

I Am a Systems Engineer and I Do...

Anabel Fraga



Why did you choose to be a Systems Engineer?

I discovered Systems Engineering while studying in the fourth year at University; my Systems and Information Engineering professor gave his students several concepts and ideas about the field. I found it so interesting that I took the second part of that course! It was my first contact with Systems Engineering and System Thinking. After years of working in other specific fields, in 2011 I started again to have contact with Systems Engineering and participated in INCOSE's International Workshop. It was then when I became more involved with the community, and I discovered that I am a systems engineer by heart, reminding me of all the lessons one professor gave me a long time ago.

And so the journey began...

I am the Deputy Associate Director of Technical Review at INCOSE, where I help with the technical review protocols and processes for events and technical products. I am a Cohort 6 inducted member of the INCOSE Technical Leadership Institute; after the two-year learning program to acquire the skills and awareness of leadership in a joint journey with worldwide colleagues (2020-2022). I am also the current president of the INCOSE Chapter of Spain, the INCOSE Technical Program Committee co-chair of the IS2023 event, the INCOSE Technical Program Committee chair of the IS2024 event, the INCOSE EMEA (Europe, Middle East, and Africa) WS 2021 Event Chair, the INCOSE EMEA WSEC 2023 Event Chair, the INCOSE EMEA Associate Director of Events, and the INCOSE EMEA EWLSE (Empowering Women Leaders in Systems Engineering) and DEI (Diversity, Equity, and Inclusion) lead. As the EWLSE and DEI lead, I am working in EMEA, with the support of the INCOSE EMEA Director, to create a mentoring program for young women engineers to guide them in their professions. I want to empower women to achieve their full potential in careers as engineers and leaders, expanding the image of the engineering and technology professions as a positive force in improving quality of life and demonstrating the value of diversity and inclusion.

As you can see, I am an active member of INCOSE, leading the Systems Engineering chapter in Spain (AEIS), consolidating the roles of the chapter and increasing the visibility of Systems Engineering. I have created new partnerships and attracted new organisations and academia to the chapter's CAB (Corporate Advisory Board), increasing it to more than double the size and starting annual meetings between the chapter board and the CAB members to align academia, industry, and the chapter on Systems Engineering initiatives in Spain. I aligned with this collaboration environment and joined efforts to create a partnership with the Spanish Women in Technology Association to start potential projects to help the STEAM initiatives in elementary schools. It allows me to spread kindness in the community as the extra value I want to give to society.

What education/qualifications do you have for Systems Engineering?

I am a Computer and systems engineer with extensive experience in both the private and public sectors and academia, specializing in Semantics and Interoperability through my involvement in research projects. With a formal education in Computer Science, Networks, eCommerce, Technical Leadership, Technology, and Information Science, I have honed my skills in analytics, engineering fundamentals, abstraction, and systems thinking. I earned an MSc. in e-Commerce and Networks, a Diploma of Advanced Studies, and a Ph.D. in Computer Science and Information Systems from the highly regarded Universidad Carlos III de Madrid, where I currently teach and have guided numerous students through their academic pursuits.

As a certified ITIL and ISO20000 professional, I have conducted training on both topics for various companies and am also certified in ININ (Interactive Intelligence) and ISO/IEC/IEEE 15288. With over 23 years of experience, I am a creative, goal-oriented team player who advocates for teamwork and has led numerous projects to successful outcomes in academia and industry.

I have authored over 100 publications in journals and conferences, reviewed EU COST proposals, served as Event Chair or Technical Program Committee Chair for over nine events, and guided more than 100 students through their bachelor's and master's final projects, as well as four Ph.D. theses presented with honor awards. As an educator, I

have taught over 1,800 students, including neurodivergent students, inspiring them to achieve excellence by adapting resources, expanding knowledge, and developing hard and soft skills while creating a comfortable environment for learning and working.

I am intrigued by cultures and interactions and have lived in multiple countries, fluent in Spanish and English, with a desire to improve my Portuguese, Italian, Swedish, and German communication skills.

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

Being an engineer means being a problem solver! In my career, I learned that hard and soft skills are a must. With soft skills, the systems engineer can be a problem solver that listens, has a system-thinking mind, the ability to think creativity and abstractly and to be able to understand the whole and the parts. They must be able to facilitate in a complex environment to create the best solution as possible following well-established processes that helps to lead the evolution of a system in its lifecycle.

Suppose you decide to be a systems engineer. In that case, you will need to be able to recognize solutions based on diverse viewpoints, help colleagues speak the same language, and even guide them to give you the right requirements. A systems engineer is a socio-technical complex puzzle solver! Always tailoring and in continuous learning, able to create patterns, inspire solutions, and lead the holistic and global vision of the organization, the project, or the product.

I enjoy learning new things daily, getting to know people, helping systems get created or evolve, mentoring people, and all the multidisciplinary aspects of Systems Engineering.

Being a systems engineer is a way to think and live; once you know it, you love it!

What advice would you give a systems engineer just starting out in their career?

My passion for engineering and innovation is evident. I want to influence women and men to progress in their careers with a high impact and humanity, showing that teamwork is essential to achieve the goals of every organization, project, or team. Through my participation in INCOSE and other councils, I motivate women and men to choose engineering as a profession and contribute to society through technological advances to build a better world for all of us and future generations. Incorporating diversity, equality, and inclusion is a reality nowadays, which I fight for in all my multifaceted positions.

Saying that, I advise young systems engineers to work hard, have an open mind, be active listeners, consider themselves as a facilitator, and embrace equality because it will help them create a better team and achieve better results in their Systems Engineering career! Also, remember to improve your soft skills and be aware of your potential!