Systems and Software Interface Working Group (SaSIWG)

International Workshop

29 January 2024

Our Origin Story….

"Everything is Software"

"Everything is Data" (Data is Software)
SW, Agile, DevOps, MLOps, HCD/Design
Digital Transformation: All Sectors, Socio-Biz-Tech, C-Suite
"Tech" = software or IT

SysE Centric

SysE + PM

Confront gaps

Wicked Problems

SysE as key-stone

The Early Days
- ROI studies and papers

SaSIWG launches
- Close interface gaps
- Find our way in "digital world"

"Breakthrough" approach
- Multi-discipline partnerships
- Engage with more "why" less "what" and "how"

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SaSIWG Purpose and Mission

Our Mission: Increase the relevance of systems engineering in business settings that are software- and data- intensive, enabling the resilience (and anti-fragility) of organizations and the products, systems and services they produce

We do this by
- improving mutual understanding of what each discipline does, and the value provided
- developing work products to address additional knowledge or capabilities for each discipline, how they work together, what they jointly design and build, and how to honor respective accountabilities
- focusing at the interfaces of systems and software engineering and related disciplines, where there are gaps, duplications, conflicts and missed opportunities (missed leverage and synergy) to drive value

where
Interfaces *include but are not limited to organizational, operational, process, project, product & service, technical (physical, logical, data) and human.*
Related disciplines *include but are not limited to digital engineering, data science, human centered design, innovation, and product.*
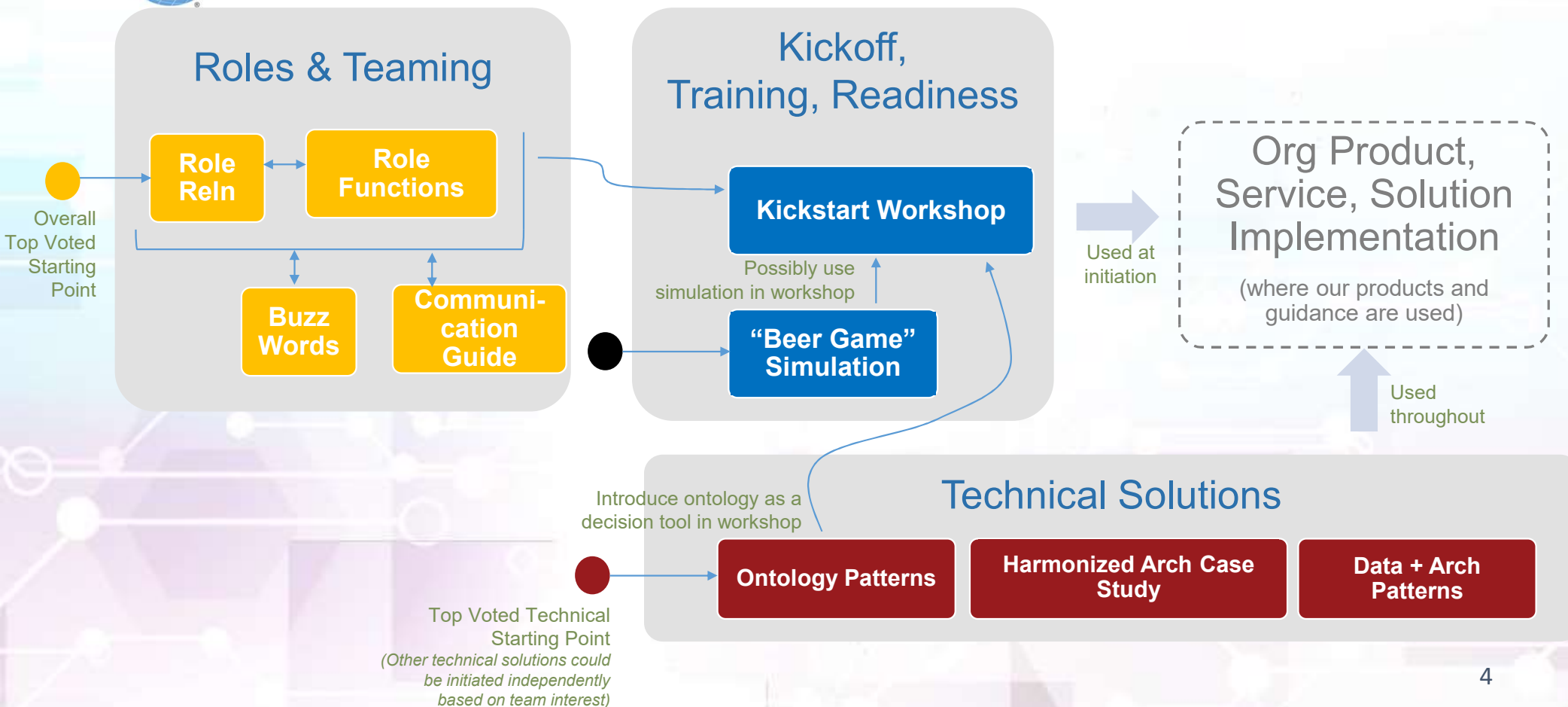
Through our mission, endeavors and work product, we will understand and resolve issues with systems-software interfaces that challenge our ability to engineer today's and tomorrow's systems

The Working Group (WG) was formed in response to the systems-software interface challenge identified as one of the top six needs of INCOSE's Corporate Advisory Board (CAB) members. A primary goal of the WG is to generate practical artifacts to be made available to INCOSE's Corporate Advisory Board (CAB) members.

The CAB has over 100 members, spanning 38+ nations with representation from industry, govt and academia. CAB members employ >200K systems engineers. See https://www.incose.org/incose-member-resources/corporate-advisory-board

INCOSE SaSIWG

SaSIWG Roadmap (Business Relevance ebook completed prior)

Roles & Teaming

Role Reln → **Role Functions**

Buzz Words

Communication Guide

Overall Top Voted Starting Point

Kickoff, Training, Readiness

Kickstart Workshop

Possibly use simulation in workshop

"Beer Game" Simulation

Org Product, Service, Solution Implementation

(where our products and guidance are used)

Used at initiation

Used throughout

Introduce ontology as a decision tool in workshop

Technical Solutions

Ontology Patterns

Harmonized Arch Case Study

Data + Arch Patterns

Top Voted Technical Starting Point
(Other technical solutions could be initiated independently based on team interest)

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Current Initiatives

eBook: Realizing Relevance - The Business Value of Thinking In Systems (when you are building software)
- landing page; direct link to ebook
- Launched May 2023 (Paper and Presentation delivered at IS2022)
- Collecting more stories, and exploring AI-generated stories

Roles Analysis: FireSky - The Story of a Software Team Realizing the Value of Systems Engineering
- Scenario based analysis of major software product change with and without Systems Engineer
- Examined interrelationships between and processes of Business, Product, Dev & Scrum Team, and Systems roles
- Draft Decision Guide for adding Systems Engineering to software and digital transformation initiatives
- Submitted paper to IS2024; SEI Webinar on 1/10/24 and DAU Webinar planned; WG collaborations in progress

Next Roadmap Endeavor

- More on roles & teaming (architecture/technical emphasis, so "tech solutions" may be addressed too!)

SEBOK Articles
- 1 article published: SWEBOK overview
- 1 article in review: SysE and Software Service Products
- 3 articles underway: SysE Relevance in SW Orgs, Sys-SW Interfaces, Current Era Software Dominant Orgs
- 1+ in backlog: SysE-SW-Prod Role Relationships, see master list for other titles in backlog

Book Club: We conduct 2 Book Clubs per year
- Recently wrapped up Donella Meadows' book, and preparing a summary deck for slideshare.net

Our eBook: Realizing Relevance
The Business Value of Thinking In Systems (When You Are Building Software)

Audience: Digital Transformation Execs
- Those who make decisions and have "buying power"
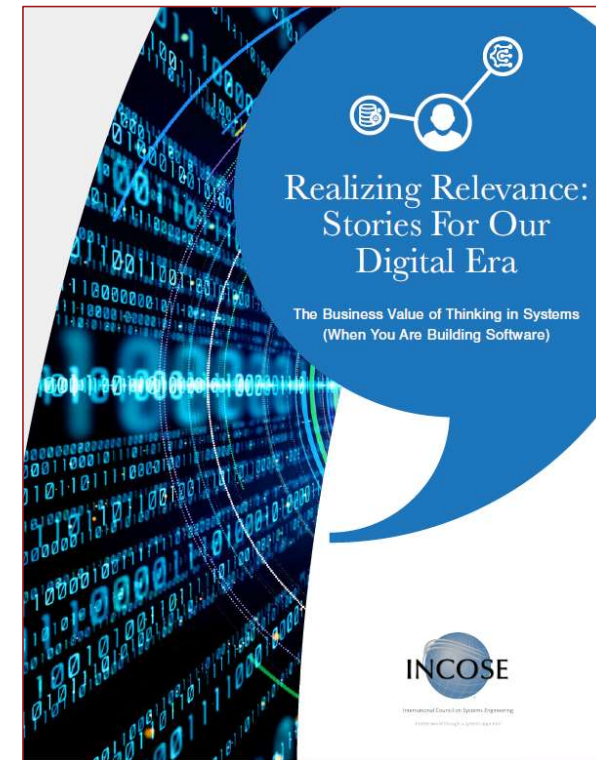
Desired Action: Acquire, Hire, Leverage SysE
- Or at least ask us for more info….

Content
- Business Systems problems in today's software- and data-centric world
- Intro to our stories: purpose and call to action
- Stories: Health, eCommerce, Startups, Aero, Auto
- Planning Worksheet & Quick Refs

eBook Format (link to ebook; link to landing page)
- Book-like reading experience, with embedded video, audio
- Initial Platform: FlippingBook, accessed via INCOSE landin
- Expansion: More stories, more books; multi-path navigation, embedded surveys

Business Relevance: We wrote 6 stories

Where we are often "incognito"

Healthcare
Aligning business & tech to compete with digitally disruptive startups

eCommerce
Fast cycle time for app release, to scale in a competitive environment

Startups
Remedying small team operational challenges that impede mission

Where we are underutilized in the "digital" playing field

Aerospace
Overcoming "glue code" challenges of underbid software contract

Automotive (Autonomous Vehicles)
Resolving overlooked ecoSYSTEM requirements for navigation software to work.

Resolving software disconnects and quality with SYSTEM digital threads for traceability

FireSky, Inc.

A fictional company providing aviation maintenance software to firefighting helicopters

- One Product Manager reporting to a Business Owner

- Three software Scrum Teams

  - Team 1: Aircraft Diagnostics
    (ruggedized laptop at the airfield)

  - Team 2: Dynamic Repair Manual
    (ruggedized laptop at the airfield)

  - Team 3: Aircraft Maintenance Status Information System
    (server at the Emergency Operations Center)

- Hosted at 10 operational locations for past 8+ years

- Requires Operating System Upgrade

https://en.wikipedia.org/wiki/Helicopter_bucket

Decision Guide: When to Add SysE
(FireSky-inspired starting point)

Are there more Changes Than Usual In

Scope Clarity, Size, Complexity

Decision Participation

Workload & Ticket Mgmt

Consideration Questions (no-jargon) listed for each category

Seeking collaboration
- Test and help us evolve the Decision Guide
- Help us create additional scenarios and stories
- Participate in evolving our underlying causal model into a simulation
  - For use in training as well as program kickoffs

"Modest but aligned actions, taken by many passionate people who bring with them insight from all levels and all silos, imbue the network with the power it needs to undertake smart, strategic action." - John P. Kotter, XLR8

SaSIWG Members & Acknowledgements

SaSIWG Active Members, with subteams noted

- Jeannine Siviy, Chair, Everything Is A System LLC, all subteams
- Yann Argotti, Renault, Relevance ebook subteam
- Eileen Arnold, Retired
- Mickael Bouyaud, Thales, FireSky subteam, SEBOK articles
- Judd Cheatwood, General Dynamics
- Leung Chim, Australia Defence Science & Technology Group
- Rita Creel, The Aerospace Corporation, FireSky subteam
- Jeff Gardner, The Aerospace Corporation
- Tom Haggerty, Eaton, FireSky subteam
- Todd Harless, Boeing
- Pat Kirwan, Bosch
- Dorothy McKinney, Retired, webmaster, Relevance ebook subteam

- Chandru Mirchandani, Leidos
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- Bill Scheible, MITRE
- Sarah Sheard, Founding Chair, Retired, Relevance ebook subteam
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- Suzette Johnson, Northrop Grumman, Relevance ebook subteam
- Stephanie White, Retired, Relevance ebook subteam
- John Wood, Naval Information Warfare Center, FireSky subteam

Questions & Discussion