Research and Reviews: Journal of Engineering and Technology
e-ISSN: 2347-226X
p-ISSN: 2319-9857

Holistic View and Interdisciplinary Field of Systems Engineering

Steven Siehan*

Department of Management and International Business, Bloomsburg University of Pennsylvania, Pennsylvania, USA

Short Communication

Received: 20-Feb-2023, Manuscript No. JET-23-94135; **Editor assigned:** 23-Feb-2023, Pre QC No. JET-23-94135 (PQ); **Reviewed**: 09-Mar-2023, QC No. JET-23-94135; **Revised:** 16-Mar-2023, Manuscript No. JET-23-94135 (R); **Published:** 27-Mar-2023, DOI: 10.4172/2319-9857.12.1.008.

***For Correspondence:**
Steven Siehan, Department of Management and International Business, Bloomsburg University of Pennsylvania, Pennsylvania, USA

E-mail: sixf@edu.cn

Citation: Siehan S, Holistic View and Interdisciplinary Field of Systems Engineering. 2023;12:008.

ABOUT THE STUDY

An multidisciplinary area of engineering and engineering management known as systems engineering focuses on how to design, integrate, and manage complex systems over the course of their lifetimes.

In order to systematise this corpus of information, systems engineering fundamentally applies systems thinking ideas. An engineered system, which is one result of such efforts, is a collection of elements that combine to effectively carry out a beneficial function as a whole.

Dealing with large or complex projects makes it more challenging to address issues like requirements engineering, reliability, logistics, team coordination, testing and evaluation, maintainability, and many other disciplines required for successful system design, development, implementation, and ultimate decommissioning. In these projects, systems engineering works with work processes, optimisation techniques, and risk management tools. Industrial engineering, production systems engineering, process systems engineering, etc. are a few examples of the technical and human-centered fields it crosses over into. Systems engineering makes ensuring that every potential facet of a project or system is taken into account and integrated into the overall design. In contrast to a manufacturing process, the systems engineering process is a discovery process. A manufacturing process is centre on repetitive tasks that produce high-quality products with the least amount of money and time. Finding the actual issues that need to be solved and identifying the failures that have the highest likelihood of occurring must come first in the systems engineering process since systems engineering entails finding solutions to these issues.

Concept

The goal of systems engineering education is to simply formalize diverse ways and, in doing so, find new

approaches and research opportunities similar to those that exist in other engineering disciplines. Systems engineering is a methodology with a holistic, interdisciplinary flavour [1,2].

Origins and traditional scope

Systems engineering only refers to a methodology and, more recently, a field of engineering. Systems engineering education aims to simply formalize many approaches in order to discover novel strategies and research opportunities that are comparable to those found in other engineering fields [3-5]. A methodology with a holistic, interdisciplinary flavour is systems engineering.

Evolution to broader scope

The phrase "systems engineer" has evolved through time to refer to an engineering process and a broader, more holistic understanding of "systems." The phrase continues to apply to both the narrower and wider scope, despite the fact that this evolution of the meaning has been a source of ongoing controversy. In the past, systems engineering was only thought of as a branch of engineering that applied to physical systems like spaceships and aircraft. Systems engineering has recently expanded to mean more, especially as humans have come to be recognised as an integral part of systems [6].

Holistic view

Early in the development cycle, systems engineering focuses on assessing and eliciting customer demands and necessary functionality, documenting requirements, then moving on to design synthesis and system validation while taking the entire problem, the system lifecycle, into consideration [7-9]. This entails having a thorough understanding of all the relevant parties.

Interdisciplinary field

Many technological disciplines frequently need to contribute to the development of systems. Systems engineering contributes to the formation of a structured development process that moves from concept through manufacturing to operation and, in certain situations, termination and disposal by offering a systems (holistic) view of the development endeavour. The holistic integrative discipline integrates contributions and balances tradeoffs between cost, schedule, and performance in an acquisition while preserving an acceptable degree of risk over the course of the item's whole life cycle. This viewpoint is frequently reproduced in educational programmes, where courses in systems engineering are taught by academics from various engineering departments, fostering an environment that is interdisciplinary [10].

REFERENCES

1. Chen J, et al. A study of factors influencing disruptive innovation in Chinese SMEs. Asian J Technol Innov. 2017;25:140-157.
2. Christensen CM. The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail. Harvard Business Press, Boston. 1997.
3. Costa AI, et al. A Knowledge-based Characterization of Open Innovation Strategies. Mimeo. 2008.
4. Dewald J, et al. Storm clouds and silver linings: Responding to disruptive innovations through cognitive resilience. Entrep Theory Pract. 2010;34:197-218.

5. Duarte V, et al. Separating the wheat from the chaff–a taxonomy of open innovation. Eur J Innov Manag. 2011;14:435-459.
6. Hart SL, et al. The great leap: Driving innovation from the base of the pyramid. MIT Sloan Manag Rev. 2002;51.
7. Kiefer CP, et al. Building a taxonomy of eco-innovation types in firms. A quantitative perspective. Resour Conserv Recycl. 2019;145:339-348.
8. Kim S, et al. Disruptive innovation and national cultures: Enhancing effects of regulations in emerging markets. J Eng Technol Manag. 2020;57:101586.
9. Mao JY, et al. Responding in kind: How do incumbent firms swiftly deal with disruptive business model innovation? J Eng Technol Manag. 2020; 57:101591.
10. Nair A, et al. Delayed creative destruction and the coexistence of technologies. J Eng Technol Manag. 2003;20:345-365.