SYNTHESYS TECHNOLOGIES

BROCHURE

2024 - 25

EXPERTISE | INNOVATION | INTEGRITY

SyntheSys TECHNOLOGIES

WELCOME

EMPOWERING PROGRESS THROUGH INTEGRATED SYSTEMS

We are a leading systems engineering company dedicated to transforming complex challenges into innovative solutions.

Our mission is to seamlessly integrate cutting-edge technology, interdisciplinary expertise, and holistic thinking to design, develop, and optimise systems that enhance efficiency, reliability, and sustainability.

With a commitment to excellence, collaboration, and forward-thinking, we strive to advance industries and drive positive impact at scale.

ABOUT SYNTHESYS TECHNOLOGIES

Operating in manufacturing and engineering markets, SyntheSys Technologies champions for tool-supported systems engineering and support for customers via systems engineering training, consultancy and leading IBM® Engineering Lifecycle Management (ELM) tools.

"LET'S GET IT RIGHT FIRST TIME, EFFECTIVELY AND EFFICIENTLY"

TODAY'S ENGINEERS ARE FACING A DRAMATIC SHIFT

To cope with rising product complexity and significant amounts of data, modern engineering teams must improve existing methods of working whilst embracing new processes and technologies to maintain a competitive edge.

THE CHALLENGE

Competitive pressures to bring products to market faster, slash development costs, maintain quality standards and counter competitor innovations are forcing organisations to change fundamentally the way their engineering teams work.

Customer and market demands are driving the need for companies to overhaul their old methods for newer, more agile processes that optimise the entire engineering life cycle.

COLLABORATIVE ENGINEERING MANAGEMENT

TALENT

Collaborative engineering management describes SyntheSys' approach to engineering management with expert personnel, process advice and appropriate tool support.

PROCESS

Our services focus on best practice systems engineering, the role that it plays within an organisation and how this can be developed and improved to achieve wider commercial objectives.

TOOLS

We have helped many organisations increase their competitiveness through advice on processes, training and the introduction of software tools.

COMPONENTS

We view collaborative engineering management as a mix of three elements which are interdependent and reliant on each other.

As such, our engineering services view the TALENT in your organisation as the heart of your business, providing creative and intuitive input.

We view your PROCESS as the brain, providing a reasoned logic to how your business works.

The TOOLS you use during your development could therefore be viewed as the skeletal network of data and functionality connecting and automating each of the elements.

TALENT

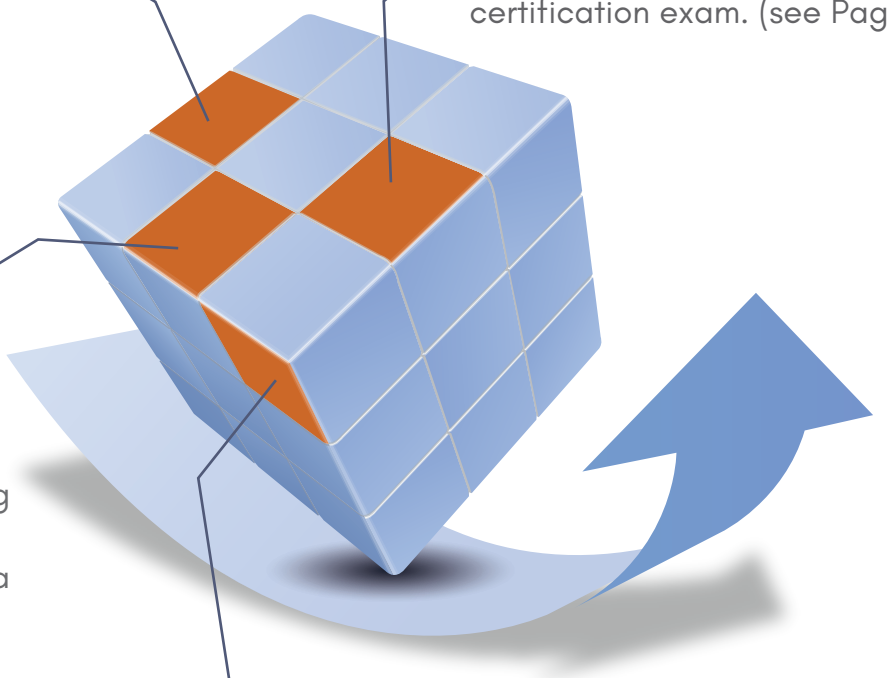
ENABLEMENT THROUGH TRAINING AND MENTORING

ENGINEERING TOOL TRAINING

We offer real depth of knowledge around the implementation of powerful engineering development tools. Our consultants have a high level of expertise in tool-supported systems engineering. (see Page 15)

CERTIFICATION TRAINING

We prepare students to sit the International Council on Systems Engineering (INCOSE) certification exam. (see Page 7)



COLLABORATIVE ENGINEERING MANAGEMENT TRAINING

Our formal and bespoke training gives a high-level foundation to the principles and practices of a formalised engineering management approach.

MENTORING AND CONSULTANCY

Our consultancy and support services focus on collaborative engineering management best practice and how enriching your talent, process and development tools will ensure you meet commercial objectives.

TALENT

FORMAL SYSTEMS ENGINEERING TRAINING COURSES

ENDORSED TRAINING PROVIDER

We maintain International Council on Systems Engineering (INCOSE) Endorsed Training Provider status. The scheme aims to differentiate systems engineering training providers by verifying that training meets a set of INCOSE standards. The standards focus on organisational activity, capability, course portfolio, competencies and reviews, as an indicator of training excellence.

For more information about our Systems Engineering and related training, visit: http://www.synthesys-technologies.co.uk/training.html

To read more about the INCOSE Endorsed training provider scheme visit: https://incoseuk.org/Normal_Files/Technical/EndorsedTrainingScheme

INCOSE SYSTEMS ENGINEERING PROFESSIONAL (SEP) EXAMINATION PREPARATION

This 5-day course equips students with the knowledge and structure of the INCOSE Systems Engineering Handbook and its constituent processes, to prepare for the SEP examination.

The course combines real-world scenarios with theory, presented in the INCOSE Systems Engineering Handbook, to provide students with a unique learning experience which will enable them to comfortably sit the INCOSE SEP examination. This course can be delivered in an approved training location, on an open-to-all basis. Alternatively, the course can be delivered on customer site to minimise travel expenses.

Click here for more information.

AN INTRODUCTION TO SYSTEMS ENGINEERING WITH REQUIREMENTS WRITING

Designed to provide a high-level foundation on the principles and practices of systems engineering, the course is aimed at those whose role heavily integrates with a software or systems development process.

The course is suitable for both engineers and non-engineers at all levels. Aligned with the INCOSE Systems Engineering Handbook, the course provides an introduction and overview of the processes required for successful systems engineering project delivery.

The creation of accurate requirements, traceable across the systems engineering life cycle, is critical for successful projects, which is why we have designed specialist modules which provide students with the techniques necessary for the creation of clear, concise and correct requirements, independent of specific requirements management tools. Best practice is drawn from the INCOSE handbook and the INCOSE guide for writing requirements.

The course is presented by an experienced systems engineering practitioner and examines the role and benefits of applying systems engineering principles within your organisation.

Click here for more information.

SYSTEMS ENGINEERING TOOLS TRAINING

We offer specialist training in adoption, implementation and acceleration of the following IBM® Engineering Lifecycle Management tools:

IBM® Engineering Requirements Management DOORS® Family
Click here for more information.

IBM® Engineering Requirements Management DOORS® Next
Click here for more information.

IBM® DOORS® eXtension Language (DXL)
Click here for more information.

IBM® Engineering Lifecycle Optimization – Publishing

Click here for more information.

PROCESS

A FORMALISED ENGINEERING APPROACH

In the dynamic landscape of today's technology-driven world, successful projects hinge on the flawless coordination and optimisation of intricate systems. At SyntheSys Technologies, we specialise in providing cutting-edge systems engineering services that catapult your project's efficiency, reliability, and innovation to new heights. We're not just another service provider; we're your strategic partner in achieving engineering excellence. With a proven track record of successfully steering diverse projects across industries, we combine technical prowess with a passion for innovation to fuel your success.

We can offer consultancy services around the following areas:

- **Architecture Design**
- **Requirements Engineering**
- **Integration and Interoperability**
- **Verification and Validation**
- **Lifecycle Management**
- **Model-Based Systems Engineering**

Our services are flexible and scalable. We can deliver services on-site, as part of your development team. We work on a call-off basis where consultancy days are charged upon usage. We can also work to provide extra resources in transitionary periods or to meet increased demands within engineering teams.

TOOLS

LEADING ENGINEERING TECHNOLOGIES

REQUIREMENTS MANAGEMENT

Providing effective ways to manage requirements, improve staff efficiency and reduce unnecessary re-work.

DESIGN MANAGEMENT

Proven functionality for modelling and design management to manage complexity within your development processes.

WORKFLOW MANAGEMENT

Facilitating individuals and teams to collaborate by providing a common work environment for alignment.

TEST MANAGEMENT

Offering test planning, construction and artefact production which assures quality and gives you automated control and governance.

cloudbaSE: Flexible Delivery for Engineering Development Tools

cloudbaSE
A SyntheSys Solution

Software and systems delivery is changing to adopt agile and continuous engineering approaches.

A flexible and effective infrastructure to support these approaches is critical to success.

Welcome to cloudbaSE, SyntheSys' Software-as-a-Service (SaaS) licensing toolset for engineering software.

Gone are the days when software was purchased and maintained on an annual basis using unreliable usage forecasts; software licences can now be rented 'on demand' matching actual usage with actual licences.

cloudbaSE RM
Requirements Manager

Proven to save time and money by helping to avoid unnecessary development costs as a result of poor requirements management.

cloudbaSE PM
Project Manager

Offers change, configuration and release management solutions.

cloudbaSE DM
Design Manager

Provides collaborative design and development for systems engineers and developers.

cloudbaSE VM
Validation Manager

Facilitates testing & validation management which transforms the way teams work together.

TOOLS – IBM® ENGINEERING LIFECYCLE MANAGEMENT

Gold Business Partner

IBM® Engineering Requirements Management DOORS® Family

Requirements Manager

IBM® DOORS® Family provides an effective way to manage requirements, improves staff efficiency and enhances overall project output. The tool automates the requirements management process and enables your teams to concentrate on building the right product, not spending time on manual tasks and rework.

- Improves the overall quality of the systems and software you deliver to your customers.
- Facilitates collaboration by providing transparency throughout the development process.
- Effective change notification allows you to analyse and administer change management.
- Enables you to respond to changes to requirements in a more controlled, effective way.
- Helps you to provide evidence of regulatory compliance.
- Integrates seamlessly into your development, test and design environments and creates a level of traceability throughout the life cycle.

IBM® Engineering Systems Design Rhapsody®

Design Manager

IBM® Engineering Systems Design Rhapsody® with IBM® Engineering Systems Design Rhapsody® Design Manager, provides proven functionality for modelling and design management. The suite of tools offers development, design and test environments for software and systems engineers and teams. The IBM® Engineering Systems Design Rhapsody® suite supports SysML, UML and AUTOSTAR whilst facilitating control of defence frameworks and industry standards.

The tool allows you to manage complexity within your software and system development processes.

- Collaborate, share and review artefacts created within IBM® Engineering Systems Design Rhapsody® or other tools.
- Ongoing validation through prototyping, swift simulation and execution to tackle errors effectively.
- Autonomous cross-checking to increase and enhance agility and promote reuse.
- Helps to reduce both recurring and non-recurring costs.

IBM® Engineering Test Management

Quality Manager

To achieve quality driven software and systems, development teams need to collaborate, share information and adopt a level of automation throughout the software and systems development process. IBM® Engineering Test Management offers test planning, test construction and test artefact management functions, which helps quality assurance teams collaborate, automate and govern more effectively.

- Uses comprehensive and customisable test plans to track quality driven software delivery.
- Provides powerful dashboards which present data and information in a more productive way.
- Offers test execution schedules which helps in optimising environment coverage.
- Facilitates collaboration of geographically dispersed teams through a web interface.
- Helps with test scheduling and execution through physical and virtual lab assets.
- Provides manual test authoring with rich text and inline images for exact test definition.

IBM® Engineering Workflow Management

Project Management

IBM® Engineering Workflow Management facilitates individuals and teams to collaborate to build better software and systems by aligning development environments. The tool provides an all-in-one common platform where the user can manage workspaces and software version control more effectively whilst facilitating development support.

- Promotes consistent processes which improves overall software and systems quality.
- Improves productivity and flexibility with an open standard-based platform.
- Improves real-time collaboration for distributed project teams.
- Gives teams a greater level of transparency with health information and status transparency.
- Offers integrated source control, work item and build capabilities.

IBM® Engineering Lifecycle Optimization – Publishing

Document Generation and Automation

IBM® Engineering Lifecycle Optimization – Publishing offers powerful, automated documentation generation functionality which helps organisations generate documents for in-house review purposes, contractual obligation, or compliance with standards.

- Synchronised document generation to meet the needs of your stakeholders from a single template, which reduces the risk of error.
- Various output formats which can be presented in multiple ways, to improve customer communication and satisfaction.
- Allows you to integrate data from multiple sources to create reports and automatically generate required documents.

REALISING THE BENEFITS

BENEFITS OF SYNTHESYS' COLLABORATIVE ENGINEERING MANAGEMENT APPROACH

MANAGES ENGINEERING COMPLEXITY

Don't let engineering complexity reduce quality, speed to market and profitability.

MANAGES ENGINEERING RISK

Ensure your organisation is able to make risk-aware engineering decisions through easy access to performance and market data.

IMPROVES OVERALL QUALITY

Protecting and maintaining the quality of your engineering output is key to engineering success.

ENSURES REGULATORY COMPLIANCE

Demonstrate your compliance with industry standards in a faster, more reliable and collaborative way.

BETTER SUPPLY-CHAIN MANAGEMENT

Ensure your supply chain benefits from a single source of truth, to lower the cost of producing and distributing goods and services.

ACCELERATES TIME TO MARKET

Digital engineering transformation is key to shortening your engineering life cycle and is proven to accelerate time to market.

CUSTOMER SUCCESSES

MAKING REQUIREMENTS PRIORITY

The complex nature of Transport for London's (TfL's) major projects means that robust requirements management is essential to success.

TOOL-SUPPORTED ENGINEERING WINS

IBM® DOORS® Family is an integral part of the requirements management process on TfL's most complex projects, providing baselining, configuration control and the ability to link related information to each other.

Click here for more information.

TRANSPORT FOR LONDON

RAIL

SyntheSys completes an upgrade of requirements management software at Network Rail

Click here for more information.

AUTOMOTIVE

SyntheSys trains over 800 Jaguar Land Rover employees on managing requirements

Click here for more information.

ENERGY

Systems engineering is pivotal to success

Click here for more information.

A CLEAR AND QUANTIFIABLE CASE FOR SYSTEMS ENGINEERING FOR COMPLEX ENGINEERING PROJECTS

Spotlight on the Research

If there was ever any doubt, we would like to share some findings from research conducted by Eric Honours which further amplifies the benefits and needs for systems engineering. Eric's research was designed to gather empirical research about how systems engineering methods relate to project success. He developed an interview approach and used it to interview project managers and lead systems engineers on 51 completed projects in 16 organisations. The overall conclusions from the research are that there is a correlation between the application of systems engineering activities and a team's ability to meet planned programme costs, schedules – and satisfy stakeholder needs.

Some of the specific findings are:

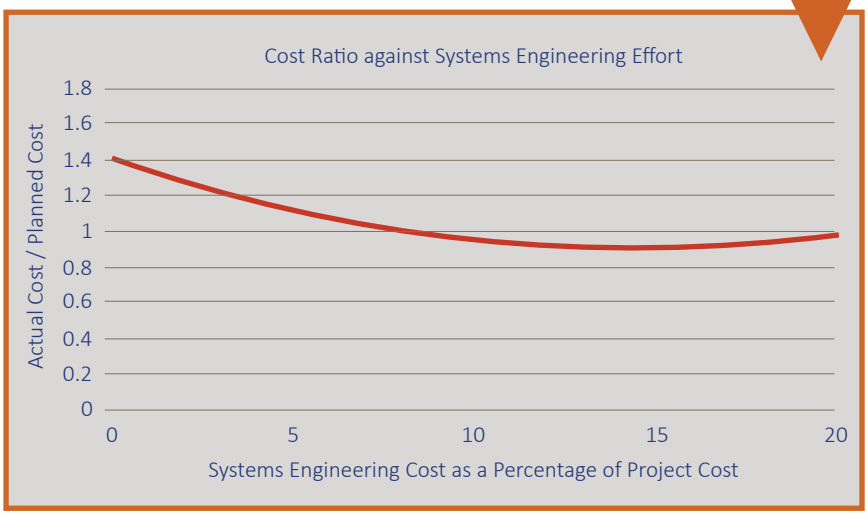
1- The level of systems engineering effort matters to the success of projects.

2- Greater systems engineering effort is associated with projects that have significantly less cost overrun.

3- There is an optimum amount of systems engineering for best project success.

4- Projects typically use less systems engineering effort than is optimum for best success.

Typically, the projects employed systems engineering at about ***half*** the optimum level



This research shows that there can be significant productivity gains through appropriate application of systems engineering effort in a project.

To read the full paper, visit: https://web.mst.edu/lib-circ/files/Special%20Collections/INCOSE2010/Systems%20Engineering%20Return%20on%20Investment.pdf

References:

[1] "Systems engineering return on investment", Eric C Honour, thesis submitted for the degree of Doctor of Philosophy, Defence and Systems Institute, University of South Australia, January 2013.

[2] "Systems and Software Engineering – System Life Cycle Processes", ISO/IEC/IEEE 15288, 15 May 2015.

[3] "The Logic of Social Systems: A Unified Deductive System Based Approach", Alfred Kuhn, 1974.

OPTIMISE MAGAZINE

OptimiSE magazine, SyntheSys Technologies' biannual publication is aimed at members of the engineering, systems and software development community. The magazine shares best practices and technical insight and gives us a platform to share company news.

This informative magazine presents a collection of articles about systems and software and we hope that you, our colleagues and customers throughout the community, will find it both interesting and useful. Also includes training information, training schedule and free resources.

1


2


3


4


5


6


7


8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9


10


11


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Follow us on LinkedIn to see useful content and interesting updates from our SyntheSys Technologies group, such as best practices in engineering life cycle management, requirements management, and verification and validation.

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