Technical Baselining.

FuSE Workshop

21 November 2022

Agenda.

Program Management
- Stream teams
- IW workshop (stream descriptions)

Key Topics
Identification and prioritization of FuSE stream topics

Fit for Future
Evaluation of key topics based on SE Vision 2035

Sloth-o-meter

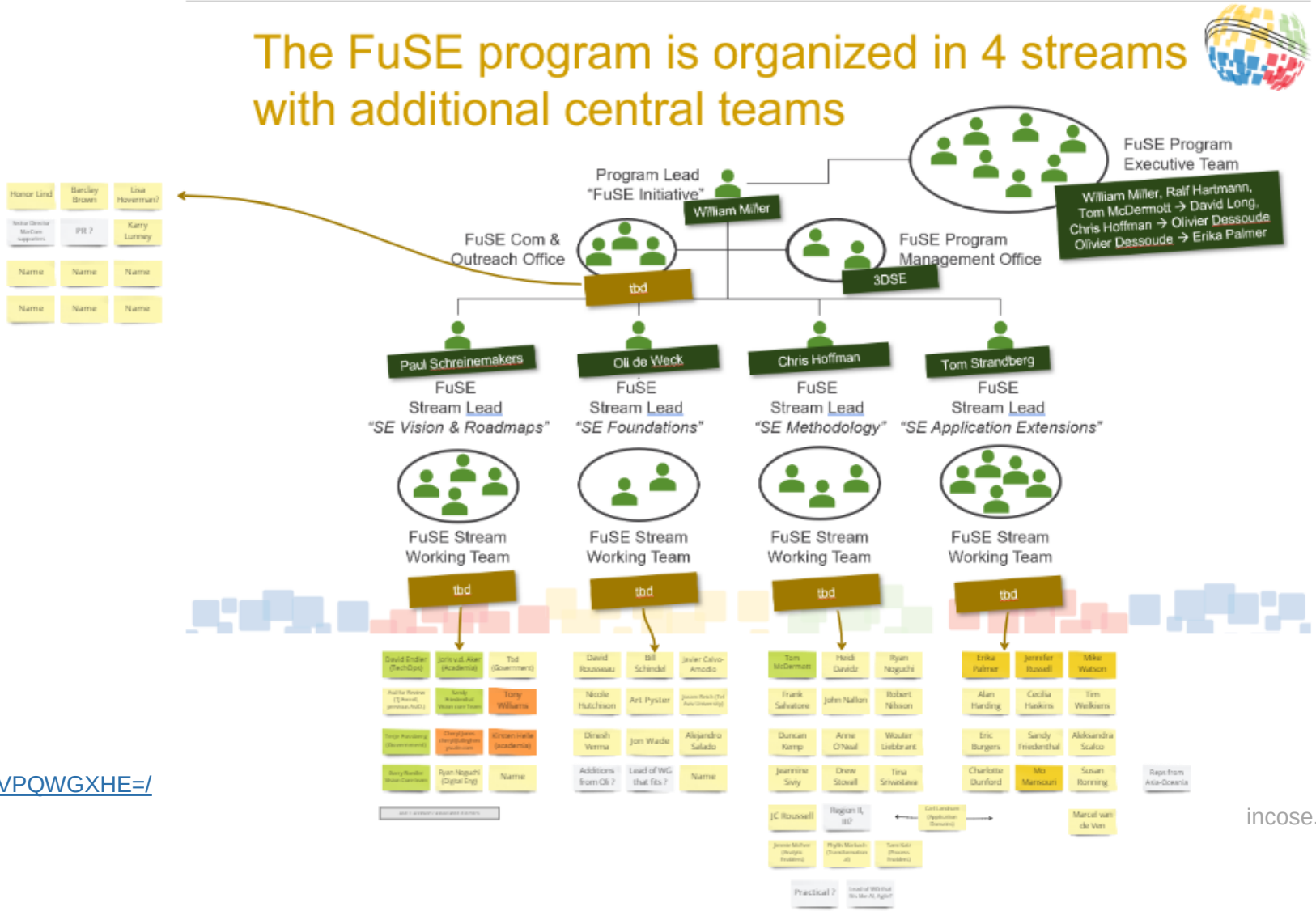
How are you feeling today?

Program Management.

- Stream Teams
- IW Workshop

Stream teams

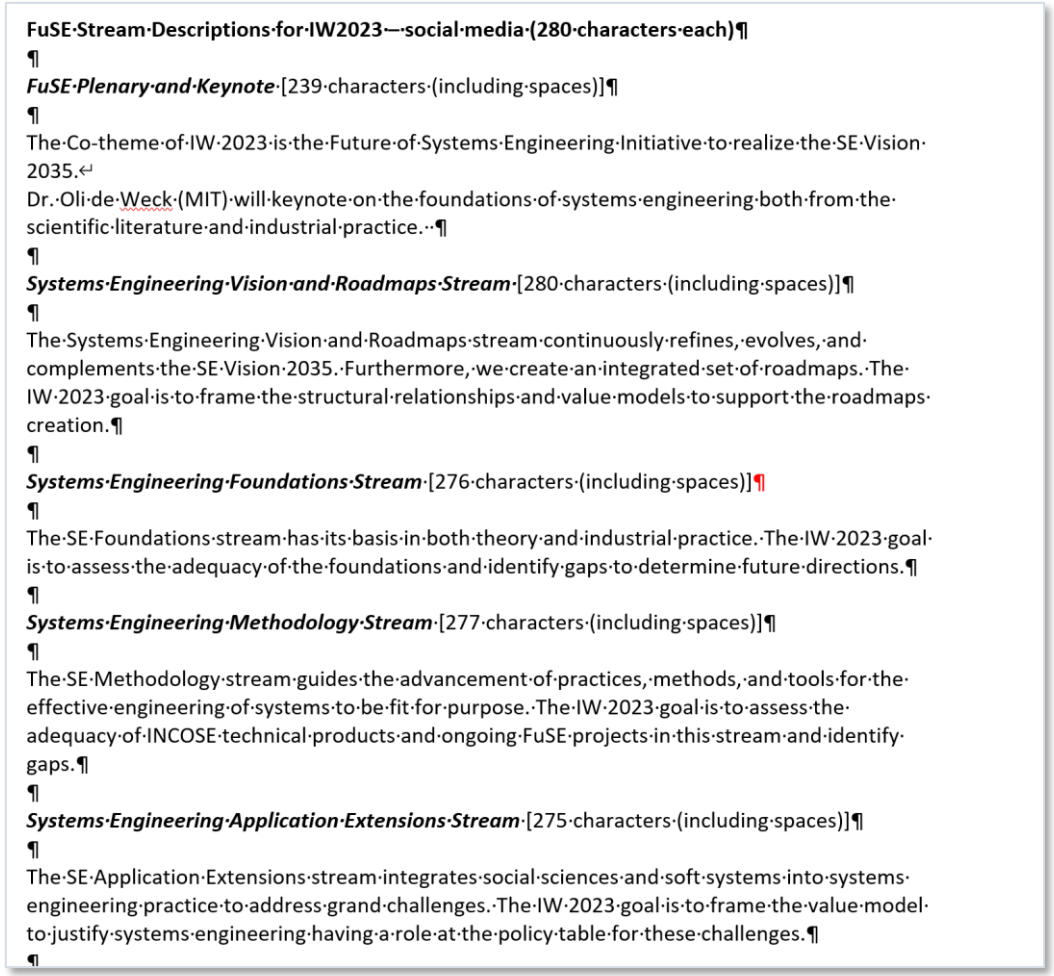
The most recent updates on the team status are tracked on the miro board.



Miro board link: https://miro.com/app/board/uXjVPQWGXHE=/
Password: FuSE-Program

Stream descriptions for IW

The stream descriptions for the IW are finalized in the word document on teams



FuSE·Stream·Descriptions·for·IW2023—·social·media·(280·characters·each)¶

¶

FuSE·Plenary·and·Keynote·[239·characters·(including·spaces)]¶

¶

The·Co-theme·of·IW·2023·is·the·Future·of·Systems·Engineering·Initiative·to·realize·the·SE·Vision·2035.↵

Dr.·Oli·de·Weck·(MIT)·will·keynote·on·the·foundations·of·systems·engineering·both·from·the·scientific·literature·and·industrial·practice.··¶

¶

Systems·Engineering·Vision·and·Roadmaps·Stream·[280·characters·(including·spaces)]¶

¶

The·Systems·Engineering·Vision·and·Roadmaps·stream·continuously·refines,·evolves,·and·complements·the·SE·Vision·2035.·Furthermore,·we·create·an·integrated·set·of·roadmaps.·The·IW·2023·goal·is·to·frame·the·structural·relationships·and·value·models·to·support·the·roadmaps·creation.¶

¶

Systems·Engineering·Foundations·Stream·[276·characters·(including·spaces)]¶

¶

The·SE·Foundations·stream·has·its·basis·in·both·theory·and·industrial·practice.·The·IW·2023·goal·is·to·assess·the·adequacy·of·the·foundations·and·identify·gaps·to·determine·future·directions.¶

¶

Systems·Engineering·Methodology·Stream·[277·characters·(including·spaces)]¶

¶

The·SE·Methodology·stream·guides·the·advancement·of·practices,·methods,·and·tools·for·the·effective·engineering·of·systems·to·be·fit·for·purpose.·The·IW·2023·goal·is·to·assess·the·adequacy·of·INCOSE·technical·products·and·ongoing·FuSE·projects·in·this·stream·and·identify·gaps.¶

¶

Systems·Engineering·Application·Extensions·Stream·[275·characters·(including·spaces)]¶

¶

The·SE·Application·Extensions·stream·integrates·social·sciences·and·soft·systems·into·systems·engineering·practice·to·address·grand·challenges.·The·IW·2023·goal·is·to·frame·the·value·model·to·justify·systems·engineering·having·a·role·at·the·policy·table·for·these·challenges.¶

¶

Find the WORD document here.

Key Topics.

Identification and prioritization of FuSE stream topics

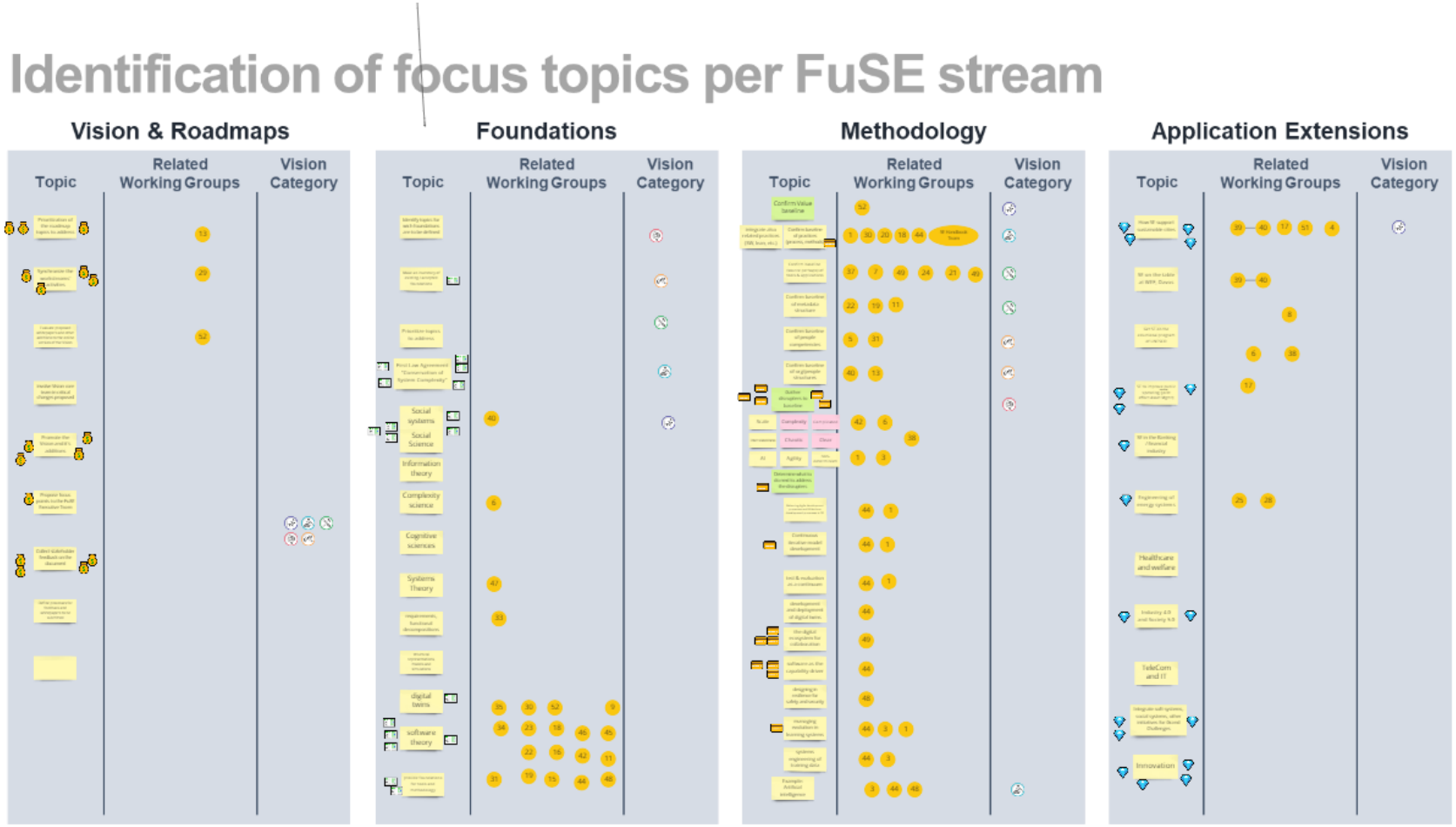
Identification of focus topic.

Brainstorming of key topics for FuSE streams

Foto Documentation

Task:

1. Step 1: Think about key topics for your stream (you can also add topics to another stream if you see some important ones). Take a post it and add it to the first column.
2. Step 2: Have a look at the Working Group and Initiative list. Does any of those seem to fit to your topic?
   Copy the orange number and add it to the second column.
3. Step 3: What vision category fits best to the topic?
   Add the symbol to the third column.



Link to respective miro frame

Brainstorming of key topics for FuSE Streams

Vision & Roadmaps

Prioritization of the roadmap topics to address	3
Synchronize the workstreams' activities	4
Evaluate proposed whitepapers and other additions to the online version of the Vision	0
involve Vision core team in critical changes proposed	0
Promote the Vision and it's additions	4
Propose focus points to the FuSE Executive Team	1
Collect stakeholder feedback on the document	4
Define processes for feedback and whitepapers to be submitted	0

Foundations

Identify topics for wich foundations are to be defined	0
Make an inventory of existing / accepted foundations	1
Prioritize topics to address	0
First Law Agreement "Conservation of System Complexity"	5
Social systems, Social Science	5
Information theory	0
Complexity science	0
Cognitive sciences	0
Systems Theory	0
requirements, functional decompositions	0
structural representations, models and simulations	0
digital twins	1
software theory	4
provide foundations for tools and methodology	2

Methodology

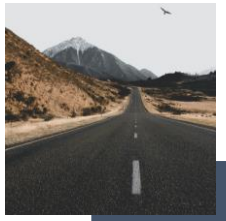
Confirm Value baseline			0
Integrate also related practices (SW, lean, etc.)			0
Confirm baseline of practices (process, methods)			1
Confirm baseline (source perhaps) of tools & applications			0
Confirm baseline of metadata structure			0
Confirm baseline of people competencies			0
Confirm baseline of org/people structures			0
Gather disrupters to baseline			5
Scale	*Complexity*	*Complicated*	0
Interrelated-ness	*Chaotic*	*Clear*	0
AI	Agility	Non-determinism	0
Determine what to do next to address the disrupters			1
Balancing Agile development processes and Milestone development processes in SE			0
Continuous iterative model development			1
test & evaluation as a continuum			0
development and deployment of digital twins			0
the digital ecosystem for collaboration			3
software as the capability driver			3
designing in resilience for safety and security			0
managing evolution in learning systems			1
systems engineering of training data			0

Application Extensions

How SE support sustainable cities	4
SE on the table at WEF, Davos	0
Get SE on the eductional program of UNESCO	0
SE to improve public spending (joint effort Asset Mgmt)	3
SE in the Banking / financial industry	1
Engineering of energy systems	1
Healthcare and welfare	0
Industry 4.0 and Society 5.0	2
TeleCom and IT	0
Integrate soft-systems, social systems, other initiatives for Grand Challenges	3
Innovation	4

Focus topics for FuSE stream

Subjective prioritization based on investments

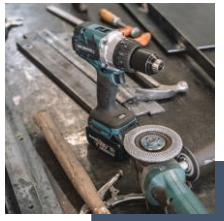


Vision & Roadmaps

- Synchronize the workstreams' activities (4 🇪🇺)
- Promote the Vision and its additions (4 🇪🇺)
- Collect stakeholder feedback on the document (4 🇪🇺)
- Prioritization of the roadmap topics to address (3 🇪🇺)

Foundations

- First Law Agreement "Conservation of System Complexity“ (5 🇪🇺)
- Social systems / social science (5 🇪🇺)
- Software theory (4 🇪🇺)
- Provide foundations for Tools and Methodology (2 🇪🇺)



Methodology

- Gather disrupters to baseline (5 🇪🇺)
- The digital ecosystem for collaboration (3 🇪🇺)
- Software as the capability driver (3 🇪🇺)

Application Extensions

- How SE support sustainable cities (4 🇪🇺)
- Innovation (4 🇪🇺)
- SE to improve public spending (joint effort Asset Mgmt) (3 🇪🇺)
- Integrate soft-systems, social systems, other initiatives for Grand Challenges (3 🇪🇺)
- Industry 4.0 and Society 5.0 (2 🇪🇺)

(Initial) Working Group allocation to stream topics.

Initial working group allocation to FuSE topics

Vision & Roadmaps

Working Group Allocation to Stream Topics
Vision & Roadmaps

	13 Enterprise Systems	29 Process Improvement	52 Value Proposition Initiative
Prioritization of the roadmap topics to address	x		
Synchronize the workstreams' activities		x	
Evaluate proposed whitepapers and other additions to the online version of the Vision			x
involve Vision core team in critical changes proposed			
Promote the Vision and it's additions			
Propose focus points to the FuSE Executive Team			
Collect stakeholder feedback on the document			
Define processes for feedback and whitepapers to be submitted			

See also XLS document

Initial working group allocation to FuSE topics

Foundations

Working Group Allocation to Stream Topics
Foundations

	6 Complex Systems	9 Decision Analysis	11 Digital Engineering Information Exchange	15 Human Systems Integration	16 Information Communications Technology	18 Integration, Verification & Validation	19 Knowledge Management	22 MBSE Patterns	23 Measurement	30 Product Line Engineering	31 Professional Competencies & Soft Skills	33 Requirements	34 Resilient Systems	35 Risk Management	40 Social Systems	42 System of Systems	44 Systems and Software Interface	45 Systems Engineering and Lawmaking	46 Systems Engineering Quality Management (SEQM)	47 Systems Science	48 Systems Security Engineering	52 Value Proposition Initiative
Identify topics for wich foundations are to be defined																						
Make an inventory of existing / accepted foundations																						
Prioritize topics to address																						
First Law Agreement "Conservation of System Complexity"																						
Social systems, Social Science															x							
Information theory																						
Complexity science	x																					
Cognitive sciences																						
Systems Theory																				x		
requirements, functional decompositions												x										
structural representations, models and simulations																						
digital twins																						
software theory																						
provide foundations for tools and methodology																						
Not yet allocated but relevant:		x	x	x	x	x	x	x	x	x	x		x	x		x	x	x	x		x	x

See also XLS document

Initial working group allocation to FuSE topics

Methodology

Working Group Allocation to Stream Topics Methodology	1	3	5	6	7	11	13	18	19	20	21	22	24	30	31	37	38	40	42	44	48	49	52	-
	Agile Systems and Systems Engineering	Artificial Intelligence Systems	Competency	Complex Systems	Configuration Management	Digital Engineering Information Exchange	Enterprise Systems	Integration, Verification & Validation	Knowledge Management	Lean Systems Engineering	MBSE Initiative	MBSE Patterns	NAFEMS-INCOSE Systems Modeling & Simulation	Product Line Engineering	Professional Competencies & Soft Skills	SE Tools Database	Small Business Systems Engineering	Social Systems	System of Systems	Systems and Software Interface	Systems Security Engineering	Tools Integration & Model Lifecycle Management	Value Proposition Initiative	SE Handbook Team
Confirm Value baseline																							x	
Integrate also related practices (SW, lean, etc.)	x							x		x				x						x				x
Confirm baseline of practices (process, methods)					x						x		x			x						x		
Confirm baseline (source perhaps) of tools & applications					x						x		x			x						x		
Confirm baseline of metadata structure						x			x			x												
Confirm baseline of people competencies			x												x									
Confirm baseline of org/people structures							x											x						
Gather disrupters to baseline																								
Scale				x															x					
Complexity				x															x					
Complicated				x															x					
Interrelatedness																	x							
Chaotic																	x							
Clear																	x							
AI	x	x																						
Agility	x	x																						
non-determinism	x	x																						
Determine what to do next to address the disrupters																								
Balancing Agile development processes and Milestone development processes in SE	x																			x				
Continuous iterative model development	x																			x				
test & evaluation as a continuum	x																			x				
development and deployment of digital twins																				x				
the digital ecosystem for collaboration																						x		
software as the capability driver																				x				
designing in resilience for safety and security																					x			
managing evolution in learning systems	x	x																		x				
systems engineering of training data		x																		x				

See also XLS document

Initial working group allocation to FuSE topics

Application Extensions

Working Group Allocation to Stream Topics Vision & Roadmaps	Automotive 4	Complex Systems 6	Critical Infrastructure Protection and Recovery 8	Infrastructure 17	Natural Systems 25	Power & Energy Systems 28	Small Business Systems Engineering 38	Smart Cities Initiative 39	Social Systems 40	Transportation 51
How SE support sustainable cities	x			x				x	x	x
SE on the table at WEF, Davos								x	x	
Get SE on the eductional program of UNESCO		x	x				x			
SE to improve public spending (joint effort Asset Mgmt)		x		x			x			
SE in the Banking / financial industry										
Engineering of energy systems					x	x				
Healthcare and welfare										
Industry 4.0 and Society 5.0										
TeleCom and IT										
Integrate soft-systems, social systems, other initiatives for Grand Challenges										
Innovation										

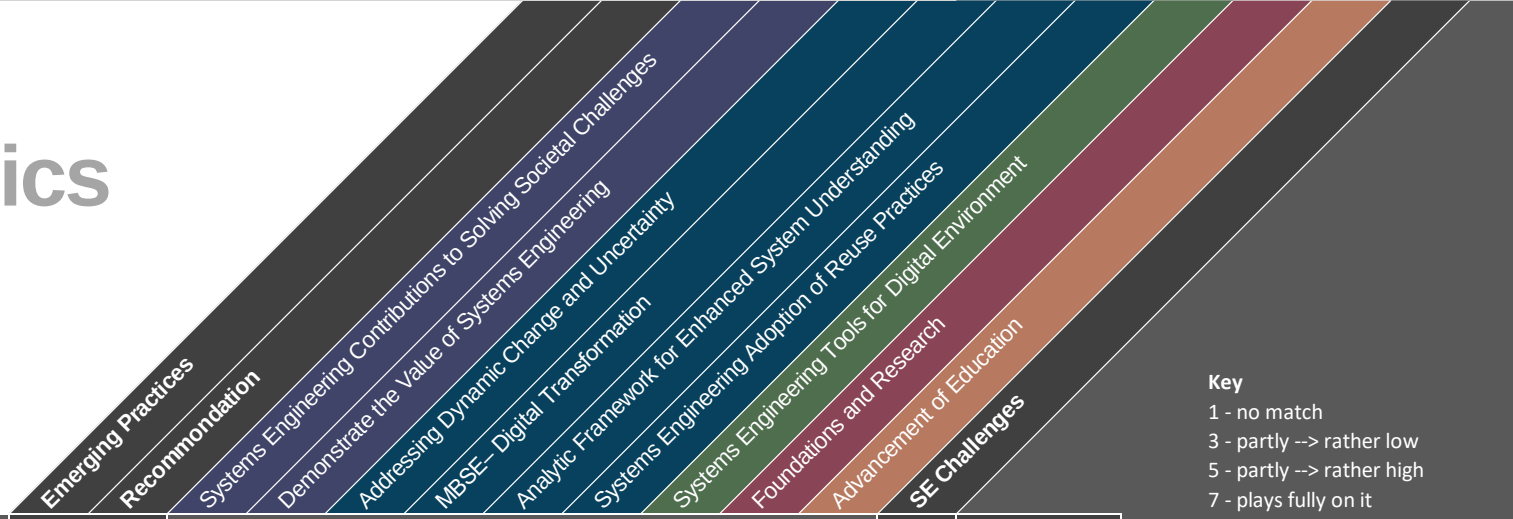
See also XLS document

Fit for FuSE.

Detailing and status quo of identified key topics

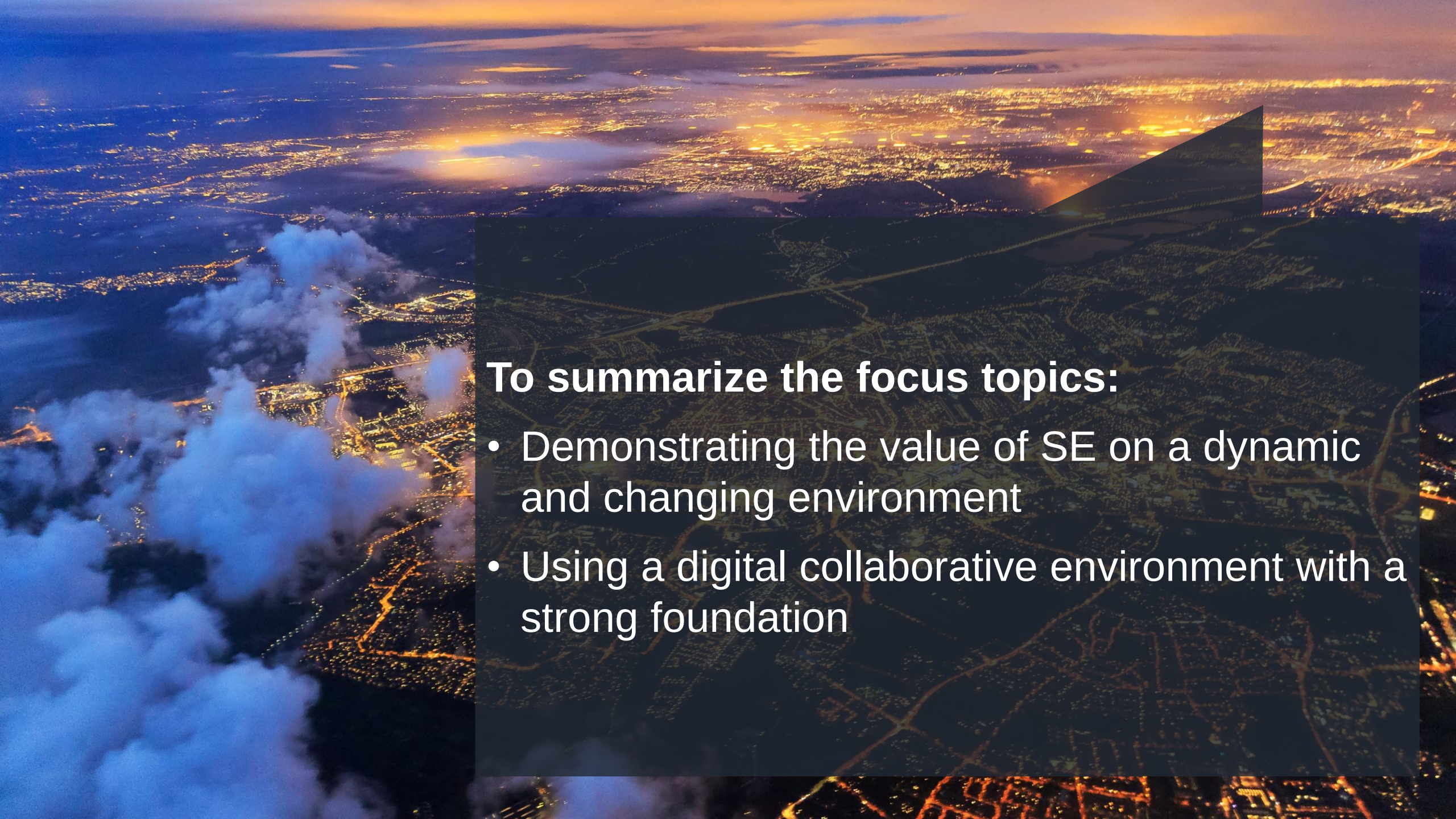
Strategic fit of focus topics

Evaluation based on criteria from SE Vision 2035



Key
1 - no match
3 - partly --> rather low
5 - partly --> rather high
7 - plays fully on it

Topic	Invest	Stream	Recommondations									Strategic fit
Synchronize the workstreams' activities	4	Vision & Raodmaps										0
Promote the Vision and it's additions	4	Vision & Raodmaps	5	5	7	7	3	7	5	7	7	53
Collect stakeholder feedback on the document	4	Vision & Raodmaps	5	7	5	5	5	5	5	5	5	47
Prioritization of the roadmap topics to address	3	Vision & Raodmaps	7	7	5	5	5	5	5	5	5	49
First Law Agreement "Conservation of System Complexity"	5	Foundations	3	5	7	5	7	5	5	7	5	49
Social Systems / Social Science	5	Foundations	7	5	3	5	5	3	3	5	5	41
Software theory	4	Foundations	3	7	7	7	5	7	7	5	7	55
provide foundations for tools and methodology	2	Foundations	3	7	5	5	7	5	7	7	5	51
Gather disrupters to baseline	5	Methodology	3	5	7	7	5	5	5	7	5	49
the digital ecosystem for collaboration	3	Methodology	5	7	7	7	5	5	7	5	5	53
software as the capability driver	3	Methodology	5	7	7	7	7	5	7	5	5	55
How SE support sustainable cities	4	Application Extensions	7	7	5	5	7	5	5	5	5	51
Innovation	4	Application Extensions	5	7	7	5	5	5	5	7	5	51
SE to improve public spending (joint effort Asset Mgmt)	3	Application Extensions	7	7	5	5	5	3	7	5	5	49
Integrate soft-systems, social systems, other initiatives for Grand Challenges	3	Application Extensions	7	7	7	5	7	5	3	7	7	55
Industry 4.0 and Society 5.0	2	Application Extensions	7	5	7	7	5	5	7	5	5	53
Coverage			79	95	91	87	83	75	83	87	81	



To summarize the focus topics:

- Demonstrating the value of SE on a dynamic and changing environment
- Using a digital collaborative environment with a strong foundation

Outlook & next steps.

Next steps: Individual meetings with streams

Let's connect.

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