



# Competency mapping in project management: An action research study in an engineering company

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## Abstract

The present study proposes a seven-step method for the project management competency map. Additionally, the method helps to evaluate and design evolution trajectories based on organisational experience and challenges. This methodological approach merges literature reviews with qualitative and quantitative research methods. Data were collected in a large Brazilian engineering company through the analysis of documentation, behavioural event interviews, self-assessment surveys and statistical analyses. The proposed method is simple, replicable and insightful for managers across all industries and consists of the following: a description of competence and performance criteria, an assessment process, a diagnosis of the current proficiency level, the identification of competence levels that differentiate professional categories, the establishment of expected profiles, a gap analysis and the association between experience and competency development.

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## 1. Introduction

To assure effectiveness in project management, it is strategic to manage individual competence and to map competence-building trajectories for the project manager and team members. Chipulu et al. (2013) suggest that project manager competencies are important in project success.

The resource-based view (RBV) literature (Barney, 1991; Prahalad and Hamel, 1990) highlights the singular and strategic characteristic for each element of the VRIO framework (value, rarity, imitability and organisation), which reinforces the importance of managing these processes in a strategic manner within an organisation that seeks the mapping and construction of competence trajectories.

Recently, with the increase in professional project management certifications, the level of interest in the competencies of project management professionals has increased (Starkweather and Stevenson, 2011). However, for Bredin and Soderlund (2013) little attention has been paid to the careers and career models of project managers.

Project management associations and institutes have implemented competency frameworks for project managers (AIPM, 2008; IPMA, 2006; PMI, 2007). These frameworks recommend competency mapping in both hard and soft skills, but focus on hard skills. However, the number of studies with a focus on soft skills is increasing, as demonstrated by Skulmoski et al. (2010), Clarke (2010a, 2010b), Stevenson and Starkweather (2010), Muller and Turner (2010) and Dainty et al. (2005). Moreover, Ahsan et al. (2013) show that job listings for project managers emphasise soft skills and competencies in a different manner than that in the literature, whereas Chipulu et al. (2013) find that industry puts more weight on generic skills than on project management knowledge.

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Given the importance attributed to these certifications within the business environment and the still emerging state of this debate, we propose here mapping, evaluation and development processes for the competence of project managers and practitioners in an organisational context. The present paper aims at closing this gap by answering the following two research questions: (RQ1) How to tailor organisation-specific project management competencies from standardized competency frameworks; (RQ2) How to systematically assess project management competence in an organisation, including which competencies differentiate each level in project management career models and which professional experiences relate to competence development in order to guide human resources development programmes. We investigate these RQs through a structured approach driven by action research in a large Brazilian engineering company, merging qualitative and quantitative methods.

The present work is divided into five sections. The discussion of academic literature on competencies is presented in Section 2. The methodological strategy that governed the present study is presented in Section 3, detailing the primary and secondary data collection instruments. The results and their respective analyses are presented in Section 4. Finally, Section 5 presents recommendations for researchers and others interested in competence in project management, considering the points of view of both organisations and academia.

## 2. Literature review

### 2.1. Concept of individual competence

The concept of competence (Le Boterf, 1995) is widely used today; however, competence has different meanings to different people (Crawford, 1998), and no universally accepted definition currently exists (Seppänen, 2002).

The definition of individual competence employed in the present work is the “ability to mobilise, integrate and transfer knowledge, skills and resources to reach or surpass the configured performance in work assignments, adding economic and social value to the organisation and the individual”, which was adapted from Ruas et al. (2005) and Fleury and Fleury (2001). In other words, it is not enough to have a stock of knowledge and skills associated with higher performance (Boyatzis, 1992; McClelland, 1973; Mirable, 1997; Spencer and Spencer, 1993); their application in valuable deliveries also matters (Le Boterf, 1995; Zarifian, 1996).

The International Project Management Association’s Competence *Baseline* — ICB (IPMA, 2006) describes the technical, behavioural and contextual competencies of project management. Varajao and Cruz-Cunha (2013) propose a tool for the process of selecting project managers based on the 46 ICB competence elements as model criteria.

The *Project Manager Competency Development (PMCD) Framework* from the Project Management Institute (PMI, 2007) describes knowledge, performance and personal competencies. Knowledge competencies are described in the *Project Management Body of Knowledge* (PMI, 2004), and performance and personal competencies are formed by units and

elements of competence. For example, the unit “Planning the project” contains the element “Approved project schedule”. Each element begins with a verb in the past tense, implying delivery of value, which makes this framework the most compatible with the definition of competence adopted in the present work.

The Australian Institute of Project Management (AIPM, 2008) model defines performance competencies in eight units according to knowledge areas, differentiating them into three professional levels: project practitioner, manager and director.

A comparative analysis of these frameworks shows that there are similarities between these frameworks in their consideration of project management processes and personal competencies. The methodological approach for framework construction was also similar (crowdsourced from practitioners). On the other hand, the IPMA (2006) does not define a performance category, as did the PMI (2007) and AIPM (2008), while being the only one to define contextual competencies. The AIPM (2008) is the only of these organisations to differentiate competencies throughout the project management career. Therefore, instead of adopting only one method, it seems more appropriate to merge them.

Rose et al. (2007) collected project management competencies in a specific company using semi-structured interviews with project managers to investigate the required competencies in project situations. The study resulted in the identification of seven competencies: technical, process, time, client, business, personal and uncertainty management.

Dainty et al. (2005) studied project management competencies in the construction sector, defining nine performance criteria, such as team building, leadership and decision-making. A panel of experts separated the managers into two groups (superior and average performance) and evaluated all participants using the defined criteria. Variance analyses were performed, revealing 12 competencies related to superior performance. This study sheds light on the establishment of proficiency levels and differentiating competencies in project management careers.

Grant, Baumgardner and Shane (1997) studied the importance of technical competencies for project managers of procurement projects for the Department of Defense. Using the characterisations of respondents and projects, a contingency analysis was performed. They concluded that technical competencies are essential, especially in the initial phases of a project and when the team has a technical level that is either very high or very low.

For Ahsan et al. (2013), project manager competencies could be deployed into knowledge, skills, and abilities. Bredin and Soderlund (2013) outline two archetypes of project manager career models: the competence strategy model and the talent management model.

It is important to highlight the contingent effect of industries and countries on key competencies, as indicated by Ahsan et al. (2013). Similarly, Chipulu et al. (2013) identified differences across countries (the U.K., the U.S., Canada, China, India, Hong Kong, Malaysia, and Singapore) and industry sectors, which place significantly different levels of salience on the six dimensions of project manager competencies.

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