

SEBoK Table of Contents

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Navigating the SEBoK

The SEBoK may be searched in the same way as a traditional wiki. In addition, navigation links have been added to each page. Please use these links if you would like to navigate the SEBoK sequentially through the table of contents. These links look like:

< Previous Article | Parent Article | Next Article >

- *Previous* - The "Previous" link will take you back one article in the table of contents.
- *Next* - The "Next" link will take you forward one article in the table of contents.
- *Parent* - The "Parent" link takes you up one level in the table of contents.)



Contents

Part 1: SEBoK Introduction

Part 2: Foundations of Systems Engineering

Part 3: Systems Engineering and Management

Part 4: Applications of Systems Engineering

Part 5: Enabling Systems Engineering

Part 6: Related Disciplines

Part 7: Systems Engineering Implementation Examples

Part 8: Emerging Knowledge

Part 1: SEBoK Introduction

- Introduction to the SEBoK
 - Scope of the SEBoK
 - Structure of the SEBoK
- Introduction to Systems Engineering
 - Systems Engineering Overview
 - Economic Value of Systems Engineering
 - A Brief History of Systems Engineering
 - Systems Engineering: Historic and Future Challenges
 - Systems Engineering and Other Disciplines
 - Fundamentals for Future Systems Engineering
- SEBoK Users and Uses
 - Use Case 0: Systems Engineering Novices
 - Use Case 1: Practicing Systems Engineers
 - Use Case 2: Other Engineers
 - Use Case 3: Customers of Systems Engineering
 - Use Case 4: Educators and Researchers
 - Use Case 5: General Managers

Part 2: Foundations of Systems Engineering

- Knowledge Area: Systems Engineering Fundamentals
 - Introduction to Systems Engineering Fundamentals
 - Systems Engineering Core Concepts
 - Systems Engineering Principles
 - Systems Engineering Heuristics
- Knowledge Area: The Nature of Systems
 - Types of Systems
 - Cycles and the Cyclic Nature of Systems
- Knowledge Area: Systems Science
 - History of Systems Science
 - Systems Approaches
 - Complexity
 - Emergence
- Knowledge Area: Systems Thinking
 - What is Systems Thinking?
 - Concepts of Systems Thinking

- Principles of Systems Thinking
- Patterns of Systems Thinking
- Knowledge Area: Representing Systems with Models
 - What is a Model?
 - Why Model?
 - Types of Models
 - System Modeling Concepts
 - Integrating Supporting Aspects into System Models
 - Modeling Standards
- Knowledge Area: Systems Approach Applied to Engineered Systems
 - Overview of the Systems Approach
 - Engineered System Context
 - Identifying and Understanding Problems and Opportunities
 - Synthesizing Possible Solutions
 - Analysis and Selection between Alternative Solutions
 - Implementing and Proving a Solution
 - Deploying, Using, and Sustaining Systems to Solve Problems
 - Applying the Systems Approach

Part 3: Systems Engineering and Management

- Systems Engineering STEM Overview
- Model-Based Systems Engineering (MBSE)
- Knowledge Area: Systems Lifecycle Approaches from Introduction to Life Cycle Processes
 - Generic Life Cycle Model
 - Applying Life Cycle Processes
 - Life Cycle Processes and Enterprise Need
- Knowledge Area: System Lifecycle Models from Life Cycle Models
 - System Lifecycle Process Drivers and Choices
 - System Lifecycle Process Models: Vee
 - System Lifecycle Process Models: Incremental from System Life Cycle Process Models: Iterative
 - System Life Cycle Process Models: Agile Systems Engineering

- Process Integration from Integration of Process and Product Models
 - Lean Engineering
- Knowledge Area: Systems Engineering Management
 - Technical Planning from Planning
 - Assessment and Control
 - Decision Management
 - Risk Management
 - Configuration Management
 - Information Management
 - Quality Management
 - Measurement
- Knowledge Area: Business and Mission Analysis from Concept Definition
 - Business or Mission Analysis
 - System Views
- Stakeholder Needs Definition from Stakeholder Needs and Requirements
- Stakeholder Requirements Definition from System Requirements
- Knowledge Area: System Architecture Definition from System Architecture and System Definition
 - Functional Architecture
 - Logical Architecture from Logical Architecture Model Development
 - Physical Architecture from Physical Architecture Model Development
- Detailed Design Definition from System Design
- System Analysis
- System Realization
- System Implementation
- System Integration
- System Verification
- System Transition from System Deployment
- System Validation
- System Operation from Operation of the System
- Knowledge Area: System Maintenance
 - Logistics
 - Service Life Management from Product and Service Life Management

- Service Life Extension
- Capability Updates, Upgrades, and Modernization
- System Disposal and Retirement from Disposal and Retirement
- Knowledge Area: Systems Engineering Standards
 - Relevant Standards
 - Alignment and Comparison of Systems Engineering Standards from Alignment and Comparison of the Standards
 - Application of Systems Engineering Standards

Part 4: Applications of Systems Engineering

- Knowledge Area: Product Systems Engineering
 - Product Systems Engineering Background
 - Product as a System Fundamentals
 - Business Activities Related to Product Systems Engineering
 - Product Systems Engineering Key Aspects
 - Product Systems Engineering Special Activities
- Knowledge Area: Service Systems Engineering
 - Service Systems Background
 - Fundamentals of Services
 - Properties of Services
 - Scope of Service Systems Engineering
 - Value of Service Systems Engineering
 - Service Systems Engineering Stages
- Knowledge Area: Enterprise Systems Engineering
 - Enterprise Systems Engineering Background
 - The Enterprise as a System
 - Related Business Activities
 - Enterprise Systems Engineering Key Concepts
 - Enterprise Systems Engineering Process Activities
 - Enterprise Capability Management
- Knowledge Area: Systems of Systems (SoS)
 - Architecting Approaches for Systems of Systems
 - Socio-Technical Features of Systems of Systems
 - Capability Engineering
 - Mission Engineering

- Knowledge Area: Healthcare Systems Engineering
- Overview of the Healthcare Sector
- Systems Engineering in Healthcare Delivery
- Systems Biology
- Lean in Healthcare

Part 5: Enabling Systems Engineering

- Knowledge Area: Enabling Businesses and Enterprises
 - Systems Engineering Organizational Strategy
 - Determining Needed Systems Engineering Capabilities in Businesses and Enterprises
 - Organizing Business and Enterprises to Perform Systems Engineering
 - Assessing Systems Engineering Performance of Business and Enterprises
 - Developing Systems Engineering Capabilities within Businesses and Enterprises
 - Culture
- Knowledge Area: Enabling Teams
 - Team Capability
 - Team Dynamics
 - Diversity, Equity, and Inclusion
 - Technical Leadership in Systems Engineering
- Knowledge Area: Enabling Individuals
 - Roles and Competencies
 - Assessing Individuals
 - Developing Individuals
 - Ethical Behavior

Part 6: Related Disciplines

- Knowledge Area: Systems Engineering and Environmental Engineering
- Knowledge Area: Systems Engineering and Geospatial/Geodetic Engineering
 - Overview of Geospatial/Geodetic Engineering
 - Relationship between Systems Engineering and Geospatial/Geodetic Engineering
 - Further Insights into Geospatial/Geodetic

Engineering

- Knowledge Area: Systems Engineering and Industrial Engineering
- Knowledge Area: Systems Engineering and Project Management
 - The Nature of Project Management
 - An Overview of the PMBOK® Guide
 - Relationships between Systems Engineering and Project Management
 - The Influence of Project Structure and Governance on Systems Engineering and Project Management Relationships
 - Procurement and Acquisition
 - Portfolio Management
- Knowledge Area: Systems Engineering and Software Engineering
 - Software Engineering in the Systems Engineering Life Cycle
 - The Nature of Software
 - An Overview of the SWEBOK Guide
 - Key Points a Systems Engineer Needs to Know about Software Engineering
 - Software Engineering Features - Models, Methods, Tools, Standards, and Metrics
- Knowledge Area: Systems Engineering and Aerospace Engineering
- Knowledge Area: Systems Engineering and Electrical Engineering
- Knowledge Area: Systems Engineering and Mechanical Engineering
- Knowledge Area: Systems Engineering and Civil Engineering
- Knowledge Area: Systems Engineering and Economics
- Knowledge Area: Systems Engineering and Enterprise IT
- Knowledge Area: Systems Engineering and Quality Attributes
 - A Framework for Viewing Quality Attributes from the Lens of Loss [New article](#)
 - Human Systems Integration
 - Manufacturability and Producibility
 - System Affordability

- System Hardware Assurance
- System Reliability, Availability, and Maintainability
- System Resilience
- System Resistance to Electromagnetic Interference
- System Safety
- System Security

Part 7: Systems Engineering Implementation Examples

- Matrix of Implementation Examples
- Implementation Examples
- Construction System Examples - **Coming Soon!**
- CyberPhysical System Examples - **Coming Soon!**
- Defense System Examples
 - Submarine Warfare Federated Tactical Systems
 - Virginia Class Submarine
- Geospatial System Examples - **Coming Soon!**
- Information System Examples
 - Complex Adaptive Taxi Service Scheduler
 - Successful Business Transformation within a Russian Information Technology Company
 - FBI Virtual Case File System
- Management System Examples
 - Project Management for a Complex Adaptive Operating System
- Medical System Examples
 - Next Generation Medical Infusion Pump
 - Medical Radiation
 - Design for Maintainability
- Space System Examples
 - Global Positioning System Case Study
 - Global Positioning System Case Study II
 - Russian Space Agency Project Management Systems
 - How Lack of Information Sharing Jeopardized the NASA/ESA Cassini/Huygens Mission to Saturn
 - Hubble Space Telescope
 - Applying a Model-Based Approach to Support Requirements Analysis on the Thirty-Meter

- Telescope
- Miniature Seeker Technology Integration
Spacecraft
- Apollo 1 Disaster
- Transportation System Examples
 - Denver Airport Baggage Handling System
 - FAA Advanced Automation System (AAS)
 - Federal Aviation Administration Next Generation
Air Transportation System
 - UK West Coast Route Modernisation Project
 - Standard Korean Light Transit System Vignette
- Utilities Examples
 - Northwest Hydro System
 - Singapore Water Management

Part 8: Emerging Knowledge

- Emerging Topics
 - Introduction to SE Transformation
 - Socio-technical Systems
 - Artificial Intelligence
 - Verification and Validation of Systems in Which AI
is a Key Element
 - Transitioning Systems Engineering to a Model-
based Discipline
 - Model-Based Systems Engineering Adoption
Trends 2009-2018
 - Digital Engineering
 - Set-Based Design
 - System of Systems and Complexity
- Emerging Research

[Go to First SEBoK Article >](#)

SEBoK v. 2.7, released 31 October 2022

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This page was last edited on 30 October 2022, at 12:37.