SYNTHESYS SYSTEMS ENGINEERS

GROUP CAPABILITY BROCHURE



INDEPENDENCE | INNOVATION | INTEGRITY









Foreword

Together, we chart a course for a better tomorrow, where innovation and compassion go hand in hand to craft a brighter future for generations to come.

It's with great pleasure that I introduce you to our Group Capability Brochure. In today's dynamic and ever-evolving landscape, the quest for knowledge and advancement knows no bounds. The pages that unfold before you encapsulate the tireless efforts of a dedicated team, fuelled by passion and driven by a shared vision.

Innovation is the heartbeat of our organisation, and we are committed to fostering a culture that empowers individuals to dream big and think boldly. Our values of independence, innovation and integrity are the cornerstones that guide us.

Within these pages, we share not only our capabilities and achievements but also the stories of those who have contributed their expertise and creativity to our shared vision. It is through their dedication and collaboration that we have witnessed the birth of groundbreaking ideas.

Beyond the innovations, it is our people who truly define us. We are a team of diverse minds and perspectives, bound together by a shared desire to make a difference. This brochure celebrates that spirit of collaboration and our commitment to fostering an inclusive environment that nurtures talent, empowers minds, and promotes the growth of individuals and communities alike.

I extend my deepest gratitude to all those who have supported SyntheSys over the years – the brilliant minds of our employees, customers, suppliers, stakeholders and the communities we serve. Together, we chart a course for a better tomorrow, where innovation and compassion go hand in hand to craft a brighter future for generations to come.

With Very Best Regards,

John S Hartas

Issue 1



Systems Engineering Specialists

In the dynamic and ever-evolving landscape of the modern world, systems engineering stands tall as a beacon illuminating the path to the future. With its holistic and interdisciplinary approach, systems engineering provides a framework that not only comprehends but also optimises complex systems.

As technology becomes increasingly integrated into every aspect of our lives, from transportation and communication to healthcare and environmental sustainability, the demand for comprehensive, efficient, and adaptable solutions becomes paramount.

Systems engineering serves as the linchpin that connects diverse domains, fostering seamless collaboration and synergy among experts from various disciplines. As we confront grand challenges such as urbanisation, resource scarcity, and global interconnectedness, the transformative power of systems engineering will be indispensable in crafting innovative, sustainable, and resilient solutions for a better tomorrow.

Embracing the principles of systems engineering is not merely an option; it is the key to unlocking the full potential of human ingenuity, shaping a future where complexities are harnessed and possibilities are limitless.

It's an approach that also advocates for a Systems Thinking approach across complex industries. Systems Thinking is an understanding of how the structure of complex systems determines their large-scale behaviour. It can provide many insights into how this sort of complexity can be modelled, predicted, managed, and addressed. Thinking systematically is about drawing on the science of finding patterns in organised complexity, and the analysis of the emergent properties of a whole, rather than the specific behaviour of individual components.

Welcome the future with the assurance that SyntheSys is by your side. Our services pave the way for innovation, efficiency, and sustainable growth. Let's embark on a transformative journey together, where possibilities know no bounds. Contact us today to unlock the true potential of your engineering projects.





Group Structure

SyntheSys

Established in 1988 with a vision to revolutionise engineering practices, SyntheSys boasts a team of highly skilled engineers and experts who possess a deep understanding of diverse disciplines. Our multidisciplinary approach enables SyntheSys to tackle intricate challenges by considering the holistic nature of modern systems. SyntheSys Systems Engineers acts as parent company to organisations offering specialist engineering services as follows.

SyntheSys TECHNOLOGIES

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

SyntheSys

Offering specialist services for Tactical Data Link (TDL) development, implementation and sustainment. The Defence team provides world class TDL training, test and evaluation and interoperability management.

Our Locations



Whitby North Yorkshire, England

Unit F16 St. Hilda's Business Centre The Ropery Whitby YO22 4ET



Newcastle-Upon-Tyne Tyne and Wear, England

The Core Bath Lane Newcastle Helix Newcastle-Upon-Tyne NE4 5TF



Our People

Like any successful enterprise, our strength lies in the capabilities of our people. Our consultants and engineers are selected for their track record in their areas of expertise. Consistently achieved excellent results means that the workforce is characterised by long service and very low staff turnover. Our people are what define us as a company. They are a mix of engineers, former armed forces and industrial personnel carefully selected for their experience and capabilities. We lead the field for independent consultancy support, systems development, and integration in our markets.

We are interested in talking to individuals with strong engineering, systems engineering, tactical data link or business development expertise. To talk to us about opportunities in our organisation, contact: recruitment@synthesys.co.uk

The Leadership Team



John Hartas Director

John's career began with designing and developing high performance, real-time, industrial control systems and software. In 1988 Dr Hartas set up SyntheSys to provide information systems products and services to government and industry markets. For John's full profile visit: https://www.synthesys.co.uk/our-people.html#j-hartas



Jacqui Readman Managing Director | SyntheSys Systems Engineers Ltd

Jacqui has an extensive wealth of knowledge in business leadership, leading operations and running a data-focused business for more than two decades. Jacqui leads SyntheSys Systems Engineers' group operation and is responsible for contracts, quality, environmental, data and HR management. For Jacqui's full profile, visit: https://www.synthesys.co.uk/our-people.html#j-readman



Mark Williamson Managing Director | SyntheSys Technologies

Mark leads SyntheSys Technologies and is responsible for the delivery and support of IBM® Engineering Lifecycle Management solutions and associated services. Mark has extensive knowledge in systems engineering following a distinguished career in both ground-breaking civilian and military engineering roles. For Mark's full profile, visit: https://www.synthesys.co.uk/our-people.html#m-williamson



Mark Hudspeth Managing Director | SyntheSys Defence

Mark Hudspeth leads SyntheSys Defence and has an abundance of technical engineering experience. Specialising in Tactical Data Links since 1993. Mark's work focuses largely on distributed test and trials engineering. For Mark's full profile, visit: https://www.synthesys.co.uk/our-people.html#m-hudspeth

To read professional profiles for the wider team, visit: https://www.synthesys.co.uk/our-people.html



Common Threads Across Industry

Whilst it's critical to recognise the unique challenges faced by many high-growth industries, it's also clear to us that there is a common thread emerging, and it's within these common threads that systems engineering has most impact.

Systems engineering is a multidisciplinary approach that focuses on designing and managing complex systems throughout their life cycle to achieve specific objectives efficiently and effectively. It can help address various challenges in different industries, but the specific issues and potential solutions may vary significantly.



Complexity Management

Industries dealing with complex systems or projects can benefit from systems engineering to better understand, model, and manage the intricate interactions and dependencies.

Requirements Engineering

Clarifying and managing requirements is crucial for any industry, and systems engineering provides tools and processes for eliciting, analysing, and managing requirements to ensure they are met.

Risk Management

Systems engineering can help identify potential risks in projects and systems early on, allowing for risk mitigation strategies to be put in place.

Integration Challenges

Many industries face integration issues when combining various components or subsystems into a cohesive and functional system. Systems engineering can help with designing and managing the integration process.

Life Cycle Management

From conceptualisation to disposal, systems engineering helps ensure that the entire life cycle of a product or project is considered, leading to more sustainable and cost-effective outcomes.

Optimisation and Trade-off Analysis

Systems engineering methodologies aid in making informed decisions when faced with multiple options, balancing trade-offs, and optimising system performance.

Stakeholder Management

Engaging and managing stakeholders effectively is crucial in any industry, and systems engineering can provide tools for communication and alignment.

Verification and Validation

Ensuring that the system meets its intended requirements and functions is a universal challenge across industries. Systems engineering offers methods to address this.

Interdisciplinary Collaboration

Industries that involve multiple disciplines can benefit from systems engineering's collaborative and integrative approach.









Combined Group Capability

Our services address the common challenges experienced across specialist engineering sectors. These services involve the integration of various components, technologies, and processes to achieve seamless functionality, reliability, and performance. No matter the specialist application, our services encompass:

Systems Architecture Design

Lay the foundation for success with our expertly crafted systems architecture. We map out the blueprint that ensures every component of your project works harmoniously, eliminating bottlenecks and fostering scalability.

Requirements Analysis

We delve deep into your project's objectives to identify and prioritise requirements, ensuring that your solution aligns precisely with your stakeholders' needs.

Integration & Interoperability

Seamlessly connect disparate systems and technologies with our integration expertise. We bridge gaps and ensure smooth data flow, reducing friction and enhancing collaboration.

Risk Assessment & Mitigation

With a keen eye for potential pitfalls, we proactively identify and mitigate risks to safeguard your project's success. Our approach minimises unforeseen challenges, saving you time and resources.

Testing, Evaluation & Validation

Ensure the reliability and quality of your systems with our meticulous testing and validation services. We leave no stone unturned, so you can deploy with confidence.

Continuous Improvement

We believe in long-term success. Our commitment doesn't end with the completion of the project; we stand by you, continuously improving and optimising your systems to stay ahead of the curve.

Engineering Development Tools

We supply leading engineering development tools which offer robust and powerful functions to automate, accelerate, improve and adapt engineering programmes. We offer unrivalled specialist test, evaluation, interoperability and simulation tools for Tactical Data Link (TDL) sustainment.

Training & Enablement

We upskill teams with knowledge development in areas such as Systems Engineering, INCOSE Systems Engineering Professional Certification training, Tactical Data Link Training, software development, project management, communication security, signals, propagation, and processing.



Meeting Sector Demands



Aerospace & Defence

With over 30 years' experience operating in the aerospace and defence sectors, we have facilitated improved organisational advice through our specialist Tactical Data Link (TDL) and broader Systems Engineering services. Our specialist TDL services include Multi-domain platform integration, military systems engineering, requirements capture, interoperability management, model-based systems engineering and operator mission stories.



Rail

Rail systems with greater capabilities means more effort for those who work to keep the network up-and-running. These challenges are only going to get harder as the years go by, and rail suppliers that can't adapt will face an uncertain future. Our services provide our rail Customers with affordable systems engineering services, tools and training to increase their efficiency and effectiveness in delivering solutions to their Customers.



Energy

The Energy industry faces huge challenges in terms of its shift towards sustainability. We have worked with Energy Customers to transform requirements management processes, and continue to supply leading systems engineering tools. We can offer expertise around Model-Based Systems Engineering and simulation services, which allow our Energy Customers to understand the behaviour of new systems and technologies.



Automotive

As the systems developed by the automotive industry grow ever smarter and more complex, many manufacturers have turned to systems engineering to ensure they keep enhancing the value of their products in a more technically demanding market. With some of the leading automotive players forming our Customer base, we provide training, tools, and systems engineering services to power the platforms and vehicles of tomorrow.



Process

Systems engineering is highly valuable in process industries, which encompass a variety of sectors, including chemical, petrochemical, pharmaceutical, oil & gas, food & beverage, and so forth. All have complex systems. Systems engineering can optimise the processes and SyntheSys delivers highly-praised bespoke solutions, necessary to meet the increasing demand and regulatory requirements within these sectors.



Infrastructure

Systems engineering plays a crucial role in infrastructure projects where it helps in the planning, design, implementation, and management of large-scale systems. Infrastructure systems can be incredibly complex, involving multiple components, stakeholders, and interdependencies. Our Customer base boasts some of the world's biggest and best engineering organisations.



Operating Philosophy



For over 30 years, SyntheSys' story has been about Customer-focus and independence. We aim to provide dependable services that offer value-for-money and contribute to our Customers' overall success. Our independence enables us to deliver solutions which are free of constraints allowing innovation to be at the heart of our services.

This focus on innovation allows us to deliver best value, high quality solutions which are built on a deep level of expertise and integrity. We do all of this with a sense of social value, where we respect and support the communities in which we operate.

Independence	Independence means that we can give our Customers advice free of the constraints that might be brought about by relationships with other organisations.
Integrity	Integrity, even if this compromises our immediate commercial gains.
Innovation	Innovation means that we invest in innovation and developing new ideas.
Customer-focus	Customer-focus is concerned with providing services that offer value-for-money, are dependable, and can be relied upon to give the Customers what they want.
Expertise	Expertise means that we employ the best people.
Social Value	We are committed to creating positive social value by actively contributing to the well-being and development of our community and beyond. We pledge to engage in actions that promote inclusivity, equality, and environmental sustainability, to help maintain thriving communities.



Customer Service Commitment



Our Customer service commitment, along with continuing professional development of our employees, ensures that Customers are the centre of our business. We have excellent relationships with our Customers, clearly evidenced by exceptionally high levels of feedback in our Customer satisfaction rates. Our commitment to Customer service ensures that our Customer satisfaction remains unrivalled. Our ability to understand our Customers' needs and provide a service which is unique to them ensures we are recognised for the highest level of Customer service available from any provider in our chosen market.

OUR CUSTOMER SERVICE COMMITMENT PROMISES:



RESPONSIVENESS

We will provide an initial response to our Customers within 1 working day of any query or enquiry. A full response will be provided within a timescale agreed with the Customer.



DEPENDABILITY

Our Customers can rely on us to deliver the product they want, when they want it. We aim to get the product right first time.



VALUE FOR MONEY

Our services give our Customers best value by implementing efficient and effective work practices.



Customer Stories

Transport for London (TfL) Heads for the Clouds



Making Requirements a Priority with Tool-Supported Engineering. The complex nature of TfL's major projects means that robust requirements management is essential to success. 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 read the full story, visit:

https://resources.synthesys.co.uk/technologies/customer-succ ess-stories/transport-for-london-heads-for-clouds.pdf

SyntheSys Adds Value to Swedish Defence Materiel Administration (FMV) with Test Support

The Swedish Defence Materiel Administration, FMV, is constantly investigating different ways to exploit existing products as well as developing new, innovative solutions. FMV has a collaborative approach to its projects which has given SyntheSys the opportunity to support various test programmes. An initial collaboration saw SyntheSys represent FMV at the Tactical Data Link Capability Team Interoperability Test Syndicate (TDL CaT ITS) with a view to test participation with their Airborne Surveillance and Control (ASC) 890 platform.

To read the full story visit: https://resources.synthesys.co.uk/defence/fmv-test-support.pdf





Technology Partners

Gold Business Partner IBM.



SAIC [№]

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Industrial Memberships & Accreditations



We are constantly looking for opportunities for collaboration with other organisations. If you believe there may be synergies between your business and ours, we would like to hear from you. Contact our team via: info@synthesys.co.uk



Social Value

We have several initiatives in place which are aimed at supporting the communities in which we operate.



STEM OUTREACH

Most notable are the Science, Technology, Engineering and Mathematics (STEM) initiatives we have developed.

Currently, SyntheSys has six active STEM ambassadors, all of whom volunteer time to inspire young people to progress further in STEM subjects. These voluntary roles involve a range of activities from mentoring, career talks and other community activity.

We believe that inspiring young talent to engage with STEM disciplines is vital in ensuring that high-growth markets secure the right skills and competencies to drive future innovation. These fields are the key building blocks to securing Britain's future economy, whilst maintaining influence in global markets.



ARMED FORCES COVENANT

We are also proud to have committed to the Armed Forces Covenant with the United Kingdom Ministry of Defence, which is a commitment between the armed forces community, the nation and the government.

The Covenant encapsulates the moral obligation to ensure that those who serve or have served in the forces, and their families, are treated fairly. SyntheSys provides direct support to military veterans employed within the company and provides wider benefits to military personnel through free on-line training and training portals.

We are constantly looking for opportunities to engage with this important community.



LOCAL COMMUNITY INITIATIVES

We recently made a donation to the Hawsker and Fylingdales Primary School libraries.

Fylingdales School, which is part of the Heritage Coast Foundation along with Hawsker-cum-Stainsacre School, was hit by a flood, which closed the school for eight months in 2022.

Following this flooding, which destroyed the majority of library stocks, SyntheSys donated £1,000 to Hawsker and Fylingdales Primary School Libraries to support the literacy development of pupils.



Social Value

As an environmentally conscious organisation, we are committed to minimising the impact of our activities on the environment. The Company takes every possible step to adopt energy-saving and recycling principles where achievable. The key points to our strategy are:

Continuously improve our environmental performance;

Reduce consumption of natural resources and improve the efficient use of those resources;

Manage waste generated from our business operations, according to the principles of reduction, re-use and recycling;

Ensure environmental and climate change criteria are considered in the procurement and provision of goods and services;

To promote environmental awareness among our Employees and encourage them to work in an environmentally responsible manner; Purchase recycled, recyclable and environmentally responsible items, where these are available, economical and suitable;

Assess and act to reduce the carbon footprint

of our business activities to meet our objectives

Comply with all relevant environmental legislation as well as other environmental requirements to which the Company subscribes, and to work towards ISO 14001:2015 accreditation;

Action regular reviews and monitoring of environmental performance to ensure environmental objectives and targets, as described, are always maintained.



Achieving net-zero emissions is a complex and multifaceted challenge that requires collaboration among various stakeholders, innovation in technology and policy, and a deep understanding of interconnected systems. Systems engineering provides a structured approach to navigate this challenge supporting the creation of a sustainable and low-carbon future.

Supporting net-zero emission targets through systems engineering involves designing and managing complex interconnected systems to minimise greenhouse gas emissions and balance them with removal or offset measures. This requires an integrated approach that encompasses various sectors and stakeholders, including energy production, transportation, industry, agriculture, and more.

We advise our customers, including governments, supply chains, private enterprise and industrial clusters, on how to best utilise systems engineering to meet ambitious Net Zero goals. In addition, we provide the tools and technologies to facilitate best-practice systems engineering to help achieve this.





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