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Critical factors for project efficiency in a defence environment

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Abstract

Defence projects are typically undertaken within a multi-project-management environment where a common agenda of project managers is to achieve higher project efficiency. This study adopted a multi-facet qualitative approach to investigate factors contributing to or impeding project efficiency in the Defence sector. Semi-structured interviews were undertaken to identify additional factors to those compiled from the literature survey. This was followed by a three-round Delphi study to examine the perceived critical factors of project efficiency. The results showed that project efficiency in the Defence sector went beyond its traditional internally focused scope to one that is externally focused. As a result, efforts are needed on not only those factors related to individual projects but also those factors related to project inter-dependencies and external customers. The management of these factors will help to enhance the efficiency of a project within the Defence sector.

Keywords: Project efficiency; Multi-project management; Defence industry; Delphi method

1. Introduction

It is well recognised that projects need to perform in an efficient manner (Jugdev and Muller, 2005; Sánchez and Pérez, 2002). According to Srivannaboon and Milosevic (2006), project efficiency should be considered as one of key metrics of project success. The importance of efficiency has grown as projects are increasingly undertaken in a multi-project management (MPM) environment where projects compete with each other for resources.

Project efficiency is especially important within the defence project environment to ensure that the projects are undertaken to not only achieve project success, but also use their resources to their greatest capability. Indeed, project efficiency has been one of the most important criteria of defence project success (Lipovetsky et al., 1997). Defence projects have a history of poor performance as identified in the *Australian 2010–11 Major Projects Auditor-Generals Report*. These reviewed major defence projects experienced programme schedule slippages of over 25% and significant cost overruns annually over the 2007–2008 to 2009–10 financial years (ANAO, 2011).

However, project efficiency in the Defence industry is not an easily measurable concept. Swink et al. (2006) noted that most current research on project efficiency has focused on the improvement of a singular project success criterion, such as time, cost or customer satisfaction. This piecemeal approach to project optimisation and efficiency fails to acknowledge the system links between all areas of project success. Similarly, the complexity of defence projects adds difficulty to the measurement of project efficiency. Defence projects are usually valued at more than hundreds of millions of dollars and require a wide range of skills and capabilities. A major defence project is usually split into a large number of smaller, mutually agreeable subprojects. Consequently, these projects are actively managed as a programme in the MPM environment. The management of projects in a MPM environment is more complex than the management of the sum of individual projects (Al-Jibouri, 2002). Thus, the establishment of a suite of efficiency factors is a key requirement for increasing overall project efficiency and mitigating the complexity of managing a project within the MPM environment. This study

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aims to identify the project efficiency factors in the Australian Defence Industry that will assist defence project managers in their efficiency analysis.

2. Literature review

Project efficiency, along with its impact on the organisation when considering the future demands, has been defined as key criterion for project success (Anantatmula and Thomas, 2010; Landoni and Corti, 2011; Shenhar et al., 2001). It relates to the use of capital, material and human resources within a project to achieve the required project outcomes (e.g. Hendriks et al., 1999). Compared to effectiveness, project efficiency is primarily monitored with an internal focus, i.e. doing things right (Crawford and Bryce, 2003; Olsson, 2006). An efficient project maximises its return from its resources within the schedule and budget constraints of a project.

There are many factors affecting project efficiency. Based on data from 110 defence projects, Dvir (2005) highlighted the impact of stakeholder management, especially the engagement of customers, on project efficiency. According to Swink et al. (2006), the main factors influencing the efficiency of new product development projects include top management support, explicit project goals, cross-functional integration, project team collocation, concurrency and a collaborative work environment. Similarly, Dvir and Lechler's (2004) study found that the quality of planning contributes toward project efficiency. However such effect is largely mitigated by the goal changes. Indeed, scope clarity plays a critical role in achieving project efficiency as misunderstandings may cause conflicts between stakeholders, which in turn hinder project efficiency (Anthony et al., 2013). Therefore, the quality of coordination between the various stakeholders is very important. Beringer et al. (2012), in particular, highlighted the critical role of intensity and quality of stakeholder engagement during the process of portfolio structuring, resource allocation and portfolio steering.

A shortcoming of the traditional review of project efficiency has been the failure to account for the multi-project management (MPM) environment in which many current projects operate. When undertaking multiple projects concurrently within the same environment (i.e. within a single company as a programme of work), the standard issues of project management including resourcing and scheduling are becoming more complex due to interactions between the individual projects. Within the MPM environment, other projects have the ability to impact on the efficiency of a targeted project through the non-timely release of shared resources and the impact on the MPM environment level schedule. Managing projects in a MPM environment relies on the same pool of project personnel, material and support resources to undertake the potentially competing requirements of multiple projects.

Thus in a multi-project environment, it is crucial to allocate resources efficiently to strategically selected projects (Cooper et al., 2001; Martinsuo and Lehtonen, 2007). This has called for portfolio management and programme management to make appropriate decisions beyond the traditional boundary of projects with the consideration of interface management and priority determination (Turner and Müller, 2003).

The fundamental difference between project efficiency in a single project and multi-project environment is the interdependency between projects and associated implications on resource requirements. Indeed, the efficiency of a single project within a multi-project environment only contributes a minor proportion towards programme or portfolio efficiency (Martinsuo and Lehtonen, 2007). Therefore, the strategic alignment of projects with an organisation's goals and the balance between projects are crucial for portfolio efficiency (Martinsuo and Lehtonen, 2007; Shao and Müller, 2011). This is normally associated with a process of prioritising projects within a portfolio for resource allocation purpose (Biedenbach and Müller, 2012) and has also created demands for competent programme manager leadership with a strategic perspective (David Strang, 2011; Shao and Müller, 2011).

Similarly, the translation of knowledge of managing single projects to programme helps to improve programme efficiency (Görög, 2011). Indeed, Biedenbach and Müller (2012) suggested that the organisation's capability of absorbing external knowledge and adapting to external market conditions plays a crucial role in achieving efficiency at the project portfolio level. Görög (2011) further pointed out that there are two typical interrelationships between projects during the implementation of a programme — resource related interdependence and scope related interdependence. Therefore, coordination, scope management, process control, stakeholder engagement, resource allocation, proper planning and monitoring at programme level are crucial for programme success and efficiency. Martinsuo and Lehtonen, 2007 also found project management maturity to be a key factor for portfolio management efficiency. However, Yazici (2009) disagreed by concluding that project efficiency is significantly affected by organisational culture rather than project management maturity. His study found that a clan culture is the most influential way to achieve project efficiency.

As such, the concept of project efficiency is evolving from a *traditional* definition with a narrow focus of "doing the thing right" to a broader scope that covers the long term, strategic issues such as effectiveness (see Fig. 1). Indeed, efficiency and effectiveness are conceptually distinct but so interlinked that they have to be treated together.

However, most previous studies concentrate on the efficiency of single project. The multi-project environment nature of the Defence sector calls for further research into project efficiency in this specific context. Within a multi-project environment, the interdependency between projects and the alignment of projects with organisation needs to be taken into consideration.

3. Research methods

The Defence Industry in Australia is centrally coordinated through the Defence Forces Project Management arm, the