

I Am a Systems Engineer and I Do...

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Why did you choose to be a Systems Engineer?



I have always been a key problem solver but more than finding any solution, I always searched for the right solution. Within my unorthodox background, I have been lucky enough to experience everything from physics to geography to engineering. This showcased the necessity of addressing a problem from different viewpoints and how one stakeholder might pose importance on one thing when compared with another stakeholder. For instance, you may go on holiday to the same destination as your friends but for different reasons or different things you want to see and explore. I was looking for complex challenges that have real world implications, something where I could get my hands dirty and systems engineering perfectly fitted those requirements. Systems Engineering in its bare essence is this, you must assess whether the system in its entirety can do the job it's supposed to do while keeping everyone involved happy and to budget & time. I chose to be a Systems Engineer because

it allows me to work throughout the full product lifecycle and collaborate with experts in different departments to understand the complete product from its initial design all the way to retirement and decommissioning.

What education/qualifications do you have for Systems Engineering?

I have always followed my curiosity as I believe whatever I find interesting will lead me to my passion. I started at the University of Glasgow, United Kingdom where I completed a BSc. Hon. In Physics with Astrophysics. Following on from this I wanted to gain experience in something more practical and less of theories. This led me to undertake a MSc. in Power Systems at the Punjab Technical University, India with a placement at the Massachusetts Institute of Technology, USA. From this I realised I had no experience in actual hands-on work and decided to undertake a Ph.D. in Civil & Environmental Engineering (Secondary: Mechanical) at the University of Strathclyde. My Ph.D. was funded by the Engineering and Physical Sciences Research Council with a travel scholarship from the European Space Agency. At this point in my journey, I was hitting brick walls while writing up my doctorate thesis – in order to overcome this challenge, I decided to take on a full-time Pg. Dip. In Geospatial and Mapping Sciences at the University of Glasgow. This was one of the hardest things to manage in my life, not only was it time demanding but to self-motivate myself to complete my Pg. Dip. deadlines whilst writing up chapters of my doctorate thesis. After developing a love for coffee, I successfully completed both the Pg. Dip. and the Ph.D. Alongside my academic journey, I have always been keen in volunteering and development roles, not only to learn and give back to the community but to meet new people. I have been student representatives throughout every degree, actively help in a soup kitchen for the homeless and have worked in numerous international collaborations such as the Space Generation Advisory Council on behalf of the United Nations. I have been lucky enough to work in numerous careers such as a structural engineer for NASA, Research Associate for the Oil & Gas Innovation Centre, Junior Lecturer at the University of Strathclyde and a Student Mentor for the University of Strathclyde Disability Services.

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

My philosophy for work is derived from an ancient Sanskrit quote, which is roughly translated to be “where a smart person stops thinking, a genius starts thinking...”. So, where you might think the story ends, maybe it's just the start to the sequel? I love to think of all the perspectives/solutions available to any one problem and seeing how different things are connected. Maybe this stems from my childhood of watching action thriller movies, but I look to find how different things are connected, dependant and influenced. Systems Engineering falls perfectly within this, not only do you have to think about the solution, but you must think about how that solution links into the bigger picture, what are the adverse effects currently and in the future? People always say that “Systems Engineering is common sense” and the general reply is, “if it is common sense then everyone would do it!”. However, I believe a better answer is that understanding “common sense” changes drastically depending on who you are talking to, the environment you're in and the culture surrounding you. For instance, haggling in India for grocery shopping is common sense while I doubt people would get very far if they attempted to haggle in their local supermarket. Systems Engineering allows me to

push my boundaries, work in areas uncommon to me and really help me develop my skill-set not only within engineering but within all aspects of an engineering project including but not limited to finance, logistics and management.

Looking more widely, I am sure SE has the potential to assist in the challenges we face today, at a number of scales. To make that happen, I think the leaders and members have to be realistic about what they can and can't do with the current state of knowledge, while setting ambitious targets for effecting change. SE is not complete, but it's much the best toolkit we have, and will surely change again as a result of being used on new problems. Closing the gap will almost certainly involve working with other professions - for example social scientists and schools of management, even politics - while not leaving behind INCOSE's traditional base in built systems.

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

I would advise younger system engineers to not worry about their lack of knowledge but volunteer themselves to increase their experience and knowledge base. This can be done via the INCOSE UK Early Careers Forum, development tutorials and/or workshops with their host organisation or third-party participation. Remember developing your skill-set isn't just about the work you do professionally but if you have ever organised a birthday party or holiday, you have showcased traits of project management, budgeting and logistics. Therefore, you are already developing a skill-set and probably have underlying knowledge without even knowing it. I would encourage young system engineers to ask questions, even if you feel uncomfortable or think it's stupid, chances are someone else is probably in the same shoes or has been in those shoes thinking it.