I Am a Systems Engineer and I Do...
Vicky Anderson

Why did you choose to be a Systems Engineer?

Systems engineering wasn't something I initially set out to do – at the start of my career I didn't even know that it was a job! I started life as an Electronic Engineer in the digital domain dealing predominately with 1's and 0's, so very detail orientated. As time went on, I became more and more interested in how my component fitted into the wider picture and what needed to happen to ensure that the system was successful. I ended up working a lot more on the integration and test portion, looking at how to verify requirements and managing the impact of change. This started to elevate my viewpoint from a micro level to a macro level and through these changed interactions I started working more closely with System Engineers which helped me realise that perhaps this was a career avenue I wanted to explore. When the opportunity arose to make a formal move across to a systems engineering role I took it and haven't looked back since!

What education/qualifications do you have for Systems Engineering?

Even though systems engineering wasn't something I was aware of when selecting my degree, I probably would have still started with my MEng degree in Electronics with Space Science and Technology as, at the time, I saw myself ultimately working as an Electronic Engineer. As time went on and I started to see the broader scope and wider picture of engineering in industry, I sought out opportunities to expand my knowledge base outside of the pure electronic engineering domain. For example, I was lucky enough to have an employer during my graduate years who was willing to let me "try out" different sections of the company (both technical and non-technical) which gave me a good appreciation of some of the other aspects which impact engineering beyond just trying to develop the "best" technical solution.

Once I had identified systems engineering as the area I was interested in, this allowed me to track down relevant internal opportunities, developing a more "formal" base in systems engineering; up until this point everything had been "on the job" learning and doing what I thought was sensible! These additional opportunities included undertaking a Post Graduate Diploma in Systems Engineering for Defence Capability at Cranfield University (Shrivenham), participating in book club sessions on the INCOSE Systems Engineering Handbook and MBSE lunch and learn sessions. These all helped to formalised the experience I had and gave me more confidence in my abilities and what I was doing.

I am looking to now consolidate my experience and pursue formal recognition for my skill set, through chartership and CSEP.

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

I chose to pursue engineering as I like to solve problems, leading to a tangible solution at the end. I also like getting to see the whole of the project, how the customer needs lead through to the end product and exploring how the different aspects interconnect. Systems engineering gives me the toolset to achieve this goal. I have a transferable skill set which has afforded me the opportunities to work on a wide variety of projects and systems, during different phases. For me, this variety is great, I love the fact that I can tackle different problems and it makes every day a bit different…keeps me from getting bored!

I like the fact that the work can span from looking at the customer needs and the context within which they sit, through to looking at how the system that is developed meets those needs and how it goes together. Unpicking what the customer thinks they want versus what they actually need is an interesting and challenging activity – it draws on having engineering experience but also softer skills to be able to guide and question where needed. I tend to think of my role sometimes as being a facilitator – I don't necessarily need to be the technical expert in the domain but I do need to know how to bring the right people together and guide the thinking and discussions to help generate an appropriate solution.

I have been very fortunate to work in technical domains that I find personally very interesting; currently I work in the space sector and am getting to apply what I have learnt over my career in terms of systems engineering to a variety of different projects and customers. Space has some unique challenges that may not exist in other domains, for

example, maintainability is interesting when the object in question is several hundred kilometres up! This has challenged my problem solving abilities and allowed me to exercise a lot of what I have learnt.

One of the biggest challenges I have faced to date in my systems engineering career is being presented with a blank whiteboard, a set of coloured pens and an edict to facilitate the generation of a truly blank sheet design for a new Open Source Satellite. Aside from the problem solving element that accompanies this, I am enjoying connecting with Systems Engineers across disciplines and companies. The system engineering community is great, it is filled with people who are truly interested in problem solving and full of passion for their subject. This has helped drive me and fuelled my ongoing desire to continue my system engineering journey.

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

Give it a go! You don't need to be the technical expert in whatever the area is; I feel you need the ability to bring people together, listen to what they are saying and consider things from different perspectives. Having an appreciation of what you don't know is also helpful so that you know when to seek appropriate advice. Being interested in the bigger picture helps, but also being able to appreciate the detail and the impact that decisions can have on lower level items is also useful skill.

Try things out! Find projects to get involved in. Early in my career I was given the opportunity to do a training project around my day job, where a group of scientists and engineers were brought together to solve a specific issue. This provided a safe place to try out some of the different system engineering skills and tools in something that emulated a real world issue.

Don't forget the non-technical aspects! I think it is important to try and get some breadth outside of the technical arenas. Business constraints can have a surprising impact on the technical solution, so having a greater appreciation of the context within which your work sits and what other external influences might be helps improve the quality of your work and ultimately the solution.

Build yourself a community! Systems engineering is a broad area which spans everything from the generation of concepts through to the ultimate disposal of the system. There are going to be aspects that you don't have experience in or haven't done before – but there are a wealth of people out there who have. I think it is important to learn from your own mistakes, but I don't think we always need to be reinventing the wheel. Utilising the experience of others can help round out your own system engineering abilities.