

The Future of Systems Engineering: Realizing the Systems Engineering Vision 2035.

A Systems Community Initiative

Launching the Next Phase

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Agenda.

- FuSE at IW 2023
- Way forward and how to get involved

FuSE at IW 2023 FACTS.

4x4 working
sessions

Active participants
who joined FuSE
sessions: **>500**

26h

worked on FuSE topics

Total
lifetime
invested: **~1,5**

years



With one word - how would you summarize your interaction with FuSE at IW?





**Thank you for
participating in our FuSE
sessions.**

Key Insights Vision & Roadmaps Stream

Topics

- **Get familiar with SE Vision 2035, roadmaps, and actions to be done.**
- **Generate first insights on what is needed to realize the SE Vision 2035**
- **Identify missing elements of the SE Vision 2035**
- **Collect means to keep the SE Vision a living document**

Key Insights

- **The goals stated in the SE Vision 2035 needs to be made measurable.**
- **It is crucial to involve a young and diverse community (within and outside) of INCOSE to realize the SE Vision 2035.**
- **Specific measures to do the above were conceptualized at IW**



Key Insights Foundations Stream

Topics

- Introduced **proposed 1st law** "Conservation of Complexity"
- Ran experiment on complexity designing a transport system to **test our hypotheses**, i.e. effort increases with complexity, etc.
- Shared case study on "technical complexity" using **Jet Engine** evolution, did group breakout work to **understand complexity drivers**
- Shared case study on "organizational complexity" using **SLS and Space X Falcon 9**, did group breakout work to **understand complexity drivers**
- **System Science WG** shared state of their work

Key Insights

- **Generated data** via the complexity **experiment**, need to post process data and **verify or falsify** our initial assumptions
- Experiment was **fun** and **mimics SE reality**, but needs **refinement** to be even more realistic
- Group breakout on technical complexity did **confirm** our basic direction, but also revealed **additional drivers** we need to considered
- Group breakout on org complexity illustrated **need for more discussion** and alignment on how to model org complexity
- Involvement of **SSWG** highlighted what is **already existing** and benefits of **joining forces**



Key Insights Methodologies Stream

Topics

Introduced the stream's purpose, content and goals.

Major disrupters and obstacles for advancing systems engineering methodologies were captured.

Selected disrupters were clarified with solution proposals generated.

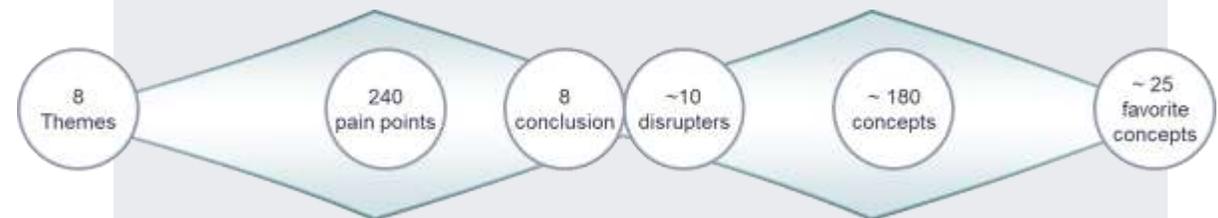
A needs gathering form for solution proposals was shared @ www.incose.org/needs

Key Insights

Disrupters were multi-dimensional and included:

- Lack of training
- Past failures leading to low trust of new items
- Limited resources
- Impeded development of practical SE methods
- Lack of support to change (stagnated culture)

Solution proposals were generated and initially screened. Work remains to form and select the highest potential solutions to focus upon.



Key Insights SE Application Extensions

Topics

Validating the stream's purpose, content and goals

Topics for extending SE applications proposed validated fit for purpose:

- **Smart Cities**
- **Innovation**
- **SE and Asset Management**
- **Grand Challenges**

Key Insights

SE Application Extensions stream purpose and topics have been validated. MoE, risks and activities have been proposed by the participants.

Smart Cities – good foundation exists for reaching out to internal & external groups. Next step is the validation by application together with mayors or alike.

Innovation – an innovation framework based on systems thinking identified to be a useful means to engage with new target groups. Good potential for collaboration between WGs.

Asset Management – Value and interest to cooperate with the Institute of Asset Management in order to align the forces. Identify the respective WGs within INCOSE.

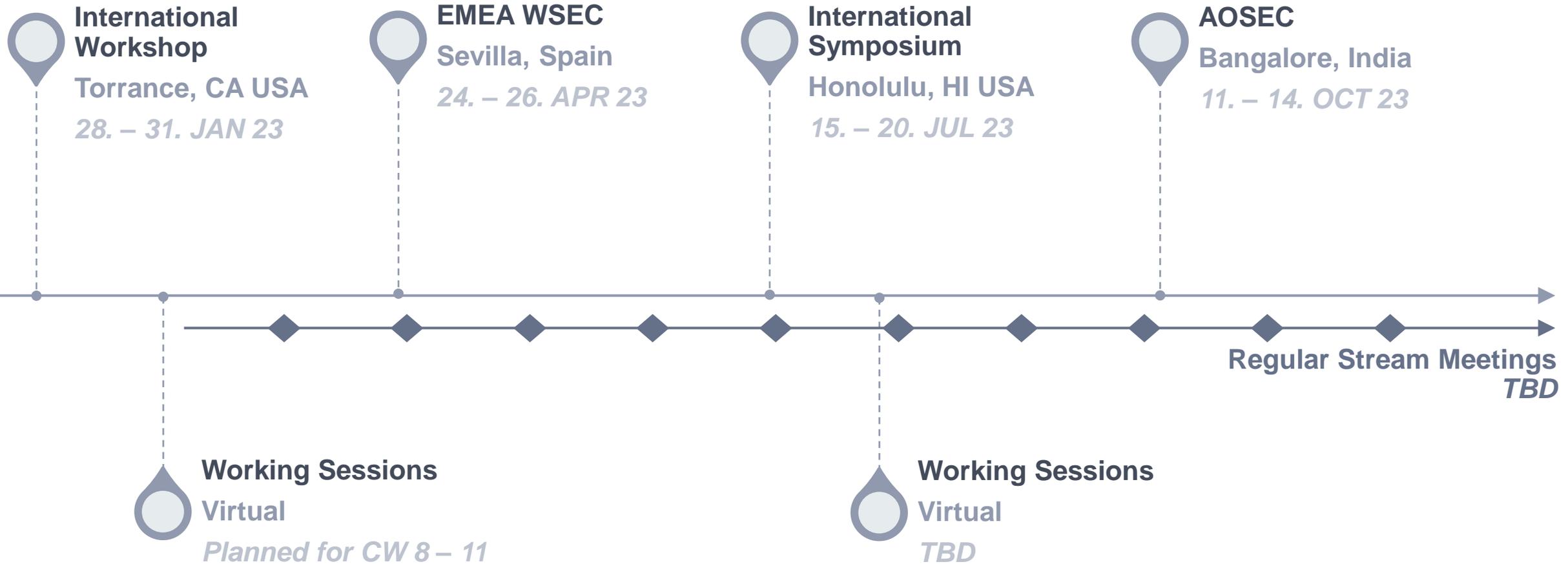
Grand Challenges – Quite some Value Propositions identified that INCOSE could provide – Proposed next step set up a cross-WG initiative and to seek collaboration with complementary organizations with a joint message to target groups.



**You will soon find the
materials from working
sessions on FuSE Yammer.**

FuSE Targeted Events in 2023

Where to engage

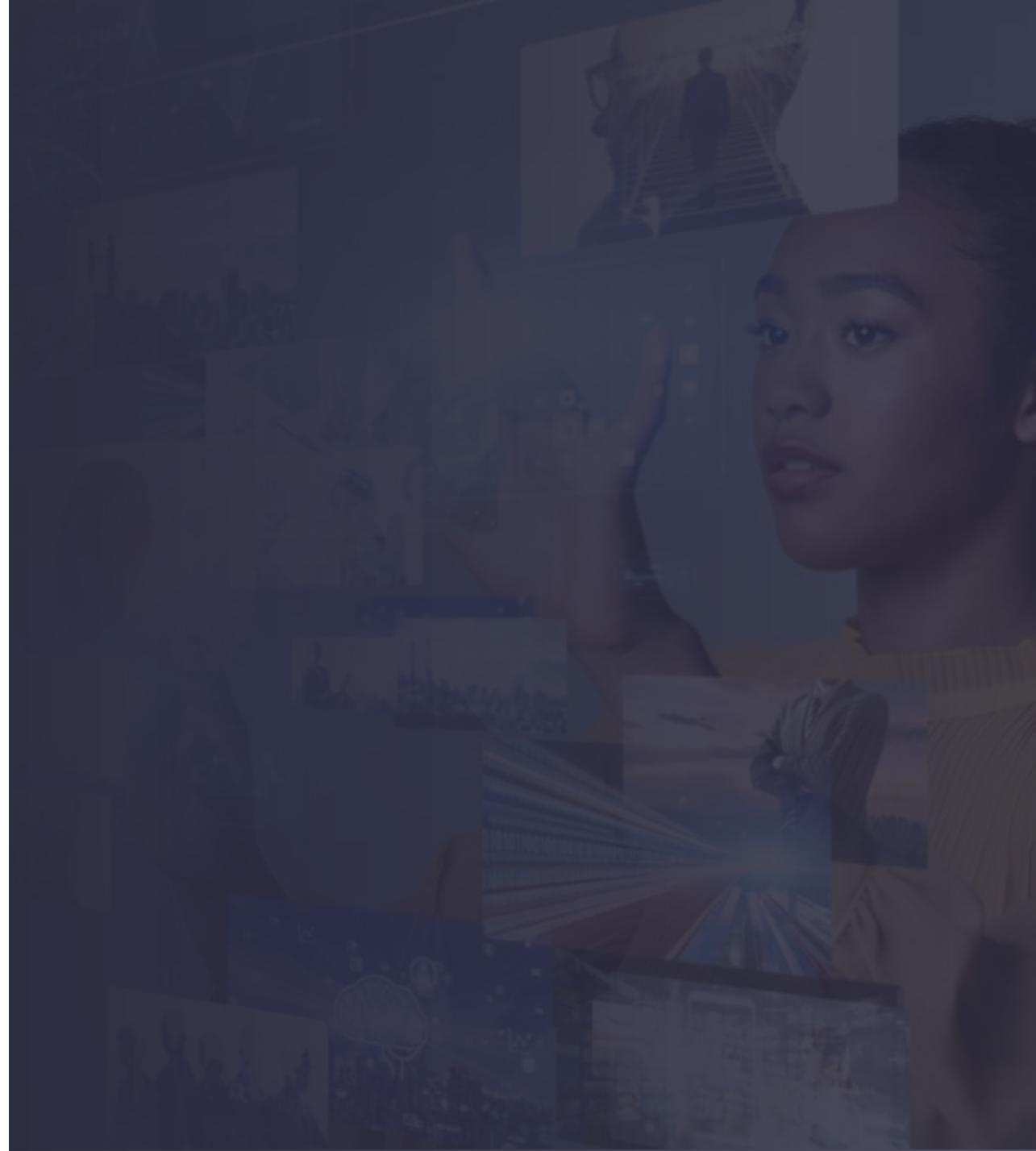


How to get involved

Way forward

- Meet us at today's marketplace
- Participate in our FuSE stream activities
- Join FuSE Yammer Community
- Meet us at the upcoming events
- Visit our Website www.incose.org/fuse
- Get in contact with the stream leads

**Please reach out to us with
your ideas!**



Let's connect.

Or find us on
www.incose.org/fuse



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FUTURE OF SYSTEMS ENGINEERING (FUSE)

Vision: Inspire the global community to realize the SE Vision

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The FuSE Program is organized in 4 streams.



Vision & Roadmaps



Foundations



Methodologies



Application Extensions

