

# Project Organization And Quality - as Seen by Various Expert Studies

*Sebastian Dworatschek, Tina Nehlsen, Ina Gatzmaga*  
*Institute for Project Management and Innovation IPMI, University of Bremen*  
*Germany*  
*e-mail: dworatschek@ipmi.de*

## Abstract

*The handling of projects using professional project management instruments has been institutionalised more and more in the past years. This found expression in a growing number of successfully closed projects. Aspects of project organization and quality management are essential success factors. This article will examine these elements integrating the results of various studies.*

*Key words: project, project organization, quality management*

## 1. Introduction

This paper will discuss project organization and quality management as success factors in project management. Therefore, results of an analysis of written contributions to project management expert conferences are presented. Next, these aspects will be further examined using the results of expert interviews with an emphasis on R&D projects. This paper closes with an integrated discussion of selected thesis of the question.

## 2. Professional Project Management Progress

As the Standish Group<sup>1</sup> found out, the growth of project management during the past decade contributed markedly to project success rates: While in 1994 31 % of the focused projects failed, this rate decreased to 15 % in 2002. The percentage of successful projects rose from 16 % to 34 % in the same period. Figure 1 shows some remarkable results of the same study concerning project finance.

Year	Waste	Spent
1994	US\$ 140 billion	US\$ 250 billion
2002	US\$ 55 billion	US\$ 255 billion

Figure 1: Total cost in projects 1994 and 2002

The Standish Group worked out, that the total cost of financial waste and budget overruns from challenged and failed projects decreased about 2.5 times. The money, spent in projects increased in eight years by 5 billion US\$ to 255 billion US\$. This leads to the conclusion that in the course of time money has been invested in much more efficient projects. Now the question raises, what factors do improve projects and drive them to success? The Interthink Consulting realized a study, which indicates an important impact of organizational aspects on project success.

## 3. The Impact of Project Management on Organizations

In 2002 a project management baseline study<sup>2</sup> that surveyed 300 professionals in 67 global organizations. One of the various results was, that over 90 % of the projects had a significant impact on the organization (18 % can be seen as extremely high value projects, which are essential to organization's success; 51 % are high value projects with an significant impact on the organization; 23 % are categorized as project of medium value, which have some impact on the organization.).

To get a deeper insight in the question of organization in projects and its changing importance in the course of time, IPMI-Study I worked out some remarkable results.

## 4. IPMI-Study I+II: Contributions to PM Conferences of the Last Three Decades

The IPMI-Study dissects into two parts: First period was from 1967 to 1987 and the second period into 1988 to 2000. The first part<sup>3</sup> of the analysis has been oriented on the IPMI-Thesaurus, the first classification system for project management. Subject of the study were contributions to PM conferences on one hand, and articles in PM journals on the other.

The second part<sup>4</sup> of the study has been done in 2000. Subject of this study were exclusively conference contributions. During this study the IPMI-Thesaurus has been extended for some necessary subtopics. Also, this study characterized the papers with reference to the GPM-Kanon, which is mostly equivalent to the International Competence Baseline (ICB) of the IPMA.

For the study 4485 contributions to international conferences (and articles) were analysed to find out their main topics. Therefore the social empirical instrument of a content analysis was applied. Each article was classified by

means of up to three descriptors of the IPMI-Thesaurus, each representing a project management topic. Choosing the design of a longitudinal analysis enables an empirical study, which gives an overview over three decades of project management discussion.

	IPMA / INTERNET	PMI	Σ
Contributions 1969-87	1287 28.6 %	442 9.9 %	1729 38.5 %
Contributions 1988-99	758 16.9 %	1716 38.2 %	2474 55.1 %
Journals 1969-87	114 2.7 %	168 3.7 %	282 6.3 %
Σ	2159 48 %	2326 52 %	4485

Figure 2: Distribution of papers by source over time

The contributions to PMI-Conferences have a share of 48.1%. Which is almost equal to contributions to IPMA (former INTERNET) 45.6 %. Only few articles from journals have been taken into account. The second part of the study did not focus any PM-articles.

## 5. Classification System IPMI-Thesaurus and GPM-Kanon

In order to be able to carry out a further classification and grouping of the 2011 contributions, it was necessary to find or develop a catalogue of descriptors (Thesaurus) concerning the topic 'Project Management'. *IPMI-Study I* applied two classification structures, which are shown in Figure 3 and Figure 4. The use and evaluation revealed deficiencies and inaccuracies, as it is the case with all descriptor catalogues. The catalogue may be extended.

Figure 3 shows two categories in detail - out of the IPMI-Thesaurus: 1. *Project Management in general* and 3. *Organization*. Categories, which are not picked out as a special theme in this paper shall just be mentioned as area to give a review: 2. *Planning & Control*, 4. *Project Information Systems*, 5. *Project Environment*, 6. *Project Personnel*, 7: *Branches/ Sectors for Project Management*.

1. Project Management in General	3. Organization
101 Philosophy, Definitions	301 Alternative Organization Forms
102 System Engineering, System Theory, System Management	302 Separate PM-Lines
103 Life Cycles (LC), Phase Models	303 Matrix Organization
104 Productivity, Efficiency, Purposes	304 Organization Aids
105 Performance Specification, Statement of work	305 Implementation, Organization Development (OD)
106 Configuration Management, Change Management	306 Start-Up of Projects
107 Quality Assurance	307 Workshops
108 Contracting Offers, Bidding	308 Integrated Project Teams
109 Risk Analysis, Risk Assessment	309 Multi project, Programs
110 PM Techniques in General	310 Organizational Networks

Figure 3: IPMI Thesaurus on Project Management (excerpt)

The descriptor groups 1 to 6 in IPMI-Thesaurus carry out a classification according to technical topics in project management. List 7 gives some supplementary information on different branches and sectors in which projects are carried out. Such a descriptor is applied to a contribution if the relation to a branch is obvious and important. The technical contents of several contributions could be perfectly characterized with one or two of the

descriptors. For others even two or three descriptors were not be enough for an exact classification. In that case one of the global overall group descriptors 100 to 700 was used.

Figure 4 shows the areas 1. *Basic Competence* and 4. *Organizational Competence* of the GPM-Kanon. The categories 2. *Social Competence* and 3. *Methodological Competence* are further areas, which are not be discussed here.

1. Basic Competence	4. Organizational Competence
1.1 Management	4.1 Employers' and Project Organization
1.2 Project and Project Management	4.2 Quality Management
1.3 Project Environment and Stakeholder	4.3 Content and Management of Contracts
1.4 System Approach and Project Management	4.4 Configuration and Change Management
1.5 Project Management Implementation	4.5 Documentation Management
1.6 Project Objectives	4.6 Project Start
1.7 Project Success and Failure Criteria	4.7 Risk Management
1.8 Project Phases and Life Cycle (LC)	4.8 Project Information Systems
1.9 Standards and Guidelines	4.9 EDP Support in Projects
	4.10 Project Close Down and Evaluation
	4.11 Personnel Management

Figure 4: GPM-Kanon on Project Management (excerpt)

One central result of the *IPMI-Study I* was to work out the importance of the topic of organization. The number of conferences, that discussed organizational aspects (*Thesaurus: area 3*) rose over the last three decades.

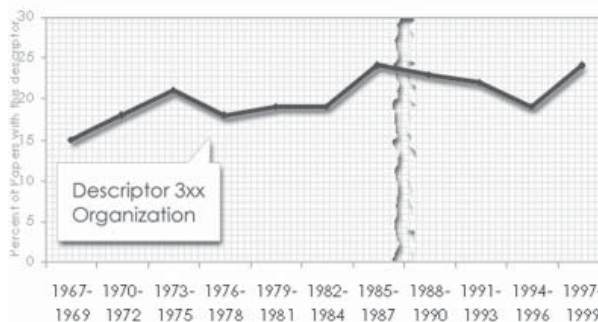


Figure 5: Proportional share of contributions on PMA and PMI conferences dealing with the topic "Organization"

Figure 5 gives an overview over the proportional share of papers on conferences of IPMA and PMI between 1967 and 1999. The descriptor contains all elements, listed in area 3 "Organization" of the IPMI-Thesaurus. Overall, over time the need for discussion about organizational topics rose to almost 25 percent in the last period of the analysed time.

As a further factor for project success *IPMI-Study I* identified the topic of quality, which bears some close relations to the question of project organization. Only in a reliable and well-structured organizational environment enables the implementation of an effective quality system.

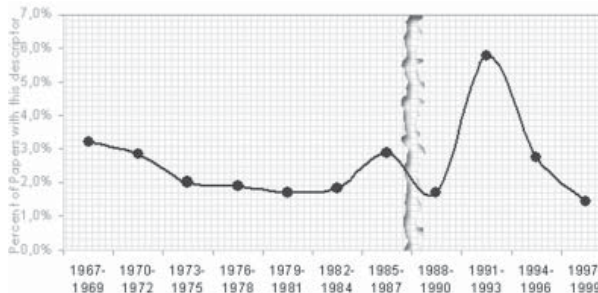


Figure 6: Course of the topic "Quality" over Time

A very important topic can be seen in the descriptor “quality”, shown in Figure 6. Over time, the proportional share of all contributions on the conference was between 1.8 and 3.1 percent. The period between 1991 and 1994 can be seen as an exception. On the 1991 conference the topic of quality marked an relative share of nearly 6,0 % of all contributions, which were 18 papers absolute. One reason for that might be the introduction of quality assurance systems worldwide, e.g. ISO norms.

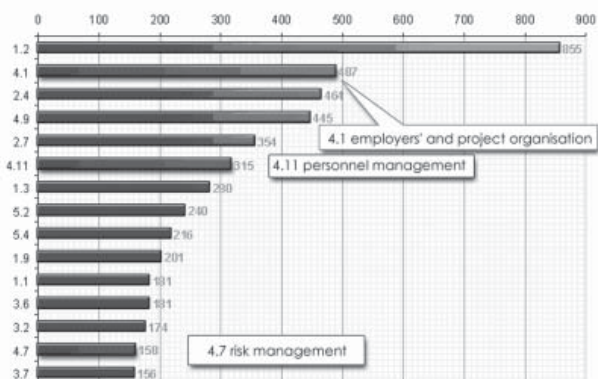


Figure 7: Overview of the most often discussed pm topics at IPMA and PMI conferences (absolute numbers of the period 1988-99)

Altogether the topic 4.1 Employers’ and Project Organization was conferred in 487 papers and thereby is the second-most referred area under discussion. 4.1.1 Personnel Management was discussed in 315 articles and marked the 6th rank. Risk Management as descriptor 4.7 was topic of 158 contributions and marked the 14th rank. All the mentioned descriptors were part of category: Organizational Competence. This may lead to the conclusion, that aspects of organizations are a very current topic and are very important for effective project management.

## 6. IPMI-Study II: PM Training Offers in Germany

In 1999 the IPMI launched a representative study on major project management topics in courses and seminars for project personnel, offered on the German market<sup>5</sup>. The study analysed the focused content, the training methods, the target group alignment, and other relevant attributes of 370 project management seminars offered by 270 suppliers of further education measurements. The following scale assessed the seminars:

[D]	No content of the specific PM topic	[C]	Low
[B]	Medium	[A]	High

Following are selected results related to the title of the Conference »The power of project organisation - quality breakthrough«.

	[D]	[C]	[B]	[A]
Company and Project Organization	231	2	103	0
Groups and Teams	149	9	178	0
Quality management	279	1	56	0

Figure 8: Content of PM courses and seminars for project personnel

It can be seen that in none of the given topics in Figure 8 were rated with a high priority (“A”) and only few were judged to be low (“C”) priority. They either had no content of the specific topic (“D”) or the topic was covered with a medium (“B”) priority.

## 7. IPMI-Study III: Project Management Expert Survey “Project Organization”

The topic “Project Organization” has been analysed in 1992<sup>6</sup> in a survey asking 167 project management experts. It focused on experience based use of different organizational models. Constitutive questions were:

1. “How have projects been organized when project management was introduced?”
2. “How are projects organized at present and after experience with PM exists?”

When introducing project management, most companies were organized by the operating department (38.9 %). With growing experience in PM, matrix organizations became the most preferred model (36.5 %), followed up by “Pure PO”. The Project Staff Organization lost influence with growing experience in project management.

Forms of Project Organization in companies	Introduction of PM	After experience with PM
Organization by functional/ operating department	65 %	27 %
Project Staff Organization	32 %	26 %
Matrix Organization	33 %	61 %
Project oriented Line Organization	13 %	22 %
Pure project organization	21 %	31 %

Figure 9: Project Organization: at PM implementation and after PM experience

## 8. IPMI-Study IV: Project Management in SME in Europe

In 1994 Huber-Jahn<sup>7</sup> accomplished a survey with 46 interviews in small and medium sized enterprises (SME) with up to 500 employees from various branches who participated in international cooperation projects. The companies were located throughout Europe<sup>8</sup>. The central questions were about their understanding of project management, project organizational forms or models and common problems in project management.

When asked about their “understanding of project management”, 41 percent considered PM as a management concept. About one third of the questioned answered that project management is network plan technique. Another 22 percent said that they understand project management as planning and controlling projects and 7 percent compared it to investment planning. None of the interviewed managers perceived “project organization” as a synonym for the PM discipline!

When explicitly asked about their organizational forms of the projects, 46 percent answered that they were using a matrix organization, 41 percent used their existing line organization and only 13 percent of the interviewees

used a separate project organization.

Another question was about common problems in project management. Of given answers, 72 percent of the 46 interviewees considered the project leadership and coordination a problem, followed by methods of planning and controlling (67 %), project personnel (57 %), and offerings and contracts (52 %). Almost half of those interviewed saw problems in the project organization (46 %). Other problematic areas in project management were PM-software (28 %) and intercultural problems (24 %).

### 9. IPMI-Study IV+V: R&D Pilot Study 2000 and VW/IPMI-study 2002

The IPMI R&D Pilot Study<sup>9</sup> examined the organization of 31 large and ten small to medium sized R&D companies and research facilities. The majority of companies (39 %) were structured using matrix organization for their projects. The use of a line organization is larger in SME and research facilities, but noticeably, in 24 % of the large companies this sort of organization is used. SME and R&D mainly used a pure project organization; larger companies rarely use this sort of project organization.

Size Organization	Large companies (76%)	SME and research facilities (24%)
Line organization	24 %	30 %
Staff-Line organization	14 %	0 %
Division Organization	10 %	10 %
Matrix organization	43 %	30 %
other (pure project organization)	10 %	30 %

Figure 10: R&D companies and research facilities: Large and SME

As a follow-up of the pilot study, a questionnaire was developed and in 2002 interviews with 250 project management experts<sup>10</sup> were realized - 40 % of the expert with IPMA-Certificate, from 60 R&D enterprises and 190 other companies, The study found out that most companies organized project actions depending on a particular project basis (and 77.5 % R&D, 83.3 % other companies).

About half of those surveyed organize PM within a line organization while only a third (R&D: 35 %, other: 57,1) of the experts consider this form of organization as relevant. Interestingly, half of those surveyed appear to get project management support via a centre of competence, sometimes called Project Office (47.5 % / 51.4 %). This seems to underline the demand and importance of in-house services on PM. Only in a third of cases the project management function is centralized (32.5 % / 37.6 %).

Another question complex dealt with the interfaces of PM and quality management systems. In general: R&D companies are equipped with more advanced systems than other enterprises, as it can be seen clearly in Fig. 11.

Interfaces of PM and Quality system	R&D companies	other companies
Certified quality management systems available	90.0 %	61.0 %
Control of compliance with standards	77.5 %	67.6 %
Quality of PM-systems controlled by audits	70.0 %	55.7 %
Integration into quality management systems given	70.0 %	48.1 %

Figure 11: Interfaces of project management and quality management systems in R&D and other companies

### 10. IPMI-Study VI: Theses on Project Management Organization

On eleven IPMA- and PMI-Congresses between 1986 and 1988 up to 649 project managers had been asked to assess 45 theses on PM-topics.<sup>11</sup>

Thesis 31 dealt with suitable organizational forms: “Although much has been said and written about project organization, the most suitable organizational form for a certain (specific) project is still not certainly known.”

306 project management experts have been asked in how far they either approve or reject this thesis (see Figure 12). With an average score of +0.9 this thesis is supposable true.

Rejection		+0.9		Approval	
-2	-1	0	1	2	
5%	11%	9%	38%	37%	

Figure 12: Thesis suitable organizational form

Thesis 36 stated: “The effectiveness of project management in practice is limited by an insufficient knowledge of alternative forms of project organizations”. 85 percent of 306 answers agreed to this statement while only seven percent disagreed (see Figure 13). With an average score of +1.3 this thesis can thus be considered definitely approved.

Rejection		+1.3		Approval	
-2	-1	0	1	2	
3%	4%	9%	28%	57%	

Figure 13: Thesis Knowledge of alternative project organizations

336 project management experts assessed Thesis 22: “Coping with arising problems in matrix organization is a serious problem for project staff and project managers.” Even though the average score is only +0.5, this Thesis is considered as supposable approved.

Rejection		+0.5		Approval	
-2	-1	0	1	2	
10%	15%	13%	33%	29%	

Figure 14: Thesis Problems with Matrix Organization

### 11. Conclusions

After evaluating various studies, the elements “organization” and “quality” can be identified as important factors for the succeeding of project. Essential for the positive influence seems to be an established project culture and the choice of the suitable project organizational form that have to be oriented on the special needs and circumstances of the company.

## 12. References

Dworatschek, S., Kruse, A. Asum, Baumann, Schmidt, Poli, Preuschoff (2002): *Project management in Germany - State and Trends*. A joint study carried out by Volkswagen Coaching GmbH ProjektManagement and IPMI University of Bremen, Wolfsburg, (deliverable in German and English).

Dworatschek, S., Hayek, A., Krause, D. (1992): *Studie zu Projektmanagement/-software in der Praxis*, IPMI Universität Bremen. In: Hayek, Asad: Projektmanagement-Software, PhD/Diss., Anhang, IPMI Universität Bremen.

Dworatschek, S., Gutsch, R. W. (1988): Theses on Situation and Tendencies in Project Management. In: *Proceedings of the 9th INTERNET World Congress*, Glasgow.

Dworatschek, S., Gutsch, R. W. (1987): Evolution of Topics in Papers of INTERNET and PMI. In: *Proceedings of the PMI Seminar/Symposium Milwaukee*, Wisconsin.

Huber-Jahn, I. (1994): *Projektmanagement für kleine und mittlere Unternehmen im europäischen Binnenmarkt - Fallstudien, Situationsanalysen und Arbeitshilfen*, PhD/Diss., IPMI, Universität Bremen.

Kruse, A. (2003): *Management von komplexen FuE-Projekten*. Szenarien, Modelle und Instrumente zur Erfolgsbewertung in einer Multi-Projektumgebung. PhD/Diss. IPMI Univ. Bremen.

Nehlsen, T., Gatzmaga, I. (2005): *Prospektive Trends in der Disziplin Projektmanagement – eine Analyse zum Anpassungsbedarf*. In: Griesche/ Meyer/ Dörrenberg (Hrsg.): *Innovative Managementaufgaben in der nationalen und internationalen Praxis* (Festschrift für Prof. Dworatschek), DUV, Wiesbaden 2001.

Pannenbäcker, O. Dworatschek, S. (1999): *Qualification of Successful Project Managers*. Do Qualification and Certification Programmes match the Requirements? In: Arto, Kähkönen, Koskinen (eds.): *Managing Business by Projects*. Proceedings IPMA-Conf., PMA Finland, Helsinki 1999, Vol. 2.

---

## Notes

<sup>1</sup> The Standish Group's 2003 CHAOS Chronicles, CHAOS 2001 & 1994. In: *PM Network*, July 2003, p.16.

<sup>2</sup> *Organizational Project Manag. Baseline Study*, Interthink Consulting, Sept. 2002. In: *PM Network*, July 2003.

<sup>3</sup> Dworatschek/Gutsch 1987.

<sup>4</sup> Nehlsen/Gatzmaga 2001.

<sup>5</sup> Pannenbäcker/Dworatschek 1999.

<sup>6</sup> Dworatschek/Hayek/Krause 1992.

<sup>7</sup> Huber-Jahn 1994.

<sup>8</sup> Germany, Spain, Turkey, Denmark, The Netherlands and Portugal.

<sup>9</sup> Kruse 2003.

<sup>10</sup> Dworatschek/Kruse et al. 2002.

<sup>11</sup> Dworatschek/Gutsch 1988.