

# How Product Lifecycle Management (PLM) Creates Value: An Evidence-Based Look at the Aerospace and Defence Industry

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## ABSTRACT

Aerospace and Defense (A&D) companies are increasingly focusing on New Product Development (NPD) as a way to create value. This study examines common methods for enhancing value within the context of Product Lifecycle Management (PLM) in the A&D industry. The study provides examples of widely used value enhancement techniques related to PLM. It suggests that organizations can achieve sustainable value creation by fostering collaboration among project stakeholders. This collaborative approach, implemented through NPD strategies, aims to deliver value by consistently achieving project objectives. The study emphasizes the importance of a robust and sustainable PLM design across collaborative project networks, such as supply chains, as a crucial factor in mitigating the risk of suboptimal value creation. Furthermore, the article highlights a positive correlation between value creation in the A&D industry and the effective implementation of PLM practices in project risk management.

## KEYWORDS

Value Creation, Product Lifecycle Management (PLM), Exploration, Exploitation, Project Management, Technology Roadmap

## INTRODUCTION

Successful companies are using new approaches to manage product development, with a focus on collaboration and networking. They are implementing refined project management strategies to create value and meet system-level product requirements. By adopting industry-specific strategies and utilizing product lifecycle management (PLM), these organizations have achieved sustained improvements in their product value chains. To stay competitive in a networked business environment, companies are frequently refining their product management strategies to be more cost effective and responsive to requirements. Besides, the growing complexity of technology development, fueled by increased collaboration, requires more advanced approaches to project and supply chain management. These new project and supply management methods necessitate careful coordination of network partners, reduced project budgets, and systems designed around companies' core competencies (Green

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& Sergeeva, 2019). For that, Williams and Samset (2010) highlighted the importance of divergent goals and factors affecting project management in each stage. Moreover, Weick et al. (2005) suggested that, throughout a project management lifecycle, individuals within the project network interpret and utilize available information and knowledge to understand their environment. This statement suggests that new and innovative strategic project management methods are needed, and that these methods should include the design of new PLM systems. Essentially, it advocates for a forward-thinking approach to project management that leverages PLM.

In this respect, strategic approaches designed for PLM are challenged by a network-centered view (Cova & Salle, 2007; Lee-Kelley & Sankey, 2008; Söderlund, 2004), where project networks require the creation of interconnections for the exchange of knowledge and experience among network actors in a continuous and interactive process. The primary concern of this article was to evaluate the value creation process out of new product development (NPD) projects in the aerospace and defense (A&D) industry. Hence, in general, new approaches for value creation are summarized in this article, and the topic is reconsidered through the perspective of the companies operating in the A&D industry. Sequentially, in the section titled “Value Creation through PLM” of this article, new perspectives and constructs of product management are conceptualized. The “Project Management Through PLM” section reviews different, simplified, and related bodies of literature. The “Research Method” section includes the methodology based on the PLM approach, to create value out of projects presenting evidence among project management approaches in the A&D industry. The “Value Creation in Projects” section describes the importance of networks in project management processes involved to create value out of product development projects in an aerospace company. The “Conclusion and Discussion” section summarizes conclusions and comments highlighting future research.

## **VALUE CREATION THROUGH PLM**

Value creation is a central concern in project, program, and portfolio management. The idea of project management as a driver of value has been a frequent topic of research (Williams & Samset, 2010; Winter et.al., 2006).

The A&D industry deals with intricate project networks, often involving numerous stakeholders and suppliers. This complexity necessitates a multifaceted approach to value creation, which goes beyond traditional financial metrics. For instance, developing new capabilities, such as enhanced learning and collaboration within the supply chain, is crucial for achieving a lasting competitive edge in this sector (Fabbe-Costes & Lechaptois, 2022, Ruuska et al., 2011). Aligning project goals with a robust risk management strategy is crucial for value creation in complex project networks. This approach ensures that potential risks are identified and mitigated, increasing the likelihood of successful project outcomes and maximizing value for all stakeholders (Ahola et al., 2013; Morris, 2013).

In project networks, the relationship between value creation approaches and PLM points out research efforts through different modes of joint project management with the subcontractors (Davies, 2004; Edkins et al., 2013). These approaches in the current project management literature are contained in PLM models. Core PLM activities for different modes of project management are exemplified in Figure 1. In the figure, internal and external factors and key issues of PLM are listed. Complementarily, there are also other academic studies that deeply analyzed iterative product lifecycle models (Artto & Wilstrom, 2005; Morris, 2013).

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