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Contemporary project portfolio management: Reflections on the development of an Australian Competency Standard for Project Portfolio Management

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Abstract

Project portfolio management is an emerging aspect of business management that focuses on how projects are selected, prioritised, integrated, managed and controlled in the multi-project context that exists in modern organisations. Competency standards have been developed by professional bodies for project managers. However, to date there has been no attempt to develop a competency standard at the portfolio management level. This paper examines the process for development of the first performance-based competency standard for project portfolio management and identifies how this contributes to the body of knowledge in both project portfolio management and project management more broadly. The intent is to use the Standard to improve project portfolio management capability and practice in organisations, which in turn promotes efficient resource use and more profitable project outcomes. Specific issues regarding Australian practice are described, along with implications for how this may impact Australian practice in the future.
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1. Introduction

This paper examines the process for development of the Australian Competency Standard for Project Portfolio Management and identifies how this Standard contributes to the project portfolio management (PPM) body of knowledge, to professional and industry practice as well as providing a bridge to further academic research, extending the recommendations of the Rethinking Project Management agenda (Winter, 2006). The Standard provides a framework for practice and makes an important contribution to theory, by providing a summation of the current PPM discourse and its application in practice in a competency context. This allows existing project portfolio management theory and practice to be drawn together, allowing practice to inform theory and theory to inform practice. The linking of theory and practice through a normative framework provides an opportunity for future research, in particular, a longitudinal study of the success of specific project portfolio management tools and techniques over time for example. This linkage also provides a common benchmark for qualitative analysis and performance measurement. As such, the Standard plays an important role in defining the performance specifications of individuals who undertake the role of project portfolio manager in organisations in both private and public organisations across a range of industry sectors and types.

2. Motivation for the study

Competence of project management personnel is important as they are seen as having a major impact on project performance and therefore on business performance (Crawford, 2004, 2005).

PPM research has gained significant momentum in recent years, with the emergence, formulation and popularity of the concept being heavily influenced by industry. In many ways this is very positive, and represents a welcome departure from much research in project management, which all too often lacks relevance to practice. However, it is clear that industry have not yet fully mastered PPM concepts in practice. A challenge for

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organisations is managing this potentially diverse range of projects (Prifling, 2010) while ensuring that the right projects are selected (Elonen and Artto, 2005). In a study conducted in 2003, Jeffery and Wilson (2004) found that of 130 CIO's of Fortune 500 companies surveyed 89% were very aware of PPM, but only 17% were realising its full value.

While there are merits to adopting such an occupational or practice-oriented focus, little research effort has been focused on PPM competencies and standards. J.K. Crawford (2007) and L. Crawford (2007) suggest that there has been an increasing interest in project management competence with '…project-based personnel actively seeking sound guidance on desired project management competencies as well as credentials that will enhance their careers'. However, while PM competencies have received some attention, PPM competencies have not been addressed (Gale, 2007; Partington et al., 2005). In order to reliably and repeatedly measure an individual's competency, a PPM benchmark or standard is required. It can be argued that, similar to other fields such as software development (Conboy, 2009), the current body of PPM knowledge now suffers from a number of conceptual problems:

Lack of cumulative tradition: A new piece of research in a particular body of knowledge should cumulatively build on existing research in that area (Dubin, 1976). According to numerous researchers (Benbasat and Zmud, 1999; Keen, 1980; Keen, 1991), this seems to be a failing of the current project management literature. This trend seems to continue where PPM research is concerned. While there are occasional references (Markowitz, 1952; McFarlan, 1981), there are few PPM studies which embrace and reflect on this tradition. One would expect that studies of PPM would draw on the existing bodies of knowledge regarding portfolio theory in other disciplines such as finance, where the concept originated, matured and have been applied and tested thoroughly over time.

Lack of clarity: A concept should be clearly and consistently explained and understood (Dubin, 1976; Metcalfe, 2004; Weick, 1989). Project management has a relatively well-conceptualised Body of Knowledge (BoK) with underpinning tools and approaches (Project Management Institute, 2008a, 2008b). However, there is considerable argument in both academic and industry communities as to what constitutes 'project portfolio management' (Thiry, 2004). The terms *portfolio management*, *program management*, *enterprise project management* and *multi-project management* have been used interchangeably in the literature (Buttrick, 2000; Center for Business Practices, 2005; Dye and Pennypacker, 2000; Kendall and Rollins, 2003; Morris and Jamieson, 2004; Office of Government Commerce, 2009). Terms such as *program*, *portfolio* and even *group of projects* have been used to describe such an environment (Patanakul and Milosevic, 2005; Platje and Seidel, 1994). Others such as Gareis (2006) have instead examined the social (*network of projects*) and temporal (*chain of projects*) relationships between individual projects, creating another set of definitions. To state that a particular strategy, process,

technique, system or any other organisational artefact is or is not an instance or contributor to PPM is almost meaningless given the lack of consensus as to what the term 'PPM' refers to.

Lack of 'theoretical glue': According to Whetten (1989), there should be a strong underlying logic and rationale that bind all of the components of that concept or theory together. A number of different PPM frameworks and process variants and derivatives exist e.g. Project Management Institute (2008a, 2008b). It is logical and perhaps inevitable that different organisations and researchers will have different ideas on how project portfolios can be managed. However, is not so much the number of methods that causes the problem, but the fact that these are so disparate. As a result, this 'fragmented adhocracy' (Banville and Landry, 1989) may prove very challenging and confusing for those who wish to embrace PPM principles when they are given completely conflicting advice.

Lack of parsimony: Concept development should advocate a parsimonious approach, removing any components if the concept which provide little additional value (Whetten, 1989). However, if we were to compile a list of all PPM principles, strategies, processes, and other artefacts that are commercially labelled as belonging to the PPM field, then we would surely find redundancy and duplication.

Limited applicability: When judging the strength of a concept or theory, a key criterion is how applicable that theory or concept is (Dubin, 1976; Metcalfe, 2004; Weick, 1989). Ideally, effective PPM frameworks should be applicable in a wide variety of contexts (Prifling, 2010). Irrespective of justification on purely conceptual grounds, much research in the community itself has highlighted the importance of broad applicability and have called for research on how these frameworks can be 'transferred' from concept to as wide a diaspora of environments as possible (Prifling, 2010). Despite this, some argue that PPM frameworks and guidelines are not built with certain contexts in mind (Crawford and Pollack, 2008).

Competency standards have been developed by industry bodies for project managers (Association for Project Management, 2006; Australian Institute of Project Management, 2010) as a means to codify the minimum performance requirements for project managers. However, whilst process-based standards for portfolio management have been developed such as that offered by the Project Management Institute (2008a, 2008b), to date there has been no attempt to develop a competency standard for the function of project portfolio management or the role of portfolio manager. Not only does this provide guidance of the expected performance of those on a project portfolio manager role, but also this research fills a gap in the current body of literature.

3. Competency theory

3.1. What is competence?

The concept of competence remains one of the most diffuse terms in the organisational and occupational literature (Robotham

and Jubb, 1996). The simple meaning of the word 'competence' is '...the ability to do something well or successfully' (Gale, 2007). However, more accurately it is defined as an '...underlying characteristic of a person in that it may be a motive, trait, skill, aspect of one's self-image or social role or a body of knowledge which he or she uses...' (Boyatzis, 1982). Competence is a normative concept rather than descriptive, requires the integration of many aspects of practice and is often regarded as a psychological construct (Gale, 2007). The competency of individuals derives from their possessing a set of attributes (such as knowledge, skills, values and attitudes), which they use to undertake occupational tasks (Gonczi, 1996). A competent person, therefore, is one who possesses the attributes necessary for job performance.

3.2. Project management competence

Researchers and practitioners in the human resources management field have been devoting an increasing interest in managerial competence models. Crawford (2000, p6) provides a detailed examination of the primary research on project management competence that commenced in the 1970s, citing the work of Gemmill (1974), Thamhain and Gemmill (1974), Thamhain and Wilemon (1977), Themhain and Wilemon (1978), Posner (1987), Cleland and King (1988), Gadeken (1991), Petterson (1991), Ford and McLaughlin (1992), Spencer and Spencer (1993) Zimmerer and Yasin (1998) and Morris (2000).

Project management competencies have become the subject of much literature and debate. Much has been written in project management texts, and magazine and journal articles about what it takes to be an effective project manager, '...culminating in Frame's work on Project Management Competence published in 1999...' (Crawford, 2000, p. 6). More recently, further research has resulted in the development of competencies for program managers (Partington et al., 2005) and operations managers (Bouraad, 2008).

3.3. PM competency standards

A standard is a measure, devised by general consent, as a basis against which judgements might be made as to levels of acceptability (L. Crawford, 2007, p. 207). The majority of standards describe the characteristics of physical artefacts, algorithms and processes, that although complex, are unambiguous once understood and can easily transcend cultural and language boundaries (Crawford and Pollack, 2008, p. 72). Various PM standards have been developed around the world, including the International Project Management Association (IPMA) 'International Competence Baseline', the Project Management Institute's Project Manager Competency Development Framework; the Australian National Competency Standards for Project Management and the UK National Occupational Standards for Project Management (J.K. Crawford, 2007; L. Crawford, 2007, p209). These standards '...have all been developed publicly with the majority being specifically designed for assessment purposes, and provide the basis for the award of

qualifications' (Crawford and Pollack, 2008, p. 75). In a number of cases, these standards have been either endorsed by national governments and form the basis for vocational qualifications within national qualifications frameworks or are endorsed by professional bodies and form the basis for award of professional qualifications or certifications (J.K. Crawford, 2007; L. Crawford, 2007, p219).

Competency standards have been categorised in numerous ways with Crawford (1999, p. 3) suggesting that they may be either attribute based or performance-based. Gale (2007) distinguishes this difference by suggesting that the distinction is based upon what project managers are expected to know as compared to what project managers are expected to do. Partington et al. (2005) suggests an alternative view, indicating that the traditional rationalistic approaches to competence are either work-oriented or worker-oriented in their nature.

Attribute based competencies are commonly those aspects relating to what project managers are expected to know and has been most prevalent in the United States. The attribute-based approach to competence has also been concerned with '...the identification and definition of high-performing or differentiating competencies...' that contribute to superior performance (J.K. Crawford, 2007, L. Crawford, 2007, p229) and is used as a basis to assess an individual's potential competence (Crawford and Pollack, 2008, p. 78).

Heywood et al. (1992) indicate that performance-based or occupational competency standards on the other hand, specify *'what people have to be able to do, the level of performance required and the circumstances in which that level of performance is to be demonstrated'* (cited in Crawford and Pollack, 2008, p78) with the emphasis being on demonstrating performance to the standards required of employment in a work context (Knasel and Meed, 1994). In a project management context, a performance-based competency standard indicates what a project manager is expected to do in their working roles, as well as the knowledge and understanding of their occupation that is required (Crawford, 2000, p. 9). The emphasis is on the threshold rather than high performance or differentiating competencies (Crawford and Pollack, 2008, p. 78).

Performance based competency standards are specifically designed for assessment and recognition of current competence. Glassie (2003) suggests that this is assessed independent of how that competence has been achieved (cited in Crawford and Pollack, 2008, p78). They also encourage self-assessment, reflection and personal development in order to provide evidence of competence against the specified performance criteria (J.K. Crawford, 2007; L. Crawford, 2007, p240). The advantage of assessment in a performance-based competency standard context is that an individual is assessed with a binary result being provided: either as person is 'competent' at the time of assessment, or 'not yet competent' (L. Crawford, 2007, p. 240).

3.4. The Australian context

Competency based training and assessment was introduced to Australia in the early 1990s through the push to restructure

Australian industry and the National Training Reform Agenda (Harris et al., 1995) and has been used as the basis for the vocational education and training qualifications in Australia. Similar standards were also used as the basis for national qualifications frameworks in the United Kingdom, New Zealand and South Africa (L. Crawford, 2007, p. 227).

The Australian National Competency Standards for Project Management were the first performance based competency standards for generic project management to be endorsed by a national government (in July 1996). They were developed over a three year period in association with industry, under sponsorship of the Australian Institute of Project Management and with funds provided by both government and industry (Crawford, 1999, p5). The Australian National Competency Standards for Project Management were adopted by a project management professional association, the Australian Institute of Project Management, as the basis for their professional registration program for project managers (Crawford, 2004; J.K. Crawford, 2007, L. Crawford, 2007; Stretton, 1992). The desire was to assess the competence of applicants by performance-based assessment in the workplace (Stretton, 1992). Performance-based competency standards used in Australia are structured in a particular way, containing: Units of Competency; Elements or Specific Outcomes; Performance or Assessment Criteria; Range Statements; and Underpinning Knowledge or Critical Knowledge (J.K. Crawford, 2007, L. Crawford, 2007, p230), following the model used in the UK (Delamare Le Deist and Winterton, 2005). Competency-based standards have been developed in Australia for the roles of project coordinator, project manager and project director. The development of a competency standard for the role of portfolio manager compliments this mix.

4. Project portfolio management

4.1. Overview of project portfolio management

The concept of project portfolio management has emerged from two complimentary, yet independent drivers, these being the need to make rational investment decisions that result in the delivery of organisational benefits (Markowitz, 1952) and the need to optimise the use of resources to ensure that the delivery of such benefits occurs in an effective and efficient manner (Dye and Pennypacker, 2000). In 1952, Markowitz first introduced the concept of the portfolio to the financial sector. He proposed the *Modern Portfolio Theory* and suggested that rational investors use diversification to optimise their portfolios: the portfolio in this case being a collection of financial assets and investments. His theory also suggested that investors can reduce their exposure to individual asset risk by holding a diversified portfolio of assets with the portfolio allowing a higher return with reduced risk, compared to the inherent risk and return ratios of the individual investments that comprise the portfolio. Whilst applicable to a project portfolio, the diversification advice offered by Markowitz does not necessarily take into account resource constraints and the interactions between various portfolios across the organisation.

McFarlan (1981) introduced the use of the portfolio management approach to the field of information technology (IT), suggesting that projects, rather than assets or investments, are the components of the portfolio and that the collective management of these unrelated projects could occur in a manner that optimises the organisation's desired business outcome whilst minimising the organisations overall level of risk. The desired business outcomes McFarlan refers to are not static, but instead, change over time as a result of shifts in the various legislative, political, economic, social and technological drivers. Whilst individual projects represent specific risks to the organisation, they also provide particular opportunities. Achieving an optimal balance between risk and reward across the diversified set of projects that was seen as the key to success in the business environment (Hubbard, 2007).

The project portfolio has been defined as '...a collection of projects or programs and other work that are grouped together to facilitate effective management of that work to meet strategic business needs' (Project Management Institute, 2008a, 2008b). Project portfolio management (PPM) involves identifying, prioritising, authorising, managing and controlling the component projects and programs and the associated risks, resources and priorities (ibid). PPM operates at the strategic level within the organisation. Unlike projects or programs, a portfolio does not have a finite life, instead it is a continuous process and requires regular tending to ensure that the portfolio remains in balance and remains consistent with the organisation's strategic objectives. Project portfolio management is focussed on creating and continually reviewing and updating the selection of projects and programs under management within the organisation at any one time, as a continuous process, akin to line management of an operational area of the business.

The International Project Management Association (IPMA) in their Competence Baseline support this definition but highlight a focus on a common and shared pool of scarce resources (2008). The Association for Project Management (2006) focuses on projects and programs being carried out under sponsorship of an organisation. The UK Office of Government Commerce (OGC) (2009) defines a portfolio as '...the totality of an organisation's investment in the changes [projects and programs] required to achieve their strategic objectives'.

4.2. The distinctive role of project portfolio manager

The role of portfolio manager was initially identified by Markowitz (1991) who suggested that the portfolio is managed by a portfolio manager. The PMI Practice Standard for Portfolio Management (2008) also identifies the discrete role of portfolio manager and defines the role as '... a senior manager [who] is responsible for establishing, monitoring and managing assigned portfolios'. The role of portfolio manager is therefore distinguished from other roles in a multi-project context, such as project management practitioner, project management professional (Gale, 2007, p. 151), project manager, senior project manager or project director (International Project Management Association, 2008) or program manager (Partington et al., 2005).

Whilst the role of project portfolio manager may have been identified as a discrete role, it is the nature of this role and the functions performed in such a role that this competency standard attempts to address. To date there have been no studies to define the competencies of portfolio managers which is clearly a gap in the current research. As such, the results of this research fill a gap in the current body of literature.

5. Research method

While any study requires a rigorous methodology, there were two particularly pertinent factors that made this research somewhat more challenging. Firstly, academics such as J.K. Crawford (2007), L. Crawford (2007) have suggested that many standards have no strong foundation in research. Crawford points to the listing of attributes in the APM BoK and IPMA International Competency Baseline as well as the personal competencies in the Project Management Institute's Project Manager Competency Development Framework as examples. Secondly, as discussed in the Introduction above, the concept of project portfolio management lacks a strong theoretical basis, and so building a competency standard from this alone is difficult and somewhat limiting.

Development of competency standards is a largely qualitative approach, based on the collective opinion of experienced practitioners as to what project personnel need to know and what they need to be able to do in order to be considered competent (Crawford, 2004, p. 1157). Creating new standards by consensus is a difficult process, where it is arguable as to whether there is any such thing as a 'best' solution. 'Rather, as Crawford and Pollack (2008, p. 72) suggest, standards that reach the marketplace are often the product of lengthy political negotiation and act as accommodated positions between the different professional associations'. Given these challenges new approaches to competency development have emerged. Partington et al. (2005) have taken an interpretive approach to studying human competence, known as phenomenography. This approach is based on the idea that, for any aspect of reality, there is a hierarchy of conceptions of that reality *in relation to some phenomenon*. The authors suggest that by taking an interpretive approach, the researcher endeavours to understand what individual workers conceive of as work and, through the elicitation of examples, however they conceive of it. It is this method, coupled with a detailed literature review of portfolio management literature that will be used to develop the competencies detailed in this paper.

To develop the Australian Competency Standard for Project Portfolio Management a five phase approach was adopted (see Fig. 1), providing a pragmatic yet robust approach, ensuring at each step that the Standard could be validated against academic literature and industry best practice. Each phase will now be discussed in turn.

5.1. Phase 1: Structured review of PPM literature

The first activity was to conduct a desktop review of the current extant literature to identify the key concepts of PPM. This involved an extensive search over four months to identify any published books, practitioner articles and papers, academic journal articles, conference proceedings and industry standards. A methodological review of past literature is a 'crucial endeavour' (Webster and Watson, 2002) for any academic research, and it is vital that this is done in a rigorous and comprehensive manner (Levy, 2006; Walsham, 2006; Webster and Watson, 2002).

The literature review included all available portfolio management literature: academic papers, practitioner papers and books, maturity models and best-practice standards such as the PMI Portfolio Management Standard (2008) and the OGC Management of Portfolios (2011).

A concept-centric approach was adopted as an author-centric literature review usually fails to adequately synthesise the literature and allow critical, constructive concept development, and so should normally be concept-centric where possible (Levy, 2006; Webster and Watson, 2002). This was particularly pertinent in this study where the objective was to critically examine the concept of how PPM is practiced. A concept matrix was used in this study, as recommended by Webster and Watson (2002) and Salipante et al. (1982), whereby the main concepts and their underlying sub-concepts were mapped against all of the literature reviewed (see excerpt in Table 1). This matrix was then used to identify the most important concepts and logical ways to group and present them. The structure for the remainder of the paper and the development of the definition and conceptualisation of PPM was then based on this logical grouping.

5.2. Phase 2: Development of concept-centric PPM competency standard

This literature review in phase 1 informed a baseline document upon which the technical review was to be based, and also to provide a basis for interviews with subject matter experts. By analysing these themes and grouping them into common topic areas a framework emerged (Table 1). Each grouping was used as the basis for each Unit of Competence, which will be discussed in the Results section of this paper.

A key aspect of this phase was to ensure consistent abstraction. When developing any definition or concept, it is always difficult to decide what level of granularity should be used. Every researcher faces a trade-off between focus and multidimensionality and between comprehensiveness and memorability (DiMaggio, 1995). In assessing the volume of literature reviewed in this study, the researcher may have been tempted to include many different concepts, philosophies, methods, tools and practices. However, bearing in mind that the objective of this study is to present a consistent, clear definition and conceptualisation, adding some structure to PPM, the researcher erred on the side of focus and memorability, adopting what Sutton and Staw (1995) call 'strategic reductionism'. All of the artefacts relating to PPM, regardless of the level of abstraction were coded and grouped into a series of high level 'intellectual bins' (Miles and Hauberman, 1999), with the definitions and conceptual development then based on these.
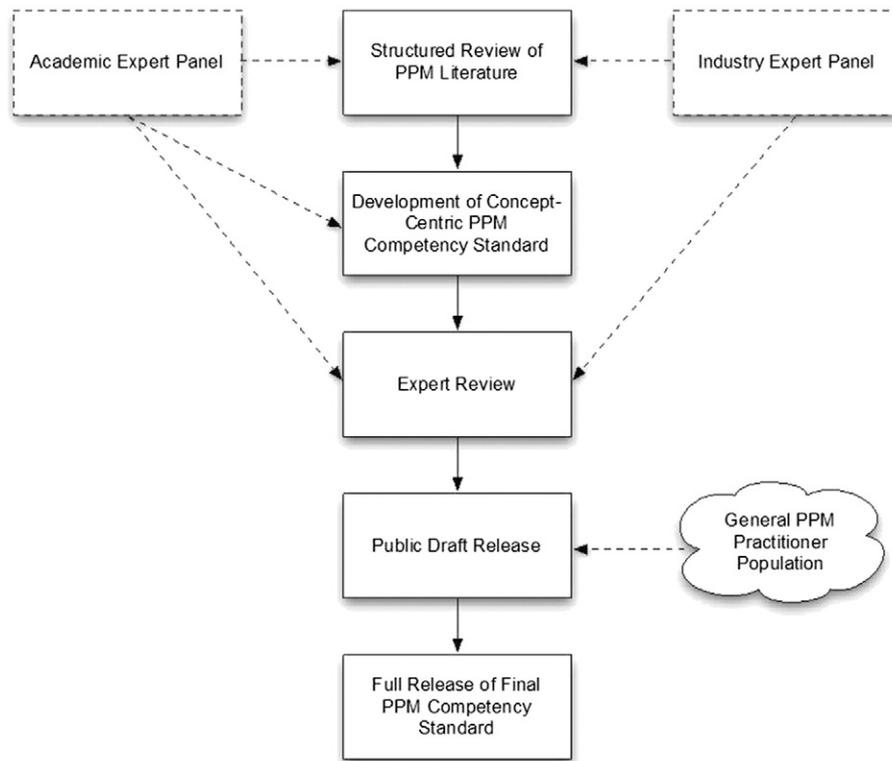
Fig. 1. The research approach.

5.3. Phase 3: Expert review

This study involved a set of interviews with industry and academic experts, an approach that is highly beneficial for applied research (Dalkey and Helmer, 1963). Firstly, combining the judgment of a large number of experts offers a better chance of getting closer to the truth. Secondly, it is easier to understand phenomena by obtaining the views of various actors. Given the ambiguous interpretation, the fragmented nature of PPM literature and its relative isolation from mainstream business, management or strategy domains (Young et al., 2011) as well as the relative immaturity of PPM (Thiry, 2004) this is highly relevant in the context of this study. Finally, pooled intelligence is often suited to the resolution of complex and ill-defined problems (Dalkey and Helmer, 1963), difficulties which typify the use of PPM.

Group size theory varies in its suggestions regarding the ideal number of expert participants in such a study. Some general rules-of-thumb indicate five to ten people for a homogenous population, but fifteen to twenty-five people for a heterogeneous population i.e. people coming from different social and professional stratifications such as academics and practitioners, as is the case in this study (Delbecq and Van de Ven, 1975; Uhl, 1983). This study involved twenty interviews, a figure at the mid-range of the recommended group size.

Twenty subject-matter experts in portfolio management, governance, risk management and those with extensive experience in project and program management as well as competency standards development were invited to provide input and feedback on the initial draft.

Verifying expertise is somewhat difficult as it can be judged by status, experience or 'a myriad of other things' (Brown, 1968). Amethodical selection of participants or allowing every willing person to take part is considered highly unscientific (Clayton, 1997; Sackman, 1975), and so systematic classification and selection was conducted. The skills and background of experts required for this study are listed in Table 2, along with the basis for identification and selection. The minimum selection criteria was based on reasonable expectations as to the typical characteristics of a PPM expert, and the criteria usually recommended for expert studies (e.g. Brown, 1968; Meyer and Booker 2001). As well as selecting a mix of practitioners and academics, the selection process also ensured that at least half of the participants had experience of practicing or researching regular PM in a non-portfolio environment, so as to enable comparison and critical reflection. It is also worth noting that the minimum criteria was relatively low as more stringent criteria requiring more industry experience or a large number of publications is somewhat unrealistic given that PPM is a relatively immature concept.

Feedback and comments were incorporated into the Standard document. Where the feedback was a comment or a question, these specific items were explored and the Standard updated, if appropriate. The expert comments provided some further validation of the proposed standard, and also provided editorial review of the content, ensuring each performance criteria was

Table 1
Excerpt from the concept matrix adopted in this study.[1]

Article	Concept							
	Project identification, categorisation and prioritisation	Project opportunity assessment, selection and portfolio balancing	Portfolio performance management and review	Portfolio governance	Portfolio resource management	Portfolio communication and change management	Portfolio risk management	Portfolio leadership
PMI Portfolio Management Standard (Project Management Institute, 2008a, 2008b)	✔	✔	✔	✔			✔	
OGC Portfolio Management Guide (OGC, 2011)	✔	✔	✔	✔	✔	✔	✔	✔
OGC P3M3 PPM Maturity Model (OGC, 2007)			✔	✔	✔	✔	✔	
PM Solutions PPM Maturity Model (J.K. Crawford, 2007; L. Crawford, 2007)	✔	✔	✔	✔	✔	✔		
Parviz, and Levin (2006)	✔	✔	✔	✔		✔		
Association of Project Managers (2006)				✔				
Krebs (2009)	✔	✔			✔			
International Competency Baseline v3 (IPMA, 2008)	✔							
Artto and Dietrich (2004)	✔	✔	✔	✔		✔		
Archer and Ghasemzadeh (1999)	✔	✔	✔					
Blichfeldt and Eskerod (2005)	✔						✔	
Blomquist and Muller (2006)	✔	✔				✔		
Bouraad (2008)				✔				
Cooper et al. (2001)	✔	✔	✔		✔		✔	
Engwall and Jerbrandt (2002)					✔			
Iamratanakul and Milosevic (2007)	✔	✔	✔					
Kendall and Rollins (2003)	✔	✔	✔		✔			
Killen et al.(2008)		✔						
Levine (2005)	✔	✔	✔		✔			
Patanakul and Milosevic (2009)			✔		✔			
Petit and Hobbs (2010)							✔	
Holland and Fathi (2007)							✔	
Meskendahl (2010)		✔						

clear and unambiguous; was technically valid; and importantly, able to be assessed.

5.4. Phase 4: Public draft release

The exposure draft was the first controlled release version of the Standard, and is intended to provide the baseline against all reviews outside the standards team. The exposure draft was released to the wider practitioner audience to determine the usability of the Standard and relevance to industry as well as ensuring that the Standard reflected the needs of the various industry stakeholders, including employers, practicing portfolio managers, human resource managers and professional bodies.

In addition to the widespread promulgation, the standard was sent to selected groups to elicit input and feedback. These groups included: representatives from competency-based assessor community; professional bodies in project management and other related fields (e.g. engineering); prominent industry representatives; selected industry and government organisations; and selected universities and vocational education and training providers.

To ensure that feedback was received from a wide range of industry bodies, a series of workshops were held in Sydney, Melbourne, Canberra and Brisbane to solicit comments from two key target groups. The first of these workshops was targeted at private and public sector organisations currently employing project portfolio management practices. A second workshop was targeted towards competency assessors and trainers. Invitations to these workshops were facilitated through Australia's largest professional body representing the project management community: the Australian Institute of Project Management.

Feedback was collected using a structured manner using a normalised collection instrument. Comments received through the public draft release process were analysed to determine relevance and where appropriate, were incorporated into the Standard to form a final release. After analysis of comments, and checks for validity and appropriateness, over fifty were used to modify the standard.

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[1] The complete matrix contained 3 concepts, 13 sub-concepts against a total of 195 references.

Table 2
Classification of experts and listing of participants.

Desired background or skillset	Method of expert identification	Minimum selection criteria
1) Project portfolio managers	● Membership of relevant consortia ● Personal contacts ● Adjunct Professors at universities	>three years PPM experience
2) Project managers, who are aware of PPM	● Membership of relevant societies (ITAA, Cutter Consortium etc.) ● Personal contacts	>five years PM experience
3) Academics who have researched PPM	Literature review of relevant academic and practitioner journals and conferences	≥three PM publications in refereed journal/conferences
4) Academics who have research PM and are aware of PPM	Literature review of relevant academic and practitioner journals and conferences	≥five PPM publications in refereed journal/conferences

Through this phase a number of practicing project portfolio managers provided specific comments:

'*The portfolio [Standard] is extremely professional and very thorough. I am actually appointed to a role which requires that I manage a large and complex portfolio of eight major acquisition projects, seven minor projects and 11 sustainment fleets with an annual budget in excess of $260m. I have in excess of $800m of future work on the books. It was with this background that I viewed the portfolio and I am pleased to report that all of the key aspects which drive my day to day business are well and truly covered.*'

(Portfolio Manager, Defence Materiel Organisation)

5.5. Phase 5: Full release

The resultant Standard was launched in early 2012, and will constitute the first published set of competency standards for project portfolio managers.

6. Results

Using the same industry standards used to formulate the framework, specific performance criteria were written. These performance criteria were grouped into similar logical themes, which became the basis of the competency *Elements*, as detailed in Table 3 below.

To complete the Standard and to clearly identify the Australian context, *Range Indicators*, *Underpinning Knowledge and Skills* and the *Evidence Guide* were added to complete each Unit of Competence, with all eight Units forming the Australian Competency Standard for Project Portfolio Management,[2] in accordance with the accepted practice. Performance criteria have been drawn from both key references and normalisation references and representative of the activities performed by project portfolio managers.

[2] The full competency standard is available at: http://www.aipm.com.au/html/pcspm.cfm.

7. Discussion

Earlier in this paper we suggested that the current body of PPM knowledge now suffers from a number of conceptual problems and highlighted the lack of: cumulative tradition; theoretical 'glue'; clarity, parsimony and applicability. Each of these will be now readdressed in light of the development of this standard.

7.1. Cumulative tradition

As a new piece of research, this Standard draws from and cumulatively builds upon existing research in the field of PPM. The tradition is also continued through the examination of PPM as it is practiced. Through this examination, we have identified that PPM literature and practice largely overlooks the original principles of modern portfolio theory espoused by Markowitz (1952), particularly in relation to the application of concept of risk versus reward. Further research is required to fully understand why this appears to be the case.

7.2. Clarity

Through the research undertaken in the development of this Standard, it became apparent that a disparity existed between terminology used in project portfolio management standards and in particular amongst academic literature, resulting in confusion and a lack of clarity. As an emerging practice that has extended beyond its original sector, there is considerable argument as to what portfolio management is in a project context. This has resulted in some confusion amongst both the academic and practitioner communities (Thiry, 2004). The terms portfolio management, program management, enterprise project management and multi-project management have been used interchangeably in the literature (Buttrick, 2000; Center for Business Practices, 2005; Dye and Pennypacker, 2000; Kendall and Rollins, 2003; Morris and Jamieson, 2004; Office of Government Commerce, 2009). Terms such as program, portfolio and even group of projects have been used to describe such an environment (Patanakul and Milosevic, 2005; Platje and Seidel, 1994). The use of portfolio management concepts and techniques is seen as a potential solution in a multi-project

context (Dye and Pennypacker, 2000), and as such, there has been a proliferation of different types of portfolios. In effect, systems employed in the management of individual projects are 'up-scaled' to manage programs and adapted for the management of project portfolios. The limitation with this approach has been that the role of the project portfolio manager had not necessarily been clarified. The Rethinking Project Management Research Agenda (Winter, 2006) also found that the body of research in the field project management generally is somewhat limited and suggested the development of a new framework complementing and extending this existing body of knowledge (Winter, 2006). This Standard helps to resolve this conflict and puts forward a proposed framework that can be used by academics and practitioners alike.

7.3. Theoretical glue

Given the different PPM frameworks and process variants and derivatives that exist, this standard attempts to address the 'fragmented adhocracy' (Banville and Landry, 1989) and attempts to reduce confusion for those who wish to embrace PPM principles which in time may minimise conflicting advice through the application of a common framework for practice.

Through the application of this individual performance baseline in practice, the PPM allows a common baseline for practitioners to reflect upon and contribute to the cumulative tradition and also provides a consistent construct for researchers to use when exploring PPM practice.

7.4. Parsimony

Performance-based competency standards represent the best attempts to state what are the attributes needed to perform the major tasks in the profession (Gonczi, 1996) and are intended to be, as Crawford (2004) puts it '...applicable to all industries and all organisations and are designed to fit the majority of situations, the majority of the time'. Such standards do advocate the use of specific tools or specific methodologies or commercially-labelled approaches, but rather describe specific skills, knowledge and practices that should be applied.

7.5. Applicability

This competency standard has a number of unique implications for industry and the broader project management 'profession'. At a minimum, it provides a basis for assessment of individual competence in project portfolio management for the purposes of industry certification or as a basis for the development of higher level vocational qualifications. It can also be used as a tool to determine job or role suitability of candidates as part of the recruitment and selection process. *'Certification clearly provides benefit to those who provide the certifications and to those who gain them, while also providing assurance to employers, who in the face of multiple similar candidates for a position need some way of making a distinction'* (Crawford and Pollack, 2008). Additionally, through the development of a nationally adopted standard, a normative link between theory and practice is created, engendering the opportunity for further research.

7.6. Further research

There are many opportunities for further research to build on this study. Firstly, every project portfolio is quite different and in particular, the organisational or strategic context in which they operate may and usually does vary considerably. Further research is required to determine if the principles and competencies are valid across the range of organisational cultures and decision-making approaches, and in particular in organisations with differing levels of project management, program management or implementation maturities. Secondly, rigorous exploratory and explanatory research is needed to determine the impact that each competency has on overall portfolio success, a task which is made inherently complex and substantive by the fact that what constitutes 'success' differs across portfolios and indeed, across various stakeholder's in a single portfolio.

Further research can also examine the various mechanisms available for implementing or achieving each competency. For example there are many risk management frameworks and framework derivatives, and some may be more or less effective in portfolio management. Fourthly, while the concept of portfolio management is relatively new, portfolio theory has much longer traditions in other disciplines such as finance. Contemporary theories and studies from those disciplines may be drawn upon and adapted to improve portfolio management in a project context. Finally, competencies are something that are developed over time, and so standard case studies and surveys and other methodologies may be limited in what they can study and the contributions they can make to the current body of knowledge. Longitudinal studies may be very valuable in studying competency development and improvement or deterioration over time.

8. Conclusion

It is clear that industry have not mastered the art of effective PPM. A challenge for organisations is managing this potentially diverse range of projects, while ensuring that the right projects are selected. This paper makes a number of contributions to the literature on project portfolio management. Firstly, it demonstrates the fact that the literature suffers from a number of conceptual issues, including a lack of cumulative tradition, clarity, theoretical glue, parsimony and applicability. Secondly, the framework developed in this study is a first attempt to define the functional performance criteria for the function of project portfolio management. Thirdly, it also forms the basis for future academic research and provides a valuable industry reference point upon which more industry-relevant research can be built. The intent is to use the Standard to improve project portfolio management capability in organisations, which in turn promotes efficient resource use and more profitable project outcomes. It also provides a basis for further research to determine its applicability across a range of organisational cultures and decision-making approaches, and in particular organisations with differing levels of project

Table 3
Portfolio manager standard—competency elements.

Unit of competency	Element	Example performance criteria
1. Identification, strategic alignment and prioritisation of projects and programs	1.1 Identification	A regular census is undertaken to identify and capture all ideas, proposed, planned, active or inactive projects and programs in the organisation, the project sponsor and project approval status, to ensure that the project portfolio is complete and correct on an ongoing basis.
	1.2 Strategic alignment	Projects and programs are assessed to determine the degree of alignment with, and contribution to one or more strategic objective.
	1.3 Prioritisation	Organisational prioritisation methods are identified, documented and reviewed to reflect changing organisational priorities.
2. Project opportunity assessment, selection and portfolio balancing	2.1 Screening	Mandatory projects and programs are identified and added to the project portfolio, where appropriate.
	2.2 Investment appraisal	Related projects are grouped for management as a program to ensure that relevant efficiencies are captured.
	2.3 Selection	A project selection model is used to select projects and programs that comprise the portfolio.
	2.4 Approval	Approved projects and programs are provided with identified funding and resources.
3. Portfolio performance management and review	3.1 Program and project delivery oversight	Projects and programs not achieving planned performance are flagged for review and further investigation.
	3.2 Portfolio continuous improvement	Lessons learned are fed into the project selection, prioritisation and portfolio balancing processes.
	3.3 Benefits management and realisation	The portfolio is actively managed to maximise achievement of organisational benefits.
4. Portfolio governance	4.1 Standards, models and approach	Decisions made at authorisation points are recorded and communicated
	4.2 Portfolio charter	A portfolio charter is prepared and regularly reviewed, which clearly establishes portfolio governance and management roles, authorities, approval limits, responsibilities and the scope of portfolio control
5. Portfolio resource management	5.1 Portfolio resource assessment	The resource capacity of the organisation is regularly reviewed and trends identified and assessed
	5.2 Skills and experience assessment	Strategies are implemented to resolve human resource deficiencies and imbalances.
	5.3 Project and program resource assignment	Resource gaps and conflicts are identified and investigated, and appropriate action is taken to resolve the identified resource constraints, in alignment with organisational strategic priorities.
	5.4 Coordination and prioritisation of resources	Resources are reallocated from projects/programs cancelled or put on hold
6. Portfolio communication management	6.1 Portfolio metrics, measurement and reporting	Portfolio data collection processes and systems are integrated into organisational processes and systems
	6.2 Stakeholder engagement and management	Internal and external stakeholders needs are considered in the ideal portfolio mix
	6.3 Communication of portfolio review outcomes	Projects selected for inclusion in and rejection from the portfolio are communicated along with the rationale for the decision
7. Portfolio risk management	7.1 Identification of portfolio risks	Standards and procedures for portfolio risk management are established and continuously reviewed
	7.2 Analysis of portfolio risks	Executive management determine the level of acceptable portfolio risk
	7.3 Monitor and control portfolio risks	Portfolio risks are actively managed to minimise organisational impact
8. Portfolio leadership	8.1 Make strategic decisions	Project/program sponsors are briefed and supported throughout the project/program lifecycles
	8.2 Lead the portfolio team	A portfolio vision is established and clearly communicated to stakeholders

management, program management or implementation maturities. Whilst it is acknowledged that the Standard needs to be tested in a range of organisations and situations, this seminal work will also inform standards work in the portfolio management domain underway in both the UK and US, and will provide a starting point for further refinement by both the practitioner and academic communities engaged in both research and praxis. In time, the standard can also be used as the basis for developing an Australian vocational qualification in project portfolio management.

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