

I Am a Systems Engineer and I Do...

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Why did you choose to be a Systems Engineer?

I didn't! It chose me! I started my working life as a graduate developing software for Flight simulators in the Defence Industry. I had a career choice limited to either a hardware or software engineer, and so I chose software as it seemed to be progressive at the time. I soon found out that the software was a minor, albeit complex, pervasive distributed entity of the system.

Next I moved into Avionics Ground Based Testing for Military Aircraft and then into Systems Process Research & Development, where we undertook research activities across the Avionics systems development life-cycle, looking into various enhancements such as animation and automation.

After this, I took up a position as a Programme Systems Level Engineer, working at Lockheed Martin, on the Air-System and Air-Vehicle Prognostics and Health Management System of the F35 Programme. This experience combined with my Advanced Systems Engineering degree course piqued and focused my interest into the whole systems development life-cycle.

I now realise that my initial work experience combined with my undergraduate degree, set me on a path towards 'whole systems thinking', thus I have evolved as a Systems Engineer. Lately, my thinking has progressed further into Large Scale Integrated Systems, System of Systems and Enterprise Systems Engineering domains.

What education/qualifications do you have for Systems Engineering?

On reflection, when I look back at my education and work experience, I realised that the first time I came across the words 'Architecture', 'Requirements' and 'Life-cycle' was many years after university! This realisation, combined with the launch of the INCOSE Academic Group (Schools Thread), motivated me to volunteer for this activity.

Though I had a minor role, I was eager to suggest that if we managed to introduce these familiar engineering words into the school curriculum (via such mechanisms as STEM net, for example) then that would be a big win!

I graduated with a degree in Controls Systems and Computer Science and then much later gained an Advanced Systems Engineering Diploma. Once I was confirmed as a 'systems thinker' then this, combined with my F35 Programme Systems Engineering experience, lead me to formalise my experience further and so I undertook INCOSE certification for the Certified Systems Engineering Professional (CSEP). I have been certified since 2010 and soon after that, I was selected to become an INCOSE Certification Application Reviewer (CAR), for which I was awarded an INCOSE Outstanding Service Award, in 2015 for improvements to the UK CSEP Review process.

What is it about Systems Engineering that you find so compelling?

In one word 'Complexity!' In my view the current state and thinking around Systems Engineering, is crudely similar to the state of the science of Chemistry prior to the discovery of the periodic table!

My current personal interest is focused on Large Scale Integrated Systems and Enterprise Systems Engineering, and this has been enforced by my direct engagement with the Single European Sky Air Traffic Management Research (SESAR) Modernization Programme. This programme is truly an Enterprise! To this end, I gave a presentation to the INCOSE UK Enterprise Systems Engineering Interest Group in 2014 - 'The SESAR Enterprise (An overview and observations of SESAR in the context of Enterprise Systems Engineering and Systems of Systems Engineering).

In my view future systems development life-cycle activities will require new Systems Engineering thinking, techniques and methods (e.g. bottom-up vs middle-out vs top-down approaches) to address international collaborations and the subsequent and significant complexity issues and emergent development behaviours related to these Enterprises that are impacted by Geo-political issues

What advice would you give a Systems Engineer just starting out in their career?

My observation is that whole systems thinking, expands your horizons across many domains that you may not have realised existed, and that you uncover relationships between topics and activities that on first inspection, were not obvious!

In my opinion, for the future we will need people who are multi-faceted and have a broad spectrum of interest in many topics and like to explore these relationships. Future systems are increasing in complexity at a pace, and when combined with the Geo-political ramifications required for the development of Large Scale Integrated Systems E.g. systems to address climate change or a mission to Mars, these will require Systems Development capabilities and skills that will require an understanding of e.g. Economics and Natural systems, to name just two.

So my advice is when looking towards the future, while developing your SE skills and capabilities, think of future proofing your business and building resilience by trying to understand these unlikely relationships and if you get the time, try to learn another language.

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