

INCOSE Midwest Gateway Chapter 2019-Q2 Newsletter



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<https://www.incose.org/midwest-gateway/>

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2019 MGC Board of Directors

- President (2019): Kirk Kittell, Boeing Company, kirk.kittell@incose-mgc.org
- Past President (2019): John Thompson, CSEP, Boeing Company, john.thompson@incose-mgc.org
- Vice-President (2019): Rob Simons, CSEP, Boeing Company, rob.simons@incose-mgc.org
- Secretary (2019/2020): OPEN
- Treasurer (2018/2019): Lou Pape, ESEP, Boeing Company, lou.pape@incose-mgc.org
- Director (2018/2019): Adeel Khan, CSEP, Boeing Company, adeel.khan@incose-mgc.org;
- Director (2018/2019): Bob Scheurer, Boeing Company, bob.scheurer@incose-mgc.org
- Director (2019/2020): Al Garcia, CSEP, Leonardo Leonardo DRS, al.garcia@incose-mgc.org
- Director (2019/2020): Brad Sather, ASEP, bioMérieux brad.sather@incose-mgc.org

President's Message

Hello, INCOSE Midwest Gateway Members--welcome to summer 2019. Projects at work, just like the weather, have really heated up in the second quarter. All of the milestones and deliverables that were hibernating over the winter are thoroughly awake now. To you INCOSE members, especially those of you who pitch in to make the chapter and our programs run: thank you for your time and effort. There's never enough time, so thank you for sharing yours.

In the busiest times at work, I weigh the value of INCOSE membership. Is it worth the time? Is it worth the cost? It comes down to two factors for me: the people I meet, and the things I learn. It's not a sophisticated model, but it works for me. As a chapter leader, if I can tune the system to provide the best quality environment to meet other systems engineers and to improve my skills to become more effective at work, then I'm satisfied. But I don't just want it for myself--I want to make sure you're also taking advantage of the benefits, some of which are subtle to recognize but are a fulfilling complement to your career.

The simplest thing you can do is simply write to us and say, "I'd like to learn more about this or that". That gives us inspiration for new programs that we can share with everyone.

The next thing is to come out to an event to meet others and to learn. You will benefit from the experience--not just from the people on stage, but from the others you meet in the audience.

What I challenge you to do is to take the next step and help us design and implement our programs. Is there something you want to learn? We can help you invite an expert to give a talk and be responsible for creating a program around it. Is there something you want to teach? Be the expert that gives a talk. Do you have an interesting systems engineering experience or opinion or question or fear? Write about it and we'll publish it to the group. Do you want to work on your soft skills? There are smaller tasks like introducing speakers, marketing programs and events, working with venues, etc., that need your enthusiasm.

Read on for more information about what the chapter is doing and how you can get involved. With your participation, the benefits of chapter membership compound.

—Kirk Kittell, 2019 MGC President

kirk.kittell@incose-mgc.org

In the News – Q2 MGC Events

For the most up-to-date event listing, go to <http://incose-mgc.org/events>

- Aug 22: Agile in Systems Engineering, Part II - <http://incose-mgc.org/agile>
- Early Sep: Metro East Speaker Event
- Late Sep: Joint PMI/INCOSE Event
- Oct 22-25: INCOSE Great Lakes Regional Conference, Cleveland - <https://www.incose.org/glrc13>
- Oct 24: INCOSE-MGC Social Event
- Nov 7: Debrief: NDIA Systems/Mission Engineering Conference and INCOSE GLRC
- Dec 5: INCOSE-MGC Holiday Party

Membership Committee: New and Returning Members

We are pleased to announce the following new and returning members in 2019. What makes our chapter great are the experiences and diversity of our membership. Current members, please be sure to introduce yourself to them at our next Midwest Gateway Chapter event!

– John Thompson, Membership Director

New Members

- Archer, Maggie Leonardo DRS, Inc.*
- Dillon, Kevin The Boeing Company
- Henke-Reed, Mary Leonardo DRS
- Wilderman, Bridgette The Boeing Company

Note: * denotes student

Membership Renewals

- Araiza, Mike Leonardo DRS Land Systems
- Franco, Mike The Boeing Company
- Gillis, Al The Boeing Company
- Hertenstein, Jake The Boeing Company
- Ingram, Matthew Mastercard
- Khan, Adeel The Boeing Company
- Kinley, William St. Charles County, Missouri
- Kittell, Kirk The Boeing Company
- Kramer, Benjamin Missouri University of Science and Technology
- Long, Suzanna Missouri University of Science and Technology
- Mobley, Michael The Boeing Company
- Pape, Lou The Boeing Company
- Parnell, Greg University of Arkansas
- Ragon, Mark The Boeing Company
- Sather, Brad bioMerieux, Inc
- Sisson, Curtis The Boeing Company
- Specking, Eric University of Arkansas
- Thompson, John The Boeing Company

New Member Introduction – Welcome Maggie Archer, Systems Engineer, Leonardo DRS

Background

I am currently a student at Washington University in St. Louis and getting my degree in systems science and engineering. My hometown is Columbus, Ohio, but I have spent most of the past 3 years in St. Louis, Missouri.



Current Role

This summer, I am interning as a systems engineer at Leonardo DRS.

What you like about Systems Engineering

The best part about systems engineering is that it truly encompasses the big picture of engineering and allows you to dive into many different areas of a project. It is easily catered to my interests and my goals.

Why you joined INCOSE

I joined INCOSE to learn more about systems engineering in the professional world and gain a community to help foster a better, holistic understanding of the field. Now is the perfect time to join to help me prepare for my future career.

Goals

I am working towards getting my ASEP certification throughout the summer. I look forward to seeing how my membership will impact me and seeing how I can contribute!

New Member Introduction – Welcome Kevin Dillon, Systems Engineer, The Boeing Company

Background

I was raised in Plano, TX, went to college in Rolla, MO [and] graduated from Missouri University of Science and Technology in 2013 with BS degrees in Aerospace Engineering and Mechanical Engineering. I also have a MS in Systems Engineering from Southern Methodist University and have recently returned [to] Missouri in June of 2018 to work for Boeing.

Current Role

Lead Model Based Systems Engineer (MBSE) for F/A-18

What you like about Systems Engineering

I enjoy the fact that a Systems Engineer has the opportunity to know the technical aspects of multiple groups across any project/program. I also like that a Systems Engineer is involved in the development and production of the project/program for the entire life cycle. Now that I am working with the MBSE initiative, I like being on the leading edge of this innovative initiative.

Why you joined INCOSE

I joined to further develop my systems engineering skills as a professional in the real world in the areas of system architecting, MBSE and skills needed to become a Chief Systems Engineer/Architect. I'd also like to gain the systems engineering certification. Now is the right time to join because I am in a true, systems engineering role and developing a great niche with MBSE and I would like to use my current role as a launch pad for future technical and management opportunities. I believe that being a part of INCOSE now will help me build my network, knowledge and experience in a practical way that is directly applicable to my current and future desired roles.

Goals

I'm just looking forward to meeting new people and growing as a systems engineer. I'm definitely interested in participating in the systems engineering certification workshop and written examination this year.

INCOSE Midwest Gateway Chapter Sponsors Free INCOSE Written Knowledge Exam

INCOSE Midwest Gateway Chapter invites members to take the INCOSE written knowledge exam and get one step closer to INCOSE Professional Certification at the ASEP or CSEP level. Part of requirement for Certified Systems Engineering Professional (CSEP) or Associate Systems Engineering Professional (ASEP) is passing the INCOSE knowledge exam.

Three certification levels are available through INCOSE:

Associate Systems Engineering Professional (ASEP)—Applicants are required to successfully pass the INCOSE Knowledge Examination.

Certified Systems Engineering Professional (CSEP)—requires a minimum of 5 years of documentable, practical SE experience, a technical degree (additional years of SE experience can be used in lieu of a technical degree), the submission of three professional references attesting to the candidate's cumulative years of experience, and successful completion of the INCOSE Knowledge Examination.

Expert Systems Engineering Professional (ESEP)— requires a minimum of 25 years of practical SE experience, a minimum of 5 years of professional leadership credits, a technical degree (additional years of experience can be used in lieu of a technical degree), and three professional references covering at

least the most recent 10 years of experience. The ESEP award is based on an INCOSE Central panel review and approval.

Virtual Certification Workshop

Midwest Gateway chapter (MGC) of INCOSE is offering a Systems Engineering Professional review workshop in preparation for a written knowledge exam. The Certification workshop will be starting in late summer/ early Fall 2019 comprised of fifteen (15) one hour, weekly Webex reviews of the John Clark Tutorial material and INCOSE SE Handbook v4.0. Each Webex review is led by an INCOSE-certified SE. While the workshop will not teach Systems Engineering it highlights INCOSE Systems Engineering Handbook and differences amongst other implementations of Systems Engineering (e.g. DoD, NASA). The written paper Knowledge Exam is scheduled for Friday, 13 December 2019. Registration and other details of 'free' written Knowledge exam and workshop is available here:

<https://incose.ps.membersuite.com/events/ViewEvent.aspx?contextID=9725473f-0078-cc9c-6598-0b3fcd80fb70>. If you have questions, please send email to louis.e.pape-ii@boeing.com and john.p.thompson3@boeing.com

Request Volunteers MGC BOD for Chapter Elections in Fall 2019

Midwest Gateway Chapter (MGC) members are encouraged to volunteer their time, treasures and talents to improve opportunities for all. One way is to become a member of the MGC Board of Directors. Responsibilities are identified in our chapter Bylaws. Commitments are typically two years (2020 and 2021). Candidates must be an active member to be nominated and remain active membership during term of position. Candidates will need to provide a brief vision statement, their profile and photo to publish on chapter website. Elections are scheduled for November so nominees need to have vision and profile completed in Sept so they can be posted and communicated to membership. If you are interested or want to recommend some, please let us know via email to john.p.thompson3@boeing.com.

Opportunities for Members – Inputs and Volunteers Needed

If you are interested participating, you can provide impactful and valued contributions to the Chapter and its members.

- Help us **plan and execute events**.
 - Especially if you live in the Metro East, we're planning an event there in August and could use some help—please contact Rob Simons (rob.simons@incose-mgc.org) or Mike McCarthy (mike.mccarthy@incose-mgc.org).
- **Write articles and share content** for the chapter newsletter.
- Help us design a booth for the **St. Louis Air Show & STEM Expo**.

Agile in Systems Engineering

By: Matt Ingram, CSEP

On May 23, the Midwest Gateway Chapter presented a talk about Agile in Systems Engineering in collaboration with Washington University's Technology & Leadership Center. The event notice is at <http://incose-mgc.org/agile>, and a brief summary of the talk is described here.

INCOSE and Agile Systems

The INCOSE created a working group for Agile Systems and Systems Engineering. Its goal is to create a body of knowledge for systems to operate "...in environments of caprice, uncertainty, risk, variability, and evolution." The working group's website is at <https://www.incose.org/incose-member-resources/working-groups/transformational/agile-systems-se>.

The concept of operating in capricious and evolving environments is not new. In an interview with *Business Week*, Apple CEO Steve Jobs said the following:

Some people say, "Give the customers what they want." But that's not my approach. Our job is to figure out what they're going to want before they do. I think Henry Ford once said, "If I'd asked customers what they wanted, they would have told me, 'A faster horse!'" People don't know what they want until you show it to them. That's why I never rely on market research. Our task is to read things that are not yet on the page.

The idea that "people don't know what they want until you show it to them" can also be expressed as "our requirements are ambiguous" or "our requirements are volatile."

The Dilemma of Caprice

Systems engineering and Agile development attempt to resolve this dilemma in opposite ways. The systems engineering approach is to engineer customer and system requirements until no ambiguity exists. The customer and the development team iron out an agreed set of requirements, trace all subsequent work to those requirements, and verify that those requirements are met.

The Agile development approach is to acknowledge that the customer will not provide final validation of the product until they see it. So the development team defines, builds, tests, and demonstrates a two-week sub-product to the customer. If the customer accepts the sub-product, then the team continues down that path, every two weeks. If the customer rejects the sub-product, then the team gathers feedback and tries again, and it is only out two weeks of work (and has a better idea of what the customer really wanted in the first place.)

Agile and Scrum

Agile Manifesto co-author Jeff Sutherland provides an entertaining introduction to the origins and philosophy of agile development in the following TEDx talk: <https://www.youtube.com/watch?v=s4thQcgLCqk>.

In the talk, he describes his experiences as a West Point cadet, a Vietnam War pilot, a medical school professor, and a bank executive. He then explains how these experiences inform his development of Agile software development, particularly the practice of Scrum.

The Scaled Agile Framework

The Scaled Agile Framework (SAFe) is a set of practices and methods to allow an organization to scale the development of its various agile teams into a large and complex system development activity. Many good training and educational resources are at the SAFe website at <https://www.scaledagileframework.com/>. A modified figure from the SAFe website is included below.

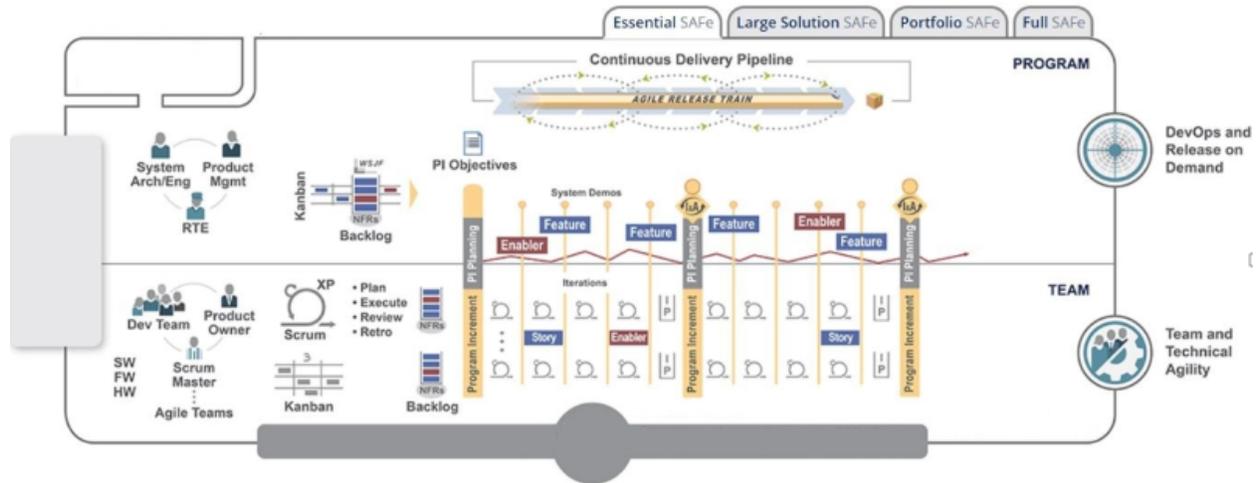


Figure 1: Essential SAFe model

The article at <https://www.playbookhq.co/blog/wsjf-weighted-shortest-job-first> explains “weighted shortest job first” (the “WSJF” in the figure) and contains an example calculation.

The Continuous Delivery Pipeline in the figure relates to the concepts of continuous integration and continuous deployment. Several successful companies have implemented continuous delivery, as described in the article at <https://techbeacon.com/devops/10-companies-killing-it-devops>

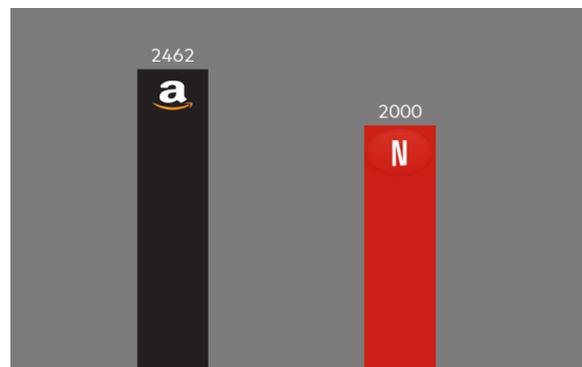


Figure 2: Daily software releases

The graphic shows the purported number of daily software releases to the production environment for both Amazon and Netflix. The data is based on the *TechBeacon* article statements below:

- “Within a year of Amazon's move to AWS, engineers were deploying code every 11.7 seconds, on average.”
- “...today [Netflix] engineers deploy code thousands of times per day.”

After the talk, several participants from Wash. U. and SLU provided positive feedback about the event and expressed hope for more collaborations with INCOSE in the future.

Guest Column – Resourcing your Personal Brand

By: Rob Simons, CSEP

Last quarter we discussed Career and Professional Development (CPD) as an approach for identifying and acquiring the knowledge and talent necessary to succeed in the workplace, especially for early-career systems engineers. The CPD value proposition represents a personal investment in yourself as well as demonstrably improving your Personal Brand. What is a Personal Brand? It is the ongoing and consistent development of yourself, how you represent yourself and how you increase your visibility and build awareness in others of your knowledge and expertise. There are many, many ways to establish a successful Personal Brand. A key element to maintaining your Personal Brand is the establishment and (continually recurring) management of a personal reference repository (PRP).

What is a PRP?

Many successful systems engineers establish and maintain references to help complete immediate or recurring task-oriented work activities. However, a PRP typically contains content with more far reaching impact. For example, spreadsheets for performing analytical computations is generally task-oriented and certainly valuable, but a reference artifact on Data Analysis and Analytics has broader and more far-reaching value. So does having the network to reach out and touch someone with that particular expertise. References (documents and people) and readings that more broadly inform and inject value in your personal brand is the real value of a PRP.

Where to Start

What is important to your Personal Brand? First, establish a repository. This may be as simple as a file folder for helpful and referential documents. Begin with some of our key SE reference documentation such as our INCOSE handbooks and relevant corporate and industry materials. Interested in a particular aspect of SE, such as Requirements? MBSE and/or Agile? Specialty Engineering? Don't forget to consider references for a particular technical domain of interest, like Space systems, Biomedical Systems, or Data Analytics. Seek out reference content to help improve your knowledge. Consider identifying the key authorities on topics of interest, and other relevant sources where information is regularly updated and expanded. If you are relatively junior, consider partnering with a mentor (pragmatic experience is priceless). If you're relatively senior, consider partnering with mentees (who likely bring new and emerging knowledge). Attend conferences, exhibits and networking events. Collaborate with your peers AND with those who represent things that you see as important to improving your Personal Brand. And lastly, engage with your INCOSE chapter and participate in INCOSE MGC activities! ☺

Suggested SE Links

Many thanks to our MGC Treasurer and ESEP, Dr. Lou Pape, who has offered the following set of references (listed below) intended to inform and guide systems engineering practitioners.

Resource Name/Description	Link
Defense Acquisition University (DAU)	https://www.dau.mil/
DAU DAG (Defense Acquisition Guide): SE Best Practices Guide	https://dag.dau.mil/Pages/Default.aspx
MITRE SE Guide	http://www.mitre.org/work/systems_engineering/guide/enterprise_engineering/
NASA SE Handbook 2017	https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20170001761.pdf
Lean for SE (Where lean comes from)	https://www.malotaux.eu/doc.php?id=79
One page architecture descriptions: A3 method	http://doc.utwente.nl/75284/
Overlap of PMP and SE (not perfect, but close to the truth); there is an INCOSE WG coordinating with PM	https://www.pmi.org/learning/library/systems-engineering-project-5857 https://doi.org/10.1002/j.2334-5837.2007.tb02973.x
Gentry Lee, Chief Systems Engineer of Jet Propulsion Lab; 2 one hour videos: “When The Canvas Is Blank,” and “Top 10 Behaviors Of A Systems Engineer”	http://spaceese.spacegrant.org/index.php?page=videos Note: Highly recommended!
Wonderful, short, readable Intro to Systems Engineering! Also highly recommended!	http://dwaynephillips.net/systemsengineering/JustEnoughSystemsEngineering.pdf Note: There’s a link to his website in the book. Click it!
Office of Deputy Assistant Secretary of Defense (ODASD) Systems Engineering System of Systems Engineering Collaborators Information Exchange (SoSECIE) (historical chart decks collected)	http://www.acq.osd.mil/se/outreach/sosecollab.html
FDA discusses benefits versus, and communicating risks (mostly medical devices, but applies to lots of areas)	https://www.fda.gov/media/98657/download https://www.fda.gov/media/81597/download
Admiral Rickover on Practical Engineering, and Engineering Management (e.g., Own your job like you’ll be there forever!)	http://ecolo.org/documents/documents_in_english/Rickover.pdf https://en.wikiquote.org/wiki/Hyman_G._Rickover http://govleaders.org/rickover.htm
MIT Open Courseware Introduction to Systems Engineering (selected video lectures on U-tube) Prof Olivier de Weck	https://ocw.mit.edu/courses/aeronautics-and-astronautics/16-842-fundamentals-of-systems-engineering-fall-2015/ https://www.youtube.com/watch?v=CTVFD44ses

Note: If you would like to submit a candidate guest column for consideration in future newsletters please contact Rob Simons (rob.simons@incose-mgc.org).

Upcoming Events

- INCOSE 29th International Symposium, 20-25 July 2019, Orlando FL (<http://www.incose.org/symp2019>)
- Spirit of STL Airshow and STEM Expo, 7-8 September 2019 Chesterfield, MO (<http://spirit-airshow.com/>)
- INCOSE Western States Regional Conference (WSRC) , 13-16 September 2019, Los Angeles, CA (<https://www.incose.org/wsrc2019>)
- INCOSE Great Lakes Regional Conference (GLRC), 21-25 October 2019, Cleveland, OH (<https://www.incose.org/GLRC13>)



29th Annual **INCOSE**
international symposium

Orlando, FL, USA
July 20 - 25, 2019