

PROJECT MANAGEMENT SOFTWARE SYSTEMS

Requirements, Selection Process and Products (6th edition)

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Preface

In-depth analysis of project management software

This report is the complete guide to a successful project management (PM) software selection program. It provides an in-depth look at the current state of the market and technologies in the PM software sector. The authors have tested and evaluated the software solutions with a high degree of detail. The report was independently written and is in no way sponsored or influenced by software vendors: advisors from the vendors merely supported the authors to gain a basic understanding of the tools' individual characteristics. Products were chosen and evaluated according to transparent criteria.

This report also contains helpful hints on the selection and introduction of project management software, as well as substantiated approaches to project management in general. The combination of an academic approach and practical hints based on the authors' project experience make this report unique. And by providing the product assessments on-line, it is ensured that readers can get access to updates and new releases quickly and easily.

I strongly recommend this work to anyone seriously involved with project management software.

Dr. Thor Möller

Member of the Executive Committee

GPM Deutsche Gesellschaft für Projektmanagement e.V.
(German Project Management Association – Member of the IPMA)

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1. How to work with this report

Software is widely used to support modern businesses project management. Surveys show that supporting software is employed in more than 75 percent of all implemented projects ([19], [28], [17, p. 196]). Originally these systems were designed for network planning and scheduling only (cp. [11], [25, pp. 37]), but modern solutions cover almost all aspects of project management.

It is no longer only project managers who use project management software. It is increasingly used by all project stakeholders: project teams, customers, suppliers, steering committees, project offices and upper management. The systems have experienced a technical development from monolithic desktop applications to highly scalable enterprise solutions. These solutions are capable of single and multi project management but are also used for portfolio management and have evolved their collaborative capabilities: Due to the success of the internet project management software has transformed into a platform for computer-supported cooperative work (CSCW), enabling geographically-dispersed teams to minimize the problems associated with working in different locations at different times (cp. [27]).

Project management software systems are increasingly used for *enterprise-wide project management*. In these cases the software supports the streamlined and standardized execution of projects according to project management process models and methodologies. The systems are highly configurable, so they can be adapted to an organization's individual needs.

Complex Implementation Projects

As a consequence, the selection and implementation of project management software has become remarkably complex. Organizations particularly have to consider the following aspects:

- The *number and functional diversity* of the available systems complicate the pre-selection of software systems (currently,

more than 220 systems are available from 200 manufacturers).

- The organization using the software must take *requirements from manifold user groups* into consideration if the software is to be accepted.
- The organization's *project management methodology* should serve as a basis for the configuration of the system. If necessary, the software must be extended by custom development.
- *Interfaces* to adjacent software systems have to be created. Financial and human resource management systems play a special role here.

In the early days of project management software, implementing it just involved procurement and installation. Today, implementation is first and foremost an organizational issue.

In this book, the *term project management software* (PMS) is used to refer to all software systems that carry out the initiation, planning, controlling and termination of projects, project programs and project portfolios. Project management software can support one or more projects, programs or portfolio management methods. The software we refer to has been specifically designed and developed for the purposes of project management (project management software in a narrow sense). Software systems that offer generic functionality, which can also be used to facilitate the management of projects (like Office software), are only regarded as project management software in a wider sense (cp. [17, pp. 28]).

Introduction

This report is divided into three parts (Fig. 1). The *first part* is an introduction and describes the fundamental aspects that need to be considered when selecting and introducing project management systems. We recommend that you the focus on these chapters if you are currently involved in the selection and implementation of PM software in your own company. The

1. How to work with this report

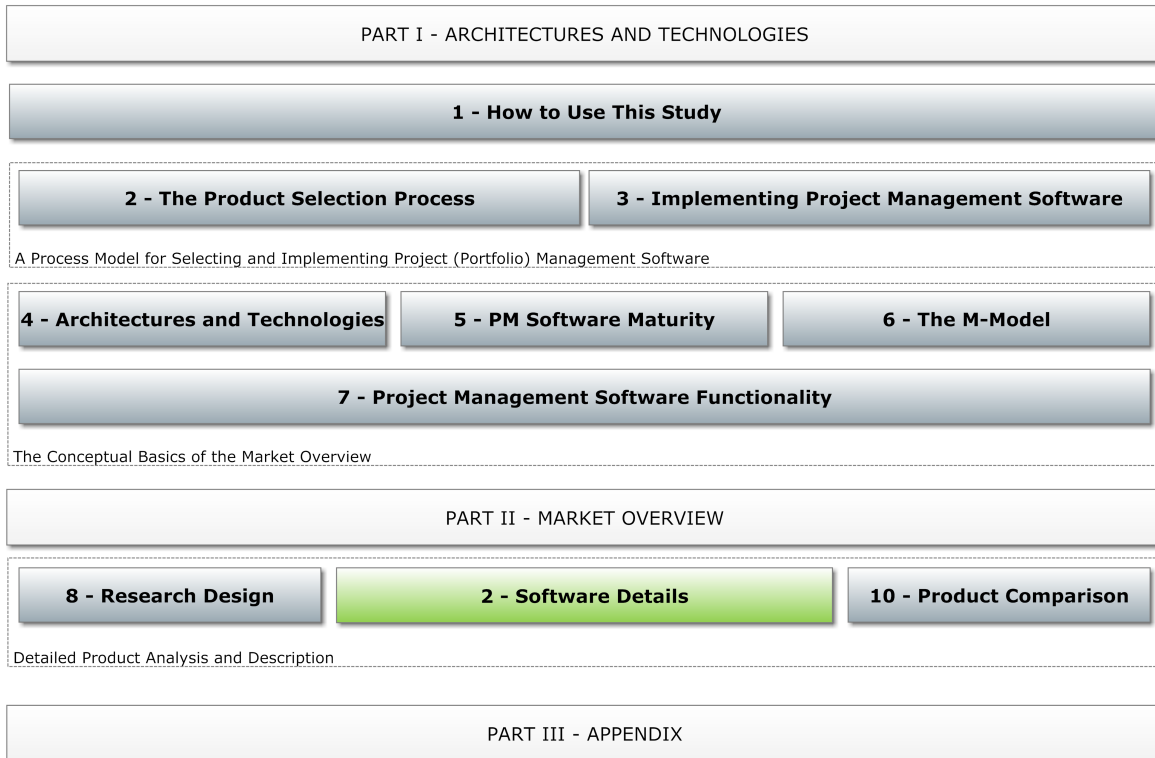


Figure 1.: Structure of the Project Management Software Systems Report

information in these chapters summarizes both current scientific findings and practical experiences from actual implementation projects, in which different products were utilized.

The chapter “*Technical aspects of PM software*” contains a brief outline of the technical characteristics and distinguishing features of the project management software products available today. You will only require more precise details if, for example, you are a representative of the IT department and are responsible for the installation and maintenance of the acquired software. In this case you will already be acquainted with the technicalities and can skip this chapter. It is aimed at those who are approaching PM software from the project management viewpoint.

Each new version of a software brings with it new functions. The order in which manufacturers implement certain functions is frequently similar. It follows the various application scenarios in the company over the course of an increasing degree of project management maturity (beginning with the planning of individual projects and progressing through to the planning and controlling of complex project portfolios or multi-project environments). The *maturity model for project management software* describes these areas of application and the typical, sometimes compulsory, development that

many project management software products go through over the course of time.

This report weighs up the project management software available using the *M-Model*, a functional reference framework that places the features they offer in a process-orientated context. The chapter dealing with the “M-Model” describes how we evaluate software. It also illustrates the relationship between this process-orientated representation of project management and thematic arrangements – for instance according to the ICB IPMA Competence Baseline.

The chapter on software functionality provides an *overview of the functionality* offered by modern software systems. It is based on the structure of the M-Model. Taking over 50 topical groups with a total of more than 270 individual software features as a starting point, this chapter describes the criteria we applied when analyzing the products in this report. It is also suitable for checking whether your own software requirements have taken everything into consideration. You can draw up your own requirement profile using the one contained in this report by using the enclosed check list.

Market Overview

The second part is concerned with specific software products and their functions. It forms the most extensive part of this report. Here you will find *detailed descriptions of several products* from different manufacturers. Each product was evaluated using the 250 criteria of the M-Model described above. These criteria are additionally grouped by functional aspects as well as project management software maturity aspects. These evaluations, together with the screenshots, will give a good impression of the respective software products. The section also contains general information on each product and its manufacturer. If you are concerned with the selection of project management software, you should have clarified your requirement profile with the aid of the previous section's check list before examining these assessment results.

In the final chapter of the second section, we compare the assessments of all products according to the M-Model, the maturity model, and the functional analysis.

Appendix

The appendix forms the third section of this report. It contains lists of the illustrations, abbreviations and literature as well as the keyword index.

For an easier read, we sometimes dispense with a detailed illustration of the assessment system in the first two sections of the report. Nevertheless, the goal of this report is not only to supply information on project management software to help you make your decision, but to make the assessment process transparent. All rules, according to product, can therefore be found in the appendix.

How to Get Updates

The manufacturers of project management software are always developing their solutions. This report allows for that via the *accompanying website* at

www.pm-software-report.com

This gives you access to updated product information during your selection. The *access code* on the inside of the cover, which is valid for six months from the date of purchase of the report, allows you to log on to the website. Newly-published assessment results will be provided here in PDF format for downloading.

8. Research Design

8.1. Selection of Systems and Research Process

For this report, we assessed stand-alone project management systems only. The report evaluates generic project management (not industry-specific) functionality. Systems that are primarily designed for the following purposes have been specifically excluded from the report: Procurement management, executive reporting (unless project management-specific), strategy definition and budgeting.

For the first edition of the report, we identified manufacturers and their software systems. We contacted approximately 200 software manufacturers via email, of which 51 applied for participation. 34 products were selected from the 51 solutions, as each of these had more than 4,000 users. Owing to the increasing consolidation of the project management software market, the prerequisites for manufacturers and products that are new to the current edition of the report have been adapted. So, *today's prerequisites* are as follows:

- The product must have been available for more than three years and have more than 5,000 users. An exception can be made if an established manufacturer of a product that fulfills these criteria publishes a new product.
- The software must provide multi-project management functions, especially in regard to resource management, organizational structures and IT architecture.
- The software must be available with an English user interface and at least one other language.
- The product must be able to actively plan and control a company's project portfolio according to strategic objectives and/or support project services automation, for instance offering management and invoicing.

Despite these criteria, new products can be included in the report if they seem to be challenging for the market or offer especially interest-

ing features in some areas. In this case, these products will be marked as *challengers*.

Software products that are added to the report are first assessed in a *one-day workshop* in which we apply the evaluation criteria. Products that have been included in previous editions of the report are regularly re-evaluated, particularly after new releases have been published. The workshops are carried out by authors together with experienced consultants from the various manufacturers. Update assessments focus on the new features but, if the technological basis has been changed since the last assessment, we also re-check the criteria that have already been assessed. A sample of randomly-selected criteria that were assessed previously is always reviewed too.

After the workshop, the data is analyzed, a product profile is compiled or updated, and this is sent to the manufacturer for verification and approval. The manufacturers are given a chance to suggest corrections, which we then verify and take into account. If necessary, additional assessment sessions take place.

This report was initiated in 2002, and new major editions have been published every 12 to 18 months in the intervening years. *Updates* to the assessments are applied approximately every three months. They are available for download as PDFs via the report's website and always included in the next reprint.

8.2. Derivation of Evaluation Criteria

This report focuses on breadth and depth of functionality rather than on non-functional quality criteria. For this reason, we use evaluation criteria that assess the products' functionality for enterprise-wide project management. We divide the products into functionality groups. These functionality groups were created in two steps. First of all, we followed a top-down approach and deduced the functionality of products from a theoretical point of view, using the so-called M-Model [1].

Next, we used a bottom-up approach to look at the functionality offered, validating the theoretical findings and making them more realistic. It also enabled us to ensure that the report reflects the functionality of state of the art project management systems. The results of this phase were mainly summarized in the form of an adapted M-Model, as described in chapter 6.

8.3. Evaluation of Systems

The software was evaluated in workshops with experienced consultants at the office of either the software manufacturer or the author. Typically, these assessments lasted one day. Some evaluations were carried out at the manufacturer's site since the complexity of the software installation and the hardware and software requirements rendered an evaluation either at the University or at our offices infeasible.

Evaluation was undertaken within the framework of the adapted M-Model (chapter 6). We checked the extent to which the software systems support the functionality, as expressed in the M-Model, by analyzing the software and its documentation. Each of the requirements presented in sections 7.1.1 to 7.11.8 was used as a single assessment criterion.

In principle, the software systems were evaluated using letters expressing the extent to which the software offers a certain kind of functionality. Four of these are used:

S — Standard functionality: The functionality is available "out of the box". The software is designed for corresponding requirements.

C — Configurable functionality: The functionality is not available by default but it can be implemented by configuration or customization. Programming is not required, or only to a very limited extent.

W — Workaround available: The software doesn't offer corresponding standard functionality, and it cannot be configured to meet such requirements. Nevertheless, the software can be used by applying a workaround (a functionality that was not created for this purpose but might be a substitute). Applying workarounds very often means coping with reduced usability and comprehensibility.

Example: A software does not offer a budgeting functionality. A workaround for this might be the usage of special (ma-

terial) resources that represent the budgets.

I — Interface available: The software doesn't offer corresponding standard functionality and it cannot be configured to meet such requirements. Instead, the software offers an interface to other software that can be employed. This software is specified in the corresponding remarks column.

Each of the assessment criteria (see chapter 7) has five *levels of fulfillment*. For each of these levels, an S, C, W, I is assigned, or no letter is given, signifying that no functionality is available. As a result, each software system obtains a row of icons indicating the extent to which a specific requirement is met or functionality is available.

Example:

A software system has the following assessment result with respect to criteria Risk Estimation (p. 46): "SSW"

This means:

1. The software offers standard functionality for documenting risks textually.
2. The software offers standard functionality for implementing risk checklists.
3. A workaround is available for implementing risk indicators.
4. There is no functionality available for configuring custom risk indicators.
5. There is no functionality available for multiple risk assessment with various risk experts.

8.4. Aggregation of the Assessment Results

In order to ease and accelerate the interpretation of the evaluation results, three different aggregations are available for each product:

- The project lifecycle support analysis
- The functional focus analysis
- The maturity profile analysis

Details on how these aggregations are calculated can be found in the Appendix (The Assessment System).

8.5. Structure of the Product Descriptions

Each product description in this report is arranged uniformly. They each begin on a left-hand page and summarize the essential product information on their first two pages.

Number of Employees

Year	Total	Product	Developer
2004	N/A	N/A	N/A
2005	N/A	N/A	N/A
2006	7,500	420	120
2007	7,500	270	104
2008	6,300	157	76
2009	5,000	161	73

The address on the first page of the description always names the software manufacturer. If available, details of distribution partners are printed on the following pages of the product description. While most manufacturers publish the number of installations, the number of employees appears to be a trade secret for some manufacturers. If stated, the number of employees is subdivided into:

- the total number of employees
- the number of employees working in context with the product
- the number of developers working on the product.

Number of Installations and Users

Region	Installations	Users
Worldwide	> 500	300,000
North America	400	250,000
Europe	113	29,288
Germany, Austria & Switzerland	12	4,183

Particularly for the larger manufacturers, the overall number of employees is not very significant. A smaller company that is dedicated to their product is not necessarily a worse investment risk than large one. The latter might decide to close the “small project management division” in order to focus on other markets—though this doesn’t seem to be very likely at the moment. Nevertheless, the number of installations does hint at the product’s establishment—

as long as the manufacturer wants to supply this information.

The product abstract describes the software briefly.

The version history lists the previous versions of the software—according to the manufacturer’s data—and summarizes the main new features in each version. Here we rely on manufacturers’ data for old versions.

The *functional focus analysis* shows the total result of the assessment, arranged according to functional groups. The darker part of the bars shows the result achieved for the criteria evaluated with “S”, which are covered by the standard configuration of the software. The entire bar also includes the functions that require configuration and which were thus evaluated with a “C”. The same applies to the maturity analysis.

Software Maturity

Single	84%
Multi	88%
Enterprise	79%
Performance	85%
Knowledge	79%

The M-Model summarizes the project life cycle assessment. As with the function analysis, a distinction is made here between functions that are available as standard (S) and those that can only be accessed by configuration (C). Evaluation results, which are attained only by the combination of C+S, are shown as gray stars. Conversely, if the stars are already attained with the functions available as standard, then they are yellow in color.



The distinction between the functions available as standard and those requiring certain adjustments to the software is frequently irrelevant in individual cases. We only assess a function with C if the required configuration is relatively simple. It must not require programming, and

8. Research Design

must be release-proof (for more detailed information see 8.3). Overall, however, the ratio of gray to yellow stars, or of the light portion of the bar to the entire bar, gives an idea of the areas in which more extensive configuration will be necessary if the corresponding functions are desired.

There is more to configuration work than the functional adaptations described here. Interfaces with other software products, the individual rights concept and, for example, the drafting of workflows or input forms in accordance with individual requirements usually generate a substantial portion of the total work.

9	Program Termination	★★★★★
9.1	Knowledge Portal	S C C W
9.2	Competence Database/Yellow Pages	S C S S S
9.3	Project Archiving	S S S S
9.4	Searching	S S S S

Following the information on the first two pages of each assessment report, the *detailed assessment results* on the individual criteria from Chapter 7 are listed on the next two pages. As in the M-Model, the overall results per group are shown as yellow or gray stars.

The assessment report continues with details on the manufacturer as well as the product.

Finally, the assessment summary text gives a brief overview of the software.

Some software vendors provide *pricing information*, while others do not. License fees certainly are just one part of the overall software implementation cost, and they strongly depend on the customer's particular situation and the vendor's licensing model. Even so, they can give a sense of a product's pricing level. Therefore, we ask vendors to provide pricing information for four scenarios, which are based on four role types:

Normal users just report progress on their tasks and track project and working time. They may also submit project ideas to the portfolio process and can be involved in workflows.

Project managers have full access to project planning and controlling functions.

Management users will use multi-project dashboards and perhaps plan resources for their sphere of responsibility.

Administrators will need a license that grants full access to all features of the software.

Actual licensing models are likely to differ from this model. Many are much more detailed. Therefore, pricing information given in this report must be considered approximate.

Project management software helps project managers and teams complete client requirements and manage time, budget, and scope constraints. However, with so many available options, choosing the right tool can be confusing, and people may not know just where to begin. Many small and medium-sized businesses across different industries are now using online project management software. This type of software uses cloud-based technology and is offered by application service providers as software-as-a-service (SaaS). The Top 10. Nowadays, these applications are expanding their functions and crossing bo