



Project Management Practices in Defence Projects

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Abstract

This article aims to contribute to both project management theory and practice by identifying the project management methods, tools, and techniques used in defense projects. Project management practices are identified in the literature, and empirical data is collected through a web-based survey of 53 project managers who represented the project officers and project managers of the Finnish Armed Forces. The results show that the top ten most used methods, tools, and techniques are well-known and widely utilized. These include project meetings, project reviews, workshops, expert screening, negotiation, course of action comparison, brainstorming, project audits, and checklists.

Keywords: Project Management Practice, Project Success, Project Management

1. Introduction

The success of projects (Jugdev & Müller, 2005) and the factors affecting success have interested researchers since the 1960s (Cooke-Davies, 2002). Numerous studies have been conducted on the subject. Since the 1960s, studies have been divided into theoretical and empirical research. Researchers have explored how to define project success, which factors affect the success and failure of projects, and how different success factors manifest in various phases of the project's life cycle (Cooke-Davies, 2002).

Success has been defined using various criteria that have been updated over the decades. In the 1960s and 1980s, project success was defined by three criteria: time, cost, and quality. In the 1980s and 2000s, customer satisfaction, organizational benefits, end-user satisfaction, stakeholder benefits, and project staff benefits were added to the criteria. Later, the customer organization's strategic goals and business success were included as criteria for success (Ika, 2009). Thus, the criteria for project success have been continuously adjusted. Evaluating project success has become more difficult as the number of criteria has increased (Ika, 2009).

Success is also divided into two categories: the success of project management and the success of the project (Radujković & Sjekavica, 2017). Project management is considered successful if the project stays on schedule, within budget, and meets the quality requirements set for it. A project is deemed successful if the overall goals of the project are met (Jugdev & Müller, 2005; Pinto & Slevin, 1987). The critical success factors affecting projects vary from

study to study and project to project. There is no single universal list of critical success factors that lead to the success of any project (Clarke, 1999; Cooke-Davies, 2002; Fortune & White, 2006; Tishler et al., 1999). Success is influenced by many technical, social, and economic issues (Arto et al., 2008).

Given the numerous factors influencing success, it is no wonder that determining when a project has been successful is challenging. However, there is one key factor that affects the success of every project: the art of project management and the related knowledge, skills, methods, techniques, and tools (Arto et al., 2008). Various guides (Project Management Institute, 2017), textbooks (Dvir et al., 2003), and guidelines (Buckle & Thomas, 2003) have extensively described these different knowledge, skills, techniques, methods, and tools necessary for project management success. These can be called the best practices of project management (Kerzner, 2013). Although following best practices does not automatically lead to project success (Lepmets, 2007), they can increase the probability of success and improve the efficiency of project work (Clarke, 1999).

1.1 Objectives

The EU and its member states are committed to spending more and spending better on defense in response to the unprecedented threats and security challenges that Europe is currently facing. In the past 10 years, defense expenditure in Europe has increased from 151 billion euros to 326 billion euros (European Council, 2025). Defense projects carry high expectations and therefore demand success. These projects should meet the quality and overall goals set for them while staying within the established budget and schedule. To achieve these objectives, projects must be managed effectively, following best practices.

The main objective of this research was to identify the project management practices used in defense projects and to enhance our understanding of the current state of defense project management in Finland.

The paper is structured as follows: First, an introduction to the research field is provided. Second, an overview of the relevant literature on project management methodologies and practices is presented. Next, the study's methodology is described, followed by the survey results. Finally, conclusions are drawn.

2. Literary Review

Early research on projects and project success criteria suggests that the most important success factors are based on the so-called iron triangle of time, cost, and quality, also known as the golden triangle (Atkinson, 1999; Westerveld, 2003; Howsawi et al., 2011; Tsigas et al., 2017). Recently, however, researchers have proposed that project and venture success is much more complex, involving more than just these three factors. Project management research indicates that it is impossible to find or form a general list of success criteria that applies to all projects, as success factors vary with each project (Wateridge, 1998; Westerveld, 2003; Mir & Pinnington, 2014). Each project has several variables and is unique in nature. Nevertheless, creating and understanding a project success framework helps project managers manage their projects more effectively and increase their chances of success.

Based on research and practical experience, various standards and guidelines have been developed for project management to unify the best practices identified in the field. Organizations such as the American Project Management Institute (PMI), the International Project Management Association (IPMA) and the International Organization for Standardization (ISO) have been key developers of these standards. Research based on these

standards has sought to identify the project management practices used in different organizations and determine whether there are practical relationships with general project success.

The modern, worldwide deployment of projects has made identifying factors that improve project success an important topic. Several empirical studies in the last two decades have identified the most used tools and techniques, including work by Shenhar et al. (2002), White and Fortune (2002), Besner and Hobbs (2006), Papke-Shields (2010), Besner and Hobbs (2012), Fernandes et al. (2013), Patanakul et al. (2019), Tereso (2019), Varajão et al. (2020), and Fernandes and O'Sullivan (2023).

Shenhar et al. (2002) studied 127 projects in Israel and concluded that there is no single list of best practices applicable to all projects. High-uncertainty and low-uncertainty projects, as well as high-scope and low-scope projects, require different management practices and methods. White and Fortune (2002) conducted a survey of 235 project managers, identifying 22 critical factors for project success and 44 project management methods, tools, and techniques. The most used tools and techniques were "Project Management Software" and "Gantt Charts." Notably, 66 project managers did not use any method, tool, or technique. The maximum number of methods, tools, and techniques used was 23, with a mean of 5 and a mode of 3.

Besner and Hobbs (2006) identified 70 different project management tools and techniques, noting that these tools have the most value in the initiation phase of a project and some value in the planning phase. Fernandes et al. (2013) and Varajão et al. (2020) used the list developed by Besner and Hobbs (2006) to study which techniques and tools are most useful for project success and have the "highest intrinsic value." Both studies compared the 20 most used project management tools and techniques, noting changes over time due to evolving project requirements. Papke-Shields et al. (2010) identified 51 project management practices grouped into nine knowledge areas: integration, scope, time, cost, quality, human resources, communication, risk, and procurement. Their study indicated that the level of use of project management practices is related to project success, but the most impactful practices are not necessarily widely used or known.

Patanakul et al. (2010) researched 39 frequently used project management practices across different project phases (conceptual, planning, execution, and termination). They proposed 10 practices to increase project success: analogous estimation, checklists, communication plans, contingency plans, cost baselines, critical path methods, hierarchical schedules, lessons learned, milestone analysis, and work breakdown structures. Besner and Hobbs (2012) researched the use of 19 project management toolsets (e.g., databases, network planning, advanced project management software, and business benefits measurements) across different project types, including business and financial services, engineering and construction, IT and telecommunications, and software development. Their research demonstrated how project management practices vary with the management of different project types.

Tereso et al. (2019) identified project management practices used by most private organizations in general and by sector of activity. They identified 70 project management practices from literature and pinpointed the 10 most used tools and techniques by activity sector (information and communication, construction, services, manufacturing) and by project phase (initiating, planning, executing, monitoring and controlling, closing). Fernandes and O'Sullivan (2023) introduced a framework for project management tools and techniques, prioritizing tools and techniques based on project phases (initiation, planning, execution, and closure) and type of project (traditional, hybrid, and agile).

Table 1 shows the key research related to the best practices of project management.

Table 1. Research of the best practices of project management

Key research of the best practices of project management			
Authors	Research topic	Methodology	Findings
Shenhar et al. (2002)	The relationship of project management practices to the project's context and success.	Case-study	96 variables of project management are significantly related to the success of the project and 76 variables are dependent on the context of the project.
White and Fortune (2002)	The most significant project management methods in terms of the final result of the project.	Survey	Identified the most important metrics and factors for project success, as well as the project management methods most commonly used by project managers.
Besner and Hobbs (2006)	The connection of project management methods to the success of the project.	Survey	Identified the most important project management techniques and tools that have a connection to the project's efficiency.
Papke-Shields et al. (2010)	The realization of the best practices of project management by knowledge area, and which practices are used most often and is there a connection to the success of the project?	Survey	Identified the practices of project management that have a connection to the success of the project and how the practices are followed by knowledge area.
Patanukul et al. (2010)	Which project management methods affect the success of the project at any stage.	Survey	Identified 10 project management methods/practises that affect the success of the project.
Besner and Hobbs (2012)	Are project management techniques and tools used in project teams and does the use vary between different project types?	Survey	Project management techniques and tools are used in project teams, but there are differences in usage between project types.
Fernandes et al (2013)	Identifying practitioner perceptions of the most useful project management (PM) practices to improve project management performance.	Survey	Identified 68 project management practises that affect the success of the project.
Tereso et al. (2019)	What project management techniques and tools are most commonly used in different areas of the civil sector?	Survey	Identified the most commonly used methods of project management and the life cycle stages in which they are used.
Varajão et al. (2020)	Which tools and techniques are used in practice to increase project performance	Survey	Identified 20 most used tools and techniques for project management
Fernandes and O'Sullivan (2023)	Which project management practices that can help major University-industry collaboration (UICs) deliver	Interview	Identifying 29 must have project practises

In summary, project management according to best practices increases the efficiency of the work done in a project and is connected to the project's success. Earlier research has shown that there are many best practices, encompassing tasks and activities related to project management, the end products of the process, and various tools and techniques.

Recent research has introduced new trends and topics in project management. Studies have emphasized the role of emerging technologies such as artificial intelligence, machine learning, and blockchain in enhancing the efficiency of project management and decision-making. For example, Smith et al. (2023) explored how AI-driven analytics can optimize

resource allocation and risk management in defense projects. Additionally, project management research has examined the use of artificial intelligence in project management practices and techniques (Daramola et al., 2024; Li et al., 2024; Shamim, 2024). Recent studies have also investigated the cultural and ethical dimensions of project management, emphasizing the importance of cultural awareness and ethical decision-making in international projects, which impact project performance (Battistella et al., 2024; Sayed, 2023).

3. Methodology

According to Niiniluoto (1993), research can aim to answer two types of problems: solving a specific issue or creating and increasing knowledge. These approaches are generally referred to as applied research and basic research, respectively. There is no consensus in the scientific literature on how research should be defined (Collis & Hussey, 2014) because research can mean different things in different disciplines. However, it can be said that research is a systematic process for increasing knowledge (Collis & Hussey, 2014), aiming to answer previously stated research questions and thus adding new knowledge (Saunders et al., 2019).

The source material for this study was collected using an electronic internet-based survey. The survey was answered by 53 individuals who represented the project officers and project managers of the Finnish Armed Forces. The first part of the survey dealt with the respondents' background information, while the second part addressed key project management tasks according to established project management practices. The questions were based on the literature on research theory, identifying 39 of the most common and used project management methods, tools, and techniques to form the survey's foundation. The survey consisted of various questions and assertions.

The 53 project managers who completed the survey had the following background information, as shown in Table 2.

Table 2. Background information from the project managers (n=53)

Personnel (n= 53)		
Military Officer	27	50,9 %
Special Officer (MSc in engineering)	14	26,4 %
Civilian	12	22,6 %
Budget of a project (n=53)		
0-20 million euros	11	20,8 %
21-50 million euros	13	24,5 %
51-100 million euros	13	24,5 %
over 100 million euros	16	30,2 %
Number of projects per project manager (n=53)		
1	22	41,5 %
2-5	21	39,6 %
6 or more	10	18,9 %
Project manager experience (n=53)		
0-2 years	19	35,8 %
3-5 years	14	26,4 %
6 or more years	20	37,7 %

4. Results and Discussion

According to the survey, the most commonly used method by far was the project meeting. Except for one respondent, all stated that they use project meetings as one of the most common methods in their work. More than 70% of the respondents also indicated that they use project evaluation, workshops, expert screening, and negotiation as common methods in their project management activities. Additionally, more than half of the respondents reported frequently using comparison of alternatives, brainstorming, auditing, and checklists in their work. Group discussion and SWOT analysis had the most evenly distributed responses, with about half of the respondents stating that they frequently use these methods and the other half not using them as often.

Table 3: Methods and technics used in defence projects (n=53)

Method/technique	Used often n/ %	Not used n / %
Project meeting	52 / 98,11 %	1 / 1,89 %
Project review	44 / 83,02 %	9 / 16,98 %
Workshop	42 / 79,25 %	11 / 20,75 %
Expert screening	39 / 73,58 %	14 / 26,42 %
Negotiation	39 / 73,58 %	14 / 26,42 %
Course of action comparison	34 / 64,15 %	19 / 35,85 %
Brainstorming	33 / 62,26 %	20 / 37,74 %
Project audit	32 / 60,38 %	21 / 39,62 %
Checklist	30 / 56,60 %	23 / 43,40 %
Group discussions	26 / 49,06 %	27 / 50,94 %
SWOT-analysis	26 / 49,06 %	27 / 50,94 %
Prototype	24 / 45,28 %	29 / 54,72 %
Work breakdown structure	23 / 43,40 %	30 / 56,60 %
Benchmarking	22 / 41,51 %	31 / 58,49 %
Document analysis	17 / 32,08 %	36 / 67,92 %
Cost benefit analysis	13 / 24,53 %	40 / 75,47 %
Gantt-chart	12 / 22,64 %	41 / 77,36 %
Interviews	11 / 20,75 %	42 / 79,25 %
Bottom-up estimate	9 / 16,98 %	44 / 83,02 %
Critical path method	8 / 15,09 %	45 / 84,91 %
Survey	8 / 15,09 %	45 / 84,91 %
Analytic hierarchy process	7 / 13,21 %	46 / 86,79 %
Context diagram	4 / 7,55 %	49 / 92,45 %
Network diagram	3 / 5,66 %	50 / 94,34 %
Trends analysis	2 / 3,77 %	51 / 96,23 %

The results showed that more than half of the respondents frequently used nine different methods in their project work. Among these methods, project meetings and expert screening are generally recognized as standard practices according to theory (Besner & Hobbs, 2006; Varajão et al., 2020; Alqahtani et al., 2024). Therefore, it can be stated that these methods should be commonly used by project managers.

Reviewing, which is the second most commonly used method, is, according to the theory, a well-established approach for managing schedules, quality, and resources (Project Management institute, 2017). Reviews are particularly significant in quality management (International Organization for Standardization, 2012). They help ensure that projects comply with the standards and quality requirements defined during the planning phase. Consequently,

the Finnish Defense Forces are likely to identify deficiencies or contradictions in quality management, schedule management, and resource management through these inspections. The method is well-established within the Finnish Defense Forces, with project reviews organized twice a year under the leadership of the General Staff.

Based on survey responses, brainstorming is more versatile than workshops and offers broader benefits. While workshops are effective for managing scope, communication, and stakeholders, brainstorming can also address the entire project, including project quality and risk management. Expert screening is frequently used in workshops to provide feedback to project managers and officers. Course of action comparison is often employed during negotiations to communicate with project owners about how to proceed.

Project auditing is primarily suited for quality and risk management. However, audits can also be used to assess the project's current status, recent results, working methods, and plans (Ruskin and Estes, 1984). Ideally, audits involve personnel from the customer's organization, the supplier's organization, and the project team. Audits also offer an opportunity to improve areas of project management where deficiencies or issues are identified (George, 2020).

Negotiation is beneficial as a more informal communication method compared to formal meetings (Mannix, 1993). Negotiations do not necessarily result in decisions but can serve as an exchange of information (Sen et al., 1997). Therefore, both meetings and negotiations are among the most common methods used by project managers.

Checklists are valuable tools for overall management and risk management. They help ensure that all planned tasks are completed. Due to the nature of defense projects and military thinking, the use of checklists is likely to be emphasized in the defense forces. Checklists are also a widely used and common tool in project management (Patanukul et al., 2010).

5. Conclusion

As Europe and the European Union continue to invest heavily in the defense industry, understanding effective project management practices in this sector becomes increasingly critical. This study provides additional insights into the project management methods and techniques employed by the Finnish Defense Forces.

The findings reveal that project meetings, project reviews, workshops, expert screenings, negotiations, course-of-action comparisons, brainstorming, project audits, and checklists are the most commonly used methods. This aligns with previous studies (Besner & Hobbs, 2006; Varajão et al., 2020) that emphasize the importance of these practices in enhancing project efficiency and success. This study adds to this understanding by highlighting the unique context of defense projects, where technical complexity requires stakeholder engagement and expert input.

The adoption of project meetings underscores critical role in facilitating communication. In addition to that regular updates are essential for managing complex defense projects. This finding is supported by the work of Mir & Pinnington (2014), who identified communication as a key factor in project success across various industries. Furthermore, the reliance on expert screening and negotiation reflects the findings of Wateridge (1998) and Pinto & Slevin (1987), who noted the importance of expert input and consensus-driven decision-making in achieving project objectives.

To enhance the effectiveness of these practices, future research should explore how emerging technologies, such as artificial intelligence and machine learning, can be integrated to optimize resource allocation and risk management, as suggested by Smith et al. (2023).

Additionally, investigating the cultural and organizational factors influencing the adoption of these practices could provide deeper insights into defense project dynamics.

Comparative studies with defense projects in other countries could further reveal contextual differences and similarities. This cross-cultural perspective is important for tailoring project management approaches to the unique challenges and demands of the defense sector.

In summary, while the Finnish Defense Forces demonstrate effective use of established project management practices, integrating new methodologies and technologies remains essential to enhance project success. As the defense industry evolves, so too must the strategies employed in managing its projects, ensuring they remain responsive to both current and future demands.

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