

Systems Science

From SEBoK
Systems Science

This knowledge area (KA) provides a guide to some of the major developments in systems science which is an interdisciplinary field of science that studies the nature of complex systems in nature, society, and engineering.

This is part of the wider systems knowledge which can help to provide a common language and intellectual foundation; and make practical systems concepts, principles, patterns and tools accessible to systems engineering (SE) as discussed in the Introduction to Part 2.

Contents

- 1 Topics
- 2 Introduction
- 3 References
 - 3.1 Works Cited
 - 3.2 Primary References
 - 3.3 Additional References

Topics

Each part of the SEBoK is divided into KAs, which are groupings of information with a related theme. The KAs in turn are divided into topics. This KA contains the following topics:

- History of Systems Science
- Systems Approaches

Introduction

The following diagram summarizes the relationships between systems science and other sections of the SEBoK

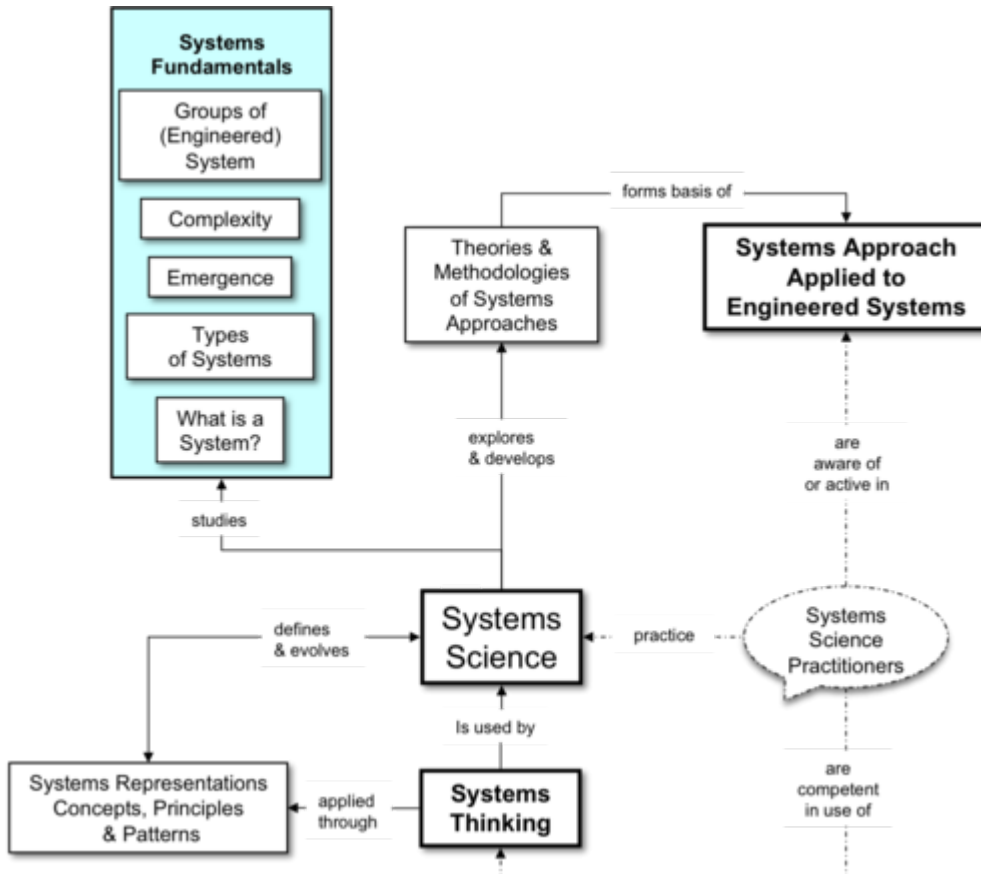


Figure 1. Systems Science in the SEBoK. (SEBoK Original)

Systems science brings together research into all aspects of systems with the goal of identifying, exploring, and understanding patterns of complexity which cross disciplinary fields and areas of application. It seeks to develop interdisciplinary foundations which can form the basis of theories applicable to all types of systems, independent of element type or application; additionally, it could form the foundations of a meta-discipline unifying traditional scientific specialisms.

The History of Systems Science article describes some of the important multidisciplinary fields of research of which systems science is composed.

A second article presents and contrasts the underlying theories behind some of the system approaches taken in applying systems science to real problems.

People who think and act in a systems way are essential to the success of both research and practice. Successful systems research will not only apply systems thinking to the topic being researched but should also consider a systems thinking approach to the way the research is planned and conducted. It would also be of benefit to have people involved in research who have, at a minimum, an awareness of system practice and ideally are involved in practical applications of the theories they develop.

References

Works Cited

None.

Primary References

Checkland, P. 1999. *Systems Thinking, Systems Practice*. New York, NY, USA: John Wiley & Sons.

Bertalanffy, L. von. 1968. *General System Theory: Foundations, Development, Applications*, Revised ed. New York, NY, USA: Braziller.

Flood, R.L. 1999. *Rethinking the Fifth Discipline: Learning within the Unknowable*. London, UK: Routledge.

Additional References

None.

< [Previous Article](#) | [Parent Article](#) | [Next Article](#) >

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