

Competences of Project-oriented Companies: A Process-based Maturity Model

Roland Gareis, PROJEKTMANAGEMENT GROUP, Vienna University of Economics and Business Administration

1. Introduction

The model of the project-oriented company (POC) is introduced. Emphasis is given to the processes, which are specific for the POC, such as

- assignments of projects and programmes,
- project management,
- programme management
- quality management of projects and programmes,
- project portfolio coordination,
- networking between projects,
- personnel development in the POC and
- organizational design of the POC.

For the performance of these processes specific competences are required by individuals, teams, and the POC overall. A maturity model for the assessment of the organizational competences is presented.

2. Strategy, structure and culture of the project-oriented company

A Project-oriented Company is a company, which

- defines "Management by Projects" as an organizational strategy,
- applies temporary organizations for the performance of complex processes,
- manages a project portfolio of different project types,
- has specific permanent organizations to provide integrative functions,
- applies a "New Management Paradigm",
- has an explicit project management culture, and
- perceives itself as being project-oriented.

POCs consider projects not only as tools to perform complex processes, but as a strategic option for the organizational design of the company. "Management by Projects" is the organizational strategy of companies dealing with an increasingly complex business environment. By applying "Management by Projects" the following organizational objectives are pursued:

- organizational differentiation and decentralization of management responsibility,

- quality assurance by team work and holistic project definitions,
- goal orientation and personnel development and
- organizational learning by projects.

POCs perceive projects and programmes as temporary organizations for the performance of complex processes, such as contracting for external clients as well as product development, marketing or reengineering activities for internal clients.

The more projects of different types a company holds in its project portfolio, the more differentiated it becomes and the higher becomes its management complexity. In order to support the successful performance of the single projects as well as to ensure the compliance of the objectives of the different projects with the overall company strategies, specific integrative structures, such as a strategic center, expert pools, a pm office, and project portfolio groups are required. Some of these permanent organizations might be virtual.

The POC is characterized by the existence of an explicit pm culture, i.e. by a set of pm-related values and norms. In the POC project management is considered as a business process, for which there exist specific procedures and a common understanding of the performance of this process.

Further, in a POC the application of a "New Management Paradigm" is required. Traditional management approaches are emphasizing detailed planning methods, are focusing on the assignment of clearly defined work packages to individuals, are relying on contractual agreements with clients and suppliers and are using the hierarchy as central integration instrument.

Compared with this traditional management approach the major concepts common to "new" management approaches such as

- organization as competitive advantage,
 - empowerment of employees,
 - process-orientation,
 - team work in flat organizations,
 - continuous organizational change,
 - customer-orientation, and
 - networking with clients and suppliers,
- can be perceived as a "New Management Paradigm".

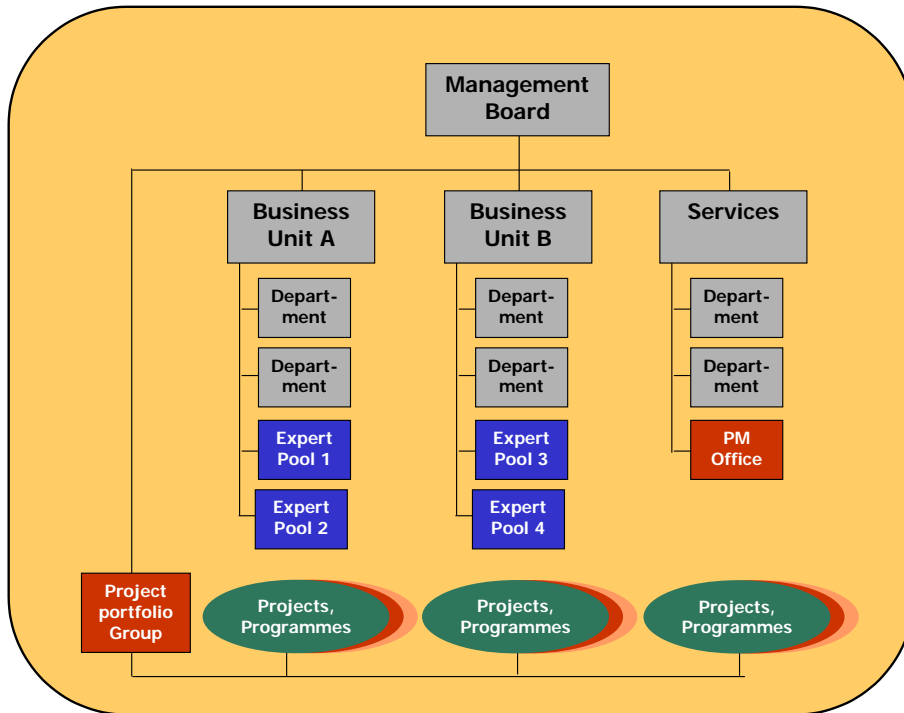


Figure 1: Organization chart of the Project-oriented Company

3. Processes of the project-oriented company

The POC is characterized by specific business processes as shown in the spider web presentation in Figure 2. The core processes project management, programme management, and project portfolio management, are briefly described.

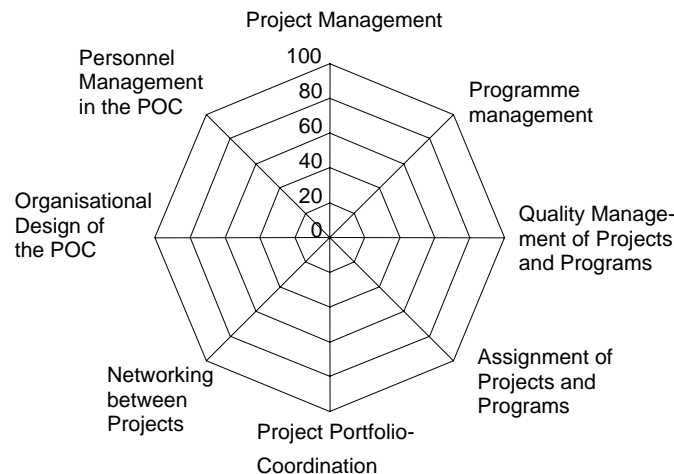


Figure 2: Specific Processes of the Project-oriented Company

Project management is the core business process of the POC. It consists of the sub-processes project start, project coordination, project controlling, resolution of a project discontinuity, and project close down.

The project management process starts with the formal project assignment and ends with the project acceptance by the project owner. The project management process is performed

in addition to the contents related processes to achieve the project results. Examples for contents related processes of an engineering projects are engineering, procurement, logistics, and construction.

Objects of consideration in the project management process are the project objectives, the scope of work, the project schedule and the project costs and earnings, as well as the project organization, the project culture, and the project context (project environment relationships, relationships to the company strategies, relationships to other projects, the business case).

Programme management has to be performed in addition to the management of the single projects of a programme. The programme management methods are similar to the project management methods, i.e. there is a programme work breakdown structure, a programme bar chart, a programme environment analysis, etc.

The advantages of designing programme organizations instead of defining a "mega-project" with several subprojects are as follows:

- a less hierarchical organization
- clear structures and a clear terminology (a programme manager and several project managers instead of one project manager and „project managers“ of the sub-projects)
- empowerment of the projects of the programme by allowing for specific project cultures, specific relationships to environments, specific project organizations, etc
- differentiation between programme ownership and different ownership for the projects.

The objectives of project portfolio management are:

- optimizing the results of the project portfolio (and not of the single projects),
- aligning the projects with the company strategies
- selection of projects to be started,
- definition of project priorities,
- coordination of internal and external resources, and
- organization of learning of and between projects.

The basis for the management of the project portfolio is a database, which allows the development of project portfolio reports. Typical project portfolio reports are the bar chart of projects, the projects profit versus risk graph, the progress chart of projects, etc.

4. Maturity models for the measurement of organisational competences

In order to describe and to measure organizational competences, models of organizational maturity can be applied. The first model relating to the measurement of the quality of the software development process, the SEI Capability Maturity Model, was developed by the Software Engineering Institute (SEI) (Paulk et al. 1991).

During the last years several specific maturity models, to describe and to measure the organizational pm competence, have been developed. Most of them are based (e.g. Ibbs/Kwark 1997) on the PMI's Guide to the Project Management Body of Knowledge (Duncan 1996).

Traditional maturity models use four to five steps to describe and to measure the competence to perform a specific process in an organization. The scale usually used is initial, repeatable, defined, managed and optimized, according to the SEI Capability Maturity Model (Paulk et al. 1991).

Maturity Level	Description of the Level
5 = optimized	<ul style="list-style-type: none"> • continuous improvement of the process • continuous collection of data to identify • analysis of defects for prevention
4 = managed	<ul style="list-style-type: none"> • process is quantitatively measured • minimum of metrics for quality and productivity exist • collection of process experiences
3 = defined	<ul style="list-style-type: none"> • Process defined and institutionalized • Process groups defined
2 = repeatable	<ul style="list-style-type: none"> • Process depends on individuals • Minimum of process controlling/guidance exists • Highly risky in case of new challenges
1 = initial	<ul style="list-style-type: none"> • Ad-hoc process, not formalized • No adequate guidance • No consistency in product delivery

Figure 3: Maturity levels of the SEI Capability Maturity Model

5. Competences of project-oriented companies

Competence can be defined as the capability, to perform a process professionally. Competence requires knowledge as well as experience. In the POC competences to perform the specific processes of the POC are required by individuals, by teams, and by the organization overall.

Not just individuals but also organizations have the capability to gather knowledge and experience and to store it in a "collective mind" (Senge 1994). Willke (1998) describes organisational knowledge as hidden in the systems of organizational principles, which are anonymous and autonomous and define the way organizations work.

It is hard to imagine, that organizations possess a "collective brain", but one could find the organizations knowledge and experience in operation procedures, description of work processes, role descriptions, recipes, routines, and databases of product-and project knowledge.

An instrument for assessing and for benchmarking the competences of POCs is the "POC-competence model". The basis for this model are the above described processes. For the description and the measurement of the competences a "spider web" is used.

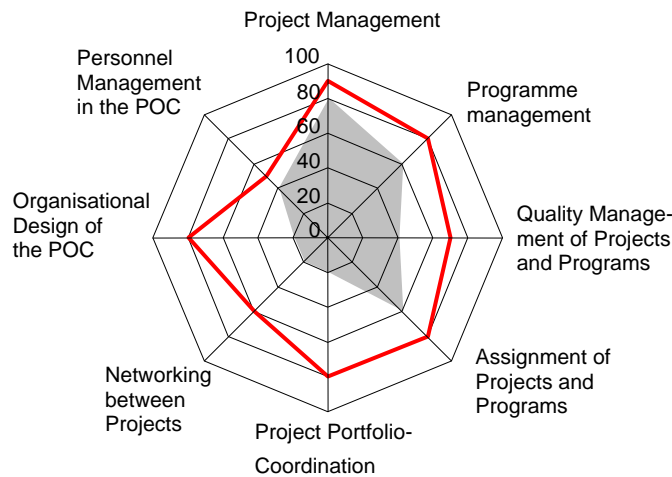


Figure 4: Spider web presentation of the organizational competences of POCs

The spider web presentation has the advantage, that it is a multidimensional presentation of the competences of the POC, allowing different maturities for different processes to be visualized. The overall competence of a company or a business unit is presented by the area, resulting of the connections of the competence points at the spider web axes. The grey shaded area in Figure 4 visualizes the current competences of a Project-oriented Company.

The assessment of the competences of a POC is based on an IT-supported questionnaire, with about 70 questions. The project management questions, e.g. relating to the project start process, are grouped in questions regarding pm-methods for the planning of project objectives, project risk, project context relationships, project organization and project culture. Each single question is assessed according to the answering possibilities "always", "often", "sometimes", "seldom" or "never".

As it can be seen in the following question, in the questionnaire it is not asked for the application of a given pm-method, but for the resulting pm-documents.

B 4.1) Which documents of project organization result from the project start-process?

always=1, often=2, sometimes=3, seldom=4, never=5

Internal project assignment	
Project organization chart	
Project role descriptions	
Project responsibility matrix	
Project communication structures	
Project specific organizational rules	
Project related incentive systems	
Others (please state:)	

Figure 5: Sample question of the "POC-competence"-questionnaire

In order to relate the answers to the questions to the competence points on the scales of the spider web a weighting system is used. After the assessment objectives for the further development of the competences of a POC can be defined and visualized in the spider web.

7. Further development of the competences in the POC

The above described POC-competence model can be applied to identify potentials for the further development of these competences in an organizational learning process. Similarly, individual- and team learning have to be organized. The relationships between individual-, team-, and organizational learning in the POC are shown in Figure 7. A comparison of the practices of different benchmarking partners can be visualized by benchmarking charts, like in Figure 6.

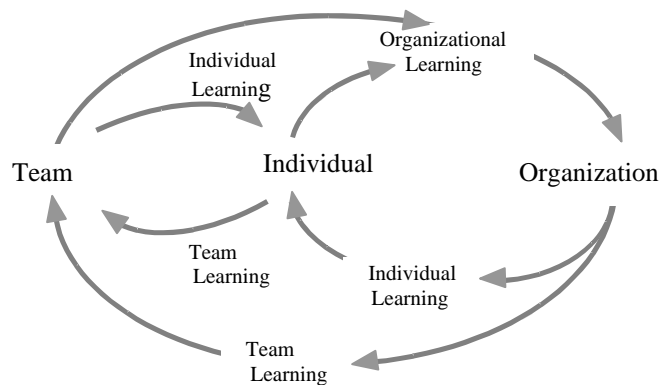


Figure 7: Relationships between Individual-, Team- and Organizational Learning

Instruments for the further development of the competences have to be differentiated for individuals, teams and organizations. Instruments to develop the competences of individuals are e.g. self assessments and training (class room, on the job). Instruments to develop the competences of teams are e.g. workshops, reflections, supervisions. Instruments to develop the competences of the project-oriented company at an organizational level are e.g. benchmarking and organizational development projects.

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