

PM Competence: People and Organisations

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Abstract

Project management competence involves an active partnership between people and organisations. A major international research project is enhancing understanding of the project management role and of the environments in which projects are managed. This paper presents research results that provide a snapshot of people in projects, and project practices in organisations, and highlights the benefits of synergistic relationships between the two.

Keywords: Project management competence

1. Introduction

As project management matures as a profession there is increasing international interest in the concept of project management competence. Demand for added value and the impact of the information age on work practices has meant that we are constantly required to deliver more for less with increasing emphasis on the competence to deliver value. Whether we recognise it or not, in every aspect of our lives, we are increasingly delivering results through projects. This places emphasis on competence of both individuals and organisations. Project management is often referred to as the 'accidental profession' (Pinto and Kharbanda, 1995). It is also a profession in formation, and much of the attention given to project management competence reflects attempts to pin down, or better understand the evolving nature of project management and the role of the project manager. A significant feature of this evolution is the growing appreciation that projects will be delivered more effectively if there is synergy between the project management competence of individuals and of the organisations in which they operate. The development of competent project managers is integral to the broader development of organisational competence.

In a rapidly changing environment, individuals and teams need the competence to work effectively without rules and reference to precedent. As Stewart (1999, p. xi) says 'the knowledge economy demands skills many workers simply do not have; and of almost all workers, it demands flexibility, alertness, and the ability to make decisions without consulting a manual'. Organisations must be equally agile in their support, providing organisational environments that foster and sustain competent project management teams and through them, effective resource utilisation and successful project outcomes.

Development of project management standards and certification programs is one aspect of this interest in competence. Other manifestations are - internal project management training and accreditation programs developed by organisations, corporate project management methodologies and the establishment of corporate Project Management Centres of Excellence. Considerable interest has been generated by a global network, mobilised under PMI's Standards Program, to develop an Organizational Project

Management Maturity Model (OPM3) to help organizations improve the management of their projects and deliver what they have committed (Schlichter and Duncan, 1999).

Despite considerable attention being given to project management, both in practice and in literature, much of the information available on the nature of the project management role and the competence required to carry out and support that role is subjective, with little foundation in research.

This paper reports on a research project that examines project management competence. In keeping with the theme of the Nordnet conference, the paper presents a snapshot of project personnel represented in the sample and the project management maturity of their organisations.

2. Background

Commencing in 1997, the University of Technology, Sydney has been leading a research project that aims to:

develop profiles of underlying knowledge, attitudes and behaviours which lead to high performance in a range of project management roles and to provide a framework for both attribute and performance based competency assessment and development, job design and selection of project personnel for improved project performance.

Funding for the project is being provided by the Australian Research Council (ARC) and industry partners (Australian Institute of Project Management, Caliper International, NSW Department of Public Works and Services, NSW Department of Housing). International partners in the research are IPMA, APM, PMI, PMISA and Human Systems Limited.

The initial research funding covered the conduct of the research project in Australia. International data collection has been funded by participating organisations in the United Kingdom, the United States, South Africa and Brazil. Through participation in the project these organisations have received internationally benchmarked

organisational competency profiles which they have used in assessment and development of the project management competence of their organisation and their people. Participating project personnel have received individual competency profiles that provide feedback and guidance for professional development.

3. Project Management Competence

Professional organisations (AIPM (Sponsor), 1996; PMI, 1996; APM, 1995; IPMA, 1998) and various commercial organisations (eg Digital, Cable and Wireless, Natwest) have attempted to identify the skills, knowledge and behaviours that they believe a competent project manager should possess. Writers and researchers (Thamhain and Wilemon, 1977; Posner, 1987; Gadeken and Cullen, 1990; Gadeken, 1991; Pettersen, 1991; Price, 1994; McVeigh, 1995; Frame, 1999) have endeavoured to identify characteristics expected in a competent project manager.

These characteristics have a number of dimensions that can be classified as follows:

Knowledge (qualifications) + Skills (ability to do a task)		Input Competencies:	the knowledge and understanding, skills and abilities that a person brings to a job
+	+		
Core Personality Characteristics (Motives + Traits + Self-Concept)		Personal Competencies:	the core personality characteristics underlying a persons capability to do a job
+	+		
Demonstrable performance in accordance with occupational / professional / organisational Competency Standards.		Output Competencies:	the ability to perform the activities within an occupational area to the levels of performance expected in employment

Figure1: Dimensions of competence

The concern of this research project is the relationship between project management competence and project management effectiveness as a basis for developing competency

profiles of effective project personnel in a range of project environments. To investigate this relationship it is necessary to establish measures of both project management competence and project management effectiveness.

Competence is a term that is widely used but which has come to mean different things to different people. It is generally accepted, however, to encompass knowledge, skills, attitudes and behaviours that are causally related to superior job performance (Boyatzis, 1982). This understanding of competence has been described as attribute based inference of competence (Heywood, Gonczi et al. 1992). To this can be added what is referred to as performance based approach to competence that assumes that competence can be inferred from demonstrated performance at pre-defined acceptable standards in the workplace (Gonczi, Hager et al. 1993). The performance based approach is the basis for what has become known as the Competency Standards Movement that underpins the National Vocational Qualifications in the United Kingdom, and the Australian Competency Standards Framework.

Australia's Competency Standards for Project Management were developed over a three year period, from 1993 to 1996, in association with industry, under the sponsorship of the Australian Institute of Project Management and with funds provided by both Government and industry. They are endorsed by the Australian Government as part of what is now known as the Australian Qualifications Framework. As the first government endorsed performance based competency standards for project management, developed under the sponsorship of a project management professional association, the Australian National Competency Standards for Project Management (1996) may be considered as de facto international standards for what project managers are expected to be able to **do**. In the United Kingdom there are three sets of project management competency standards developed within the NVQ (National Vocational Qualifications) framework (CISC, 1997; OSCEng, 1997; MCI, 1997). These competency standards have not, however, generated the same level of global interest as the Australian standards. This may in part be due to the adoption, in development of the Australian standards, of the Guide to the Project Management Body of Knowledge (PMI, 1996) as the knowledge base.

With over 250,000 copies distributed worldwide, the Guide to the Project Management Body of Knowledge (PMI, 1996) can be considered a de facto global standard for what a project manager is expected to **know** in managing a project. The Guide and its associated certification program have been adopted by major global corporations as an internal standard, providing a basis for commonly understood terminology, tools and techniques of project management. Knowledge provides a sound foundation for competence, but it is important to remember that it is only one dimension of a complex construct.

The following integrated model of project management competence was developed to guide this research project (Crawford, 1997):

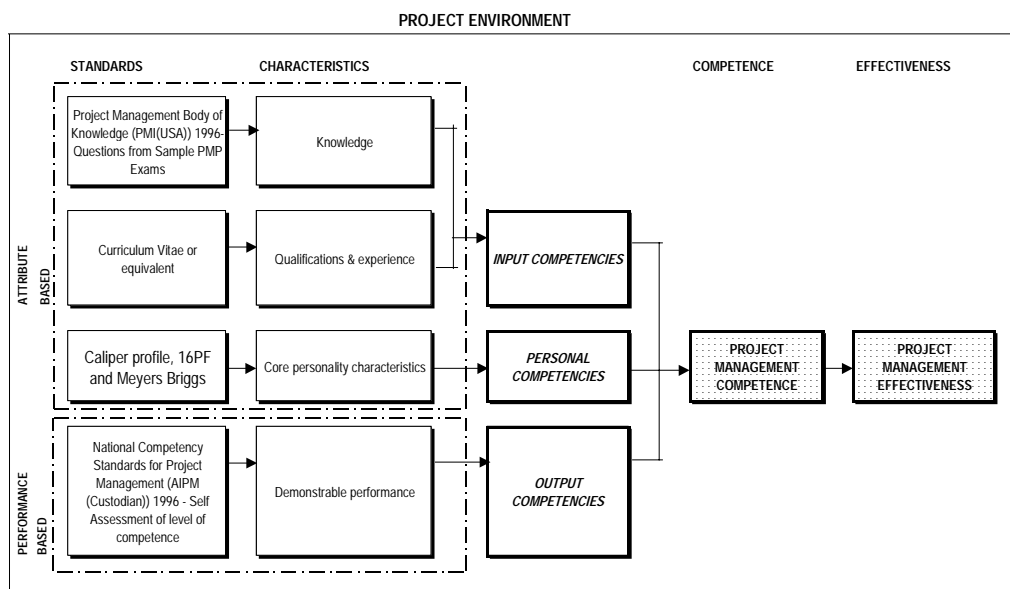


Figure 2: An integrated model of project management competence

This model has been used as a basis for development of instruments to collect data that provide insight into assessment and development of project management competence:

- 1.1 ***Project Management Knowledge:*** a test, using the PMI's A Guide to the Project Management Body of Knowledge as the knowledge standard. The test is based on the PMI's Project Management Professional (PMP) exam and is intended to identify

the extent of a person's knowledge of formal project management processes and terminology.

1.2 ***Qualifications and Experience:*** a questionnaire, gathering information on qualifications and number of years experience in project management and other fields.

1.3 ***Personality:*** one or more personality tests have been used to identify core personality characteristics. The primary test used is the Caliper Profile, initially known as the Multiple Personal Inventory (MPI). It is an instrument that has been specifically developed to predict successful performance in a number of job roles (Greenberg and Greenberg 1980). In a small number of cases, for comparative and validation purposes, participants have also completed either the Meyers Briggs test or the 16 PF, a personality questionnaire that measures 16 primary aspects of adult personality (Cattell, Eber et al. 1970).

1.4 ***Performance based competence:*** self assessment against the Australian National Competency Standards for Project Management

1.5 ***Project Environment:*** a questionnaire that establishes the nature of the project environment in which the person normally operates, including such factors as

- Job title
- Project size and duration
- Number of projects
- Project complexity
- Application area (industry)
- Organisational project management maturity

1.6 ***Project Management Effectiveness:*** Supervisor and self rating on a number of dimensions including:

- Value to the client
- Value to the organisation
- Effectiveness of relationship with peers in achieving project goals
- Ability to inspire and encourage the performance of others
- Frequency with which the person completes projects on time, within budget and achieving project goals
- Use of recognised project management methodologies

Data collection for the research was achieved by inviting organisations to arrange for between five and twenty of their project personnel to participate in the research. The aim has been to achieve a sample that is representative of a range of project and organisational types, and industry sectors. This has been largely achieved in Australia where the project has been funded through a research grant. The international data collection has been less representative and largely driven by the interest and enthusiasm of participating companies.

For the individual, the data collection process has involved 3 hours of pre-work, followed by a half day workshop conducted in a location to suit the participating organisations. Following data collection and preliminary analysis for the first phase, the process has been streamlined to reduce the time commitment. It is currently being formatted for web based delivery to facilitate ongoing international data collection.

Meanwhile, analysis is being conducted based on a sample of 353 project personnel, distributed by country and industry as follows¹:

¹ E & C: Engineering, Construction, Industrial; IS/IT and Telecomms: Information Systems, Information Technology and Telecommunications; Business Services: includes Financial Sector, Retail etc.

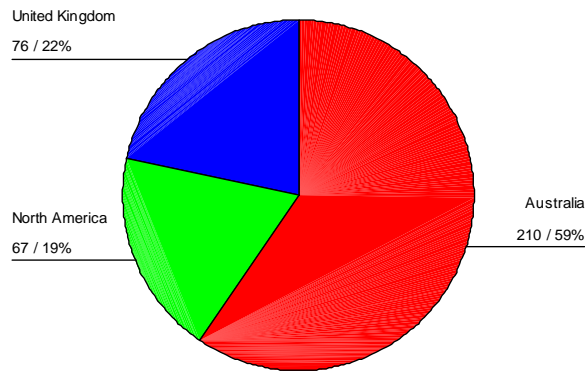


Figure 3: Distribution of sample by region

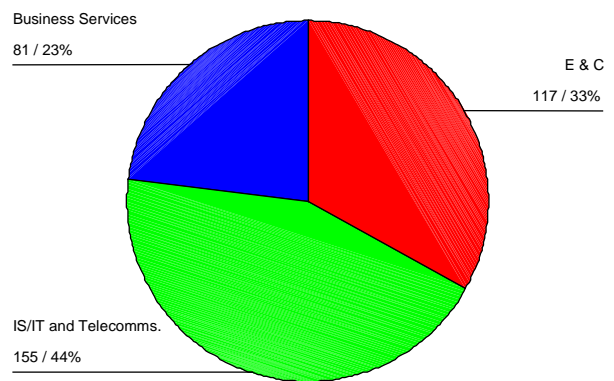


Figure 4: Distribution of sample by industry sector of organisation

Data have been collected from South Africa and Brazil, but have been excluded from analysis at this stage as current sample sizes are considered to be too small to be representative. As the Australian sample was funded by a collaborative research grant, the proposed sample size of 210 has been achieved. Data collection in North America and the United Kingdom will continue and country representation will be increased through research collaborations and industry participation. Growth of the dataset enhances opportunities for refinement of analysis of environment specific project management competence.

4. A Snapshot of People in Projects

4.1 Age

For the current sample of project personnel, the average age is 43 years (Figure 5).

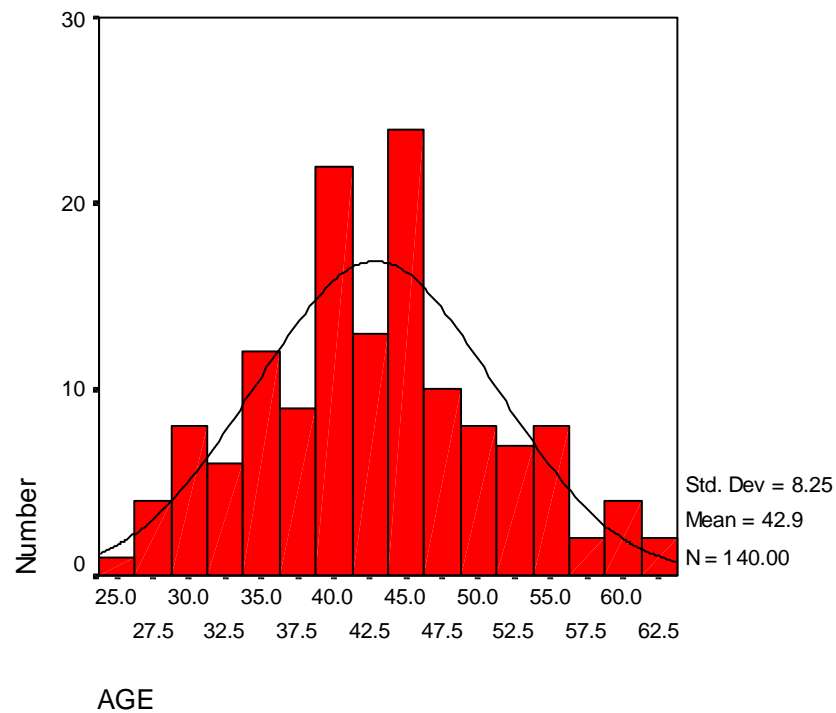


Figure 5. Age profile of project personnel in sample

4.2 Project Management Experience

Those in the IS/IT and Telecommunications sector have an average of 15 years project management experience, compared with 13 years for the Engineering and Construction sector, and 8 years for Business Services, reflecting the more recent adoption of project management in this sector. It is tempting to attribute the longer average project management experience in IS/IT and Telecommunications to the sustained growth in this sector compared with the cyclical nature of Engineering and Construction (Figure 6).

Industry Sector of Organisation	Total Years PM Experience				
	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 6: Total Years PM Experience

4.3 Education

Level of education is consistent across all three industry sectors, with over 75% of respondents (n=261) reporting that they hold a Bachelor's Degree or higher.

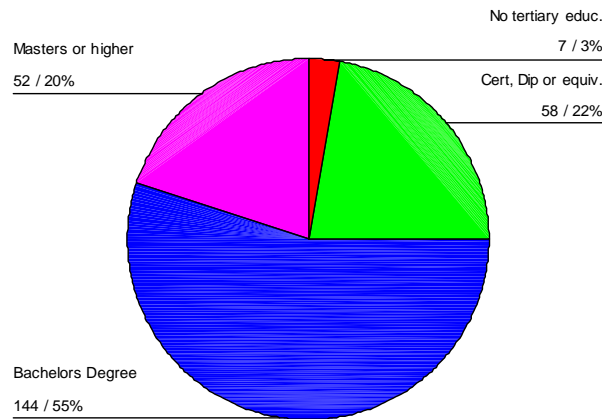


Figure 7. Highest level of tertiary education

Just under 50% of the sample have primary qualifications in engineering, demonstrating the traditional affinity of this discipline with the practice of project management. A third of the sample have primary qualifications in areas less closely associated with project based activities including business, law and social sciences.

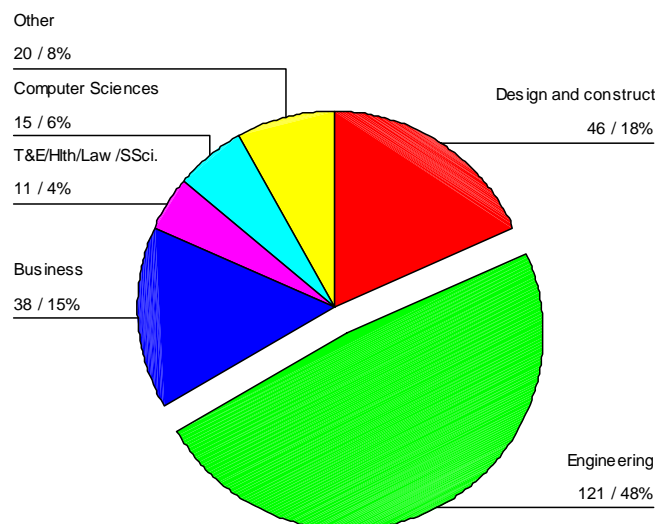


Figure 8: Primary disciplines of respondents

Within engineering, the dominant sub-disciplines are electrical/mechanical engineering (41%), civil/structural engineering (40%), telecommunications (11%) and chemical/industrial engineering (8%).

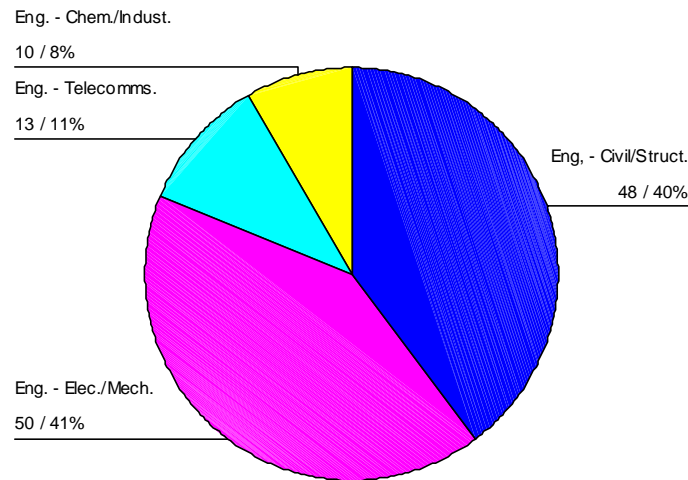


Figure 9: Engineering sub-disciplines of respondents

4.2. Project role

The majority of respondents (59.3%) indicated that their current primary role was that of Project Manager. However, the dimensions of the role vary considerably both within and between organisations.

Primary Project Role	Frequency	Percent
Team Member	27	8.3%
Team Leader	45	13.9%
Project Manager	192	59.3%
Project Director	22	6.8%
Programme Manager/Director	25	7.7%
Unspecified	13	4%
Total	324	100%

Figure 10: Primary Project Role

4.5 Project Management Practices

Self assessment by research participants against the Australian National Competency Standards for Project Management (ANCSPM) provides a picture of the extent to which they use formal project management practices. The Competency Standards address three levels of project management practice:

Level 4: Team member or specialist

Level 5: Project Manager of well defined projects

Level 6: Manager of multiple or complex projects; strategic role

Reported project management practices at these three levels relate well to the primary project roles, with 66% of those who claim the title of Project Manager using practices at Level 5.

Across industry sectors, average results for use of formal project management practices are at Level 5 (ANCSPM), with the lower level for the Business Services sector reflecting the more recent adoption of project management in these organisations.

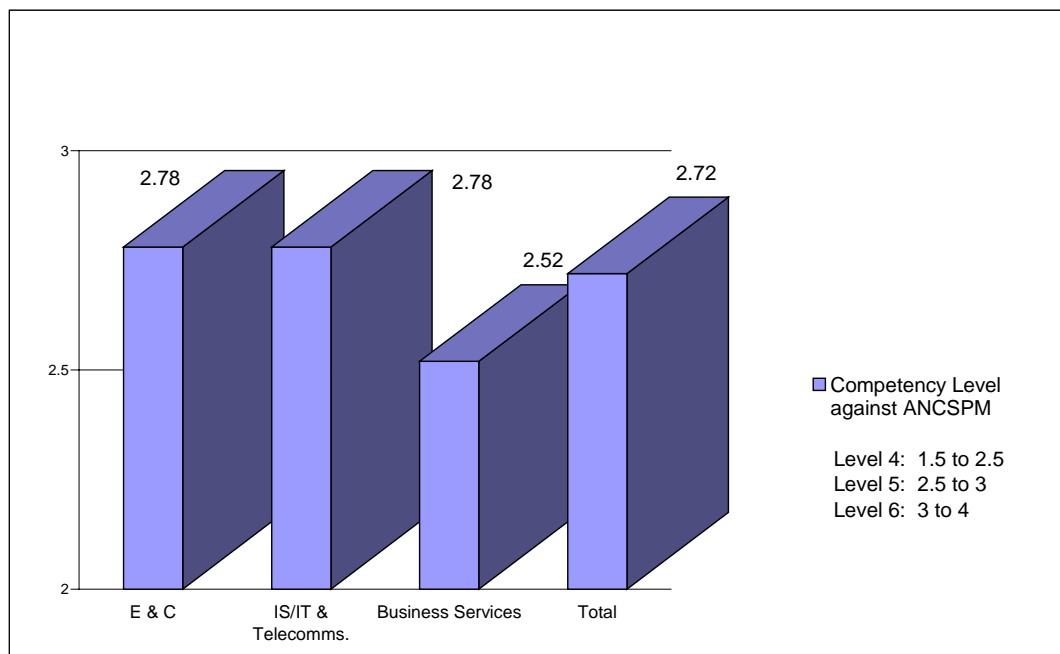


Figure 11: Self assessment against the Australian National Competency Standards for Project Management: Averages for industry sector of organisation.

5. A snapshot of the project management competence of organisations

Participants in the research were asked to identify the ‘level of maturity of the project management systems’ in their operational area, using a framework based on the SEI Capability Maturity Model (Software Engineering Institute, 1999). Categories and descriptions given were as follows:

Level	Description
Initial Level	Ad hoc and chaotic; relies on the competence of individuals, not that of the organisation
Repeatable Level	There is a project management system and plans are based on previous experience
Defined Level	Common, organisation wide understanding of project management activities, roles and responsibilities
Managed Level	Stable and measured processes against organisational goals; variations are identified and addressed
Optimising Level	The entire organisation is focused on continuous improvement

Results for competence of organisations in three industry sectors (shown below, Figure 12) reflect the results for competence of individuals. The Engineering and Construction and IS/IT & Telecommunications sectors are reported as having higher levels of competence for both the individual and the organisation than for the Business Services sector.

	% 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 12: Maturity of organisational project management systems by industry sector

Assessment against the Australian National Competency Standards for Project Management requires project personnel to provide workplace or other evidence that they have carried out the project management practices at the standards indicated by performance criteria. An organisation that has project management systems and deploys them effectively therefore provides an environment in which project managers can develop and demonstrate their competence.

6. Assessing and developing the competence of people and organisations

Results from the UTS research project support what common sense tells us. Project competent organisations that provide supportive environments will attract and develop competent project people. The two must work together. Many change programmes have failed because they dealt with only one aspect of the system that delivers project outcomes. For instance, introduction of a project management methodology will not on its own improve organisational project performance. People must be trained and encouraged to use the methodology and they should be involved in its development so that they have a sense of ownership. On the other hand, any investment in training for project personnel will be wasted if the systems of the organisation hamper rather than support project working.

The research reported here has already provided participating organisations and individuals with opportunities to assess their project management competence against international benchmarks and globally relevant standards. Knowing where you are is the first step in getting to where you want to be. Equally important is a clear vision of the path to get to where you want to be. Some organisations have realised that their project personnel will be unable to achieve higher levels of competence unless the organisation more effectively recognises and supports project working. Project personnel have identified gaps in their competence that guide them in seeking developmental opportunities either in their workplace or through training. One project manager, realising that he could not improve his own competence until he changed his organisation, introduced a project management methodology to the organisation and started training those around him by acting as a role model and mentor. Project management competence flows from a synergistic relationship between people and organisations.

The development of competent project managers is integral to the broader development of organisational competence. Competent project managers form a causal loop with the competent organization. The initial setting of qualification standards like the Australian National Competency Standards is a strategic decision that must be made by an organisation's executive management. Qualifications determine project manager selection, training, and mentoring needs. In turn, this enables project assignment by qualification, factoring in organisational needs like project manager authority and control for prioritized projects within an organisation's portfolio. Accountability creates the basis for performance measurement and the development of competency based pay structures that result in prestige and influence of the project manager's position. The improved representation of the project manager's role, in turn, informs expectations for organisational performance and loops back to developing new targets for organisational qualification standards. The result is synergy between the project management competence of individuals and of the organisations in which they operate.

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