

AeroGlider - Definitions

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1 List of Concepts

1.1 System

A set of interconnected components that work together towards a common goal. The components can be physical, such as parts and/or workers, software or a combination of both.

(1) A set of elements in interaction. (von Bertalanffy 1968)

(2) combination of interacting elements organized to achieve one or more stated purposes (ISO/IEC/IEEE 2015)

(3) A system is an arrangement of parts or elements that together exhibit behavior or meaning that the individual constituents do not. (INCOSE Fellows, 2019)

1.2 Engineering

Engineering is the art of understanding, simplifying, analyzing, modeling, and evaluating physical and mathematical concepts in order to implement them in a project and make it work safely and satisfactorily.

(1) The application of scientific knowledge to practical problems, or the creation of useful things. The traditional fields of mechanical engineering, electrical engineering, etc. are included in this definition. (Checkland 1999)

(2) To (cleverly) arrange for something to happen. (Checkland 1999)

1.3 Systems Engineering

Systems engineering is the interdisciplinary way of organizing and documenting the steps to be followed in a complex system so that the project can flow in an organized and effective manner throughout its lifecycle.

(1) Interdisciplinary approach governing the total technical and managerial effort required to transform a set of customer needs, expectations, and constraints into a solution and to support that solution throughout its life. (ISO/IEC/IEEE 2010)

(2) An interdisciplinary approach and means to enable the realization of successful systems. It focuses on defining customer needs and required functionality early in

the development cycle, documenting requirements, then proceeding with design synthesis and system validation while considering the complete problem:

- *Operations*
- *Performance*
- *Test*
- *Manufacturing*
- *Cost & Schedule*
- *Training & Support*
- *Disposal*

Systems engineering integrates all the disciplines and specialty groups into a team effort forming a structured development process that proceeds from concept to production to operation. Systems engineering considers both the business and the technical needs of all customers with the goal of providing a quality product that meets the user needs. (INCOSE 2012)

(3) A transdisciplinary and integrative approach to enable the successful realization, use, and retirement of engineered systems, using systems principles and concepts, and scientific, technological, and management methods. We use the terms “engineering” and “engineered” in their widest sense: “the action of working artfully to bring something about”. “Engineered systems” may be composed of any or all people, products, services, information, processes, and natural elements. (INCOSE Fellows 2019)

1.4 Systems Engineer

Systems engineer is the professional who follows the objectives of systems engineering. This person is responsible for project organization, multidisciplinary integration, and team integration. Additionally, they will translate customer needs into viable solutions.

A systems engineer is “a person who practices systems engineering” and whose systems engineering capabilities and experience include sustained practice, specialization, leadership or authority over systems engineering activities. Systems engineering activities may be conducted by any competent person regardless of job title or professional affiliation. (Created for SEBoK)

1.5 Stakeholder

Stakeholders are all individuals and entities that have interest, influence, or involvement in a project.

(1) Individual or organization having a right, share, claim, or interest in a system or in its possession of characteristics that meet their needs and expectations (ISO/IEC/IEEE 2015)

(2) Individual or organization having a right, share, claim, or interest in a system or in its possession of characteristics that meet their needs and expectations; N.B. Stakeholders include, but are not limited to end users, end user organizations, supporters, developers, producers, trainers, maintainers, disposers, acquirers, customers, operators, supplier organizations and regulatory bodies. (ISO/IEC June 2010)

(3) An individual, team, or organization (or classes thereof) with interests in, or concerns relative to, a system. (ISO/IEC 2007)

(4) A stakeholder in an organization is (by definition) any group or individual who can affect or is affected by the achievement of the organization's objectives. (Freeman 1984)

1.6 Milestone

Milestones are specific points achieved in a project that are used to demonstrate the progress of the project and help predict when the next steps can be completed.

(1) A significant point or event in the project. (PMI 2008)

(2) A scheduled event used to measure progress. (IEEE 1998)

1.7 Necessity

Needs are all the pains of a customer that can be alleviated by the solutions your project can bring.