Relationships between Systems Engineering and Project Management

From SEBoK
Relationships between Systems Engineering and Project Management

This topic discusses the relationship between systems engineering (SE) and project management (PM). As with software engineering, there is a great deal of overlap. Depending on the environment and organization, the two disciplines can be disjoint, partially intersecting, or one can be seen as a subset of the other. While there is no standard relationship, the project manager and the systems engineer encompass the technical and managerial leadership of a project between them, which requires the enterprise of each project manager and system engineer to work out the particular details for their own context.

Contents

- 1 Overlap
- 2 Defining Roles and Responsibilities
- 3 Practical Considerations
- 4 References
  - 4.1 Works Cited
  - 4.2 Primary References
  - 4.3 Additional References

Overlap

There is a great deal of significant overlap between the scope of systems engineering, as described here (in the SEBoK), CMMI (2011), and other resources and the scope of project management, as described in the *PMBOK® Guide* (PMI 2013), CMMI (2011), and other resources as illustrated in Figure 1.

![Figure 1. Overlap of PM and SE. (SEBoK Original)](image)

These sources describe the importance of understanding the scope of the work at hand, how to plan for critical activities, how to manage efforts while reducing risk, and how to successfully deliver
Defining Roles and Responsibilities

Regardless of how the roles are divided up on a given project, the best way to reduce confusion is to explicitly describe the roles and responsibilities of the project manager and the systems engineer, as well as other key team members. The Project Management Plan (PMP) and the Systems Engineering Management Plan (SEMP) are key documents used to define the processes and methodologies the project will employ to build and deliver a product or service.

The PMP is the master planning document for the project. It describes all activities, including technical activities, to be integrated and controlled during the life of the program. The SEMP is the master planning document for the systems engineering technical elements. It defines SE processes and methodologies used on the project and the relationship of SE activities to other project activities. The SEMP must be consistent with, and evolve in concert, with the PMP. In addition, some customers have technical management plans and expectations that the project’s SEMP integrate with customer plans and activities. In the U.S. Department of Defense, most government project teams have a systems engineering plan (SEP) with an expectation that the contractor’s SEMP will integrate and remain consistent with customer technical activities. In cases where the project is developing a component of a larger system, the component project’s SEMP will need to integrate with the overall project’s SEMP.

Given the importance of planning and managing the technical aspects of the project, an effective systems engineer will need to have a strong foundation in management skills and prior experience, as well as possess strong technical depth. From developing and defending basis of estimates, planning and monitoring technical activities, identifying and mitigating technical risk, and identifying and including relevant stakeholders during the life of the project, the systems engineer becomes a key member of the project’s management and leadership team. Additional information on Systems Engineering Management and Stakeholder Needs and Requirements can be found in Part 3: Systems Engineering and Management.

Practical Considerations

Effective communication between the project manager and the system engineer is essential for mission accomplishment. This communication needs to be established early, and occur frequently. Resource reallocation, schedule changes, product/system changes and impacts, risk changes: all
these and more need to be quickly and clearly discussed between the PM and SE.

References

Works Cited


Primary References


Additional References


SEBoK v. 2.0, released 1 June 2019

Retrieved from


- This page was last edited on 21 August 2019, at 21:23.