Vision & Roadmaps Work Stream.

EMEA WSEC live session on Thursday 25th 2023

Paul Schreinemakers

Agenda.

- Stream Intro (5 min)
  General overview of the SE Vision & Roadmap stream
- 2023 activities (5 min)
  What is the planning of activities during 2023
- Collect feedback (2x40 min)
  Collect feedback of the in the SE Vision 2025 listed challenges & roadmap topics + roadmap topics
- Inventory of willingness to participate (10 min)
  Who of the participants of this session is willing to participate in the stream's near future activities
- Closure

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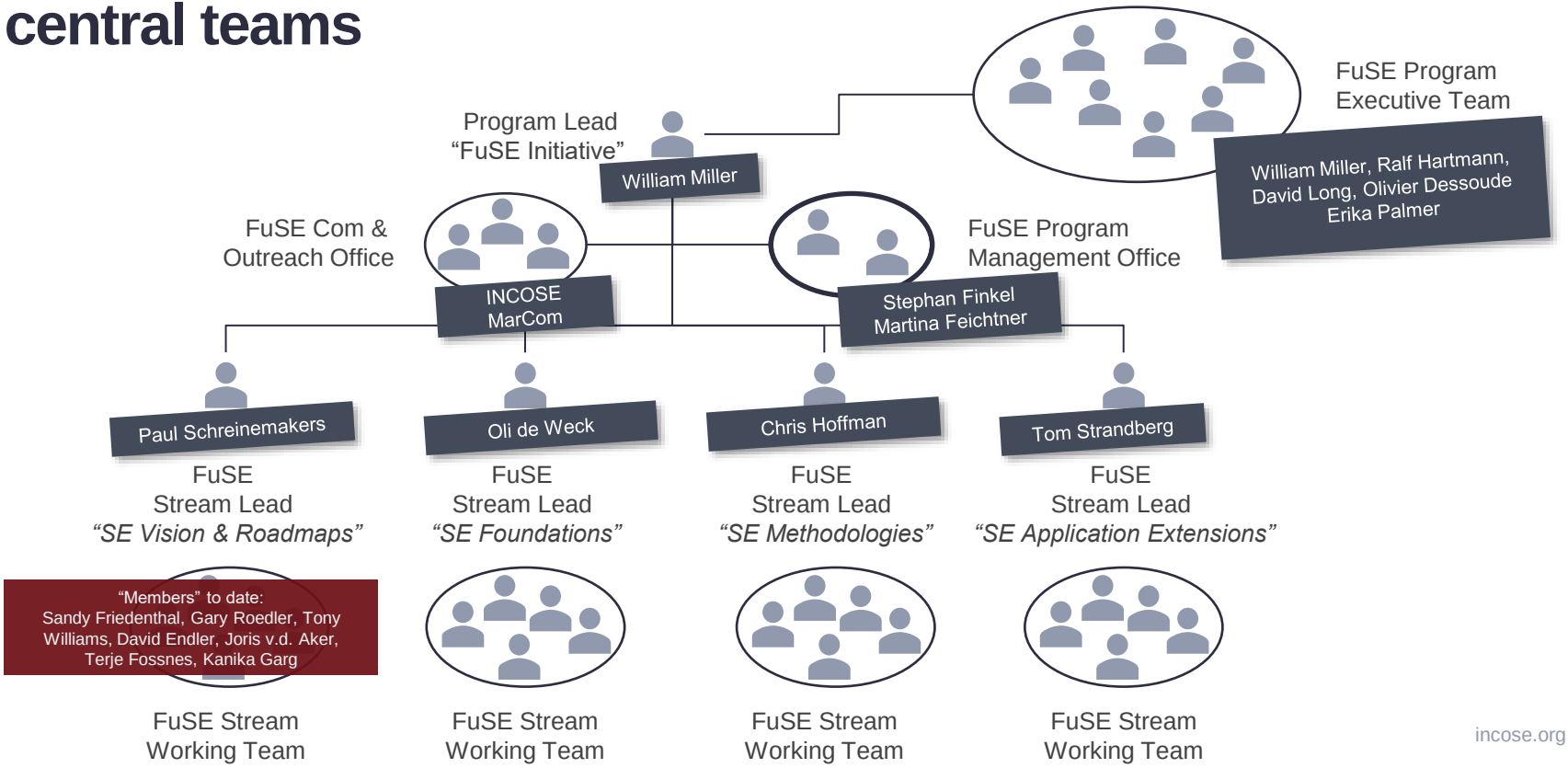
The FuSE program is organized in 4 streams with additional central teams



The V&R Stream’s objectives

- The Systems Engineering Vision and Roadmaps stream continuously refines, evolves, and complements the SE Vision 2035. Furthermore, we create an integrated set of roadmaps across the four interrelated FuSE streams. The concurrently executed streams will guide and influence each other.
- **The 2023 goal is to frame the structural relationships and value models for the roadmaps’ creation.**

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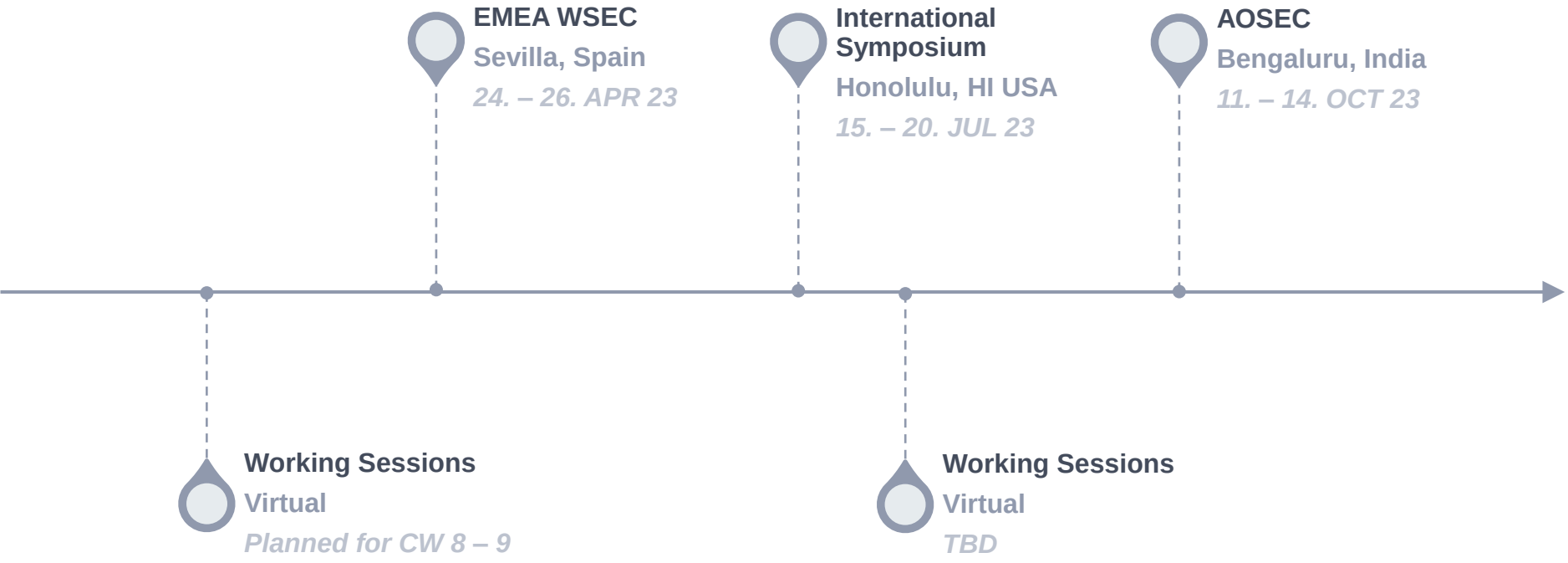
SE V&R interactions & participations in 2023

- Vision supplements
  - Quarterly meetings to evaluate add-on information and white-papers
- Roadmap activities
  - Synchronize plans for the overall and stream specific roadmaps
  - Meet every 1 to 2 months (frequency as needed)
- V&R Stream meetings
  - Quarterly meeting to evaluate white paper submissions
  - Synchronize roadmaps with FuSE and other streams

Targeted Events in 2023

Where to engage



Topics for today's session.

- Stream introduction,
- Share planning for the stream, incl. how people can participate during the IW and beyond
- Collect feedback on the SE Grand Challenges
- Collect feedback on the Roadmap

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Challenges

Feedback on SE Challenges

- 10 min – Group gets acquainted with the grand challenges including recommendations (“Gallery walk” through vision)
- 20 min – Give your reasoning for prioritization of SE Challenges (Post-its on the posters (including reasoning))
- 10 min – Recommendation what to work on first (place dots on topics listed on the posters)

Please do the following actions on the Miro ‘room’ dedicated to this effort:

1. 20 min: Identify missing key-topics in the SE Challenges (by using post-its)

2. 10 min: Prioritize the topics to be addressed by FuSE (by allocating the dots provided to you)

Miro application

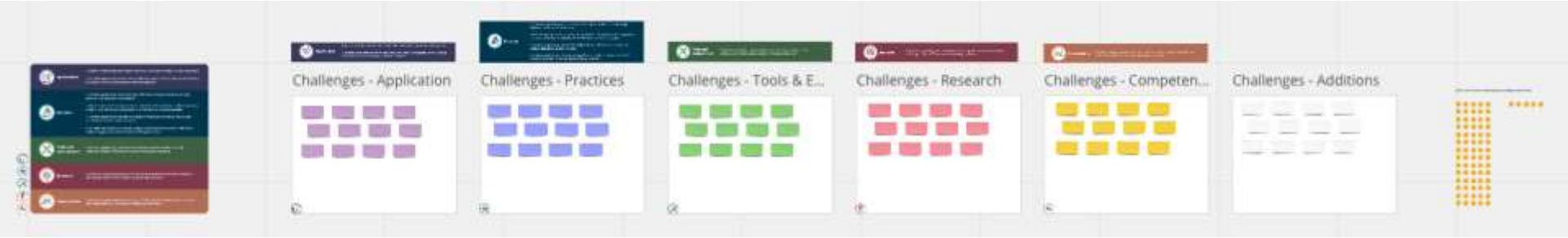

Photo Documentation

Team 1

Photo Documentation

Team 2






Challenges: Overall

Team 1+2

- THE IDIOTIC RESPONSE THE ANTHROPOCENE
- 80% of Programs fail to net TQC
- THE CHALLENGES LOOK LIKE OBJECTIVES - WHAT ARE THE PROBLEMS BEING ADRESSED ?
- VUCA VOLITITY COMPLEXITY UNCERTAN&Y ABIGOUITY [WE ARE NOT PREPARED]
- DIGITAL INFORMATION AGE + AI .
- SYSTEM SCIENCE DOES NOT YET EXIST - WE ARE LIKE ALCHEMISTS.
- Balance between Experience /Training people
  + maturity of tooling
  + maturity of processes
- WE LACK SUFFICIENT SYSTEM SENSIBILITY (RAY ISON..)

Prioritization on category level
Prioritization on item level

Challenges: Application 5

Team 1+2

- APPELLATIONS ARE ASSETS THAT MUST BE ALIENED WITH SE PRACTICES & PROCESSES
- OBESTIVE IS DEAL WITH COMPLEXITY STABLISHING PROCEDURES ONCE THIS IS WORKING IT COUD BE WEED IN WHATEVER TYPE OF PROBLEMS
- Application of SE is not yet visible for the majority of management statements
- Systems engineering contributes innovative solutions to major societal challenges.: yes, SE can, however the reality is something else
- Systems engineering demonstrates value for projects and enterprises of all scales, and applies across an increasing number of domains: yes, if we assume that there is an understanding
- Demonstration with proof is important. Make reports per domain on adaptability and results
- Develop opensource Models for Sustainable Ecosystems (e.g. .Electro-Mobility)
- In Some kinds of Projects/Organisations, the interface / interaction / overlap between technical management disciplines is not straight forward . (PM, SE, ILS, CM,...)
  How to establish good integration?
- APPLICATIONS VIEW MAY BE TOO NARROW
- Develop Demonstrator to socialize the interest of SE in engineering Sustainable world

Prioritization on category level
Prioritization on item level

Challenges: Practices

5

Team 1+2

- Systems engineering anticipates and effectively responds to an increasingly dynamic and uncertain environment: yes
- Model-based systems engineering, integrated with simulation, multi-disciplinary analysis, and immersive visualization environments is standard practice: It there is any in place
- Systems engineering provides the analytic framework to define, realize, and sustain increasingly complex systems: Right till a certain level
- Systems engineering has widely adopted reuse practices such as product-line engineering, patterns, and composable design practices: No Idea

1

- CONTINUOUS DIGITAL MONITORING OF THE ENVIRONMENT TO SUPPORT ECO-INTERVENTION
- Risk: complex Practices are no longer understood Develop levels Of SE practice sets

Prioritization on category level
Prioritization on item level
Prioritization on category level
Prioritization on item level

Challenges: Tools & Environment

3

Team 1+2

- TOOLS & ENVIRONMENT COMES AFTER THE APPLICATION
- THE TOOL IS NOT THE GOAL - IT IS A MEDIUM.
- TOOLS WILL CHANGE AN EVOLVE. LET THE INDUSTRY WORK ON THAT NOT IMPORTANT AT ALL AS OBJECTIVE.
- Tools and Environment stems engineering tools and environments enable seamless, trusted collaboration and interactions as part of the digital ecosystem: Solve the confusion MBSE – MBE - Digital Twin - BIM
- TOOLS ENVIRONMENT TOOLS SHOULD / COULD BE MORE HOLISTIC AND COVER MORE OF THE ENTIRE SE PROCESS .(MANY TOOLS TODAY SEEMS MORE SUB -OPTIMIZED FOR CERTALIU TASKS ONLY)
- SURVIVAL OF THE FITES !
- Tools and Environment stems engineering tools and environments enable seamless, trusted collaboration and interactions as part of the digital ecosystem: It could be
- This applies For all software tools nowadays Stimulate open interface protocols

1

Prioritization on category level
Prioritization on item level

Challenges: Research

6

Team 1+2

- SYSTEMS ARE EVERYWHERE + EVERYTHING
- RESEARCH: SE SHOULD / COULD BE PART OFANY STEM CURRICULA, ANDEARLY, A IT MAY HELPSTUDENTS IN MOST OF THEIRWORK DURINGTHE EDUCATION
- FOCUS ON THINKING RATHER THAN ENGINEERING
- ALL SYSTEMS ARE COMPLEX - OR EANISED INFORMATION. FROM NUCLEONS
- TO SOCIAL SYSTEMS EVERYTHING IS CONNECTED EVERYTHING IS CHOLE EVERYTHING IS A PART OF SOMETHING
- ADD INFORMATION TO A SYSTEM MAKES IT MORE COMPLEX THE ETHCIENCY OF INFORMATION STORAGE IS INDIRECT PROPORTIONAL TO COMPLICATED
- THERE ARE CONCEPTS, THEORIES PRINCIPLES THAT ARE TRULY UNIVERSAL TO EVERYTHING
- (RE)UNIFY SYSTEMS THINKING WITH SE
- RESEARCH INTO DIFFERENT TYPES OF COMPLEXITY- COMPUTER / TECH- SOCIAL- ECOLOGICAL
- Systems engineering practices are based on accepted theoretical foundations and taught as part of the systems engineering curriculum: In some how
- HOW DOES THEORY SUPPORT OUR PRINCIPLES
- Presentation Monday of Sys . Science by Javier, showed the Progress and challenges of sys . science Research.

2

- Garry Comment : from attending Information society of System Science : There are many Sys . Science theories & they are conflicting with each other .

Prioritization on category level
Prioritization on item level

Challenges: Competencies

10

Team 1+2

- SE. EDUCATION IS PARAMOUNT EVERY ENGINEER SHALL HAVE SE KNOWLEDGE FROM THE BEGINING
- COMMON VOCABULARY, COMMON ENVIRONMENT, COMMON SET OF PROCESSES, THESE THREE MUST BE KNOWN AND SHARE ALWAYS
- Part of education : secondary school Problem solving learn to state a problem before jumping to a solution or conclusion
- Competencies needs to be prioritized to enable the future of SE not being so complex
- Focus also on personal development not just theoretical
- SOCIAL ENGINEERING COVID19 GENERATION, LEARNING ENABLER 1
- Motivational System? 1

- Systems engineering education is part of the standard engineering curriculum, and is supported by a continuous learning environment: Maybe

Prioritization on category level
Prioritization on item level

Challenges: Additions

Team 1+2

- ACTIVE CURATION OF PRINCIPLES
- LISTENING TO & LEARNING FROM OTHERS 1
- Digging deeper 1

Prioritization on category level
Prioritization on item level

Roadmap

Elaborate Roadmaps

- 10 min – Group gets acquainted with the Vision Roadmap
- 20 min – Identify additional / modified topics for the roadmap (collection on post-its)
- 10 min – Prioritize roadmap items, to be addressed by FuSE (Identify priorities by allocating 5 Dots each)

Please do the following actions on the Miro ‘room’ dedicated to this effort:

1. 20 min: Identify missing key-topics in the SE Vision Roadmap (by using post-its)

2. 10 min: Prioritize the topics to be addressed by FuSE (by allocating the dots provided to you)

Roadmap: Overall

Team 1+2

- DEMONTRATING VALUE TO SOCIETY, NOT JUST PROJECTS 5
- How to know the major societal challenges ? How to make sure the involvement of all perspectives and cultures in defining challenges? 4
- Extend Systems me Engineering: Practices to organization, processes, governance, ecosystem e.g., leveraging UAF 5
- SE BECOMES PRINCIPLE - BASED 4
- SE AS A POTENTIAL TRANSDISQPLINE 4

Prioritization on category level
Prioritization on item level

Roadmap: Application

Team 1+2

- 2025: Determine societal problems. And how to monitor them .
- ABSTRACT 2 2025 CONCRETE WITH PRAGMATIC CONNECTING PEOPLE
- 2025 Determine current fields / sectors and adaption indicators
- Politics University Organizations “Industry"
- CHANGE BEST PRACTICES TO "APPROPRIATE PRACTICES” ADAPTED TO THE APPLICATION, TASK , AND TAILORED PROCESS NEEDED TO ACCOMPLISH THE PRODUCT (SOFT OR HARD)
- ADD OR , AT LEAST, IDENTIFY APPENDICES TO THE HANDBOOK

Prioritization on category level
Prioritization on item level

Roadmap: Practices

Team 1+2

- A proper & clear plan / approach
- Develop and generate pattern driven data
- CONTINUOUS DIGITAL MONITORING OF THE ENVIRONMENT TO SUPPORT ECO- INTERVENTION 1
- Make new-SE experts validate our ontology and communication material .(do they understand ?)
- CLOSE 5 th Edition of INCOSE HANDBOOK BEFORE 2025
- PUBLISH A "SYSTEMS ENGINEERING (?) “ ONTOLOGY.

Prioritization on category level
Prioritization on item level

Roadmap: Tools & Environment

Team 1+2

- More understanding
- STANDARDIZED LIBRARIES SHOULDUSE AN AGREED BASIS AS AFOUNDATION , E.G. THE
  - INCOSE SE HANDBOOK
  - UN SDG
  - OTHER RREFERENCES WITHIN – MEDICINE – ARCHITECTURE – AUTOMOTIVE – AEROSPACE – etc .
- LANGUAGE AND TERMINOLOGY STANDARIZATION IS A MUST BEFORE PROCEDING ANY FURTHER.

Prioritization on category level
Prioritization on item level

Roadmap: Research

Team 1+2

- Presentation Monday of Sys . Science by Javier showed the Progress and challenges of sys . Science Research .
- TOP- Down APP And:
  - standardizations
  - Laws,
  - Reduction
  - Efficient education
- Bottom-up Approach:
  - Communities
  - Mentoring
  - Self Training
  - Education
- Greek Philosophy: Islamic Philosophy: Chinese Philosophy: International Understanding of System Science
- (RE)UNIFY SYSTEMS THINKING SE
- ESTABLISH PRO BONO FRAMEWORK TO GET OUT THERE AN DO GOOD STUFF - SPREAD THE WISDOM
- Books - HANDBOOK. ARTICLES - SPECIFIC BOOKS RELATED TO SPECIALIST DISCIPLINES
- CREATE ASSETS FOR USE / TRAINING BASED ON THE KNOWLEDGE BASE
- TEST + RE – EVALUATE OUR SYSTEM KNOWLEDGE SUCH AS ISO 15288 + SE HANDBOOK IN THE CONTEXT OF SYSTEM SCIENCE
- ESTABLISH TAILORED ENTRY POINTS + COMMUNICATION + EXPLORATION OF THE KNOWLEDGE BASE
- ESTABLISH PARTNERSHIP WITH EDUCATION + RESEARCH BODIES OTHER SYSTEM ORGANIZATIONS THERE ARE MANY !
- START TO SYSTEMATICALY COLLATE + INTEGRATE KNOWLEGE ABOUT SYSTEMS + ABOUT SYSTEMS PRACTICE
- AGREE THE FRAMEWORK FOR OR ORGANIZING OUR SYSTEM SCIENCE KNOWLEDGE
- Propagate benefits of system Engineering with practical cases. MAKE THEM MORE VISIBLE

Prioritization on category level
Prioritization on item level

Roadmap: Competencies

Team 1+2

- create generic study materials as open source
- Best practices
- Approach all technical universities
- REACH AGREEMENTS / OR FORMAL SUPPORT WITH UNIVERSITIES AND ORGANIZATION (ISO, IEEE.)
- PRACTICAL TRAINING GETS EASIER THAN THEORY MAKE MORE PRACTICE OF SE APPLICATION INENTERPRISES / UNIVERSITIES
- IDENTIFY ALREADY EXISTING " SYSTEMS “ DISCIPLINES BEING TAUGHT AND WHERE .
- ORGANISE THE ISO STANDARDS AS A SYSTEM BASED ON SYSTEM SCIENCE
- CREDABILITY BEING RECOGNISED AS NOT RESTRICTED TO "OLD" VIEW OF ENGINEERING
- ENGAGEMENT ! ENGAGEMENT ! ENGAGEMENT ! - BUT BE CREDIBLE !
- 5 % OF PROBLEMIS TECH. 95% PROBLEM IS PEOPLE
- EVERYONE DOINGSE SHOULD ATLEAST BE ASEP.- COMMON LANGUAGEBASE KNOWLEDGE

Prioritization on category level
Prioritization on item level

This is what we got out of the Vision & Roadmaps Mini-Event

… and this is what we got out of IW2023 & the mini-event









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Are you willing to actively participate?

- The FuSE team and specifically this stream welcomes your involvement in the effort.
- Are you willing to participate?
  Please add your name / e-mail address to fuse@incose.net

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Let's connect.

Or find us on
www.incose.org/fuse

Bill Miller
FuSE Program Lead

e William.Miller@incose.net

Paul Schreinemakers
Stream Lead "SE Vision & Roadmaps"

e paul.schreinemakers@incose.net

Stephan Finkel
PMO Contractor | 3DSE

e Stephan.Finkel@incose.net

Oli de Weck
Stream Lead "SE Foundations"

e deweck@mit.edu

Martina Feichtner
PMO Contractor | 3DSE

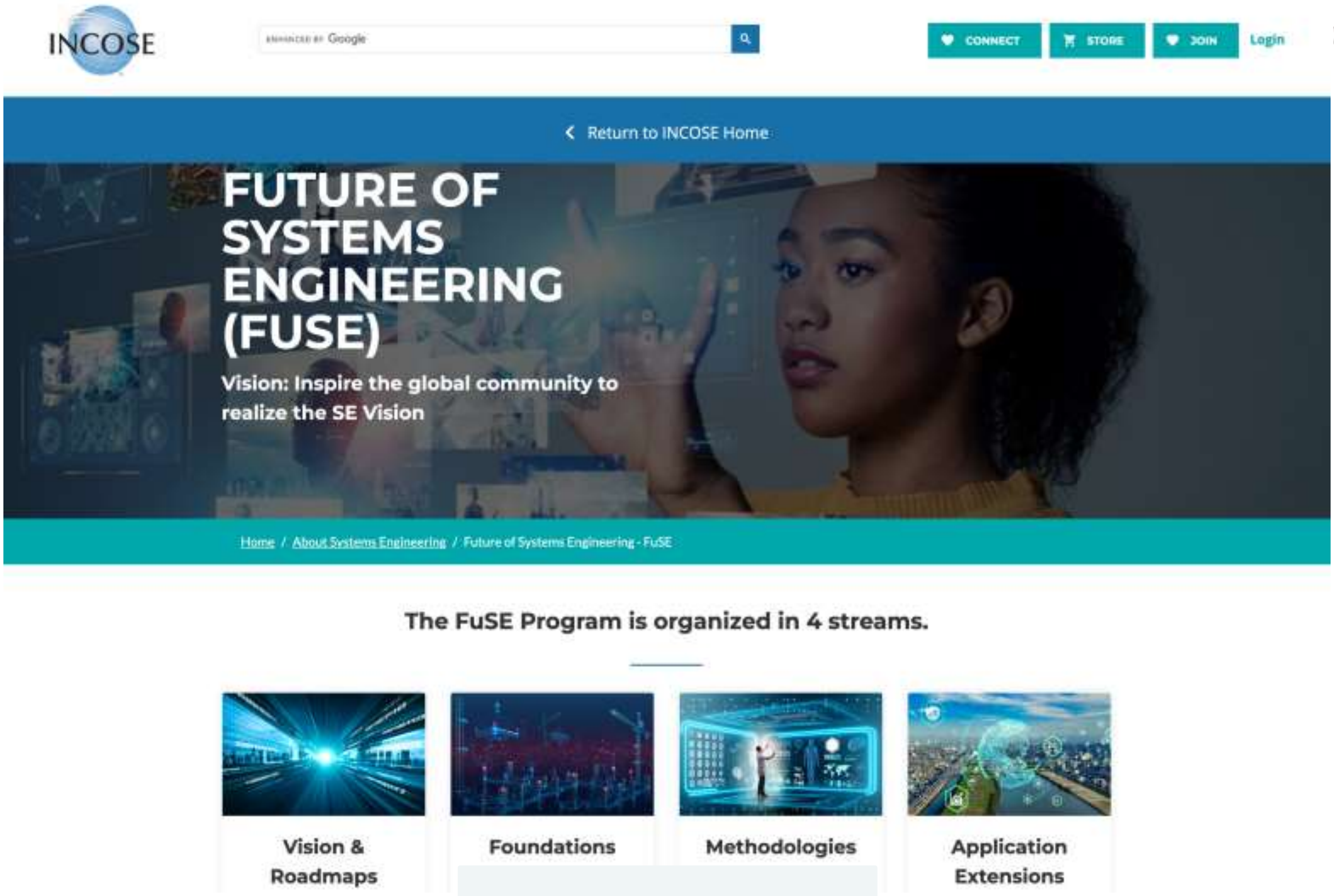
e Martina.Feichtner@incose.net

Chris Hoffman
Stream Lead "SE Methodologies"

e christopher.hoffman@incose.net

Tom Strandberg
Stream Lead "SE Application Extensions"

e tom.strandberg@incose.net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Methodologies
Application Extensions