Project Management Competence for the New Millenium

Lynn Crawford
University of Technology, Sydney

Abstract

Project management has developed in the 20th Century, as a recognised field of practice, with origins in 'hard' projects, primarily in engineering and construction. These origins have influenced the development of project management as practitioners strive for professional status through establishment of practice and performance standards.

As we enter the 21st Century, the practice of project management is rapidly spreading beyond traditional project based industries and 'hard' projects. It is being adopted as an approach to management in areas of emerging technologies, and of entire organisations. This wider application of project management is an important factor in the maturing of project management as a profession and raises questions about the value of existing project management standards in relation to the nature of projects and project management roles

Using results of an international research study of project management competence, this paper will consider the changing nature of projects and the environments in which they are being conducted. It will question whether current ideas about project management competence, as reflected in standards such as the PMBOK® Guide (PMI 1996) and the Australian National Competency Standards for Project Management (AIPM (Sponsor) 1996) in their current forms, and offer suggestions for their review to ensure relevance in assessing and guiding the development of project management competence for the 21st Century.

Project Management at the end of the 20th Century

Project management as we know it today, reflects its origins in the defense and aerospace, engineering and construction projects of the postwar period. These were primarily major projects, well resourced, with well defined goals and methodologies for achieving them. The focus in these projects was on the role of the project manager, who had single point responsibility (Bechtel 1989; Stretton 1994) and authority commensurate with that responsibility. Emphasis was on time and cost performance of single projects with a related interest in development of tools for planning and programming.

This early focus on planning and programming and on the role of the project manager, is reflected in the origins of the project management professional associations. INTERNET, now known as the International Project Management Association (IPMA), began in the 1960's as a forum for European network planning practitioners to exchange knowledge and experience(Stretton 1994). The Project Management Institute began in North America in 1969, as *an opportunity for professionals to meet and exchange ideas, problems and concerns with regard to project management, regardless of the particular area of society in which* ***managers*** *function (Cook 1981).* In Australia, the Project Managers Forum, now the Australian Institute of Project Management, was formed in 1976, for similar reasons.

By the 1990's, the focus on the project manager had shifted to include the whole of the project team and the organisational context for management of projects. Recognising this change in focus, INTERNET was renamed the International Project Management Association; the UK based Association of Project Managers became the Association for Project Management; and the Australian Project Managers Forum became the Australian Institute of Project Management. The title of the Project Management Institute (PMI) from the start recognised a wider range of project management roles than that of the Project Manager, and their Project Management Professional (PMP) Certification Program reflected this.

Interest and activity in development of standards and certification processes for project management professionals began in the 1980's and bore fruit in the 1990's with the globally distributed PMBOK® Guide (PMI 1996), the APM Body of Knowledge (APM (UK) 1993), a number of European PM BoK's, and the IPMA's Competency Baseline (IPMA 1999). These documents all reflect the definition of project management given in the PMBOK® Guide (1996 p.167): *the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project.*

Arising from the Competency Standards movement (Thompson 1989), competency standards for project management have been developed in Australia, under the auspices of the Australian Institute of Project Management (AIPM (Sponsor) 1996) and in the United Kingdom (CISC 1997; MCI 1997; OSCEng 1997).

Crawford, L. (2000) Project management competence for the new millenium. In: *Proceedings of 15th World Congress on Project Management, London, England*, IPMA

Whereas the Project Management Bodies of Knowledge and the IPMA's Competency Baseline primarily identify the skills and knowledge required by project managers, the competency standards establish performance criteria for what project managers are expected to be able to demonstrate that they can do in order to be assessed as competent.

The BoK's and Competency Standards focus on the project manager and on the tools, techniques, skills and knowledge that individuals require to manage individual projects. There is little guidance in terms of management of multiple projects, portfolio management or *the more strategic factors that affect project outcomes* (Morris 1999).

As Morris (1999) says, *while the subject of project management is now comparatively mature, and recognized by thousands if not millions of managers as vitally important, it is in many ways stuck in a 1960s time warp* where the focus of attention and therefore of standards is on:

- The project manager rather than the project team
- The individual project rather than the organisational portfolio of projects
- Tools and techniques for managing performance and reporting (primarily on time and cost) of individual projects rather than wider strategic and contextual issues

Development of standards and certification for project management has been a driving force within the project management profession throughout the 1990's. Predictions of future direction for project management suggest that this interest will continue (Gadeken 1998; Hartman 1997; Morris 1998). Existing standards such as the PMBOK® Guide (PMI 1996), the ICB (IPMA 1999). BS6079 (British Standards Board 1996) and the Australian National Competency Standards for Project Management (AIPM (Sponsor) 1996) (which uses the PMBOK® Guide as its knowledge base) , have been developed primarily for management of individual projects, by people primarily with background and experience in 'hard' projects (engineering, construction, defense and aerospace); for project managers rather than project teams and specialists. All standards recognise the need for review. How is project management evolving and what issues should be addressed to ensure that existing standards remain relevant for management of projects in the next millenium?

The future of project management

There is much interest and speculation concerning the future of project management. The 1998 PMI Research Program Team commissioned a consultant report, gathered input at PMI '98, and referred to other documents to produce a forecast and assessment of the future of the project management profession and the Project Management Institute, published as The Future of Project Management (Project Management Institute 1999a). Owen Gadeken conducted a 'future search' seminar at the PMI Annual Seminars and Symposium held in Chicago, Illinois and reported on his findings at the IPMA World Congress in Slovenia in 1998 (Gadeken 1998). It is not surprising that there is considerable synergy between the findings of these two studies, with implications for consideration in review of existing project management standards.

Growth and diversity of the project management profession

There is clear evidence that interest and participation in project management are accelerating. Membership of the Project Management Institute grew at an average of around 8% per annum from 1985 through 1993, and at 33% per annum from 1994 through 1999 (source: PMI Headquarters). The Australian Institute of Project Management has experienced similar growth rates, from an average of 6% per annum from 1985 through 1993, to an average of 25% per annum from 1994 through 1999 (source: AIPM National Headquarters). The Project Management Institute estimates that there are approximately 4 million people in the USA who potentially view project management as a profession of choice and they extrapolate this to estimate a further eleven million in the rest of the world (Project Management Institute 1999b)p.4.

An important aspect of the growth in membership of project management professional associations and in the potential overall size of the profession, is the composition of that membership. Construction, engineering, defense and aerospace have been the traditional starting point for modern project management. In Australia, construction continues to dominate the membership of the Australian Institute of Project Management (43% in 1999). This is no longer the case for the Project Management Institute, where Construction represents only the third highest number of members (3884), after Computers/Software/DP (4062); Telecommunications (4467); and Information Technology (4062) (Project Management Institute 1999b) p. 42. If AIPM is accepted as operating in less mature project management environment than the USA, then the dominance of Information Systems, Information Technology and Telecommunications in the USA can be seen as an indication of the future for Australia.

Business Management Services is the fifth highest category of PMI membership, but comes in third for AIPM. As management by projects is adopted as an approach by organisations, the Business Services sector must be considered as a potentially high growth area for the future.

Research data (Crawford 1999a), from a sample of 353 project personnel from the USA, UK and Australia, provides interesting insights into the relative level of PM experience in the Engineering and Construction, IS/IT and Telecommunications and Business Services sectors. It may be surprising to some to find that those in IS/IT and Telecommunications actually report a higher mean level of PM experience than those in the Engineering and Construction sector. The industry sector representation of the sample reflects the dominance of PMI membership by the IS/IT and Telecommunications sectors and the Business Services sector is, as might be expected, least well represented and has the lowest level of average project management experience.

	Total Years PM Experience				
Industry Sector of Organisation	**Count**	**Max**	**Minimum**	**Mean**	**Median**
Engineering & Construction	117	47	1	13	11
IS/IT and Telecommunications	155	46	0.5	15	13.5
Business Services	81	35	1	8	7.5
Total	**353**	**47**	**0.5**	**13**	**11**

Figure 1: Total Years PM Experience by Industry Sector

Project management competence of personnel is, on average, at the same level for the Engineering and Construction and IS/IT and Telecommunications sectors, but is lower for the Business Services sector (Crawford 1999b). It is important to remember, however, that this assessment is made against the Australian National Competency Standards for Project Management, which, in their current form, strongly reflect a 'hard' project management paradigm grounded in expertise and experience dominated by the Engineering and Construction sectors.

From an organisational viewpoint, assessed according to the generalised criteria used in the SEI Capability Maturity Model, both the Engineering and Construction and IS/IT Telecommunications sector have similar profiles of project management maturity. The Business Services sector, however, reports lower levels of organisational maturity (Figure 2), indicating that this sector, which can be expected to be most affected by growth due to the trend towards adoption of management by projects by organisations, will need to address the competence of both individuals and organisations.

	% of responses per sector		
	E & C	**IS/IT & Telecomms.**	**Business Services**
Initial	8.8%	7.7%	23.1%
Repeatable	17.7%	20.4%	42.3%
Defined	39.8%	38.0%	25.6%
Managed	26.5%	24.6%	9.0%
Optimising	7.2%	9.3%	0.0%
Total	100.0%	100.0%	100.0%

Figure 2: Organisational Project Management Maturity by Industry Sector

Differences in the nature of projects in the various industry sectors and application areas can be looked at in a number of ways. One approach, proposed by Turner and Cochrane (1993), the Goals and Methods Matrix, identifies project types according to the extent to which project goals and methods are defined. Data from research on project managers and their environments (Crawford 1998) indicates that both goals and methods in projects in the Business Services sector tend to be less well defined than in either the Engineering and Construction or IS/IT and Telecommunications sectors (Figures 3,4,5).

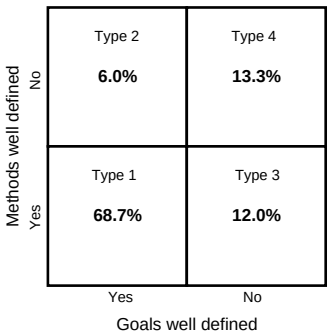

Figure 3: Engineering and Construction Sector

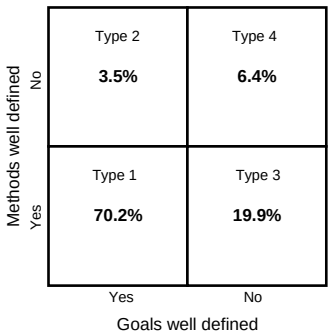

Figure 4: IS/IT and Telecommunications Sector

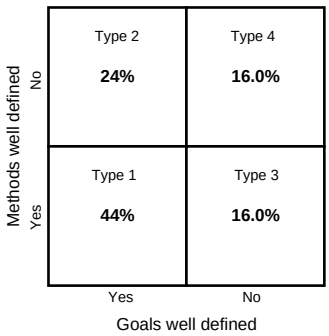

Figure 5: Business Services Sector

Definition of goals and methods for projects is a project management skill and it is possible that the reporting of less well defined goals and methods in the Business Services Sector may be a result of the associated lower levels of individual and organisational project management competence. On the other hand, as project management approaches are applied in an increasing spectrum of projects, and throughout whole businesses, the nature of projects can be expected to encompass an increasing number of projects that challenge definition. Time series data is necessary to identify whether, with an increase in the number of activities defined and managed as projects, there is an associated increase in projects for which goals and/or methods are less well defined.

As Type 1 projects, or those with well defined goals and methods are predominant in both the Engineering and Construction and IS/IT and Telecommunications Sectors, it is reasonable to assume that existing project management standards are best suited to projects of this nature. Review of standards should therefore take into account the competence required for management of more ambiguous, less well defined projects.

Project Management Roles

As identified earlier in this paper, existing project management standards are primarily directed at the project manager. Although the role of the project manager may have been well defined when Bechtel claim to have first used the term in the early 1950's (Bechtel 1989), the degree of clarity has become considerably reduced as the range of project types has increased. The title of project manager is used in different organisations and in different industry sectors with a wide range of meanings. Aligned with this lack of consistency in the definition of the role of the project manager is the lack of clear career paths in project management (Gadeken 1998).

The concept of career paths highlights the need for definition of project management roles beyond that of the project manager. There have been suggestions in recent years that the role of the single project manager is becoming less important, as responsibility for projects is shared by project team members (Hartman 1995; Lawler 1992; Moravec 1997). For this to work effectively, each member of the project team needs to have a clearly defined role, extending the need for project management role definitions.

Existing project management standards have been developed without associated rigour in the definition of the roles to which they apply, and this should be addressed in future reviews of the standards. Internally, organisations such as Boeing and Cable and Wireless have devoted considerable effort to definition of project management roles, but these definitions are intra-company. A globally accepted framework of role definitions would provide the benefits for inter-company and inter-country projects that are fuelling interest in project management standards and certification. Such a framework would also provide the basis for career pathways in project management.

Conclusions

Project management competence, as defined by existing standards such as the PMBOK® Guide and Australian National Competency Standards for Project Management, have been developed on the basis of a view of project management influenced by well resourced and well defined major projects. They are primarily directed at providing guidance to project managers in management of discrete projects.

Review of these standards should take account of

- the changing nature of projects as project management is adopted for an increasing range of activities
- strategic management of multiple projects including portfolio management

- organisational factors that influence the management of projects
- a range of project management roles, beyond that of the project manager, and the identification of career paths
- definition of project management roles and alignment of standards with those definitions.

References

AIPM (Sponsor)(1996) National Competency Standards for Project Management. Australian Institute of Project Management.
APM (UK)(1993) Project Management Body of Knowledge. Association for Project Management (APM).
Bechtel, Stephen D Jr. (1989) Project Management - Yesterday, Today and Tomorrow. PM Network III(1, January), 6-8.
British Standards Board(1996) Guide to project management: BS6079: 1996.
CISC(1997) Raising standards: Construction Project Management: NVQ/SVQ Level 5. London: CISC (The Construction Industry Standing Conference).
Cook, Desmond L. 1981. Certification of Project Managers - fantasy or reality? In *A decade of project management: selected readings from Project Management Quarterly: 1970 through 1980.* Edited by John R Adams and Nicki S Kirchoff.Project Management Institute.
Crawford, Lynn. (1999a) In Search of the Competent Project Manager. Proceedings of the Australian Institute of Project Management National Conference, 1999. Melbourne, Australia: Melbourne, Australia: AIPM.
Crawford, Lynn. (1999b) PM competence: people and organisations. Nordnet Conference. Helsinki, Finland: Helsinki, Finland: Nordnet.
Crawford, Lynn H. (1998) Standards for a Global Profession - Project Management. PMI 29th Annual Seminars and Symposium. Long Beach, California: Project Management Institute.
Gadeken, Owen C. (1998) Next generation project management. Proceedings 14th World Congress on Project Management. Ljubljana, Slovenia:pp 488-493p. Ljubljana, Slovenia: IPMA and Slovenian Project Management Association.
Hartman, Francis. (1995) A case study of the applications of self-managing project team principles. Project Management Institute: 26th Annual Seminars and Symposium. New Orleans, Louisiana, USA: Upper Darby, PA: PMI.
Hartman, Francis. (1997) Trends and Improvements: Looking beyond modern project management. Project Management Institute: 28th Annual Seminars and Symposium. Chicago, Illinois: Upper Darby: PMI.
IPMA. (1999) ICB: IPMA Competence Baseline. Caupin, G, Knopfel, H, Morris, P, Motzel, E, and Pannenbacker, O. Germany, International Project Management Association.
Lawler, E. E. 1992. *The ultimate advantage: creating the high involvement organization.* San Francisco: Jossey-Bass.
MCI. 1997. *Manage Projects: Management Standards - Key Role G.* London: Management Charter Initiative.
Moravec, M Johannessen O Hjelmas T A,(1997) "We have seen the future and it is self-managed," *PM Network* September: 33-36 .
Morris, Peter W G. (1998) Article for 1998 APM Yearbook: BOK/BOC [Web Page].; Accessed 27th November 1999. Available at: http://www.umist.ac.uk/CRMP/BoK_page.htm.
Morris, Peter W G. (1999) The management of projects: the new model [Web Page Accessed 27th November 1999. Available at: http://www.umist.ac.uk/CRMP/.
OSCEng(1997) OSCEng Levels 4 and 5: NVQ/SVQ in (generic) project management. Occupational Standards Council for Engineering.
PMI. (1996) A Guide to the Project Management Body of Knowledge. Upper Darby, PA, Project Management Institute (USA).
Project Management Institute. 1999a. *The future of project management.* Newtown Square, Pennsylvania: Project Management Institute Headquarters.
Project Management Institute. 1999b. *The PMI project management fact book.* Newtown Square, PA: Project Management Institute, Inc.
Stretton, Alan,(1994) "A short history of project management: part one: the 1950s and 60s," *The Australian Project Manager* 14 (1): 36-37 .
Thompson, Peter,(1989) "The meaning of vocational qualifications," *Education + Training* 31 (3) .
Turner, J R and Cochrane, R A. (1993) Goals-and-methods matrix: coping with projects with ill defined goals and/or methods of achieving them. International Journal of Project Management 11(2, May), 93-112.