Vision and Bio: CIO, INCOSE

Barclay R. Brown, Ph.D., ESEP

Vision for INCOSE Information Technology

Before changing my focus to systems engineering and MBSE about 17 years ago, my career was focused on leading and architecting software development projects. To recall a formative example, around Christmas time in 1999 I was not partying like it was that year, but was instead preparing to fly to London to try to rescue a large, troubled software project that my employer, a worldwide developer of then-cutting-edge web and e-commerce solutions, had undertaken for a startup company. The source of the trouble was a lack of clear focus on the requirements, functionality, and capabilities of the new web site, which was intended to be a kind of eBay for industrial equipment. To rescue the project, I applied an object-oriented software development method, using what came to be known as the Rational Unified Process, including the use of use cases, architectural diagrams, and descriptive system modeling in UML. Applying these methods, the precursors to current MBSE methods using SysML, enabled us to recover the project and execute successfully.

As the new director of project management for the company, my next mission was to recover a $5m web site development project, and I used similar methods to similar effect. A key element of my vision for INCOSE IT is that we apply what we know from systems engineering and MBSE to our IT systems and projects. IT is often treated as a utility, like water or power, and as users we expect it simply to be there when we need it. But behind IT (and behind water and power for that matter) are systems, and systems can be understood, developed, and managed using systems engineering and systems thinking. No systems engineer imagines that the right way to build a new power plant is to jot down a few vague ideas about what we need and then call in a crew to start digging, pouring concrete and purchasing equipment.

The world of IT moves and changes rapidly, and INCOSE must also move and change to be the most effective. IT should lead in this area, and challenge the organization to increasing levels of automation, efficiency, and communication. Every function within INCOSE can be improved by the application of current IT technologies. In 2020, as I became the INCOSE Assistant Director for Online Collaboration, I immediately pushed for the acquisition of Zoom as the primary technology for live online communication. The push came at a time when headlines were accusing Zoom of security issues, problematic information routing and storage of information, and many other sensationalistic issues. We persevered, evaluating such claims on their own detailed technical merits. As Zoom is increasingly adopted worldwide, and was used successfully to deliver the INCOSE IS2020 online, this choice has been confirmed. INCOSE stands to save thousands of dollars each month in communication costs, while achieving high quality worldwide audio and video communication through the use of Zoom.

At the same time, we began a push for the implementation of Microsoft Teams, implemented on an enterprise cloud-based platform as part of Microsoft 365 (formerly Office 365). This choice too has been validated as Microsoft is now positioning Teams as the replacement for Skype for Business, used by many major corporations and organizations worldwide. Out intent is to continue to leverage the latest Microsoft enterprise-level technology for INCOSE communication and collaboration.
In addition to the fast adoption of effective new tools and systems to enhance INCOSE’s ability to carry out its mission, my intent is to focus on quality in all of our digital communication and online web presence. As systems engineers and systems thinkers, we should be able to see how our IT systems function as parts of the larger INCOSE system, analyze communication paths, and optimize the overall system’s performance. Compared to the world of online communication and collaboration, and even compared to some other engineering societies, we have some overdue needs in the areas of web site navigation, online discussions, audio/video blogs/vlogs/podcasts, and even reliable email communication.

As a final note, I do recognize that in INCOSE our membership skew to, shall we say, pre-millennial generations, and many of us did not grow up with anything like current online technology. Even as engineers in highly technical fields, we may often be behind the times in our own knowledge and use of digital technology. Unfamiliarity and lack of knowledge may breed unwarranted fear in areas like security, privacy and perceived value. But we need not use our fear of hacking, GDPR or email spam to resist or avoid new technology. My strategy here is education—there is no substitute for learning how to handle technology safely and securely, while still achieving maximum benefit. I plan to prioritize the education of INCOSE members on the IT technologies available in the world and in INCOSE. As an example, did you know that the vast majority of headline-making hacking incidents involve social engineering—the digital version of a “con game” where hackers take advantage of users’ lack of knowledge about how security works, to dupe them into revealing passwords or installing malicious software? Is your INCOSE password the same one you use for any other website? Go change it now, please!

I’m excited about the possibilities that exist for INCOSE. I believe that systems engineers, when we are able to combine our systems knowledge with proper grounding and intuition about current and future technologies, can be key contributors to realizing a better world through a systems approach.

Bio

Barclay R. Brown is an Engineering Fellow at Raytheon Technologies, focusing on model based systems engineering and artificial intelligence. Before joining Raytheon in 2018, he was with IBM for 14 years, serving in the public sector practice of IBM Global Business Services, where he was the lead systems engineer for some of IBM’s largest development projects. He also served as the worldwide lead for the IBM systems engineering software business in the aerospace and defense industry. Prior to IBM, he managed large software development and web site projects and consulted on software development methods.

Dr. Brown has been a practitioner, consultant and speaker on systems engineering and software development methods for over 25 years. He received a bachelor’s degree in Electrical Engineering followed by master’s degrees in Psychology and Business and a Ph.D. in Industrial and Systems Engineering. He is a certified Expert Systems Engineering Professional (ESEP), Certified Systems Engineering Quality Manager, the former INCOSE Director for the Americas, and an adjunct professor at several universities.