of different project plans (for example, the action plan resulting from the project environment analysis with the work breakdown structure). By cross-checking the completeness of the project plans, project-management quality can be ensured. In order to integrate data from different project plans, a common structural basis is required. The work breakdown structure allows one to relate time, cost, or resource data to different levels of work packages. So the demands for appropriate information from different members of the project organization can be met.

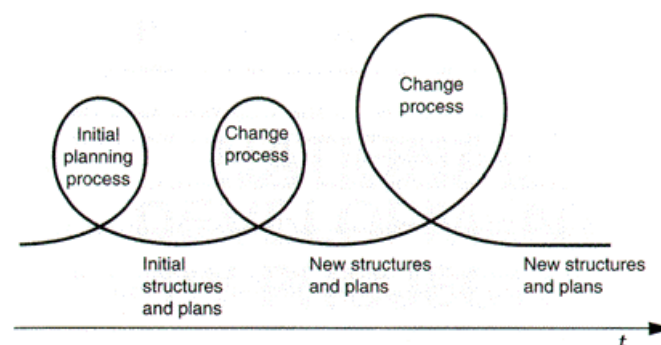


FIGURE 1.20 Cyclic project planning process.

In order to reduce uncertainty, traditional project planning develops very detailed (such as project owner meetings and project team meetings). Further the timing of deterministic plans. This approach is based on the belief that better plans lead to better project performance, where "better plans" means more detailed plans. Such linear thinking assumes a stable project environment. In an environment of discontinuities, less detailed plans, but plans for alternative project scenarios and new planning methods, such as scenario techniques and discontinuity analyses, are required. By applying these methods, the complexity and the dynamics of projects can be met.

The development of project plans by the project team members, in cooperation with representatives of the project owner, suppliers, and authorities, results in a commonly shared project perception. Project plans then are no longer just a means to generate project data, but become a communication instrument and contribute to the development of the project culture.

Projects are subject to evolution. In order to relate to the continuous changes in projects, a cyclic project planning process is required (Fig. 1.20). Any resulting deviations from the original plans might be appreciated as a learning experience.

CONCLUSION

A company that frequently uses projects as temporary organizations can be perceived as a project-oriented company. In order to implement management by projects explicitly, appropriate corporate structures and cultures are required. Projects have to be complemented by new integrative structures, such as strategic centers, resource pools, steering committees, and networks of projects.

The project-management culture of a Project-Oriented Company is characterized by a global perception of projects, by a strategic and operative project-management approach, and by the promotion of project autonomy and evolution.

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