

Systems Engineering

Welcome to the fascinating world of Systems Engineering!

We live in a world where the complexity of our systems, whether they are technical, social, financial or anything in between, is constantly increasing. This is not only true at a system level, due to the increased interactions and dependencies between system elements and the blurring of traditionally hard boundaries, but also at a higher level, due to the fact that we now live in a truly connected world.

Systems Engineering describes an approach for realising successful systems in an increasingly complex world.

Don't Panic!

Embarking on your Systems Engineering journey can be scary!

Here at IfSE we offer a complete set of Systems Engineering resources to help to realise your Systems Engineering potential as quickly, efficiently and painlessly as possible.

These range from products, such as guides, posters and books, to services, such as Professional Registration and Certification.

You can also get involved with our vibrant Systems Engineering community through our various groups and by attending our events, including our flagship Annual Systems Engineering Conference (ASEC).

The Institute for Systems Engineering (IfSE) is the professional home for systems engineers in the UK.

Key Aspects of Systems

Systems

Systems Engineering is an approach to realising systems successfully. These systems can be almost anything and range from planes and rockets, to boats and trains, from medicines and cars to computers, smart phones and tablets, and just about anything in between! We need to ensure that we are not only building the system right, but also building the right system!

Life Cycle

When developing a system we consider the whole cradle-to-grave life cycle, with stages that cover conception, development and production, through to utilisation and support and, finally, retirement.

Key Enablers

In order to apply Systems Engineering in an efficient manner we need to ensure that we have competent people, effective processes and sharp tools in place. We need to get the balance right between all three of these.

Processes

Our approach covers process areas such as technical, management, organisation and the customer supplier agreement processes.

Complexity and Communications

We increase our understanding of the system by identifying and managing complexity and ensuring efficient communication between all stakeholders.

About This Z Guide

This leaflet is intended as an introduction and overview of the IfSE Z0 poster which can be purchased via the IfSE Online Store: www.ifse.org.uk

This series of working guides is produced by members of The Institute for Systems Engineering (IfSE).

For further information, advice and links to helpful websites go to: www.ifse.org.uk

Download copies of this leaflet and other Systems Engineering resources online at: www.ifse.org.uk

For more information about the worldwide Systems Engineering professional community, go to: www.incose.org

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Lead author: Professor Jon Holt

ORGANISATIONAL
Mission
Business
Return on Investment

MANAGEMENT
Cost
Time
Resource
Quality
Risk

CONCEPTION
Who?
What?
How?
NEEDS
When?
Why?

DEVELOPMENT
A → B
ARCH
INTERFACE
OHVVK

PRODUCTION
Can we build it?
Do the bits work?
Do the bits fit?

SUPPORT
Can we fix it?
I can help?

VERIFICATION
Safe? Reliable? Secure?
TRADE OFFS
SOLUTION 1
SOLUTION 2
GATE

VALIDATION
Skill Safe? Skill Reliable? Skill Secure?
GATE

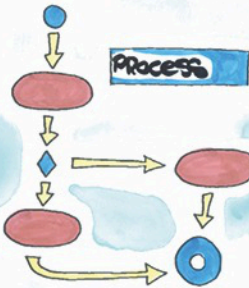
UTILISATION
RE-USE
RECYCLE
TRUCK
LESSONS LEARNED
ARCHIVE
Retire
me
up

COMPLEXITY

SYSTEMS THINKING

COMMUNICATION

People



TECHNICAL
Needs
Problem
Solution
Verification
Validation

BUILD THE SYSTEM RIGHT

BUILD THE RIGHT SYSTEM

AGREEMENT
Acceptance
Confidence
Consensus



SYSTEMS ENGINEERING