

Application of System Engineering to Project Management: How They Relate and Overlap

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ABSTRACT

Task administration is the procedure through which work is instated, arranged, executed, and controlled by a group to accomplish an objective. Since project management activities are different from normal business activities that are conducted every day, project management calls for special technical and management skills amongst team members. The successful completion of a project depends largely on systems engineering and the management of various programs. Systems engineering refers to an interdisciplinary approach that facilitates the realization and success of complex systems. The purpose of system engineering is to, therefore, influence the whole system through various cohesive subsystems. The principles of system engineering are synonymous with most characteristics of project management. System engineering is, therefore, applicable to advance project management. This paper looks at the application of system engineering to project management.

KEYWORDS

Management Skills, Project Management, System Engineering, Task Administration, Teamwork

1. INTRODUCTION

1.1. Topic Background

Project management as a discipline has permeated through various fields of application, including civil engineering and construction. Project management is applicable to any field that requires management and the completion of large tasks that must be broken down into smaller tasks to facilitate efficient completion (Klenke, 2016). Jeremy et al. (2017) follow the historical backdrop of task administration in the early years where substantial ventures in structural design were overseen by a gathering of individuals containing planners, structural architects, and developers. This set of experts would break down projects into smaller activities that were completed in phases within a particular period of time. Postponement in the consummation of one stage would cause delays in finishing alternate stages, so this would cause delays in the culmination of an entire undertaking (Galli, 2018; Jeremy et al., 2017)

Pioneers of task administration have assumed a noteworthy part in propelling the utilization of venture administration through their advancement of undertaking administration apparatuses (Jeremy et al., 2017). Additionally, the development of the standard tools for project management facilitated successful application of principles of project management to other fields than civil engineering. For instance, in construction management, there seems to be many parties involved in the successful completion of a project, starting with the real state owners at the top, going down to general contractors,

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subcontractors involved, safety inspectors, department of buildings, and so on. Great coordination is needed for this to be a success (Galli & Kaviani, 2017).

In 1950, project management earned recognition as an independent and distinct field that was characterized by engineering management principles. Since the invention of modern project management, the field evolved to enable management's other projects from a variety of fields. System engineering and project management are inseparable.

Project management, on the other hand, enables the execution of a series of actions that facilitate the achievement of the primary goal. Application of system engineering to project management is, therefore, not new. The goal of project management is to enable the planning and execution of the activities required to successfully deliver a product/service that meets the needs of customers. While there are many similarities between system engineering and project management, there are some discrete features that make the two distinctively different. For example, the tools used to achieve each are different.

System management applies to project management in a variety of ways. Sharon et al. (2013) posit that the System Engineering Management Plan (SEMP) is a document that defines the processes and methodologies that a project employs in the delivery of a new product or service. The SEM must be consistent and in alignment with the project management plan, which is the master document for a project. It is important to understand other ways that system engineering applies to project management, which is the focus of this paper.

1.2. Problem Statement

System engineering plays a critical role in project management. While project management involves the supervision and control of activities that facilitate the achievement of the overall goals of a project, system engineering focuses on the supervision and control of each independent activity that contributes to the achievement of goals (Sharon et al., 2013). It is important to note, however, that project management and system engineering are distinct and unique processes that utilize different tools and approaches.

The project manager and system engineer play different roles during a project, although each is designed to contribute towards the achievement of a common goal. The importance of careful planning, as well as the cautionary execution of expertise by both, largely determines the success of a project.

A framework builder oversees keeping up the traceability of components of the framework configuration, including the necessities, capacities, parts of the framework, and check forms. The project manager, on the other hand, is responsible for identifying the required changes and instituting the best schemes to meet these changes by customer needs. While there is a wealth of literature on the specific roles of project managers and system engineers, there still lacks a clear delineation of the interaction between the two in facilitating successful completion of the same project.

Also, there is a gap in knowledge regarding the application of system engineering to project management and how this application enhances the success of a project. The purpose of this research is to investigate how system engineering applies to project management.

1.3. Research Hypothesis

System engineering assists in the progression of project management by facilitating the identification of customer needs and providing crucial tools such as SEM to deliver a product or service. The overlapping roles of system engineers and project managers make the two indivisible when it comes to the successful delivery of a project.

1.4. Originality

There is a wealth of literature that shows the crucial role that system engineering plays in project management. Additionally, there is substantial literature on the application of system engineering to product management. However, there is a gap regarding how system engineering enables the

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