

---

# **Project management**

---

# Assessing organisational project management capability

Received (in revised form): 22nd July, 2003

## David Hillson

is Director of Risk Doctor & Partners (see [www.risk-doctor.com](http://www.risk-doctor.com)). He is a Fellow of the Association for Project Management (APM) in the UK and is active in the Project Management Institute (PMI) further afield. David is recognised for his pioneering and practical contributions to project management and risk management, both through his work as a consultant and trainer, and through his regular conference presentations and papers. He received the PMI 2002 Distinguished Contribution Award in recognition of his work in developing risk management over more than ten years, as well as his pioneering efforts in promoting project management in Europe. His interest in benchmarking arises from his personal and professional commitment to excellence and continuous improvement. David is also a Fellow of the UK Institute of Risk Management (IRM), and a member of the Chartered Management Institute.

## Abstract

Many businesses recognise project management as a core competence and seek to deliver benefits to the business through effective management of projects. But how can an organisation know whether its project management processes are adequate? Can a business compare itself with best practice or its competitors? Is there an accepted benchmark for organisational project management capability? The Project Management Maturity Model (ProMMM) has been developed to meet these needs. It describes four levels of increasing project management capability (Naïve, Novice, Normalised and Natural), with each ProMMM level further defined in terms of four attributes, namely culture, process, experience and application. It presents a generic benchmarking framework applicable to project-based organisations in any type of industry, including those responsible for facilities management projects, and does not presume any prior level of project management capability. ProMMM allows organisations to assess their project management capability against agreed criteria, set realistic targets for improvement, and measure progress towards enhanced capability. This paper outlines the structure of the ProMMM framework, and presents a case study where ProMMM has been used to support development of effective project management.

## Keywords:

project management, benchmarking, maturity models, capability assessment

David Hillson  
Risk Doctor & Partners  
3 Lower Heyshott  
Petersfield GU31 4PZ, UK  
Tel: +44 (0)7717 665222  
E-mail: [david@risk-doctor.com](mailto:david@risk-doctor.com)  
Website: [www.risk-doctor.com](http://www.risk-doctor.com)

## THE NEED FOR BENCHMARKING PROJECT MANAGEMENT CAPABILITY

Many businesses are recognising the power of a project-based ('projectised') approach, and are implementing project management

## Value of project management

as a core competence. The value of a formal and structured approach to project management is becoming increasingly recognised as the discipline develops and more organisations begin to reap the benefits of proactive project-based management. The successful business will be the one which manages its projects most effectively, maximising competitive benefits while minimising the inevitable uncertainty. Guidelines and standards define best practice project management (see, for example, the Project Management Institute's Guide to the Project Management Body of Knowledge (PMBOK),<sup>1</sup> the Body of Knowledge from the UK Association for Project Management (APM),<sup>2</sup> or British Standard BS6079-1:2002<sup>3</sup>), and there are a number of sources of help available to organisations wishing to develop or improve in-house project management processes.

## Purpose of benchmarking

In order for an organisation to be able to determine whether its project management processes are adequate, agreed measures are required to enable it to compare its management of projects with best practice or against its competitors. As with any change programme, benchmarks and maturity models can play an important part in the process by defining a structured route to improvement. The purpose of a benchmark exercise is to assess current capability, diagnose strengths and weaknesses, and identify gaps where improvement is required. A maturity model offers a framework with a number of defined levels of capability against which the current position can be assessed objectively. It also defines the next level of capability to which the organisation can aspire, creating an improvement target for development programmes.

### EXISTING PROJECT MANAGEMENT BENCHMARKS

## Existing models

A number of project management practitioners have developed benchmarks for assessing project management capability based on the principles of maturity models, and this seems likely to remain an important area for future development. A recent review has identified over thirty project management maturity models in the market,<sup>4</sup> of which a number of examples are well established.<sup>5-15</sup> The majority of these models assess project management capability against bodies of knowledge, and test the completeness of process coverage. While knowledge and processes are undoubtedly important contributors to project management capability, they are by no means the only important element, and a number of other attributes should be assessed to give a true picture of an organisation's project management capability.

## PMI's OPM<sub>3</sub>

In a major project, the Project Management Institute (PMI) has been developing the Organisational Project Management Maturity Model (OPM<sub>3</sub>) since May 1998,<sup>16-20</sup> and the first release is due to be launched at the end of 2003 (details at [www.pmi.org/info/PP\\_OPM3.asp](http://www.pmi.org/info/PP_OPM3.asp) and from [opm3info@pmi.org](mailto:opm3info@pmi.org)). The OPM<sub>3</sub> seeks to describe and assess an organisation's ability to enact strategy

through selection and delivery of multiple projects. It provides a hierarchical structure with a number of best practices, each comprising multiple capabilities, with each capability leading to outcomes which can be assessed by key performance indicators (KPIs) and metrics. When issued, OPM3 is likely to offer a very comprehensive assessment and framework, though the complexity of its broad scope addressing best practices/capabilities/outcomes/KPIs/metrics at three organisational levels (projects, programmes and portfolios) through four levels of maturity (standardise, measure, control, continuously improve) may discourage some potential users.

### **THE PROJECT MANAGEMENT MATURITY MODEL**

#### **Origins of ProMMM**

ProMMM has been developed to meet the needs of organisations for a maturity-model framework capable of acting as a capability benchmark.<sup>21,22</sup> Its structure draws on established concepts from existing models such as the Capability Maturity Model (CMM) from Carnegie-Mellon Software Engineering Institute<sup>23,24</sup> and the EFQM Excellence Model from the European Foundation for Quality Management.<sup>25</sup> It also draws on a previously published model developed to assess organisational risk management capability (the Risk Maturity Model).<sup>26</sup> The basis for ProMMM is practical and pragmatic, based on the empirical experience of its developers in providing project management consultancy across a wide range of industries over many years. The lack of an academic research base is not felt to be a disadvantage, as ProMMM represents the accumulated wisdom and expertise of project management professionals who are leading practitioners in the field.

One may ask why ProMMM was developed when so many other frameworks exist against which organisational project management capability can be benchmarked. The majority of the models listed above compare project management capability against standards such as the PMI PMBoK,<sup>27</sup> focusing on knowledge areas and process groups. A number of other elements contribute to project management capability which are captured in ProMMM (see below), including vital areas of organisational culture, human aspects such as skill and experience levels, and practical issues of implementation and application.

In addition, a number of existing models use a complex structure making an assessment difficult to implement and interpret. The structure of ProMMM is simple without being simplistic, allowing key strengths and weaknesses to be highlighted for further attention, and covering a broad range of performance indicators within its hierarchical structure.

ProMMM acts as a benchmark for organisational project management capability, describing four increasing levels, with defined stages along the way, against which organisations can benchmark themselves. Since its original development, there has been considerable interest in ProMMM as a means of assisting

**ProMMM track record**

organisations to introduce effective project management. ProMMM has been used by many major organisations to benchmark their project management processes as part of an improvement initiative, from a variety of industry sectors including: construction, nuclear, public sector, telecoms, defence, pharmaceutical and engineering. It offers a generic framework allowing assessment of project management capability in organisations from any industry, including those responsible for FM projects, and is not dependent on prior achievement of a particular level of project management process.

**ProMMM structure****THE PROJECT MANAGEMENT MATURITY MODEL STRUCTURE**

The ProMMM describes four levels of increasing project management capability, termed Naïve, Novice, Normalised and Natural. These four levels correspond to recognised stages of adult learning,<sup>28</sup> though they are applied through ProMMM to organisational learning rather than to individuals. The aim is to provide a structured route to excellence in project management, with defined stages along the way against which organisations can benchmark themselves. The various levels can be summarised as follows:

**Maturity levels**

- The *Naïve* project management organisation (ProMMM Level 1) is unaware of the value of using projects to deliver business benefits, and has no structured approach to project management. Management processes are repetitive and reactive, with little or no attempt to learn from the past or to prepare for future threats or uncertainties.
- At ProMMM Level 2, the *Novice* project management organisation has begun to experiment with project management, perhaps through a small number of nominated individuals, but has no formal or structured generic processes in place. Although aware of the potential benefits of a structured approach to managing projects, the *Novice* organisation has not effectively implemented project management processes and is not gaining the full benefits.
- The level to which most organisations aspire when setting targets for management of projects is captured in ProMMM Level 3, the *Normalised* project management organisation. At this level, project management is implemented across all aspects of the business. Generic project management processes are formalised and widespread, and the benefits are understood at all levels of the organisation, although they may not be fully achieved in all cases.
- Many organisations would probably be happy to remain at Level 3, but ProMMM defines a further level of maturity in project management capability, termed the *Natural* project management organisation (Level 4). Here the organisation has a fully project-based culture, with a best-practice approach to project management in all aspects of the business. Project-based

information is actively used to improve business processes and gain competitive advantage.

### ProMMM attributes

Each ProMMM level is further defined in terms of four attributes, namely culture, process, experience and application. These allow an organisation to assess its current project management capability against agreed criteria, set realistic targets for improvement, and measure progress towards enhanced project management capability. The four attributes were selected to represent the areas required for effective project management, reflecting the wide recognition that tools and training are not sufficient enablers. Many organisations make the mistake of believing that purchasing ‘the right software tool’ and sending staff on training courses will result in effective project management. It is clear, however, that other factors are equally important, if not more so. As a result, ProMMM provides four key attributes against which organisational project management capability can be assessed:

- One crucial area is organisational *culture* (how we think), covering the mindset, ethos and belief structure of the organisation, which drive instinctive assumptions and reactions.
- A second element required for effective project management is embodied in the *process* attribute (how we do things), covering methods, tools and techniques available to support project management.
- A third essential contributor to project management is *experience* (what we know and can do), both individual and corporate, expressing the extent to which the principles and practice of project management are understood.
- Lastly, project management must be put into practice, and the effectiveness of *application* (actually doing it) will be a key measure of project management maturity.

### Attributes of each maturity level

The ProMMM framework defines each of the four maturity levels against the four attributes, summarised as follows:

- For the Level 1 Naïve project management organisation, the attributes are all at the lowest level. The *culture* is resistant to change, and the need for project management is not recognised. There are no project management *processes*, no *experience* of using project management and no *application* within the business.
- The *culture* of the Level 2 Novice project management organisation is not fully convinced of the benefits of project management and tends to see it as a necessary overhead. *Processes* are rather ad hoc, and their effectiveness depends on the limited *experience* of a few key individuals who may have little formal training. Project management *application* is inconsistent and patchy.

- Level 3 project management organisations have Normalised project management into their way of operating, with a *culture* that recognises the value of projects and expects to reap benefits from managing them. Generic and formal *processes* are in place, with the necessary resources available, and staff have adequate *experience* and expertise to undertake effective project management. *Application* is routine and consistent across all projects.
- At Level 4 Natural, a project-based *culture* drives the organisation into proactive project management, seeking to gain the full advantages of the changing business environment. Best-practice *processes* are implemented at all levels of the business, with regular updating and active learning from previous projects. All staff have a degree of *experience* of using project management processes to assist their tasks, and *application* is widespread and second-nature across all areas.

Each attribute is further defined in a number of diagnostic characteristics, against which assessment can be performed. Attribute descriptions are summarised in Table 1.

## USING THE PROJECT MANAGEMENT MATURITY MODEL IN PRACTICE

### Conducting a ProMMM assessment

The ProMMM can be used by organisations to benchmark their project management processes, and to support the introduction of effective in-house project management. With ProMMM, implementation of a project management approach can be managed effectively to ensure that the expected benefits are achieved in a way that is appropriate to the needs of each particular organisation. Assessment of an organisation's project management capability against the ProMMM framework can be undertaken using two complementary approaches: a perception-based questionnaire, and structured interviews with key staff.

### Self-assessment questionnaires

#### The Project Management Maturity Model Questionnaire

The ProMMM Questionnaire can be used to allow an organisation to diagnose its current position within the ProMMM framework. By assessing performance against the four attributes, areas of strength and weakness can be identified, using the standard definitions associated with the four ProMMM levels. For each attribute, a series of questions in the ProMMM Questionnaire explores respondents' perception of the degree to which their organisation manages projects effectively, with a range of answers provided to each question corresponding to one of the four ProMMM levels. Questions are provided to explore each of the lowest-level diagnostic characteristics below each of the four attributes. Sample questions are detailed in Table 2. (It should be noted that the corresponding ProMMM level scores shown in Table 2 are not visible to those completing the genuine

**Table 1:** Attributes of ProMMM levels

	<b>Level 1: Naïve</b>	<b>Level 2: Novice</b>	<b>Level 3: Normalised</b>	<b>Level 4: Natural</b>
Summary definition	Unaware of the need for management of projects. No structured approach to projects. Repetitive and reactive management processes. Little or no attempt to learn from past or to prepare for future.	Experimenting with project management, through a small number of individuals. No generic structured approach in place. Aware of potential benefits of managing projects, but ineffective implementation, not gaining full benefits.	Management of projects built into routine business processes. Formalised generic project management processes implemented on most or all projects. Benefits understood at all levels of the organisation, although not always consistently achieved.	Project-aware culture, with proactive approach to project management in all aspects of the business. Active use of project information to improve business processes and gain competitive advantage.
Culture	No awareness of the benefits of project management. Resistant/reluctant to change. Tendency to continue with existing processes.	Project processes may be viewed as additional overhead with variable benefits. Project management only used on selected projects.	Accepted policy for project management. Benefits recognised and expected. Prepared to commit resources in order to reap gains.	Top-down commitment to project management, with leadership by example. Proactive project management encouraged and rewarded.
Process	No formal processes.	No generic formal processes, although some specific formal methods may be in use. Process effectiveness depends heavily on the skills of the in-house project team and availability of external support.	Generic processes applied to most or all projects. Formal processes, incorporated into quality system. Active allocation and management of project budgets at all levels. Limited need for external support.	Project-based business processes. ‘Total Project Management’ permeating entire business. Regular refreshing and updating of processes. Routine project metrics with constant feedback for improvement.
Experience	No understanding of project principles or language.	Limited to individuals who may have had little or no formal training.	In-house core of expertise, formally trained in basic skills. Development of specific processes and tools.	All staff project-aware and using basic skills. Learning from experience as part of the process. Regular external training to enhance skills.
Application	No structured application. No dedicated resources. No project tools.	Inconsistent application. Variable availability of staff. Ad hoc collection of tools and methods.	Routine and consistent application to all projects. Committed resources. Integrated set of tools and methods.	Second-nature, applied to all activities. Project-based reporting and decision-making. State-of-the-art tools and methods.

ProMMM Questionnaire, and are provided only for clarity for the reader. Also in Table 2 the four possible answers to each sample question are presented in order of increasing ProMMM level, i.e. 1–2–3–4, but answer order is randomised in the genuine version.)

It is important to seek responses from a wide range of staff, and to guarantee that the responses of specific individuals will not be identified, in order to preserve confidentiality and encourage frank expressions of opinion. Responses can be analysed for the whole dataset as well as by various organisational factors, such as job role, site or business area. This sub-analysis allows differences in project management maturity across the organisation to be

**Table 2:** Sample ProMMM Questionnaire questions

Question	Possible answers (pick one only)	ProMMM Level
How does the organisation respond to the claim that effective project management is critical to business success?	Reactive response – project management is not required for success	1
	Variable response – project management is tolerated but sometimes seen as an unnecessary ‘add-on’	2
	Objective response – project management is recognised and accepted as part of business	3
	Proactive response – project management is welcomed as an essential contributor to meeting business objectives	4
To what extent is the organisation committed to proactive and systematic management of projects?	No commitment	1
	Partial commitment	2
	Consistent policy for project management	3
	Whole-hearted top-down commitment	4
How formal are project management processes? Are they fully defined, with clear scope and objectives?	There are no project management processes in place	1
	Processes are informal and specific to particular projects	2
	Generic processes exist covering most aspects of the business	3
	Formal processes are flexibly applied to match requirements	4
How stable and mature are project management processes?	There are no project management processes in place	1
	Project management processes are immature and still developing	2
	Project management processes are stable and mature	3
	Project management processes are regularly refreshed/updated	4
How well do staff understand the underlying principles of project management?	No understanding	1
	Basic understanding	2
	Thorough understanding	3
	Intuitive understanding	4
What level of familiarity and expertise do staff have in using the practical skills and techniques of project management?	No knowledge or expertise of project management techniques	1
	Basic grasp of standard techniques	2
	Effective use of all main techniques	3
	Expert use of all current techniques	4
What is the scope of application of project management processes?	No application of project management processes	1
	Applied to occasional projects (especially large/difficult/strategic)	2
	Routinely applied to all projects and bids	3
	All activities are encompassed by the project management process	4

assessed, exposing areas of particular strength which might act as models for others, as well as revealing which parts of the organisation might need special attention.

The questionnaire responses can be entered into a database, allowing attribute scores to be calculated and analysed. Each ProMMM attribute (Culture, Process, Experience, Application) can then be assessed using a number of targeted questions. Answers to each question are scored 1–4, indicating the corresponding ProMMM level. The mean score is calculated for each question, and for the set of questions for each attribute, with standard deviations showing the degree of agreement between respondents. The ProMMM levels for each attribute are determined by rounding the mean score to the nearest decimal place, and the overall ProMMM level is calculated as the average of all four attributes. Results are presented as a radar plot of the four attributes, as well as numerical values of attribute scores and overall ProMMM level, as shown in Figure 1.

**Analysing  
questionnaire data**

**Interpretation of ProMMM Questionnaire results**

The structure of the ProMMM framework facilitates analysis of the resulting data and allows detailed interpretation to expose strengths and weaknesses in current project management capability. The assessment is undertaken bottom-up, with scores for individual questions being averaged to give attribute scores, which are in turn averaged to give an overall ProMMM level. All scores are calculated to one decimal place, recognising that organisations undertaking improvement initiatives are likely to lie between levels in the ProMMM framework.

Having performed a bottom-up calculation, interpretation is done top-down in three stages:

1. ProMMM level
2. attribute scores
3. individual questions.

The overall ProMMM level defines the position of the organisation within the ProMMM framework, as a Naïve, Novice, Normalised or Natural project management organisation. The summary descriptions of these types of organisation (Table 1) can be used as headlines to present the results of the analysis, although these are necessarily generalisations. Further detail on the particular position of an organisation is gained by a more in-depth analysis of the results at lower levels, namely attributes and individual questions.

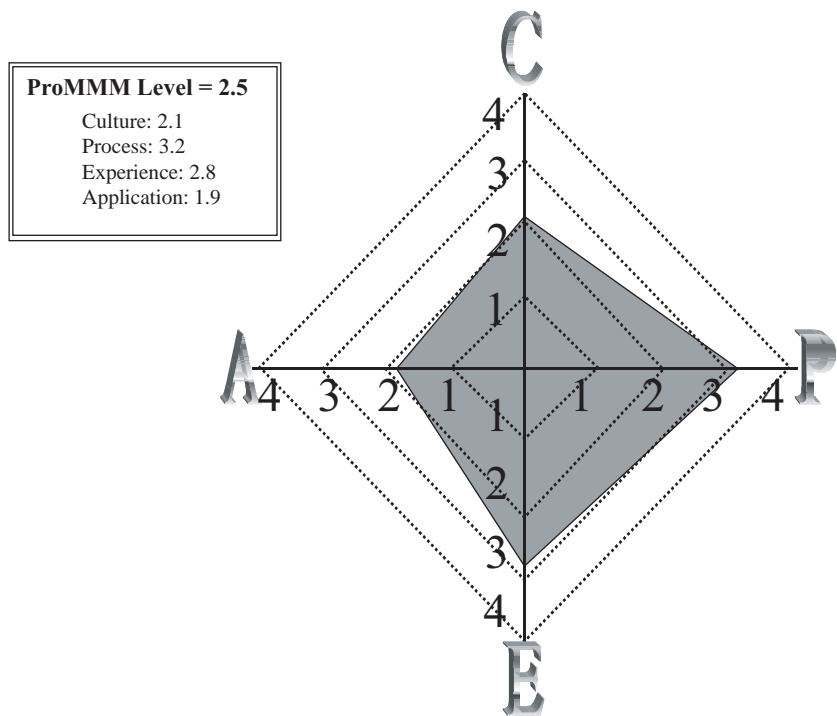


Figure 1: Sample ProMMM radar plot

### Typical attribute combinations

Attribute scores expose areas of particular strength and weakness within the overall assessment of an organisation at a particular ProMMM level. Intermediate positions can also be recognised, such as 'Improving Novice', or 'Enhanced Normalised', and these are particularly useful where there is a discrepancy between attribute scores, which reveal strengths and weaknesses in the project management approach. One common combination of attribute scores is high C/P with low E/A, indicating organisations which believe in project management and have implemented project processes, but whose staff lack the necessary skills and experience leading to limited application effectiveness — good theory but poor practice. Another frequent result is high P/E and low C/A, representing an organisation with the necessary infrastructure in terms of processes and skills, but whose culture does not recognise the value of project management, again leading to a failure to apply a project management approach — able but not willing.

The final level of analysis addresses results for individual questions, which allows a detailed consideration of particular aspects of project management capability, giving the degree of granularity necessary for understanding project management maturity in depth, and allowing development of an effective improvement programme.

At each level of interpretation, calculation of standard deviation can be used to indicate the extent of agreement between respondents, with standard deviations of up to 0.6 being considered normal for a questionnaire-based approach.

### Limitations of questionnaires

#### ProMMM structured interviews

Interviews can be used to supplement, enhance or reinforce the results obtained from the ProMMM Questionnaire, since it is recognised that the questionnaire only assesses the perceptions of respondents and therefore represents a subjective opinion. A questionnaire-based approach is also limited in scope, since it can only address those issues listed in the questions. Finally, there is room for significant differences in interpretation of the meaning of questions between respondents, especially where unfamiliar concepts are used, or where there are native language differences.

### Structured interviews

In order to verify the data obtained from ProMMM Questionnaire returns, a set of structured interviews is therefore often conducted, with key staff selected to represent a wide cross-section of the organisation. Each ProMMM interview lasts about one hour, and should be based around a structured interview framework which covers all four ProMMM attributes. Interviewers should adopt a range of different interviewing styles in order to maximise interview effectiveness, and not restrict themselves to following the interview framework rigidly. Where an interview exposes issues of interest relevant to the assessment of project management capability, the interviewer should be free to pursue such lines, and as a result not all questions in the ProMMM

interview framework necessarily need to be covered in all interviews.

### **CASE STUDY USING THE PROJECT MANAGEMENT MATURITY MODEL**

#### **Using ProMMM in an improvement initiative**

A recent study (December 2000–January 2001) was undertaken for a multinational organisation<sup>29</sup> wishing to enhance project management capability, who requested a ProMMM assessment in order to define the starting point for their improvement initiative. The organisation had recently been through a merger process, and their operations were conducted on seven major sites across two continents.

Project Management Maturity Model Questionnaires were distributed by e-mail to 750 staff involved in projects, ranging from senior management to project team members. Responses identified site, job role and technical area, allowing a detailed analysis of any variance in project management capability across different parts of the organisation. In addition to the questionnaire, a set of structured interviews were held with 30 senior staff, including project directors and project managers across all sites and technical areas within the company.

#### **Attribute results**

On analysis of the ProMMM Questionnaire returns, the organisation was rated at ProMMM Level 2.6, representing an ‘Improving Novice’ project management organisation. Attribute scores were:

- culture 2.6
- process 2.7
- experience 2.4
- application 2.6

Higher scores for culture, process and application combined with a lower score for experience indicated that the principles and framework for effective project management were in place, and that these were being used in practice. It was, however, necessary to ensure that staff had the skills and knowledge required to apply project management effectively. The company was advised to build on the foundation of its project-aware culture and good project processes, but concentrating on developing the competence levels of staff.

#### **Specific questions**

Specific strengths and weaknesses relating to particular characteristics within each attribute were indicated by answers to individual questions in the ProMMM Questionnaire which suggested that, though the organisation was aware of the benefits of project management, it was reluctant to change, perhaps as a result of ‘change fatigue’ following the recent merger. Processes were found to be formally established, but were not perceived as stable or effective. Project management techniques were consistently applied, but there was a lack of supporting tools. The greatest area

of concern was in experience levels, where individuals had limited practical skills, and there was no formal organisational learning from experience.

## **Interview findings**

Conclusions from the structured interviews broadly confirmed the findings of the questionnaire analysis. Key issues arising from interviews included confirmation of the presence of 'change fatigue', and highlighted the need to pay attention to operating as a single global organisation post-merger without losing the distinctive strengths and legacy of each location. The roles and expectations for Project Managers required clear definition, and it was also important to develop and support project management skills and team working. Process improvement needed to be focused on simplification of existing processes to remove non-value-added activities, with particular attention to decision making, prioritisation and resource management.

## **Recommendations and results**

As a result of the ProMMM analysis, the organisation defined the scope and content of a project management improvement initiative, with a detailed implementation plan which took full cognisance of the findings of the ProMMM assessment, focusing on areas revealed as weaknesses by the analysis. Two years after the initial ProMMM benchmarking study was completed, the organisation has established a global virtual Project Management Support Office (PMSO) as a centre of excellence for project management, and reports significant improvement in performance of its projects. Specific areas identified during the ProMMM assessment have been tackled by the PMSO with senior management support, and the performance and morale of staff involved in projects has increased. The organisation is becoming recognised by its industry peers for its effective use of project management, and PMSO staff are being invited to address conferences to share their success story. These presentations acknowledge ProMMM benchmarking as an essential foundation for the achievements gained, since it exposed areas requiring priority development attention, as well as confirming areas of strength which could be consolidated.

## **CONCLUSION AND SUMMARY**

The ProMMM presented here represents a practical and empirical approach to assessing current project management capability, based on a simple pragmatic foundation. It is applicable to project-based organisations in any industry. Organisations wishing to improve the effectiveness of their project management need to be able to measure current capability and define improvement targets. The ProMMM framework allows diagnosis of the current position as well as presenting a well-defined target in the next ProMMM level, allowing improvement to be planned and providing a foundation for measurement of progress. The assessment process is simple to administer, using self-assessment questionnaires and/or structured interviews, and the analysis is straightforward to perform and

## Simple, powerful and pragmatic

understand, with a bottom-up assessment and top-down interpretation. The results are powerful and pragmatic, exposing strengths and weaknesses at a level of detail that enables improvement plans to be targeted precisely. Organisations are likely to find this pragmatic approach both valuable and cost effective, since ProMMM allows them to assess their project management capability against agreed criteria, set realistic targets for improvement, and measure progress towards enhanced project management effectiveness and performance.

## ACKNOWLEDGMENTS

An earlier version of this paper was presented to the 2001 Project Management Institute Annual Seminars & Symposium.<sup>30</sup> Full details of the ProMMM approach to benchmarking project management capability are available from the author or from PMProfessional Solutions at [solutions@pmprofessional.com](mailto:solutions@pmprofessional.com), or visit [www.pmprofessional.com/solutions/consult/prommm.html](http://www.pmprofessional.com/solutions/consult/prommm.html) for details and a demo.

## References

1. Project Management Institute (2000) *A Guide to the Project Management Body of Knowledge*, 2000 edn, Newtown Square, PA, Project Management Institute, (CD-ROM).
2. Association for Project Management (2000) *Project Management Body of Knowledge*, 4th edn, High Wycombe, UK, Association for Project Management.
3. British Standard BS6079-1 (2002) *Project Management — Part 1: Guide to Project Management*, London, UK, British Standards Institute.
4. Cooke-Davies, T., Schlichter, J. and Bredillet, C. (2001) 'Beyond the PMBoK Guide', in *Proceedings of the 32nd Annual Project Management Institute Seminars & Symposium (PMI 2001)*, Nashville, USA, 7–10 November, Newtown Square, PA, Project Management Institute.
5. Seidman, W. and McCauley, M. (1996) 'Measuring the Revolution: Quantitative Metrics of Project Management Maturity', in *Proceedings of the 27th Annual Project Management Institute Seminars & Symposium (PMI 1996)*, Newtown Square, PA, Project Management Institute.
6. Remy, R. (1997) 'Adding Focus to Improvement Efforts with PM3', *PM Network*, Vol. 11, No. 7.
7. Fincher, A. and Levin, G. (1997) 'Project Management Maturity Model', in *Proceedings of the 28th Annual Project Management Institute Seminars & Symposium (PMI 1997)*, Newtown Square, PA, Project Management Institute.
8. Hartman, F. T. and Skulmoski, G. (1998) 'Project Management Maturity', *Project Management*, Vol. 4, No. 1, pp. 74–78.
9. Ibbs, C. W. and Kwak, Y-H. (1998). 'Benchmarking Project Management Organisations', *PM Network*, Vol. 12, No. 2, pp. 49–53.
10. Hartman, F. T. (2000) *Don't Park Your Brain Outside*, Newtown Square, PA, Project Management Institute.
11. Lubianiker, S. (2000) 'Opening the Book on the Open Maturity Model', *PM Network*, Vol. 14, No. 3, pp. 30–33.
12. Voivedich, B. and Jones, M. (2001) 'Developing and Applying a Project Management Capability Maturity Model', in *Proceedings of the 32nd Annual Project Management Institute Seminars & Symposium (PMI 2001)*, Nashville, USA, 7–10 November, Newtown Square, PA, Project Management Institute.
13. Kerzner, H. (2001) *Strategic Planning for Project Management Using a Project Management Maturity Model*, New York, John Wiley.

14. Crawford, K. (2002) *Project Management Maturity Model: Providing a Proven Path to Project Management Excellence*, New York, Marcel Dekker.
15. Pennypacker, J. S. and Grant, K. P. (2003) 'Project Management Maturity: An Industry Benchmark', *Project Management Journal*, Vol. 34, No. 1, pp. 4–11.
16. Combe, M. W. 1998. 'Standards Committee Tackles Project Management Maturity Models', *PM Network*, Vol. 12, No. 8, p. 21.
17. Schlichter, J. (1999) 'An Organisational PM Maturity Model', *PM Network*, Vol. 13, No. 2, p. 18.
18. Schlichter, J. (1999) 'Surveying Project Management Capabilities', *PM Network*, Vol. 13, No. 4, 39–40
19. Schlichter, J. and Skulmoski, G. (2000) 'Organisational Project Management Maturity: New Frontiers', in *Proceedings of 15th IPMA World Congress on Project Management*, London, 22–25 May, High Wycombe, UK, Association for Project Management.
20. Schlichter, J. (2001) 'PMI's Organisational Project Management Maturity Model: Emerging Standards', in *Proceedings of the 32nd Annual Project Management Institute Seminars & Symposium (PMI 2001)*, Nashville, USA, 7–10 November, Newtown Square, PA, Project Management Institute.
21. Hillson, D. A. (2001) 'Benchmarking Organisational Project Management Capability', in *Proceedings of the 32nd Annual Project Management Institute Seminars & Symposium (PMI 2001)*, Nashville, USA, 7–10 November, Newtown Square, PA, Project Management Institute.
22. Hillson, D. A. and Timerick, S. (2001) 'Project Management Benchmarking in Theory and Practice', in *Proceedings of the Effective Project Management 2001 Conference*, London, 30–31 October, High Wycombe, UK, Association for Project Management.
23. Paulk, M. C., Curtis, W., Chrissis, M. and Weber, C. B. (1993) 'Capability Maturity Model Version 1.1', *IEEE Software*, Vol. 10, No. 4, pp. 18–27.
24. Paulk, M. C., Weber, C. B., Curtis, W. and Chrissis, M. (Eds) (1995) *The Capability Maturity Model: Guidelines for Improving the Software Process*, Reading, MA, Addison-Wesley.
25. EFQM (1999) 'The EFQM Excellence Model — Companies Version', ISBN 90-5236-360-9. Further details from the European Foundation for Quality Management (EFQM), Avenue des Pléiades 15, B-1200 Brussels, Belgium, Tel. +32 2775 3511, Fax +32 2775 3535, e-mail model.info@EFQM.org, website www.EFQM.org
26. Hillson, D. A. (1997) 'Towards a Risk Maturity Model', *International Journal of Project & Business Risk Management*, Vol. 1, No. 1, pp. 35–45 [The Risk Maturity Model was a concept of, and was originally developed by, HVR Consulting Services Limited in 1997. All rights in the Risk Maturity Model belong to HVR Consulting Services Limited.]
27. Project Management Institute, ref. 1 above.
28. Clarkson, B. and Luca, J. (2003) 'The Transitions of a Novice Project Manager', in *Proceedings of the 2003 World Conference on Educational Multimedia Hypermedia & Telecommunications (ED-MEDIA 2003)*, Honolulu, Hawaii, 23–28 June.
29. Hillson & Timerick, ref. 21 above.
30. Hillson, ref. 21 above.